WHITE SANDS MISSILE RANGE AVIAN PROTECTION PLAN

Submitted to:

Original Prepared February 2014 by:

EDM International, Inc.

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Fort Collins, Colorado 80525-3479 USA

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ACRONYMS AND ABBREVIATIONS

ABS	acrylonitrile butadiene styrene
AFD	Avian Flight Diverter
APLIC	Avian Power Line Interaction Committee
APP	Avian Protection Plan
BFD	Bird Flight Diverter
BGEPA	Bald and Golden Eagle Protection Act
BISON-M	Biota Information System of New Mexico
BLM	Bureau of Land Management
BMPs	Best Management Practices
CFR	Code of Federal Regulations
DGF	Department of Game and Fish
DOD	Department of Defense
DPW	Department of Public Works (WSMR)
EDM	EDM International, Inc.
EO	Executive Order
EPA	U.S. Environmental Protection Agency
EPRI	Electric Power Research Institute
ESA	Endangered Species Act
EWT	Endangered Wildlife Trust
FR	Federal Register
GAP	Gap Analysis Project
GIS	Geographic Information System
HDPE	high-density polyethylene
IEEE	Institute of Electrical and Electronics Engineers
ILE	Institution of Lighting Engineers
INCRMP	Integrated Natural and Cultural Resource Management Plan
INRMP	Integrated Natural Resource Management Plan
IVM	Integrated Vegetation Management
kV	kilovolt
MBTA	Migratory Bird Treaty Act
MOU	Memorandum of Understanding
mph	miles per hour
NESC	National Electrical Safety Code
NMACP	New Mexico Avian Conservation Partners
NMNHP	New Mexico Natural Heritage Program
NSP	Northern States Power
OHN	overhead neutral wire
OHS	overhead static wire
PVC	polyvinyl chloride

ACRONYMS AND ABBREVIATIONS, continued

ROW	right-of-way
ROWs	rights-of-way
RR	Range Road
SFD	Swan Flight Diverter
SVD	Spiral Vibration Damper
T/E	threatened or endangered
U.S.	United States
USFS	U.S. Forest Service
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
UV	ultraviolet
WCA	Wildlife Conservation Act
WSMR	White Sands Missile Range
WSNM	White Sands National Monument

EXECUTIVE SUMMARY

This Avian Protection Plan was written to address an Army Environmental Performance Assessment System (EPAS) Class 1 Negative Finding at White Sands Missile Range (WSMR) in 2010. The finding stated that "Installation infrastructure is not managed or a plan in place and implemented to avoid non-compliance with the Migratory Bird Treaty Act and Bald and Golden Eagle Protection Act resulting from bird powerline electrocutions." The writing of this APP was also encouraged by the U.S. Fish and Wildlife Service Office of Law Enforcement to significantly reduce or eliminate bird electrocutions at WSMR.

The electrical power grid at WSMR is extensive and complex, with hundreds of miles of distribution lines, thousands of poles, and a wide variety of configurations. Currently, WSMR maintains and operates a significant portion of the electrical grid servicing the facility. Three rural electric cooperatives also service lines within WSMR. WSMR also has an extensive population of birds-of-prey which, due to their large size, are most at risk to electrocution. Birds of prey will use power poles for roosting, foraging, and nesting, which has resulted in multiple electrocutions and power outages at WSMR.

This plan addresses 12 key elements described in Chapter 1.1. A partial survey of power lines at WSMR was completed, and results are included in Appendix J. Each pole or area was ranked according to hazard and given a retrofit Priority 1-4, with the most hazardous poles ranked Priority 1. State of the art methods for retrofitting poles are described in detail in Chapters 8.0 through 15.0, with an Implementation Schedule (Chapter 15.6) outlining a 15 year period to implement this plan, subject to available funding. WSMR is also carrying out golden eagle surveys and monitoring to determine areas where eagles are most likely to be electrocuted. This work will help to further prioritize lines to be addressed.

With implementation of this Avian Protection Plan, in conjunction with additional eagle surveys and monitoring, WSMR will make significant progress in reducing bird injuries and mortalities on the electrical power grid, and will be accomplishing corrective actions to rectify the 2010 EPAS Negative Finding.

1.0 INTRODUCTION AND POLICIES

1.1 Introduction

The White Sands Missile Range (WSMR), the largest military installation in the U.S., is located in south central New Mexico (Figure 1-1) and covers nearly 3,200 square miles in parts of five counties. WSMR's primary mission is to provide the U.S. Army, Navy, Air Force, Department of Defense (DOD), and other entities with high quality services for experimentation, test, research, assessment, development, and training.

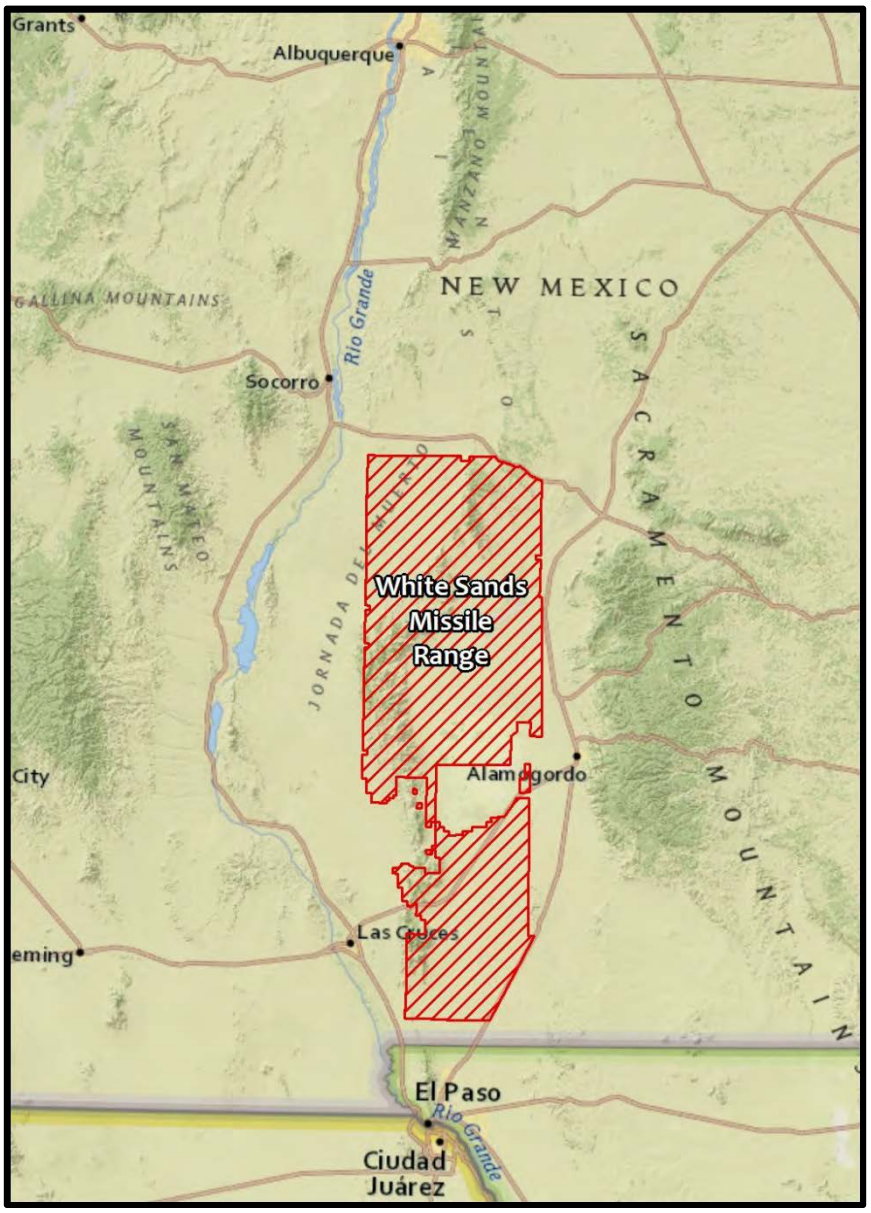


Figure 1-1. WSMR is located in south-central New Mexico.

The electrical power grid at WSMR is extensive and complex, with hundreds of miles of distribution lines, thousands of poles, and a wide variety of configurations. The majority of the poles and lines are mapped in the WSMR Geographic Information System (GIS). Transmission voltage comprises a minor component of the WSMR power grid system.

Currently, WSMR maintains and operates a significant portion of the electrical grid servicing the facility. Three rural electric cooperatives also service lines within WSMR, including Socorro Electric Cooperative (northwest WSMR), Otero County Electric Cooperative (northeast), and Sierra Electric Cooperative (central-west).

WSMR works proactively to protect avian species on its electrical system. In support of this objective, WSMR initiated this Avian Protection Plan (APP) to minimize electrocution risks and collision hazards for birds on its system and to develop a comprehensive nest management program.

In 2005, the Avian Power Line Interaction Committee (APLIC) and U.S. Fish and Wildlife Service (USFWS) developed *Avian Protection Plan Guidelines* to assist entities in creating an APP that will best fit their needs while furthering the conservation of avian species. An APP is a system-specific document that delineates a program designed to reduce the avian risks resulting from avian interactions with electric facilities (APLIC and USFWS 2005).

As part of the APP guidelines, APLIC and USFWS (2005) outlined 12 key elements that provide a basic framework for an APP. Although not all of these elements are applicable to every APP, based on specific variables, they represent an overview of elements that should be considered for inclusion in an APP. The principles presented in these guidelines were developed to allow entities the flexibility to tailor an APP that will best fit their needs while furthering the conservation of avian species and benefitting from improved regulatory compliance, reliability, service, and long-term cost savings.

The WSMR APP process encompasses all 12 of these key elements recommended by APLIC and USFWS (2005) in the *Avian Protection Plan Guidelines*, which include:

1. Facility Policy
2. Training
3. Permit Compliance
4. Construction Design Standards
5. Nest Management
6. Avian Reporting System
7. Risk Assessment Methodology
8. Mortality Reduction Measures
9. Avian Enhancement Options
10. Quality Control
11. Public Awareness
12. Key Resources

Table 1-1 outlines where in this document these key elements are discussed. Based on these key elements, both processes and actions are integral to developing a defensible APP and effective program to reduce avian interactions with power lines.

Table 1-1. 12 key APP elements reference guide.

APLIC and USFWS 2005 APP Guidelines Component	APP Section
Department of Defense Environmental & Avian Protection Policy	Section 1.2 Chapter 6
Training	Sections 16.1, 16.2 Appendices G, L
Permit Compliance	Chapters 2, 5 Appendices D, E
Construction Design Standards	Chapters 7, 8, 9, 10, 11, 12, 13
Nest Management	Sections 3.4, 6.6 Chapter 11
Avian Reporting System	Chapter 6 Appendix F
Risk Assessment Protocol	Chapter 14 Appendix J
Mortality Reduction Measures	Sections 3.1, 3.2, 3.3 Chapters 8, 9, 10, 11, 12, 13, 15
Avian Enhancement Options	Chapter 17
Quality Control	Chapter 6
Public Awareness	Section 16.3
Key Resources	Sections 1.2, 16.2 Chapters 2, 5, 6, 16.2 Appendices B, C, E, G, H

Three overall processes or actions are delineated in Figure 1-2, each included in this APP. The first component requires avian-friendly construction standards to minimize risks to birds on newly constructed facilities. The second component is a proactive program to identify issues before they occur through a Risk Assessment, followed by implementation of appropriate mortality reduction measures. Finally, a reactive component driven by an avian reporting system is required to effectively respond to existing conditions or in response to a specific mortality or injury event or problem nest site.

In addition to these three integral processes, an effective program includes tracking incidents of avian mortality, injury, or nesting to facilitate identification of high-risk or problem areas. Tracking events is reactive, but can facilitate proactive systematic retrofitting.

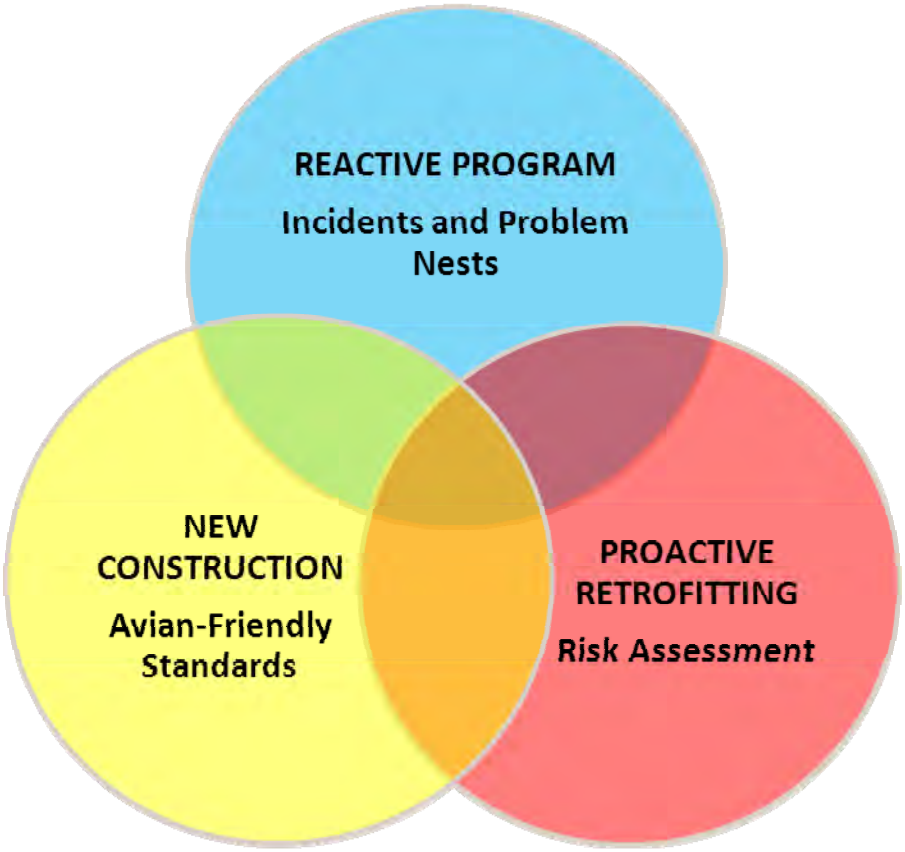


Figure 1-2. Primary components of an APP.

As part of an ongoing commitment to protect bird species throughout its entire system, WSMR developed the WSMR APP consistent with the APLIC and USFWS Guidelines (2005). The WSMR APP is designed to provide a single resource for power line activities relating to avian protection for WSMR's management and personnel in the field. The document addresses avian protection issues, the regulatory context for avian protection, regulatory compliance procedures, training programs in avian protection, and various avian protection strategies. The WSMR APP will be updated annually.

For programmatic questions regarding the WSMR APP, please contact:

- Environmental Stewardship Branch of the Environmental Division of the Department of Public Works (DPW), U.S. Army Garrison White Sands (575) 678-2225

1.2 Department of Defense Environmental and Avian Protection Policies

WSMR environmental policies reflect federal standards for environmental management on federal lands, within the particular constraints of a military context. Under the Sikes Act (1960) and subsequent amendments, Integrated Natural Resource Management Plans (INRMPs) must be developed for military lands. The INRMPs must provide land management directives for multiple and non-consumptive natural resources uses, including habitat and species conservation, as consistent with military preparedness (USFWS 2013a). As of April 2013, WSMR is updating and revising the WSMR INRMP, expanding the document to also include cultural resources in the Integrated Natural and Cultural Resource Management Plan (INCRMP).

Executive Order (EO) 13186 (2001) directed all federal agencies whose actions may have a "measurable negative effect on migratory bird populations" to develop a memorandum of understanding (MOU) with the USFWS to promote migratory bird conservation. EO 13186 recommends that the MOU address the goals summarized below, as appropriate and practicable:

- Integrate avian conservation practices into agency activities and avoid or minimize impacts to migratory birds.
- Restore and enhance bird habitat.
- Prevent or minimize pollution or deleterious habitat modification.
- Address avian habitat and conservation in agency planning and coordinate with federal and non-federal partners, such as Partners-in-Flight and the USFWS.
- Identify potential sources of unintentional migratory bird take resulting from agency actions that may have measurable negative population effects and minimize these effects.
- Promote research, including population monitoring, and information exchange related to migratory bird conservation.

The DOD and USFWS entered into an MOU to promote the conservation of migratory birds (USFWS 2006). The MOU describes steps that will ensure DOD operations, except for military readiness activities, will be consistent with the goals of avian conservation. Specific DOD activities covered under the MOU include: natural resources management; maintenance, construction, and operation of general infrastructure; operation of industrial activities; construction or demolition of facilities; and hazardous waste cleanup. No migratory bird take is authorized under the MOU. The operation of utilities does not meet the definition of a military readiness activity in Take of Migratory Birds by the Armed Forces (50 CFR Part 21, 28 February 2007).

The *WSMR Strategic Plan for the 21st Century, 2001-2005* (WSMR 2001) contains the WSMR Vision, which emphasizes natural resource management and

stewardship: “We will continue to emphasize customer focus, sound resource management, innovative use of technology, modernized infrastructure, stewardship of our land, and superior quality of life.”

Thrust Area 3 (Sustainability) Goal 3.3 of the *WSMR Strategic Plan* emphasizes environmental stewardship: “As stewards of American’s Range for the 21st Century, we will continue to protect and enhance the quality of our environment.”

The *WSMR Strategic Plan* includes the following environmental objectives:

- Build environmental considerations into our daily routines, including operational decision-making processes, development of Range programs, plans, and policies.

- Assure that our Environmental Program achieves and maintains compliance with all statutory and regulatory requirements.

- Assure continued use of our land for conducting diversified testing and training by maintaining our natural and cultural resources on an ecosystem scale.

- Prevent pollution at the source and not shift pollutants between ecosystems or mediums.

- Restore previously contaminated sites to an acceptable risk level.

Policies specifically pertaining to protection of birds were outlined in the WSMR January 24, 2002 Commander’s Guidance *The Migratory Bird Treaty Act and Bald and Golden Eagle Protection Act – Conservation* (Appendix A). Currently, the Garrison Environmental Division (Environmental Division) is drafting a policy letter to replace and update the 2002 Commander’s Guidance. In addition, commitments WSMR has made to the USFWS to minimize bird electrocutions on the WSMR electrical infrastructure are presented in a May 26, 2011 letter to the USFWS Office of Law Enforcement (Appendix B). These commitments are consistent with this APP and associated protocols.

White Sands Missile Range Regulation 200-2, *The White Sands Missile Range Environmental Protection During Military & Non-Military Activities* (15 May 2013) includes a number of requirements that contribute to bird conservation, including (but not limited to):

- “Do not harass, collect, possess, harm, disturb, or destroy wildlife or their parts to include but not be limited to snakes, bats, birds, nests, eggs, or nestlings.”

- “Contact PWE at 678-2225 to assist with nuisance, injured, or dead wildlife.”

- “Off-road vehicle use is prohibited without prior approval from PWE.”

- “All trash must be collected, placed in designated dumpsters or other approved trash containers with lids.”

- “Unless specifically approved by PWE, mission activities, training and testing, shall not occur in the vicinity of arroyos, creeks, springs, riparian areas, playas, and lake beds.”

Prohibited Use Areas include wildlife water developments, or areas where migratory bird nests occur.

1.3 Utilities Privatization

The high voltage utility system at WSMR is subject to a government-mandated evaluation and review process that could result in utilities privatization. If privatized, implementation of this APP will be included as a requirement for whichever entity (the government, private company, or cooperative) operates and maintains the high voltage system. If a private entity assumes the operation and maintenance of the high voltage system, they will assume responsibility for implementing this APP, and for compliance with all applicable federal and state laws.

2.0 REGULATORY CONTEXT

2.1 Federal Requirements

Federal law protects most birds and their nests. The three main federal laws in the U.S. protecting birds include:

1. Migratory Bird Treaty Act (MBTA)
2. Bald and Golden Eagle Protection Act (BGEPA)
3. Endangered Species Act (ESA)

Birds fall into one or more categories with different protection and permitting requirements. Table 2-1 presents a breakdown of the protection afforded to different birds.

Table 2-1. Protected status for birds.

PROTECTION	EAGLES	FEDERALLY LISTED BIRDS	STATE-LISTED BIRDS	MIGRATORY BIRDS (NATIVE SPECIES)	GAME BIRDS	NON-NATIVE SPECIES
MBTA	✓	✓	✓	✓		
ESA		✓	✓ [a]			
BGEPA	✓					
State Regulations	✓	✓	✓	✓	✓ [b]	

MBTA=Migratory Bird Treaty Act, ESA=Endangered Species Act, BGEPA=Bald and Golden Eagle Protection Act
[a]State-listed species also may be covered by the ESA.
[b]Some game bird species are also non-native species; however, for this APP "Non-native Species" does not include game birds, as discussed in Section 4.2.

When protected species are injured or killed, the applicable laws are enforced by the USFWS. WSMR lies within USFWS Region 2, which is headquartered in Albuquerque, New Mexico (Figure 2-1).

It is important for WSMR's personnel to be aware of and comply with these laws and applicable permit conditions, including reporting bird fatalities and injuries to the Environmental Division. The Environmental Division will continue to coordinate directly with the USFWS (see Chapter 6.0 *Management Procedures and WSMR Reporting Systems*). Each of these federal laws is discussed in detail below.

Figure 2-1. WSMR lies within USFWS Region 2.

2.1.1 Migratory Bird Treaty Act (MBTA)

The MBTA (16 U.S.C. 703-712) protects the majority of birds in the U.S., with the exception of non-native species (e.g., House Sparrow [*Passer domesticus*], European Starling [*Sturnus vulgaris*], Rock Pigeon [*Columba livia*], Monk Parakeet [*Myiopsitta monachus*], Eurasian Collared-dove [*Streptopelia decaocto*]), and non-migratory species (e.g., game birds, including wild turkey and various quail species). The list contains 1,026 species. See 50 CFR § 10.13 for a full list of birds protected under the MBTA.

The purpose of the MBTA is to afford protection to migratory birds, their parts, nests, eggs, and nestlings. The MBTA states that, unless permitted by regulation, it is unlawful to "pursue, hunt, take, capture, kill, possess, sell, barter, purchase, ship, export, or import any migratory birds alive or dead, or any part, nests, eggs, or products thereof."

Liability under the MBTA is strict liability, which means liability without fault. A criminal violation is a Class B Misdemeanor and provides for a fine of $15,000 per count for a person or organization/corporation; and up to six months imprisonment for a person. There are no civil provisions (Note: There is also a Class A Misdemeanor

violation that applies to hunting over bait and a Class E Felony violation that applies to sale). Forfeitures can include all guns, traps, nets, and other equipment, vessels, vehicles, and other means of transportation used to aid in violations.

2.1.2 Bald and Golden Eagle Protection Act (BGEPA)

Bald Eagles (*Haliaeetus leucocephalus*) and Golden Eagles (*Aquila chrysaetos*), their eggs, and their nests receive additional protection under the BGEPA (16 U.S.C. 668-668d, 54 Stat. 250 and Amendments). The BGEPA states "no person shall take, possess, sell, purchase, barter, offer for sale, transport, export, or import any Bald or Golden Eagle alive or dead, or any part, nests or eggs, thereof without a valid permit to do so."

The BGEPA definition of the term take is to "pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, molest or disturb." The USFWS published a final rule in the Federal Register (FR 31132 Volume 72, No. 107 5 June 2007) defining the term "disturb" to mean "to agitate or bother a Bald or Golden Eagle to a degree that causes, or is likely to cause, based on the best scientific information available, (1) injury to an eagle, (2) a decrease in its productivity, by substantially interfering with normal breeding, feeding, or sheltering behavior, or (3) nest abandonment, by substantially interfering with normal breeding, feeding, or sheltering behavior."

The USFWS published Final Rules (FR 46836 Volume 74, No. 175) on 11 September 2009, authorizing the issuance of permits to take Bald Eagles and Golden Eagles, or their nests, on a limited basis. Section § 22.26 governs the issuance of permits to take Bald Eagles and Golden Eagles where the take is associated with, but not the purpose of, an activity, and the take cannot practicably be avoided. Most take authorized under this section will be in the form of disturbance, and the USFWS will only authorize take of Bald or Golden Eagles if it can be determined that the take (1) is compatible with the preservation of the Bald Eagle and the Golden Eagle and (2) cannot practicably be avoided. Section § 22.27 establishes the issuance of permits for removing eagle nests where (1) necessary to alleviate a safety emergency to people or eagles, (2) necessary to ensure public health and safety, (3) the nest prevents the use of a human-engineered structure, or (4) the activity or mitigation for the activity will provide a net benefit to eagles. Applications for either individual (i.e., one-time) or programmatic (i.e., recurring) permits to take eagles are discussed in Chapter 5.0 *Permit Compliance*.

Liability for BGEPA violations is based in knowing or wanton disregard for the consequences of the action. Criminal violations are either Class A Misdemeanors or Class B Misdemeanors. Class A misdemeanors include a fine of $100,000 for a person and $200,000 for an organization/corporation and up to one year imprisonment for a person. Class B Misdemeanors include a fine of $25,000 for an individual or organization/corporation and up to six months imprisonment for an individual. Civil penalties have three levels, $25,000, $12,000 and $500. Forfeitures can include all guns, traps, nets, and other equipment, vessels, vehicles, aircraft and other means of transportation used to aid in violations.

2.1.3 Endangered Species Act (ESA)

The ESA (16 U.S.C. 1531-1544) protects fish, wildlife, and plants that are federally listed as threatened or endangered (T/E). The ESA makes it illegal to import, export, take, transport, sell, purchase, or receive in interstate or foreign commerce any living or dead species listed as T/E. "Take" under the ESA means to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct with a listed species. Violations may include significant habitat modification or degradation that impairs essential behavioral patterns such as breeding, feeding, or sheltering and results in wildlife death or injury.

Criminal violations are either Class A Misdemeanors or Class B Misdemeanors. Class A misdemeanors include a fine of $100,000 for a person and $200,000 for an organization/corporation and up to one year imprisonment for a person. Class B Misdemeanors include a fine of $25,000 for an individual or organization/corporation and up to six months imprisonment for an individual. Civil penalties have three levels, $25,000, $12,000 and $500. Forfeitures can include all guns, traps, nets, and other equipment, vessels, vehicles, aircraft and other means of transportation used to aid in violations.

2.2 New Mexico Requirements

States typically have statutes and regulations that broadly protect all native wildlife species, including game birds not protected by the MBTA. In addition to protecting federally listed species within their borders, many states maintain a list for state-listed T/E species. Note: although upland game birds, such as wild turkey and quail, are not protected under the MBTA, they are regulated by state wildlife laws.

Fish and wildlife in New Mexico are protected under New Mexico Statutes, Chapter 17 New Mexico has the New Mexico Wildlife Conservation Act (NM ST § 17-2-37), which is voluntary and operated through landowner cooperation. WSMR observes the WCA and is involved in the conservation of state-listed species. Additionally, the New Mexico Department of Game and Fish (NMDGF) maintains a list of state threatened or endangered species at the Biotoa Information System of new Mexico (http://www.bison-m.org).

2.3 Local Regulations

Local governments can further restrict certain activities that may impact wildlife species covered by state and federal statutes. Generally, these activities include land development regulations or ordinances applicable to power line siting and construction. For WSMR, this may only apply to areas serviced by the local electric cooperatives.

2.4 Enforcement

Under the ESA, sections 7 and 10 have provisions to allow for the "take" of an individual bird that is incidental to an otherwise lawful and permitted activity. Take encompasses direct mortality, harming (i.e., injury), and harassing. Likewise, the

BGEPA has a process for issuing eagle nest take permits. The MBTA, however, does not have an "incidental take" provision as part of the permitting process. Therefore, fatalities of birds protected under the MBTA may be considered a take and could result in prosecution.

According to the federal *Avian Protection Plan Guidelines* (APLIC and USFWS 2005), an entity implementing the principles in the APP Guidelines will greatly reduce avian fatality risks, as well as the risk of enforcement under the MBTA. While the MBTA has no provision for allowing unauthorized take, the USFWS realizes some birds may be killed even if reasonable measures are taken to protect them. The USFWS Office of Law Enforcement carries out its mission to protect migratory birds through investigations and enforcement, as well as by fostering relationships with individuals, companies, industries, and other government agencies that have taken effective steps to minimize their impacts on migratory birds, and by encouraging others to enact such programs. Unless a take is authorized, it is not possible to absolve individuals, companies, or agencies from liability even if they implement avian mortality avoidance or similar conservation measures. However, the Office of Law Enforcement focuses its resources on investigating and prosecuting individuals, companies, or agencies that take migratory birds without regard for their actions and the law, especially when conservation measures have been developed but are not properly implemented or an agreement to avoid take is not followed.

Under the MOU developed between the DOD and USFWS to promote the conservation of migratory birds (USFWS 2006) and pertaining to WSMR, potential enforcement actions and authorization of take would be consistent with the MOU's established processes, also meeting the requirements of EO 13186. The approaches and resolutions described in the WSMR APP are in accordance with the goals and objectives outlined in the federal MOU.

2.5 Third-Party Lawsuits

In addition to potential law enforcement actions by the federal government, there also is potential for third-party lawsuits by outside parties (such as non-governmental organizations) if they are displeased with bird electrocution injuries and bird fatalities at WSMR. Third parties could challenge the USFWS for failure to cite or fine WSMR, or challenge WSMR for failing to take corrective actions to remediate electrocution hazards.

3.0 AVIAN INTERACTIONS

Rural electrification of the U.S. began in the late 1800s and expanded rapidly. As wires began to span rural areas, avian collisions and electrocutions began to occur. Collisions with rural telegraph wires were first documented in 1876 (Coues 1876).

North American electric utilities focused on raptor electrocutions during the winter of 1970-1971 when numerous eagle deaths resulting from poisoning (*n*=30+) and electrocution or shooting along power lines (*n*=300+) were recorded in Wyoming and Colorado (Olendorff et al. 1981). The following year, the U.S. Rural Electrification Administration published Bulletin 61-10 to reduce raptor electrocutions, and several electric companies began testing safer power line designs (Olendorff et al. 1981). The new pole-top designs formed the foundation for the definitive work on raptor electrocutions: *Suggested Practices for Raptor Protection on Power Lines: The State of the Art in 1996* (APLIC 1996). This document was first published in 1975 and revised in 1981, 1996, and 2006. During 1989, nine major electric utilities joined to form APLIC to further study electrocutions and bird collisions (Lewis 1997).

3.1 Line Electrocutions

The scrutiny of avian electrocution and associated mitigation has increased and is viewed as a high priority in managing raptor populations worldwide (Lehman et al. 2007, Tinto et al. 2010, Rollan et al. 2010). Extensive research has subsequently been conducted to identify particular aspects of utility systems and raptor biology that increase electrocution hazards.

Power lines situated in areas with low vegetation and flat terrain, such as the Tularosa Basin, are particularly attractive to raptors because they provide structures from which to hunt and roost (Boeker 1972, Benson 1981). Eagles and buteos (i.e., soaring hawks) actively use pole structures, particularly in areas where prey is abundant and few other perch sites exist (Olendorff et al. 1981). Pole perches give raptors a wide range of vision and greater attack speed when hunting. Additionally, poles provide a place for raptors to broadcast territory boundaries and find either sun or shade (Colson and Associates 1995). Twelve North American raptor species (Blue 1996) have been documented nesting on utility structures. Ospreys are particularly frequent nesters on such structures (Nelson and Nelson 1976, Blue 1996). Smith (1985) observed that eagles and hawks often perch on outer and upper utility tower sections during the day and roost on inner and lower sections during the night.

Some raptors, such as the Red-tailed Hawk (*Buteo jamaicensis*) actively seek power line corridors (Ansell and Smith 1980), and certain North American raptor species more readily use power line structures for perching. For example, forest-dwelling accipiters such as the Cooper's Hawk (*Accipiter cooperii*) and Sharp-shinned Hawk (*Accipiter striatus*) rarely perch on power poles, as they prefer the seclusion and shelter of trees and often use these natural perches (Olendorff et al. 1981).

Historically, the eagle most commonly electrocuted in North America is the Golden Eagle (Figure 3-1). In general, Golden Eagles are electrocuted more frequently than Bald Eagles, and Golden Eagle juveniles are more frequently electrocuted than adults (Benson 1981). The hawk and owl species most commonly electrocuted in North America are the Red-tailed Hawk and Great Horned Owl, respectively (Harness 1997). Detailed species descriptions are provided in Chapter 4.0 *Bird Species Susceptible to Utility Interactions.*

Figure 3-1. Golden Eagle.

Numerous factors contribute to electrocution potential including bird size, sex, and age; line clearances (spacing); precipitation; wind direction; and season. Bird dimensions are particularly important when considering bird protection. Within species, female raptors tend to be electrocuted more often than males, probably because females are larger. Young birds tend to be electrocuted more often than adults, probably because young birds are less experiences fliers (Harmata et al. 2001, Rubinolini et al. 2001, Dwyer and Mannan 2007). Electrocutions also tend to occur near nests (Dwyer and Mannan 2007).

APLIC recommends a minimum of 60 inches horizontal spacing and 40 inches vertical spacing between phase-to-phase and phase-to-ground to minimize eagle electrocutions (APLIC 2006). Table 3-1 provides a range of measurements for species susceptible to electrocution at WSMR. A large female Bald Eagle may have a 96-inch wingspan; however, APLIC's recommended 60-inch horizontal spacing is used based on the fleshy wrist-to-wrist distance for large birds, such as eagles (APLIC 2006). Protections for larger birds will also protect species with shorter wingspans.

Table 3-1. Range of bird sizes for species susceptible to electrocution at WSMR.

SPECIES	WINGSPAN (INCHES)	WRIST-TO-WRIST (INCHES)	LENGTH (HEAD-TO-TAIL) (INCHES)	HEIGHT (HEAD-TO-FOOT) (INCHES)	WEIGHT (POUNDS)
Turkey Vulture	63-72	24-28	24-32	14-21	3.5-5.6
Bald Eagle	66-96	31–36	27-37	18-28	4.4-14
Golden Eagle	72-90	31–54	27-38	18-26	6.6-14
Swainson's Hawk	44-54	16-23	17-22	13-16	1.3-2.7
Red-tailed Hawk	42-58	14-23	17-25	13.5-22	1.5-3.5
Harris's Hawk	40-49	—[a]	17.5-24	11-17	1.2-2.6
Ferruginous Hawk	52-60	22	20-27	19	2.0-4.5
Rough-legged Hawk	48-56	—[a]	18-23	—[a]	1.6-3.1

Table 3-1. Range of bird sizes for species susceptible to electrocution at WSMR, continued.

SPECIES	WINGSPAN (INCHES)	WRIST-TO-WRIST (INCHES)	LENGTH (HEAD-TO-TAIL) (INCHES)	HEIGHT (HEAD-TO-FOOT) (INCHES)	WEIGHT (POUNDS)
Aplomado Falcon	31-40	—[a]	14-18	—[a]	0.5-1.0
Peregrine Falcon	37-46	13-20	14-18	11-15	1-2.1
Prairie Falcon	35-45	16	14-18.5	—[a]	0.9-2.5
Greater Roadrunner[b]	22	—[a]	20-24	—[a]	0.6-0.8
Great Horned Owl	36-60	17–25	18-25	12-16	3-1-5.5
Barn Owl	42	15-20	—[a]	—[a]	1.0
American Crow	33-40	—[a]	16-21	—[a]	1.0
Chihuahuan Raven	41-43	—[a]	18-21	—[a]	1.2

Adapted from APLIC 2006, The Birds of North America Online 2011, Clark and Wheeler 2001, Cornell Lab of Ornithology 2011, Rocky Mountain Raptor Program 2011, Sibley 2000, Terres 1991, Wheeler 2003, Wheeler and Clark 1995.

[a] Information not available

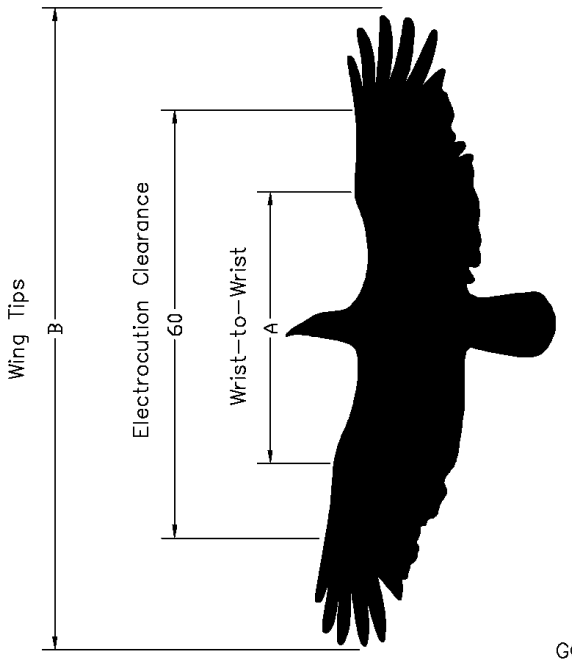
[b] Several birds have been electrocuted at ground banks at WSMR.

Since immature eagles are most vulnerable to electrocution when they begin or terminate a flight, the distribution line spacing recommendations were developed specifically to minimize electrocutions of these younger birds. Figure 3-2 provides a graphical representation of eagle dimensions and recommended clearances relative to electric distribution structures.

Although transmission lines typically have sufficient clearances to avoid phase-to-phase and phase-to-ground contacts, transmission electrocutions have been recorded on certain at-risk configurations. The transmission structures examined at WSMR during the November 2012 field assessment had sufficient clearances where an electrocution risk to eagles was not applicable for the transmission voltages.

When lines are designed they must adhere to the National Electrical Safety Code (NESC). Section 235 of the NESC covers horizontal and vertical clearances for wires carried on the same supporting structure. These clearances are designed for human safety, not birds, but at higher voltages the effect can be the same. For example, the NESC clearances are greater than the bird protection calculations for 230 kilovolt (kV) phase-to-phase clearances for bird protection, based on the APLIC recommendations.

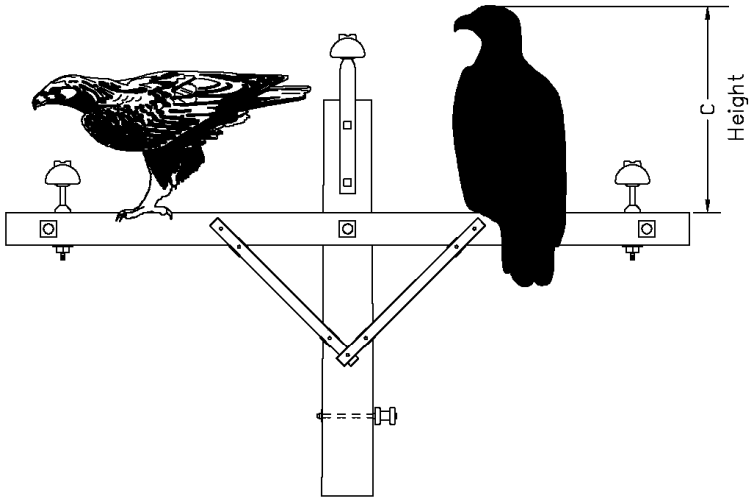
A number of other factors, in addition to bird size and conductor separation, contribute to increased electrocution risk. Inclement weather is a major factor with eagle electrocutions (Benson 1981), and some golden eagle electrocutions at WSMR appear to be associated with windy and wet winter weather when birds seek shelter on the leeward side of power poles (Cutler pers. comm. 2013). Raptors with wet feathers are more vulnerable to electrocution above 5kV (Nelson 1979, Olendorff et al. 1981), and wet birds may have greater difficulty navigating around energized conductors when flying to and from poles. Dry feathers are typically good insulators (Nelson 1979), but dry birds contacting live wires with their beak and foot are susceptible to electrocutions even below 5kV (Olendorff et al. 1981).



EAGLE DIMENSIONS

DIMENSIONS (INCHES)

	A	B	C
BALD EAGLE	36	96	28
GOLDEN EAGLE	42	90	26



RECOMMENDED CLEARANCES FOR EAGLES

1. 60 Inches horizontal to accommodate the wrist-to-wrist dimension of an eagle.
2. 40 Inches vertical to accommodate a perching eagle.

Figure 3-2. Illustration of eagle size and recommended clearances to minimize electrocution hazards (APLIC 2006).

Wind direction relative to crossarm orientation affects the probability of electrocution (Benson 1981, Boeker 1972, Nelson and Nelson 1976, Nelson 1977). Crossarms mounted perpendicular to the wind allows raptors to soar away from the structure and attached wires. Raptors taking off from crossarms mounted parallel to prevailing winds can more easily be blown into energized conductors or conductor jumper wires. Wind orientation presumably places inexperienced fledgling birds at greater risk than the adults.

Raptor electrocutions often fluctuate seasonally. Increased seasonal precipitation or storm events may increase the electrocution risk. In the winter, power line structures provide sit-and-wait hunting perches, allowing raptors to seek prey without expending energy hunting in flight (Benson 1981). During the spring, raptors may increase their exposure to electrocution by utilizing pole structures as nesting sites. Seasonal fluctuations of prey abundance also may influence the number of raptors electrocuted in a particular area (Benson 1981, Olendorff et al. 1981).

Behavior can affect both electrocution and collision risks with power lines. Nesting, courtship, and territorial defense can make raptors more susceptible to going phase-to-phase or phase-to-ground on structures. Breeding birds carrying nesting materials or prey items back to the nest also can result in avian electrocutions (APLIC 2006).

3.2 Substation Electrocutions

Although substation outages occur less frequently than distribution system equipment faults, they often are more costly and affect more users than line faults. Substation outages not only affect reliability, but also damage equipment and may involve costly environmental cleanup (e.g., spilled oil from a ruptured transformer).

Birds and other wildlife enter substations for several reasons: to find food, avoid predators, seek shelter, build nests, or establish/broadcast territories. WSMR uses herbicides to control weeds at substations, which should reduce the presence of rodents which could, in turn, attract raptors. The top four animal groups responsible for most substation outages in the western U.S. include birds, squirrels, snakes, and raccoons (Distribution Systems Testing Application and Research 2005). According to the Electric Power Research Institute (EPRI) study *Distribution Wildlife and Pest Control* (EPRI 2001), most substation animal problems occur on the low side, which has less clearance than the larger transmission high side; however, electrocution issues can be associated with both areas within substations. The most problematic substation facilities are breakers/reclosers, bus conductors, and power transformers.

Parallel to the discussion of bird interactions with power lines, a bird's size and activity within a substation can result in increased electrocution risks. Bird nesting and foraging within a substation significantly increases the electrocution risk to both adult and young birds.

Substation protection approaches includes both "isolation" and "insulation" to minimize animal contacts. Isolation is simply providing enough clearance to reduce the risk of an animal from physically being able to bridge the phase-to-phase or phase-to-ground distances in a substation. According to the *Guide for Animal Deterrents for Electric Power Supply Substations* (Institute of Electrical and Electronics Engineers

[IEEE] 1993), the most effective method to reduce animal-caused outages is to increase clearances. Unfortunately, this approach is not always possible. Below 69kV, APLIC and the USFWS recommend 60 inches of wingspan clearance for eagles and 40 inches for hawks (APLIC 2006). Additionally, the recommended vertical clearance for perching eagles is 40 inches. Some substation equipment is constructed with inadequate separation, requiring additional cover-up materials to mitigate potential problems (Figure 3-3).

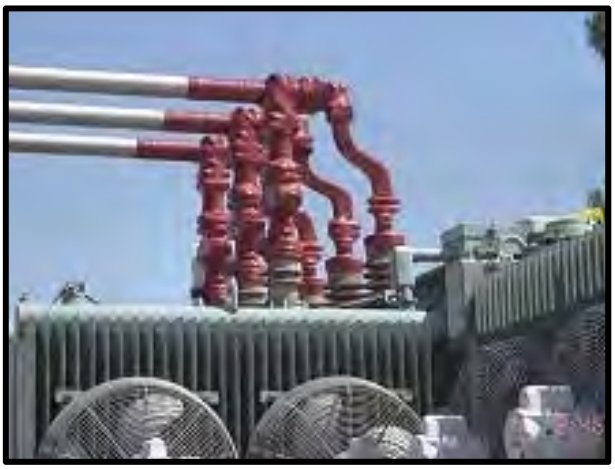


Figure 3-3. Substation fitted with insulation.

Installation of cover-up materials and devices must adhere to NESC and all other pertinent safety requirements. It is important to recognize that no uniform standards exist for animal covers, and some are more resistant to ultraviolet (UV) and other environmental degradation than others. This degradation can lead to electrical tracking problems on the cover-up material, resulting in reduced performance, equipment damage, or faults. When products are selected, their properties should be thoroughly reviewed by engineering. Additionally, field crews must be instructed on the proper method of product installation and long-term maintenance.

*Caution: Raptor protection measures using insulation are **not** designed to protect linemen. Many products are not rated for the full line voltage and are designed to protect birds from incidental contacts only.*

3.3 Collisions

Birds face collision threats from many sources such as power lines, communication towers and related wires, wire fences, wind turbines, cars, aircraft, and trains. Although birds often exist near power lines without significant collision risks, problems emerge in localized areas where certain risks occur.

Although no collision risks were identified specific to WSMR during the field review (see Chapter 14.0 *Risk Assessment Protocol*), collision risk factors for birds and power lines have been included in the WSMR APP for potential future use and

reference (see Chapter 10.0 *Collisions*). Collision risks vary in place and time, as discussed below. Future habitat changes could increase the collision risk in specific areas of WSMR, such as increase in water depth of the regional playas.

A number of factors contribute to species vulnerability to collision with overhead wires. Collision risks vary as a function of line design, adjacent land cover (habitat), and local avian populations (APLIC 2012, Bevanger and Brøseth 2001, Mojica et al. 2009, Rollan et al. 2010). Specifically, utility structure type and location; habitat use near power lines; and bird size, maneuverability, and flight behavior all are factors in assessing avian collision risks.

Bird size, maneuverability, and flight behavior, are particularly important in evaluating a species' vulnerability to colliding with power lines (APLIC 2012, Jenkins et al. 2011). Large, heavy-bodied birds such as herons, cranes, swans, geese, and pelicans are particularly susceptible to power line collisions. These species' large wingspans and poor maneuverability place them at a greater collision risk (Figure 3-4). Although relatively small and maneuverable, many species of ducks also are vulnerable to collision because of their high flight speed, low altitude, and flocking behavior. Birds flying in flocks can be at increased collision risk because their view can be obscured by other members of the flock. Consequently, waterfowl, cranes, pelicans, and other flocking species have an added collision risk. Finally, the less-controlled flight of juvenile or immature birds is more likely to result in collision than the flight of an adult (APLIC 2012).

Figure 3-4. Sandhill Cranes (*Grus canadensis*) flying over a marked power line.

Historically, raptors have been considered to be at relatively low risk of collision with power lines. However, reports of raptor collision mortality from power lines suggest that collisions involving raptors are occurring more widely than previously recognized. Multiple California Condors (*Gymnogyps californianus*) have collided with power lines (Meretsky et al. 2001, Snyder 2007). On the Aberdeen Proving Ground on the upper Chesapeake Bay, Maryland, Mojica et al. (2009) documented 21 Bald Eagle carcasses, each showing blunt force trauma typical of collisions and each located under distribution lines. Mojica et al. (2009) also documented one Osprey (*Pandion haliaetus*) and multiple owl species under similar scenarios. Harness et al. (2003) documented three Golden Eagle carcasses mid-span under distribution power lines, and the Ventana Wildlife Society (2009) documented collisions by Northern Harrier (*Circus cyaneus*) and White-tailed Kite (*Elanus leucurus*). Studies have shown that Blue Cranes (*Anthropoides paradiseus*), Cape Vultures (*Gyps coprotheres*), and Bonelli's Eagles (*Hieraaetus fasciatus*) are more vulnerable to colliding with lines in foraging habitats (Shaw et al. 2010, Boshoff et al. 2011, and Rollan et al. 2010, respectively). Peregrine Falcons (*Falco peregrinus*) can be at risk because they attain high speeds when

pursuing prey near the ground (Olendorff and Lehman 1986). Many of the carcasses reported in these studies were found in circumstances similar to those where collision was inferred as the cause of death on transmission lines (Heck 2007) or were actually observed (Murphy et al. 2009). Taken collectively, scattered reports of events that are relatively difficult to detect suggest a more widespread pattern of raptors colliding with overhead power lines.

Risks emerge primarily in localized areas, most often where overhead wires, high quality habitats, and species with poor maneuverability co-occur. The proximity of power lines to locations where birds are landing and taking off can be critical (Stehn and Wassenich 2005). Collisions with power lines can occur during daily flights within a day-use area, particularly in ecologically sensitive areas such as wetlands, lakes, and rivers, where birds congregate to nest, feed, roost, migrate, or winter. Intermittent wetlands and playas are other good examples of habitats that attract birds. A power line bisecting these areas (e.g., a line located between a feeding area and a roosting site of wetland birds) can be problematic, especially when only a short distance separates the use areas, resulting in birds making a short flight at the critical height. Birds crossing power lines at low altitudes several times a day makes them more susceptible to collision, as does flying in low light. The timing and duration of inclement weather and low-light conditions also affect bird collision rates (APLIC 2012).

Bird collisions with power lines can occur during seasonal movements (i.e., migration) as well, although during migratory flights, the flight altitudes of most bird species are higher than transmission lines. The collision risk for migratory birds would be associated with bird species' presence and use of specific habitats. Power lines located near or between habitats used during migration (e.g., roosting, foraging areas) may increase the collision risk to migrating birds, as the birds land and take off within these areas. The migration collision exposure parallels exposure from birds' daily movement patterns, although the exposure period typically would be shorter.

Figure 3-5. On the left, the wire orientation of the lattice structure in a horizontal configuration reduces the number of wire planes as compared to a vertical configuration on the right.

Structure type is an important factor to consider when determining collision likelihood. Conductors placed in a vertical configuration, as compared to a horizontal plane, increase the risk of avian collision (Figure 3-5). Overhead static wire (OHS) also increases the likelihood of collision. On transmission structures, the smaller diameter of the OHS as compared to the electrical conductors reduces the line profile, making the OHS more difficult to see and increasing the collision risk (APLIC 2012, Pandey et al. 2007). Based on published field observations, birds that collide with power lines are generally thought to see the

larger diameter energized lines. Birds adjust their flight altitude upward to avoid the energized lines (Pandey et al. 2007, Murphy et al. 2009, Martin and Shaw 2010) and subsequently collide with the smaller diameter OHS. Collision risks are exacerbated during low light, fog, or inclement weather when smaller diameter lines become particularly difficult for birds to see and avoid.

The physical location of a power line alignment also can affect the incidence of collision. Topography has been shown to affect collision risk in certain species (Bevanger and Brøseth 2001). As shown in Figure 3-6, trees and topographic features (e.g., rock outcroppings) can provide natural barriers to shield power lines from birds in flight (APLIC 2012).

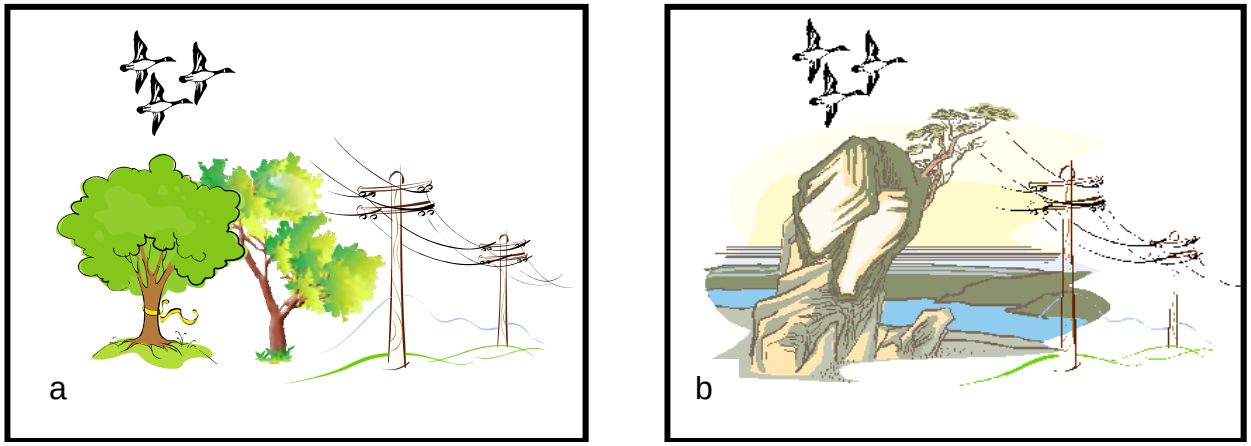


Figure 3-6. Vegetation (a) and topography (b) creating flight barriers that route flying birds over a power line, thus minimizing collision risk.

3.4 Nesting

3.4.1 Stick Nests

Bird nests can occur in trees and cavities, on cliffs and rocky outcrops, and on manmade structures (e.g., power poles, substations, buildings). A number of bird species commonly use power line structures for nesting, especially in open areas with limited elevated nesting substrates. A nest is defined as any readily identifiable structure built, maintained, or occupied for incubating and rearing of birds.

Nests are sometimes located in areas that compromise electrical clearances (Figure 3-7). Nest materials, their debris, foreign objects used for nest building, bird excrement, and the birds carrying prey items into the nest can result in power outages, flashovers, pole fires, equipment contamination, bird electrocutions, and loss of eggs and young. However, nest removal alone typically does not solve the problem because many bird species will rebuild at the same location.

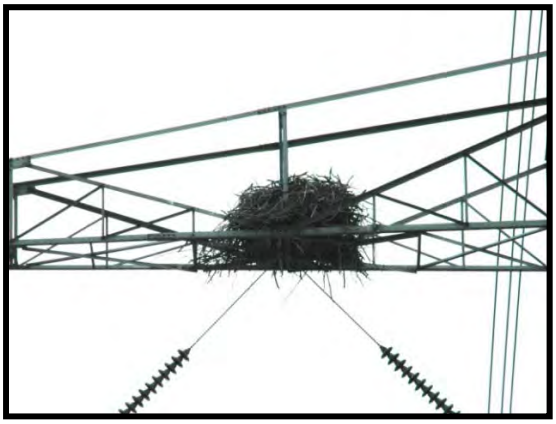


Figure 3-7. Bald Eagle nest on a steel lattice transmission structure.

For nest management it is important to identify a number of factors, including the species involved and whether the nest is active or inactive. The information contained in this APP discusses key elements of nesting issues on power lines, options to address these issues, and resources available for both short- and long-term nest management planning.

3.4.2 Cavity Nests on Utility Structures

Woodpeckers are problematic on utility lines when they create nest cavities in wooden power poles. These cavities can cause significant damage to poles by allowing increased moisture intrusion and wood decay, thereby reducing the structural integrity of the pole. Large or numerous excavations may require restoration or replacement of the affected pole(s). Figure 3-8 is an example where a utility installed plastic mesh on a wood H-frame structure to deter woodpeckers, but the approach was unsuccessful.

Figure 3-8. Woodpecker damage to a wood H-frame structure.

Unfortunately, woodpeckers can cause extensive damage in a short time period, which can result in pole failures in the interval between routine inspections and the implementation of maintenance/repair or replacement procedures. The cavities also create problems for inspectors and maintenance personnel, since they may create a climbing hazard for linemen and may fail because of the loss of wood strength and pole viability. Further, abandoned nest cavities may harbor undesirable animals or insects, such as wasps, creating an additional maintenance hazard for line personnel.

3.4.3 Ground Nests in Rights-of-Way or Substations

Some bird species may nest on the ground within transmission line rights-of-way (ROWs) and substations (Figure 3-9). These nests are protected during the nesting season, thus affecting vegetation management (e.g., mowing) and other maintenance and construction activities in these areas.

Figure 3-9. Killdeer eggs within substation fenced area.

3.5 Bird Streamers and Insulator Contamination

In some instances, bird use of power structures does not cause bird injury or mortality but may create a maintenance issue. For example, outages can result when birds foul equipment. Birds can create outage problems with their excrement under two mechanisms: bird “streamers” and “pollution”.

3.5.1 Streamers

A bird streamer is long excrement released by large birds (Figure 3-10) (Burnham 1995, van Rooyen et al. 2002, Zhou et al. 2009). Outages can result when birds foul equipment, and streamer-related outages occur when a streamer bridges the gap between energized and grounded portions of a structure or the streamer fills part of that gap and facilitates arcing through air or tracking over conductors (van Rooyen et al. 2003). Streamers can be launched by both perched and flying birds; physiologically, only large birds can cause streamer outages.

Figure 3-10. An Osprey producing a "streamer" from the edge of a nest.

The number and species of birds around a line segment, and their voiding behavior, influences whether streamers are a concern. During a fault investigation, it is important to understand the difference between streamers and pollution because the retrofitting solution differs substantially for each mode of failure. When bird pollution occurs, the insulators are covered with feces and a resulting fault tracks across the insulator. Burn marks are easily visible across insulator sheds and on the conductor hardware. In contrast, bird streamer outages occur when feces fill an air gap between an energized conductor and ground (typically a lattice tower member). With streamers, the fault often propagates vertically towards the tower. Signs of such an outage are hard to detect although small burn marks can sometimes be seen on the energized hardware and on the lattice tower.

3.5.2 Avian Pollution

Bird contamination or pollution occurs when feces build up on the insulators from repeated defecation, which undermines the insulating qualities and may result in a phase-to-ground flashover across the surface of the insulator string, particularly under wet conditions (Figure 3-11). Bird pollution can lead to tracking faults, particularly on the underside of insulators where rain increases conductivity but does not wash insulators clean. This type of contamination can be caused by birds of any size.

Figure 3-11. Accumulated avian excretion (bird pollution) on an insulator. Bird pollution can lead tracking faults, particularly on the underside of insulators where rain increases conductivity but does not wash insulators clean.

As discussed for streamers, during a fault investigation, it is important to understand the difference between streamers and contamination since the retrofitting solutions differ.

4.0 BIRD SPECIES SUSCEPTIBLE TO UTILITY INTERACTIONS

There have been 290 species of birds documented at WSMR. Resident and migratory species considered most susceptible to interactions with power lines at WSMR are listed in Table 4-1. Each species is described further in each respective species' summary that provides the following information:

- Federal and state regulatory status
- Risk factors (e.g., electrocution, collision, nesting)
- Distribution
- Habitat
- Diet
- Seasonal occurrence at WSMR
- Cautionary statements if in proximity to birds or their nests

Although WSMR personnel are not authorized to handle birds or bird nests without the appropriate federal permit and authorization from the Environmental Division, the following cautionary information is presented as safety reminders in the event a bird or nest materials are handled.

Caution: Safety measures should be used in proximity to bird nests and if handling dead or injured birds.

Eye Protection: Beaks vary significantly in size and shape from species to species. Some birds like birds of prey and vultures have sharp beaks designed for tearing apart flesh. Others like water birds have long spear-like beaks for impaling fish. Eye protection must always be worn when handling birds to avoid potential injury to WSMR personnel.

Heavy Leather Gloves: Always use extreme caution when handling birds of prey. These birds have talons that are extremely sharp and strong. Heavy leather gloves must always be worn when handling birds of prey as their talons can injure a human. Heavy gloves also are suggested for birds with prominent beaks to avoid potential injuries to hands.

Table 4-1. Bird species most susceptible to electrocution risks from WSMR operations.

COMMON NAME	SCIENTIFIC NAME	TYPICAL RISK[1]
Native Species		
Turkey Vulture	*Cathartes aura*	E, P
Bald Eagle	*Haliaeetus leucocephalus*	C, E, S
Golden Eagle	*Aquila chrysaetos*	C, E, N, S
Swainson's Hawk	*Buteo swainsoni*	E, N
Red-tailed Hawk	*Buteo jamaicensis*	E, N
Harris's Hawk	*Parabuteo unicinctus*	E, N
Ferruginous Hawk	*Buteo regalis*	E, N
Rough-legged Hawk	*Buteo lagopus*	E
Aplomado Falcon	*Falco femoralis*	C, E
Peregrine Falcon	*Falco peregrinus*	C, E
Prairie Falcon	*Falco mexicanus*	C, E
Greater Roadrunner	*Geococcyx californianus*	E
Great Horned Owl	*Bubo virginianus*	E[2], N
Barn Owl	*Tyto alba*	E
American Crow	*Corvus brachyrhynchos*	E[2], N
Chihuahuan Raven	*Corvus cryptoleucus*	E[2], N
Non-Native Species		
House Sparrow	*Passer domesticus*	N[3]
European Starling	*Sturnus vulgaris*	N, P[3]
Rock Pigeon	*Columba livia*	N, P[3]
Eurasian Collared-dove	*Streptopelia decaocto*	N[3]
Monk Parakeet	*Myiopsitta monachus*	N[3]

[1]Typical Risk: C=Collision, E=Electrocution, N=Nesting, S=Streamers, P=Pollution
[2]Substation Electrocution Risk
[3]Non-native species that commonly nest or perch in substations.

Although a number of bird species occupy or move through WSMR, focus species described in this chapter are limited to those birds that either commonly occur, have been directly documented in the area, are considered to be rare or sensitive, or may be especially susceptible to electrocution risks.

Both the number and diversity of bird species in New Mexico vary seasonally. Although birds are present throughout the year, some species are more prevalent during the breeding season (i.e., spring/summer), some occupy this area during the winter, and others move through only during spring and fall migration. The species summaries describe the general patterns of these seasonal occurrences on a regional basis. In addition, seasonal migration patterns are dynamic and often vary on a yearly basis due to changes in weather patterns and prey populations; therefore, the data presented in this plan should be used as a general guideline.

This background information, used in conjunction with the at-risk structure configurations identified and discussed in this APP, will aid in minimizing risks to these and other birds on WSMR's system.

- Distribution maps based on favorable habitat in New Mexico are available through the state's Gap Analysis Project at: http://www.gap.uidaho.edu/bulletins/6/FRSNMGAP.htm

- The GAP Land Cover Viewer below is nationwide: http://gis1.usgs.gov/csas/gap/viewer/land_cover/Map.aspx

- The National Map Viewer contains standardized data: http://viewer.nationalmap.gov/viewer/

Gap Analysis Project (GAP) predicted distributions are created using a Geographic Information System (GIS) modeling process that combines species habitat association rules with species geographic range. The output layers are intended to provide more accurate information about the current distribution of species within their general ranges than is generally available from published range maps. This is because range maps do not include information on the ecological conditions that favor the presence of the species and typically include areas of unsuitable habitat within the species' ranges. In contrast with maps that show only locations with known observations, however, GAP-predicted distributions also include areas where species have not been observed, but could occur based on known habitat preferences.

- Interactive online mapping of species distribution maps using GIS can be accessed at: http://gap.uidaho.edu/species_viewer.html

- Species range and distribution data may be accessed and downloaded at: http://www.gap.uidaho.edu/species_data.html

- Avian species lists for White Sands National Monument (WSNM) can be viewed at: http://www.npwrc.usgs.gov/resource/birds/chekbird/r2/whitesan.htm

4.1 Native Species

The species discussed in this section are protected under the MBTA and/or the BGEPA. In most cases, these species also are afforded protections at the state level.

4.1.1 Turkey Vulture

Status

☒ **MBTA** ☐ **Federally Endangered** ☐ **State Endangered**
☐ **BGEPA** ☐ **Federally Threatened** ☐ **State Threatened**
☐ **ESA** ☐ **State Species of Special Concern**

Issues

☒ **Electrocution**
☐ **Collision**
☐ **Nesting**
☒ **Streamers/Pollution**

Distribution - Turkey Vultures (Figure 4-1) are the most widely distributed vulture species in North America. This species breeds from southern Canada; throughout much of the U.S.; and south through Mexico, Central America, and South America (Kirk and Mossman 1998).

Habitat and Food Sources - A variety of habitats are used for foraging, roosting, and breeding. Turkey Vultures occur most frequently in open areas that provide adequate cliffs or large trees for nesting, roosting, and resting. Roost sites are often in undisturbed stands of large trees.

Figure 4-1. Turkey Vulture.

Preferred breeding habitat includes isolated and undisturbed forested areas that provide rock crevices, logs, stumps, and abandoned buildings for nest sites. Foraging habitats include grasslands, agricultural land, and pasture, but areas of intensive row crops appear to be avoided (Kirk and Mossman 1998).

Turkey Vultures have a well-developed sense of smell and are adept at detecting concealed carrion. They are almost exclusively scavengers and rarely take live prey. They primarily feed on mammals (wild and domestic) but also consume reptiles, amphibians, birds, fish, crustaceans, and sometimes plant material (Kirk and Mossman 1998).

Seasonal Occurrence - The Turkey Vulture is a common summer resident statewide (Biota Information System of New Mexico [BISON-M] 2013a, U.S. Geological Survey [USGS] 2013a). On WSNM, this species is an occasional summer resident and breeder (USGS 2013b, WSMR 2013).

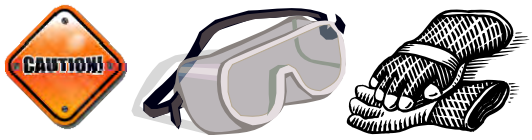
4.1.2 Bald Eagle

Status

- ☒ **MBTA**
- ☒ **BGEPA**
- ☐ **ESA**
- ☐ **Federally Endangered**
- ☐ **Federally Threatened**
- ☐ **State Species of Special Concern**
- ☐ **State Endangered**
- ☒ **State Threatened**

Issues

- ☒ **Electrocution**
- ☒ **Collision**
- ☐ **Nesting**
- ☒ **Streamers/Pollution**



Distribution - The Bald Eagle (Figure 4-2) is widely distributed across Canada and the U.S. (Buehler 2000). Bald Eagles are most common, and tend to breed near fresh, brackish, or salt water, but juvenile, immature, sub-adult, and migrating birds can be observed in almost any natural landscape. Some areas of North America have resident eagle populations, while other areas show seasonal shifts between breeding and wintering populations.

Figure 4-2. Adult Bald Eagles.

Habitat - Throughout the year, Bald Eagles frequent the coast, rivers, lakes, reservoirs, and terrestrial habitats adjacent to these water bodies (Buehler 2000). They also use semi-desert or upland desert shrub communities and grasslands, including areas that support prairie dog colonies (Andrews and Righter 1992).

Nests are typically located in the largest available tree capable of supporting the species' substantial nest. Nests are routinely used over consecutive years and new materials are added each year, leading to nests that can become extraordinarily large (Grubb 1976, Anderson and Bruce 1980, Buehler 2000).

The major habitat components on wintering grounds include a food source and suitable trees for diurnal perching and night roosting. Bald Eagles commonly feed on fish, waterfowl, and carrion, and food availability is likely the single most important factor influencing winter eagle distribution and abundance (Steenhof 1976). Wintering Bald Eagles may gather in large aggregations and share communal roosts, diurnal perches, and feeding areas. Perches are an essential element in Bald Eagles' selection of foraging areas, since perches are necessary for hunting and resting (Stalmaster and Newman 1979). Perch sites are typically in open view of potential food sources and are generally within 160 feet of water (Vian 1971).

The Bald Eagle commonly feeds on fish, waterfowl, and carrion; however, Bald Eagles also will forage in upland habitats for terrestrial prey species. Deer and elk carcasses provide valuable food sources for wintering eagles.

Seasonal Occurrence - Bald Eagles migrate and winter throughout most of the state (USGS 2013a). While this species may occur locally in summer throughout New

Mexico, only a few pairs have nested in the state (primarily Sierra and Colfax counties), (Stahlecker 2009, The Santa Fe New Mexican 2011, New Mexico Avian Conservation Partners [NMACP] 2013a, BISON-M 2013b).

Bald Eagles are rarely seen at WSMR, and no nests or winter concentration areas occur on the facility. Habitat at WSMR is suboptimal for Bald Eagles because of the lack of a large water body with appropriate prey and roosting or nesting trees nearby.

Identification - Differentiating between adult Bald Eagles and adult Golden Eagles is relatively easy, based on the distinctive white head and tail of the Bald Eagle and the golden head of the Golden Eagle (Figure 4-3 and Figure 4-4, respectively).

Figure 4-3. Adult Bald Eagle.

Figure 4-4. Golden Eagle.

Distinguishing immature birds (Figure 4-5) is more challenging. Juvenile Golden Eagles can be identified by distinctive white "windows" in the wings and a white base at the tail (Liguori 2005, Wheeler and Clark 1999). Juvenile Bald Eagles have neither of these markings, and Bald Eagles require 5 years to reach maturity and exhibit the full white head and tail feathers. Additionally, note the immature Bald Eagle shown in Figure 4-5 lacks the yellow beak and eyes of an adult bird.

Figure 4-5. Immature Bald Eagle.

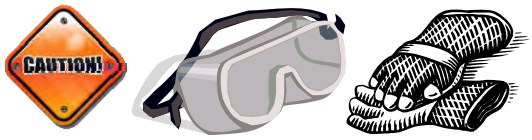
4.1.3 Golden Eagle

Status

- ☒ **MBTA**
- ☒ **BGEPA**
- ☐ **ESA**
- ☐ **Federally Endangered**
- ☐ **Federally Threatened**
- ☐ **State Species of Special Concern**
- ☐ **State Endangered**
- ☐ **State Threatened**

Issues

- ☒ **Electrocution**
- ☒ **Collision**
- ☒ **Nesting**
- ☒ **Streamers/Pollution**



Distribution - Golden Eagles (Figure 4-6) are one of the largest raptors in North America, and their large size makes the species particularly vulnerable to electrocution hazards (APLIC 2006). Golden Eagles primarily occur throughout western North America; however, during winter, they also occur irregularly in eastern North America (Kochert et al. 2002).

Figure 4-6. Golden Eagle.

Habitat and Food Sources - Golden Eagles are birds of open habitats and landscapes. Although open grasslands, sagebrush steppe, and broad valleys are the preferred habitats, Golden Eagles also can be found at higher elevations, along river corridors, and near conifer forests, particularly during migration. Arid, sloping valleys, benches or flatlands bisected by canyons, and gullies or rock outcrops are preferred over flat, featureless terrain.

Breeding habitat for Golden Eagles generally consists of lowland and upland desert shrub communities and grasslands, lowland bluffs and cliffs, desert and submontane shrub communities, piñon-juniper, and montane riparian woodlands (Behle 1981). Nests often are located on cliff faces and large rock outcrops, although birds also will use large, ponderosa pines to small junipers or even utility poles (Glinski 1998). Breeding pairs may alternate between nest sites each year. Winter habitats generally include arid, shrub-steppe country and are mostly similar in physical appearance to the summer areas.

Primary prey species for Golden Eagles consist of small and medium-sized mammals (e.g., ground squirrels, rabbits), but Golden Eagles also will feed on insects, snakes, birds, juvenile ungulates, and carrion. Although it is rare, this bird may take large, healthy mammals, hunting cooperatively in pairs (Terres 1991).

Seasonal Occurrence - Golden Eagles breed locally in suitable habitat throughout the state (NMACP 2013b, USGS 2013a). This species breeds and winters at WSMR and is particularly prevalent in the Tularosa Basin during the winter (NMNHP

and WSMR 2001). Band returns from three Golden Eagles killed or observed at WSMR from 2009-2010 included immature eagles initially banded in Nevada and Montana (Figure 4-7).

Figure 4-7. Immature Golden Eagle (C60) banded by the Raptor View Research Institute in Montana in 2008 and recovered at WSMR in 2009 after it was found electrocuted.

In March 2013, WSMR conducted a 5-day aerial (helicopter) survey for Golden Eagles and nests. Surveys were designed and carried out by The American Eagle Institute and The Peregrine Fund. Observers documented 174 nests within an estimated 39 potential breeding areas; however, some potential habitat on the range was not covered. Signs of occupancy were documented at 20 breeding areas, with incubating adults observed at 4 sites. Extrapolation to areas of potential breeding habitat not surveyed would add roughly 17 potential breeding areas to the 39 nest clusters located on the aerial surveys, bringing the total estimate at WSMR to potentially 56 breeding areas. Assuming 75% are occupied, the resulting 42 occupied breeding areas would result in a nesting density of 76 square miles per pair (Driscoll, unpublished data). Additional ground-based surveys are being conducted by The Peregrine Fund, which will contribute information on power poles and lines used by eagles for roosting. This information will be incorporated into this APP and into the WSMR Retrofitting Data Matrix to prioritize the retrofitting of poles and lines used by Golden Eagles.

4.1.4 Swainson's Hawk

Status

- ☒ **MBTA**
- ☐ **BGEPA**
- ☐ **ESA**
- ☐ **Federally Endangered**
- ☐ **Federally Threatened**
- ☐ **State Species of Special Concern**
- ☐ **State Endangered**
- ☐ **State Threatened**

Issues

- ☒ **Electrocution**
- ☐ **Collision**
- ☒ **Nesting**
- ☐ **Streamers/Pollution**

Distribution - Swainson's Hawks (Figure 4-8) inhabit the Great Plains and desert shrublands of western North America from Canada to northern Mexico. They undertake one of the most remarkable migrations of any raptor species in North America when they vacate their breeding grounds and migrate in large flocks to Argentina.

Habitat and Food Sources - The Swainson's Hawk is a bird of open country, frequenting grasslands and desert shrublands that are interspersed with trees. The species also occurs in agricultural areas. They nest in scattered or isolated trees and in riparian areas on the edge of more open country. These hawks are quite tolerant of humans and occasionally place their nests near human habitation.

Breeding birds forage primarily on small vertebrate species, particularly ground squirrels. Insects comprise the predominant portion of their diet during the non-breeding period (The Peregrine Fund 2009).

Figure 4-8. Swainson's Hawk.

Seasonal Occurrence - The Swainson's Hawk is a summer resident in appropriate habitat statewide (USGS 2013a). Although this species breeds in fairly low numbers in New Mexico, the Swainson's Hawk is a common breeder in Dona Ana and Otero counties (NMACP 2013c, BISON-M 2013c). This species also is a common summer resident and breeder on adjacent WSNM (USGS 2013b) and nests throughout WSMR (NMNHP and WSMR 2001, Brubaker et al. 2003). This species frequently nests on power poles at WSMR, and, therefore, is at greater risk of electrocution (Cutler pers. comm. 2013).

4.1.5 Red-Tailed Hawk

Status

- ☒ **MBTA**
- ☐ **BGEPA**
- ☐ **ESA**
- ☐ **Federally Endangered**
- ☐ **Federally Threatened**
- ☐ **State Species of Special Concern**
- ☐ **State Endangered**
- ☐ **State Threatened**

Issues

- ☒ **Electrocution**
- ☐ **Collision**
- ☒ **Nesting**
- ☐ **Streamers/Pollution**

Figure 4-9. Red-tailed Hawk.

Distribution - Red-tailed Hawks (Figure 4-9) are the most common and widely distributed large raptor in North America. Except for the northern-most populations in Alaska and Canada, they are year-round residents in nearly every state, as well as in Mexico and Central America. This species is perhaps the most commonly electrocuted buteo species in North America (APLIC 2006).

Habitat and Food Sources - Red-tailed Hawks are generalists in their habitat preference. During the nesting season, Red-tailed Hawks may occur from sea level to 9,000 feet in elevation. They commonly occupy forested lands, open country with scattered trees, edge areas between different habitat types, agricultural lands, and riparian zones. Red-tailed Hawks will use large trees, cliffs, and man-made structures for nesting, depending on the substrate and prey availability in nearby areas (Preston and Beane 2009), and have been documented nesting on electric utility structures (Gilmer and Wiehe 1977, Knight and Kawashima 1993, Blue 1996). This raptor is relatively tolerant of humans and often occurs in human-dominated landscapes, such as rural subdivisions and agricultural areas.

This hawk typically prefers to nest in a tall tree with good aerial access, often nesting in a wide range of habitats including spruce forests, aspen stands, wooded stream valleys, canyons, woodlots, and lower-elevation coniferous or deciduous woodlands. The availability of tall trees for nesting with foraging habitat nearby is important in many areas, but cliffs or other elevated locations also may be used for nesting. Winter habitats tend to be more open and include upland pastures, grasslands, and forests. In general, the basic habitat types are similar throughout the year.

Perch availability is important for Red-tailed Hawks, which generally hunt from a perch. This raptor is an opportunistic forager, commonly preying on small and medium-sized mammals (e.g., rodents, rabbits), birds, and reptiles (including snakes).

Seasonal Occurrence - Red-tailed Hawks are common year-round residents statewide (USGS 2013a, New Mexico Avian Protection Working Group 2005, BISON-M 2013d). This species both breeds and winters at WSMR (NMNHP and WSMR 2001, WSMR 2013) and has been documented nesting on electrical power poles (Brubaker et al. 2003).

4.1.6 Harris's Hawk

Status

- ☒ **MBTA**
- ☐ **BGEPA**
- ☐ **ESA**
- ☐ **Federally Endangered**
- ☐ **Federally Threatened**
- ☐ **State Species of Special Concern**
- ☐ **State Endangered**
- ☐ **State Threatened**

Issues

- ☒ **Electrocution**
- ☐ **Collision**
- ☒ **Nesting**
- ☐ **Streamers/Pollution**

Distribution - In the U.S., the Harris's Hawk (Figure 4-10) occurs throughout the year in scattered isolated populations in Arizona, New Mexico, Texas, and irregularly California (Dwyer and Bednarz 2011).

Habitat and Food Sources - Breeding and winter range for the Harris's Hawk consists of semi-open desert scrub, savanna, grassland, and wetland habitats (Dwyer and Bednarz 2011).

In the U.S., the Harris's Hawk primarily feeds on medium-sized mammals (lagomorphs), birds, and lizards (Dwyer and Bednarz 2011).

Figure 4-10. Harris's Hawk.

Seasonal Occurrence - Harris's Hawks occur throughout the year in suitable habitat in the extreme southeastern and southwestern portions of the state (USGS 2013a). This hawk is rare to uncommon in Lincoln, Otero, and Socorro counties (BISON-M 2013e). Harris's Hawks have been documented at WSMR (WSMR 2013).

4.1.7 Ferruginous Hawk

Status

- ☒ **MBTA**
- ☐ **BGEPA**
- ☐ **ESA**
- ☐ **Federally Endangered**
- ☐ **Federally Threatened**
- ☐ **State Species of Special Concern**
- ☐ **State Endangered**
- ☐ **State Threatened**

Issues

- ☒ **Electrocution**
- ☐ **Collision**
- ☒ **Nesting**
- ☐ **Streamers/Pollution**

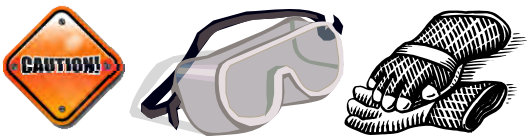


Figure 4-11. Ferruginous Hawk.

Distribution - Ferruginous Hawks (Figure 4-11) inhabit the Great Plains and Intermountain West from southern Canada to central Mexico.

Habitat and Food Sources - This large hawk is a bird of open country, inhabiting arid grasslands, semi-desert shrublands, and often the interface between piñon-juniper woodlands and sagebrush basins. They tend to occur in more unbroken or unfragmented landscapes and avoid heavily forested areas, steep canyons, and high elevations (Bechard and Schmutz 1995). They often nest in isolated trees or sparse tree groves; on windmills, cliffs, and rocky outcrops; and occasionally on the ground, particularly within rolling “badland” habitats. During winter, Ferruginous Hawks often utilize open farmland, grasslands, deserts, and other arid regions associated with rabbits, prairie dogs, or other major prey species.

Ferruginous Hawks primarily prey on small mammals. West of the Continental Divide, rabbits, hares, and pocket gophers comprise the main food source, while east of the Continental Divide they primarily feed on ground squirrels and prairie dogs (Bechard and Schmutz 1995). In all areas, however, Ferruginous Hawks commonly prey upon prairie dogs.

Seasonal Occurrence - Ferruginous Hawks breed across the northern two-thirds of the state and may be found statewide during winter (USGS 2013a, NMACP 2013d). This species is rare to uncommon in southcentral New Mexico (BISON-M 2013f). Ferruginous Hawks are rare winter residents at WSNM (USGS 2013b) and have been documented at WSMR (WSMR 2013), including the Main Post cantonment area (Cutler pers. comm. 2013).

4.1.8 Rough-Legged Hawk

Status

☒ **MBTA** ☐ **Federally Endangered** ☐ **State Endangered**
☐ **BGEPA** ☐ **Federally Threatened** ☐ **State Threatened**
☐ **ESA** ☐ **State Species of Special Concern**

Issues

☒ **Electrocution**
☐ **Collision**
☐ **Nesting**
☐ **Streamers/Pollution**

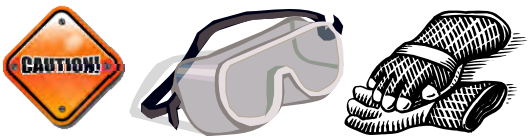


Figure 4-12. Rough-legged Hawk.

Distribution - The Rough-legged Hawk (Figure 4-12) breeds across northern Canada and Alaska. Only during the winter do they occur in the lower 48 states.

Habitat and Food Sources - In its winter range, the Rough-legged Hawk prefers open country at lower elevations. It typically occupies open grasslands, sagebrush flats and basins, agricultural land, wetlands, wet meadows, dunes, pasture, and river deltas. Rough-legged Hawks often are observed perched along these open areas when foraging. Low rocks and shrubs may be used in the absence of higher sites, but power poles, lone buildings or other structures, fences, and lone trees or snags are all used as resting or hunting perches.

The Rough-legged Hawk's winter diet consists mainly of small mammals, but species composition reflects different taxa available in their winter range. Voles, mice, and (to a lesser extent) shrews comprise the majority of prey items taken in most areas (Bechard and Swem 2002). They also will opportunistically feed on a wide variety of carrion during the winter (Bechard and Swem 2002).

Seasonal Occurrence - The Rough-legged Hawk winters throughout the state (USGS 2013a). This species is rare to uncommon in southcentral New Mexico (BISON-M 2013g). Rough-legged Hawks are rare winter residents at WSNM (USGS 2013b) and have been documented at WSMR (WSMR 2013).

4.1.9 Aplomado Falcon

Status

☒ **MBTA** ☐ **Federally Endangered** ☒ **State Endangered**
☐ **BGEPA** ☐ **Federally Threatened** ☐ **State Threatened**
☐ **ESA** ☐ **State Species of Special Concern**

Issues

☒ **Electrocution**
☒ **Collision**
☐ **Nesting**
☐ **Streamers/Pollution**

Figure 4-13. Aplomado Falcon.

Distribution - The Aplomado Falcon (Figure 4-13) has a scattered and uncertain distribution in southcentral New Mexico, southeastern Arizona, and western Texas; northern and southeast Mexico; Central America; and large parts of South America (NMACP 2013e). This falcon is listed as a nonessential, experimental population in New Mexico (Federal Register 42300 Volume 71, No. 143).

Habitat and Food Sources - Aplomado Falcons inhabit coastal prairies and desert grasslands with scattered yucca and mesquite. This falcon also occupies oak woodlands and riparian gallery forests in the middle of desert grassland, coastal savannahs, marshes, and tidal flats (Keddy-Hector 2000, NMACP 2013e).

Birds and insects make up most of this falcon's diet, but bats, small rodents, and lizards also are taken (Keddy-Hector 2000).

Seasonal Occurrence - Although very rare, the Aplomado Falcon may occur throughout the year in the southern and central portions of New Mexico (USGS 2013a). It is probable the Aplomado Falcon formerly bred at WSMR, but following its steep population decline, it is now considered a vagrant at WSMR (NMNHP and WSMR 2001). WSMR participated in a reintroduction program from 2007-2012, given suitable grassland habitat located within the facility. However, to date, no known breeding Aplomado Falcons have established within WSMR. Extensive grasslands that would support individual or breeding Aplomado Falcons occur at WSMR (Federal Register 42300 Volume 71, No. 143). Individual falcons are documented at WSMR occasionally, with the last sighting in September 2013. West of WSMR, Aplomado Falcons have nested on a transmission line crossing the Armendaris Ranch (Cutler pers. comm. 2013).

4.1.10 Peregrine Falcon

Status

- ☒ **MBTA**
- ☐ **BGEPA**
- ☐ **ESA**
- ☐ **Federally Endangered**
- ☐ **Federally Threatened**
- ☐ **State Species of Special Concern**
- ☐ **State Endangered**
- ☒ **State Threatened**

Issues

- ☒ **Electrocution**
- ☒ **Collision**
- ☐ **Nesting**
- ☐ **Streamers/Pollution**

Distribution - The Peregrine Falcon (Figure 4-14) occurs worldwide in a wide variety of habitats including tundra, wetlands, deserts, maritime islands, continental forests, plains, and mountains. It is absent as a breeder only from the Amazon Basin, the Sahara Desert, most of the steppes of central and eastern Asia, and Antarctica (White et al. 2002).

Habitat and Food Sources - The Peregrine Falcon usually nests on cliff ledges and forages over adjacent coniferous and riparian forests. Migrants and winter residents mostly occur around reservoirs, rivers, and marshes, but also occur in grasslands, agricultural areas, and less often in other habitats (Andrews and Righter 1992).

This falcon's diet consists mostly of small to medium-sized birds, but occasionally mammals such as bats, voles, and ground squirrels (White et al. 2002).

Figure 4-14. Peregrine Falcon.

Seasonal Occurrence - The Peregrine Falcon occurs in all but extreme northeastern New Mexico throughout the year (USGS 2013a). This falcon is rare in the southcentral portion of the state (BISON-M 2013i). The American subspecies (*Falco pergrinus anatum*) breeds locally in montane areas of New Mexico, generally nesting on cliffs at middle elevations, including in the Sacramento Mountains east of WSMR and to the south in the Organ Mountains on Fort Bliss. Although not documented, Peregrine Falcons are likely to nest in the Oscura and San Andres Mountains (Montoya and Juergens pers. comm. 2013).

4.1.11 Prairie Falcon

Status

☒ **MBTA** ☐ **Federally Endangered** ☐ **State Endangered**
☐ **BGEPA** ☐ **Federally Threatened** ☐ **State Threatened**
☐ **ESA** ☐ **State Species of Special Concern**

Issues

☒ **Electrocution**
☒ **Collision**
☐ **Nesting**
☐ **Streamers/Pollution**

Distribution - The Prairie Falcon (Figure 4-15) occurs in western North America from central Mexico to central British Columbia (Steenhof 1998).

Habitat and Food Sources - The Prairie Falcon inhabits arid, open plains and the shrub-steppe deserts of western North America where canyons, cliffs, or bluffs provide cover and nest sites (Steenhof 1998). Prairie Falcons usually nest on cliff ledges, but occasionally elsewhere including trees, power poles, buildings, and steep sides of arroyos (New Mexico Avian Conservation Partners 2013f).

Prairie Falcons hunt birds and small mammals from perches or while in flight, swooping low over open country (Kingery 1998). Prairie Falcons eat primarily ground squirrels, when available, and they also prey on grassland songbirds, such as Horned Larks and meadowlarks, particularly in winter.

Figure 4-15. Prairie Falcon.

Seasonal Occurrence - The Prairie Falcon occurs throughout the year in appropriate habitat in all but the eastern portions of the state. This falcon inhabits eastern New Mexico only during winter (USGS 2013a). The Prairie Falcon is rare to uncommon in southcentral New Mexico (BISON-M 2013j), but is known to occur and breed at WSMR (NMNHP and WSMR 2001).

4.1.12 Greater Roadrunner

Status

- ☒ **MBTA**
- ☐ **BGEPA**
- ☐ **ESA**
- ☐ **Federally Endangered**
- ☐ **Federally Threatened**
- ☐ **State Species of Special Concern**
- ☐ **State Endangered**
- ☐ **State Threatened**

Issues

- ☒ **Electrocution**
- ☐ **Collision**
- ☐ **Nesting**
- ☐ **Streamers/Pollution**

Distribution – The Greater Roadrunner (Figure 4-16) occurs throughout the year in arid portions of the southwestern U.S. (NMDGF 2013). It can be found from western California to eastern Arkansas, south to central Mexico, and as far north as northern California and central Colorado (USGS 2013c).

Figure 4-16. Greater Roadrunner.

Habitat and Food Sources – The Greater Roadrunner inhabits semiarid and arid open country with scattered scrub (Hughes 2011). In New Mexico, this species is found in flat or rolling terrain and builds a hidden platform nest in a mesquite, shrub, yucca, or cactus (NMDGF 2013).

Greater Roadrunners are opportunistic omnivores, but primarily feed on lizards and grasshoppers. Other common food items include caterpillars, crickets, snakes, mice, eggs, carrion, prickly pear fruits, and young quail. This bird also consumes venomous prey items such as scorpions, tarantulas, wasps, and rattlesnakes (NMDGF 2013, Hughes 2011).

Seasonal Occurrence – The Greater Roadrunner is a non-migratory species that is most common in the southern portion of the state and in the Pecos and Rio Grande river valleys, usually below 7,000 feet (NMDGF 2013). The Greater Roadrunner is a common resident at WSMR (BISON-M 2013k).

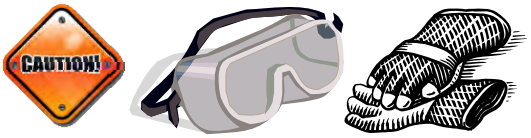
4.1.13 Great Horned Owl

Status

☒ **MBTA** ☐ **Federally Endangered** ☐ **State Endangered**
☐ **BGEPA** ☐ **Federally Threatened** ☐ **State Threatened**
☐ **ESA** ☐ **State Species of Special Concern**

Issues

☒ **Electrocution**
☐ **Collision**
☒ **Nesting**
☐ **Streamers/Pollution**



Distribution - The Great Horned Owl (Figure 4-17) is widespread throughout North America, from wilderness to rural locations to urban parks and suburbs (Terres 1991). Most individuals are permanent residents throughout their breeding range (Houston et al. 1998).

Habitat and Food Sources - The Great Horned Owl is very adaptable and probably has the most diverse habitat and climatic tolerance of any North American owl species. It inhabits virtually every type of terrain in North America from sea level to 11,000 feet in elevation. If there is a preferred habitat, it would include mature deciduous woods that border water, with scattered conifers for maximum roosting concealment and adjacent open habitats for hunting (Owling.com 2001).

Figure 4-17. Great Horned Owl.

During the day, this nocturnal species often roosts in dense tops of conifers. Great Horned Owls forage from dusk until dawn; however, individual owls also will forage during the day (Terres 1991).

Great Horned Owls are highly territorial, and pairs defend their territories throughout the year. This species is the earliest nesting owl in North America. Great Horned Owls do not construct their own nest site, but customarily adopt the previous year's nest of other bird species such as Red-tailed Hawks, crows, or magpies. Hollow trees are occasionally selected as nest sites. In mountainous or rough terrain, particularly where few trees exist, Great Horned Owls will nest on ledges and large, rocky depressions (Owling.com 2001). Great Horned Owls also have been documented nesting on electric utility structures (Blue 1996, Hunting 2002).

Small mammals compose the bulk of this owl species' diet. However, Great Horned Owls will prey on almost any animal ranging in size from scorpions and grasshoppers to geese, skunks, and small pets.

Seasonal Occurrence - The Great Horned Owl is a common year-round resident and breeds statewide (USGS 2013a, Houston et al. 1998). This species occurs throughout WSMR, including Main Post cantonment area, and is a common breeder (WSMR 2013; Cutler pers. comm. 2013, Brubaker et al. 2003).

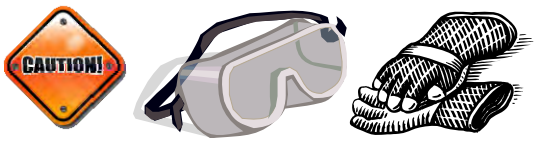
4.1.14 Barn Owl

Status

- ☒ **MBTA**
- ☐ **BGEPA**
- ☐ **ESA**
- ☐ **Federally Endangered**
- ☐ **Federally Threatened**
- ☐ **State Species of Special Concern**
- ☐ **State Endangered**
- ☐ **State Threatened**

Issues

- ☒ **Electrocution**
- ☐ **Collision**
- ☐ **Nesting**



Distribution - The Barn Owl (Figure 4-18) is widespread throughout the world, from wilderness to rural locations to urban parks and suburbs (Terres 1991).

Figure 4-18. Barn Owl.

Habitat and Food Sources – Barn Owls inhabit primarily open habitats such as grasslands, deserts, marshes, and agriculture fields, but also occur in and around metropolitan areas. Lack of nest and roosting sites can limit use of suitable foraging habitat. This species nests or roosts in cavities in trees, cliffs, rock outcrops, caves, river/arroyo banks, and human-created structures (e.g., barns, hay stacks, nest boxes) (Marti et al. 2005).

The Barn Owl's diet is dominated by small mammals such as rodents, shrews, bats, and lagomorphs. A smaller percentage of the Barn Owl's diet consists of birds, reptiles, amphibians, and arthropods (Marti et al. 2005).

Seasonal Occurrence – The Barn Owl is a year-round resident throughout New Mexico (New Mexico Avian Protection Working Group 2005, USGS 2013a). It is common at WSMR within the appropriate habitat types (WSMR 2013), and has been found electrocuted at ground banks at WSMR.

4.1.15 American Crow

Status

- ☒ **MBTA**
- ☐ **BGEPA**
- ☐ **ESA**
- ☐ **Federally Endangered**
- ☐ **Federally Threatened**
- ☐ **State Species of Special Concern**
- ☐ **State Endangered**
- ☐ **State Threatened**

Issues

- ☒ **Electrocution**
- ☐ **Collision**
- ☒ **Nesting**
- ☐ **Streamers/Pollution**

Figure 4-19. American Crow.

Distribution - American Crows (Figure 4-19) are the most widespread crow species in North America. They breed throughout much of the continental U.S. and southern half of Canada. Northern populations in much of Canada are migratory and breeding birds retreat south during the winter (Verbeek and Caffrey 2002).

Habitat and Food Sources - A habitat generalist, the crow occupies a variety of habitats including urban, rural, riparian, agricultural, coastal, pasture, and woodland areas. They avoid large, dense forests and desert expanses. Their ability to adapt has facilitated large population increases in some areas, especially in cities. Crows can form immense winter roosting flocks of many tens of thousands of birds.

Crows are opportunistic foragers and will eat nearly anything including invertebrates, amphibians, reptiles, small birds and mammals, birds' eggs, grain crops, seeds and fruits, carrion, and discarded human food (Verbeek and Caffrey 2002).

Seasonal Occurrence - The American Crow occupies the northwestern, west-central, and extreme northeastern portions of New Mexico throughout the year. This species occurs only during the winter in the area surrounding Las Cruces (USGS 2013a). This species is uncommon throughout WSMR and is most likely to been seen at the Main Post cantonment area (WSMR 2013).

4.1.16 Chihuahuan Raven

Status

- ☒ **MBTA**
- ☐ **BGEPA**
- ☐ **ESA**
- ☐ **Federally Endangered**
- ☐ **Federally Threatened**
- ☐ **State Species of Special Concern**
- ☐ **State Endangered**
- ☐ **State Threatened**

Issues

- ☒ **Electrocution**
- ☐ **Collision**
- ☒ **Nesting**
- ☐ **Streamers/Pollution**

Distribution - The Chihuahuan Raven (Figure 4-20) breeds from the southwest U.S. through northeast Mexico. In the U.S., this species primarily breeds in the southwestern and eastern portions of New Mexico and in southeast Arizona. It also is known to breed in southeast Colorado, southwest Kansas, western Oklahoma, and the western half of Texas. Winter range is similar, but extends farther south than the breeding range. Distribution information is not definitive because of the difficulty distinguishing this species from the Common Raven (Dwyer et al. 2013).

Figure 4-20. Chihuahuan Raven.

Habitat and Food Sources - The Chihuahuan Raven's preferred habitat during the breeding season is dry, open grassland with scattered trees and shrubs. This species also occurs in unbroken desert scrub, and the open, lower edge of piñon-juniper woodland. The Chihuahuan Raven nests in trees and, in open country, on windmills or utility structures. During winter, these ravens may congregate to feed in agricultural fields, near towns, and at landfills (Dwyer et al. 2013).

The Chihuahuan Raven feed on large insects (especially grasshoppers and beetles), cultivated grains, carrion, eggs, young birds, fruits, scraps of human food, lizards, and small mammals (Dwyer et al. 2013).

Seasonal Occurrence - The Chihuahuan Raven occurs year-round in the southwestern and eastern parts of the state (USGS 2013a, Dwyer et al. 2013). This raven is a common breeder in Dona Ana and Otero counties (BISON-M 2013l). Chihuahuan Ravens are common permanent residents and breed throughout WSMR, including use of electrical power poles for nesting (NMNHP and WSMR 2001; Brubaker et al. 2003). Raven carcasses have been found at WSMR ground banks (Cutler pers. comm. 2013) and were recorded below distribution power poles during the November 2012 field assessment.

4.2 Non-Native Species

The MBTA provides legal protection for most birds and their nests in the U.S. (see 50 CFR Part 10.13 for a list of applicable species). However, the MBTA does not protect introduced species, such as the House Sparrow, European Starling, Rock Pigeon (formerly Rock Dove or Common Pigeon), Eurasian Collared-dove, or Monk Parakeet. Refer to Federal Register 12710, Volume 70, No. 49 for a complete list of non-native, human-introduced bird species not covered under the MBTA. These species are not protected under federal law and are not regulated by the State of New Mexico. This section describes those non-native species either documented to occur or potentially occurring at WSMR. Although the Monk Parakeet has not been documented at WSMR (WSMR 2013), this species is being included because it is rapidly expanding its territory within the U.S. and can be problematic on electric infrastructure.

4.2.1 House Sparrow

Status

☐ **MBTA** ☐ **Federally Endangered** ☐ **State Endangered**
☐ **BGEPA** ☐ **Federally Threatened** ☐ **State Threatened**
☐ **ESA** ☐ **State Species of Special Concern**

Issues

☐ **Electrocution**
☐ **Collision**
☒ **Nesting (Substations)**
☐ **Streamers/Pollution**

Figure 4-21. House Sparrow.

Distribution - The House (or English) Sparrow (Figure 4-21) is an introduced species and occurs throughout the U.S. It is a medium-sized, stocky sparrow with black-streaked brown upperparts and pale gray underparts. Although the House Sparrow is not protected under the MBTA, there are more than 30 native sparrow species that are protected by federal and state laws, so care should be taken to properly identify the bird species involved.

Habitat and Food Sources – The House Sparrow is a cavity nester. Since they are small birds, they will nest in places too small for larger birds like starlings. They will occupy cavities within substations. House Sparrows typically forage on wild and domestic grains (corn, oats, wheat, sorghum), weed seeds, and commercial birdseed. During the breeding season, insects and other arthropods are consumed (Lowther and Cinc 2006).

Seasonal Occurrence – House Sparrows are abundant residents and breed throughout the state (USGS 2013a). It is a common year-round resident at WSMR (BISON-M 2013m, WSMR 2013).

4.2.2 European Starling

Status

☐ **MBTA** ☐ **Federally Endangered** ☐ **State Endangered**
☐ **BGEPA** ☐ **Federally Threatened** ☐ **State Threatened**
☐ **ESA** ☐ **State Species of Special Concern**

Issues

☐ **Electrocution**
☐ **Collision**
☒ **Nesting (Substations)**
☒ **Streamers/Pollution**

Distribution - The European Starling (Figure 4-22) is an introduced species and occurs throughout the U.S. It is a medium-sized, black songbird with short, triangular wings, speckled plumage, and a short tail. The adult in breeding plumage has a distinctive yellow bill and speckled black plumage with purple-green iridescence.

Figure 4-22. European Starling.

Habitat and Food Sources – Starlings are cavity nesters and will nest in substations and access buildings through chimneys, vents, and other openings. They are opportunistic feeders, consuming an extremely diverse diet that varies seasonally, geographically, and with the age of the individual. In general, starlings feed on invertebrates, fruits, berries, grains, and certain seeds (Cabe 1993).

Seasonal Occurrence – European Starlings are abundant residents and breed throughout the state (USGS 2013a). In 1996, this species was listed as an uncommon species, occurring as a year-round resident at WSMR (BISON-M 2013n), but occurs throughout the facility (WSMR 2013), depending on habitat and human influences.

4.2.3 Rock Pigeon

Status

☐ **MBTA** ☐ **Federally Endangered** ☐ **State Endangered**
☐ **BGEPA** ☐ **Federally Threatened** ☐ **State Threatened**
☐ **ESA** ☐ **State Species of Special Concern**

Issues

☐ **Electrocution**
☐ **Collision**
☒ **Nesting (Substations)**
☒ **Streamers/Pollution**

Distribution – The Rock Pigeon, or feral city pigeon (Figure 4-23), is an introduced species and occurs throughout the U.S. They are large, chunky doves with variable plumage (some can be entirely chestnut, white, black, and variations in between).

Habitat and Food Sources – Rock Pigeons are opportunistic and will perch and nest on different substrates both in the wild and in urban areas. They often nest on covered, flat surfaces, including ledges and beams in buildings and substations.

Figure 4-23. Rock Pigeon.

Rock Pigeons primarily forage on seeds (e.g., corn, oats, millet, barley) and fruits (Johnston 1992).

Seasonal Occurrence – Rock Pigeons are abundant residents and known to breed throughout the state (USGS 2013a). In 1996, this species was listed as an uncommon species, occurring as a year-round resident at WSMR (BISON-M 2013o) and, similar to the European Starling, occurs throughout the facility (WSMR 2013), depending on habitats and human influences.

4.2.4 Eurasian Collared-Dove

Status

- ☐ **MBTA**
- ☐ **BGEPA**
- ☐ **ESA**
- ☐ **Federally Endangered**
- ☐ **Federally Threatened**
- ☐ **State Species of Special Concern**
- ☐ **State Endangered**
- ☐ **State Threatened**

Issues

- ☐ **Electrocution**
- ☐ **Collision**
- ☒ **Nesting (Substations)**
- ☐ **Streamers/Pollution**

Figure 4-24. Eurasian Collared-dove.

Distribution - The Eurasian Collared-dove (Figure 4-24) was first released in the New World on New Providence, Bahamas in the mid-1970s. Since that time, this species has spread quickly across North America. There appears to be little to limit the spread of this species. It is unknown what effects the Eurasian Collared-dove will have on native doves. The species' range is not continuous in North America and the Caribbean. It is fairly uniformly distributed from Florida and Georgia to the Gulf Coast and locally common from the southeastern part of the U.S. through the Midwest and Intermountain West to the west coast, with the population expanding into other areas of the U.S. and Canada (Romagosa 2012).

Habitat and Food Sources – The Eurasian Collared-dove is found mostly in suburban, urban, and agricultural areas where food, roost, and nest sites are available. This species nests in trees and buildings (e.g., barns) and avoids heavily forested areas and areas of intense agriculture if no suitable roost, nesting, and feeding sites are available.

The Eurasian Collared-dove primarily feeds on seed, cereal grain, some green parts of plants, berries, and small amounts of invertebrates (Romagosa 2012).

Seasonal Occurrence – The Eurasian Collared-dove was considered to be distributed virtually statewide by 2003 (BISON-M 2013p) and is known to occur at WSMR (WSMR 2013).

Identification - This dove is slightly larger than the native Mourning Dove, which is protected under the MBTA and occurs at WSMR (Figure 4-25). The Eurasian Collared-dove is sandy color with a darker back and a blue-gray wing patch. It has white-tipped tail feathers and a black half-collar on the back of its neck from which it gets its name. The short legs are red and its beak is black.

Figure 4-25. Larger Eurasian Collared-dove in comparison with smaller native Mourning Dove.

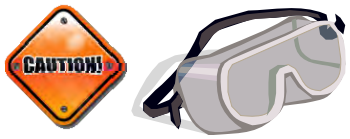
4.2.5 Monk Parakeet

Status

- ☐ **MBTA**
- ☐ **BGEPA**
- ☐ **ESA**
- ☐ **Federally Endangered**
- ☐ **Federally Threatened**
- ☐ **State Species of Special Concern**
- ☐ **State Endangered**
- ☐ **State Threatened**

Issues

- ☐ **Electrocution**
- ☐ **Collision**
- ☒ **Nesting (Substations)**
- ☐ **Streamers/Contamination**



Distribution: The Monk Parakeet (Figure 4-26) (also known as the Quaker Parrot) is a new addition to the list of non-native nuisance birds in the U.S. Monk Parakeets are from the temperate zones in South America and have flourished as far north as New York and Chicago, with large populations in Florida and the Houston area. The Monk Parakeet population in Florida is believed to exceed 100,000 (Aronson and Szejko 2010). The population is expected to double every 4 to 5 years.

Habitat and Food Sources: Like the other exotic bird species discussed, Monk Parakeets have easily adapted to urban areas and human-related activities. This green and gray parakeet constructs large dome-shaped nests of woven sticks, often on utility structures (Figure 4-27), and commonly nests in substations. They eat fruit, nuts, seeds, leaf buds, berries, and blossoms and are opportunistic in foraging (Spreyer and Bucher 1998).

Seasonal Occurrence: Although wild Monk Parakeets are not known to presently occur in New Mexico, this species' distribution is rapidly expanding. The Monk Parakeet has expanded into neighboring states and is, therefore, included in this APP.

Figure 4-26. Monk Parakeet.

Figure 4-27. Monk Parakeet Nest.

4.3 Game Birds

The provisions of the MBTA do not pertain to non-migratory game birds such as quail and wild turkey; however, state hunting laws regulate take for these species. Removing the nest of a game bird is not likely to occur at WSMR, and the ecology of these species makes them unlikely candidates for electrocution.

5.0 PERMIT COMPLIANCE

5.1 Permits Relating to Avian Interactions

The following is an overview of federal permits issued by the USFWS and the State of New Mexico that may be obtained to address avian interactions with power lines. The Environmental Division is responsible for determining which permits would apply to WSMR operations, and for applying for maintaining all permits. If the electrical utility at WSMR is privatized in the future, the private entity will take on this responsibility.

Federal permit applications are available online at: http://www.fws.gov/permits/ApplicationMain.html. Each permit application form is included in Appendix C. The general activities allowed for each type of permit are listed in Table 5-1. For additional guidance on nesting issues refer to the USFWS Nest Destruction Memorandum and Region 2 Interim Empty Nest Policy in Appendix D.

5.1.1 Special Purpose Salvage Permit (MBTA)

Issue: If a carcass of a migratory bird, T/E species, or eagle is discovered, a Special Purpose Salvage Permit is required to dispose of it. USFWS Region 2 states that removal of a carcass implies possession; therefore, a salvage permit is needed because a bird carcass may not be possessed without a permit. Without a permit, all bird carcasses must be left on site, unburied.

WSMR currently maintains a Special Purpose Salvage Permit. This federal permit is required to pick up dead birds, abandoned nests, nonviable eggs, and their parts. However, all salvaged birds must be transferred to a designated holding facility, and each bird must be tagged with the following information:

- Date and location the specimen was salvaged.
- Name and contact information of the person who salvaged the specimen.
- Permit number under which the specimen was salvaged.

WSMR stores bird carcasses in a designated freezer. All birds salvaged must be deposited at a designated repository within 6 months of acquisition, per the specific permit directives. However, if the carcass is an eagle carcass or that of a T/E species, USFWS notification and coordination is still required, even with a permit. Accurate records of operations on a calendar-year basis must be maintained. Records must include the species salvaged, date salvaged, city or county and state where the bird was salvaged, and final disposition of the specimen.

Table 5-1. Actions allowed for each type of federal and state permit.

ACTIONS ALLOWED FOR EACH PERMIT TYPE	SPECIAL PURPOSE SALVAGE PERMIT	SPECIAL PURPOSE RELOCATE PERMIT	DEPREDATION PERMIT	RECOVERY PERMIT (ESA)	EAGLE NEST TAKE PERMIT	NO FEDERAL PERMIT REQUIRED	NEW MEXICO[1]
Dispose of a bird carcass							
Migratory bird	✓						✓
Game bird[2]						✓	✓
Non-native bird						✓	
T/E species	✓						✓
Eagle	✓						✓
Destroy/Remove a bird nest (inactive)							
Migratory bird						✓	
Game bird[2]						✓	
Non-native bird						✓	
T/E species				✓			
Eagle					✓		
Destroy/Remove a bird nest (active)							
Migratory bird			✓				✓
Game bird[2]						✓	✓
Non-native bird						✓	
T/E species				✓			✓
Eagle					✓		✓
Relocate a bird nest							
Migratory bird		✓[3]					✓
Game bird[2]						✓	✓
Non-native bird						✓	
T/E species				✓			✓
Eagle					✓		✓

Table 5-1. Actions allowed for each type of federal and state permit, continued.

ACTIONS ALLOWED FOR EACH PERMIT TYPE	SPECIAL PURPOSE SALVAGE PERMIT	SPECIAL PURPOSE RELOCATE PERMIT	DEPREDATION PERMIT	RECOVERY PERMIT (ESA)	EAGLE NEST TAKE PERMIT	NO FEDERAL PERMIT REQUIRED	NEW MEXICO[1]
Transport severely injured birds[4]							
Migratory bird						✓[5]	✓
Game bird[2]						✓[5]	✓
Non-native bird						✓[5]	
T/E species						✓[5]	✓
Eagle						✓[5]	✓
Euthanize severely injured birds							
Migratory bird						✓[5]	Not Allowed
Game bird[2]						✓[5]	Not Allowed
Non-native bird						✓[5]	No permit needed
T/E species						✓[5]	Not Allowed
Eagle						✓[5]	Not Allowed

[1] Scientific/Education Permit
[2] Some game bird species are also non-native species; however, for this APP "Non-native Species" does not include game birds, as discussed in Section 4.2.
[3] Contact the Regional USFWS Migratory Bird Permit Office for both active and inactive nests.
[4] Due to lack of wildlife rehabilitators in the area, WSMR turns over all injured birds to NMDGF.
[5] Sick or injured migratory birds may be transferred to a licensed veterinarian or rehabilitator under the "Good Samaritan clause" of the MBTA (USFWS 2004). It is the responsibility of the veterinarian or rehabilitator to obtain the applicable permit required to euthanize any migratory bird. A USFWS Office of Law Enforcement Agent must be contacted before any federally listed T/E species or eagle is touched or moved. Federally listed T/E species or eagles may not be euthanized. WSMR personnel are not allowed to euthanize any bird. Contact the Environmental Division first or the bird rehabilitator, if needed, for instructions on how to safely transport the sick or injured bird.

As a condition of the Special Purpose Salvage Permit, the USFWS is authorized to enter the premises at any reasonable hour to inspect the wildlife, books, and records. An annual report form from the Regional Migratory Bird Permit Office must be completed. Reports can be found at http://www.fws.gov/migratorybirds/mbpermits.html. This report must be completed and submitted annually to the USFWS by 31 January. A Special Purpose Salvage Permit is effective for 3 years and may be renewed.

5.1.2 Special Purpose Relocate Permit (MBTA)

Issue: If an active migratory bird nest, not federally listed as threatened or endangered, needs to be relocated, a Special Purpose Relocate Permit is needed.

A Special Purpose Relocate Permit is required to relocate active nests belonging to migratory species. The majority of bird species occurring in WSMR are protected. Exceptions include the introduced species discussed in Section 4.2 *Non-Native Species* and non-migratory game birds discussed in Section 4.3 *Game Birds*. The nesting season varies by species and geographic area, but most birds nest between 1 March and 31 August.

The Special Purpose Relocate Permit is not to be used to remove (i.e., destroy) active nests of migratory species. Destruction of an active nest is handled on a case-by-case basis by applying for a USFWS Depredation Permit (see Section 5.1.3 *Depredation Permit*).

Relocation of an inactive migratory bird nest may require a Special Purpose – General Application 21.27 Permit (Form 3-200-10F) (see Appendix C), but this is subject to change. The Regional USFWS Migratory Bird Permit Office should be contacted for the most recent information on the relocation of both active and inactive nest sites.

Eagles and T/E species and their nests receive additional protection under the BGEPA, ESA, and state regulations; therefore, their active and inactive nests may not be impacted without the appropriate permit(s) (see Section 5.1.4 *Recovery Permit,* Section 5.1.5 *Eagle Nest Take Permit,* and Section 5.2 *New Mexico Permits*).

Currently, the Special Purpose – Miscellaneous application (Form 3-200-10F) is used to request a Special Purpose Relocate Permit. The Special Purpose Relocate Permit is effective for 1 year and requires submittal of an annual report listing the actions taken. The permit may be renewed annually. Personnel must carry a copy of this permit when engaging in permitted activities. The permittee must maintain records and file reports in accordance with the permit requirements. Recordkeeping must include the date and location of each nest relocated, species, name of the person who removed the nest, and permit number under which the specimen was removed. An annual report must be completed and submitted to the USFWS by 31 January of each year.

5.1.3 Depredation Permit (MBTA)

Issue: If an active migratory bird nest not federally listed as threatened or endangered needs to be removed, the preferred action is to relocate the nest after acquiring a Special Purpose Relocate Permit. If an active nest needs to be removed and it is not possible to relocate the nest, a Depredation Permit is required.

A Depredation Permit is required to remove (i.e., destroy) active nests belonging to species protected by the MBTA. The majority of bird species occurring in WSMR are protected. Exceptions include the introduced species discussed in Section 4.2 *Non-Native Species* and non-migratory game birds discussed in Section 4.3 *Game Birds*. The nesting season varies by species and geographic area, but most birds nest between 1 March and 31 August.

The Depredation Permit is not to be used to relocate nests of migratory species. Relocation of a nest is handled by applying for a USFWS *Special Purpose Relocate Permit*, as described in Section 5.1.2.

A Depredation Permit authorizes certain management and control activities necessary to provide for human health and safety, protect personal property, or allow resolution of other injury to people or property. A Depredation Permit is intended to provide short-term relief from migratory bird depredation until long-term measures can be implemented to reduce or eliminate the problem. Orphaned young and eggs must be turned over to a federally licensed wildlife rehabilitator.

A Depredation Permit can be obtained only on a case-by-case basis. After the initial permit is obtained, it may be amended. Except in emergency situations (i.e., threat to human health or safety) the Depredation Permit must be amended prior to each removal. The permit is effective for 1 year and requires an annual report listing the actions taken. The permit may be renewed each year. Personnel must carry a copy of this permit when engaging in permitted activities. It is important to note that eagles and T/E species receive additional protection and, in these cases, both active and inactive nests are protected; therefore, a Depredation Permit is not the appropriate permit for eagles or federally listed species.

The permittee must maintain records and file reports in accordance with the permit requirements. Recordkeeping must include the date and location of each nest removed, species, name of the person who removed the nest, and permit number under which the specimen was removed. An annual report form must be submitted to the USFWS by 31 January of each year.

This permit should be used as a last resort to manage problem nests. When possible, a migratory bird nest that may become a human health or safety concern should be removed (destroyed) outside the active nesting season, per the USFWS Nest Destruction Memorandum or the Region 2 Interim Empty Nest Policy (refer to Appendix D) or relocated as discussed in Section 5.1.2 *Special Purpose Relocate Permit*.

5.1.4 Recovery Permit (ESA)

Issue: If WSMR encounters a T/E species nest that needs to be removed or relocated, a special permit under the ESA is required: a section 10(a)(1)(A) Recovery Permit - Scientific Purposes and Enhancement of Propagation or Survival Permit (Recovery Permit).

A Recovery Permit is required to remove or relocate nests belonging to species protected by the federal ESA. Removal or relocation of a federally listed T/E species' nest is a special case and requires close coordination with both federal and state agencies. Application for this permit includes requirements to ensure compliance with the ESA and its implementing regulations. Coordination with the USFWS' Endangered Species Permits Office and the Ecological Services Office is necessary. Refer to the USFWS website for additional permit information: http://www.fws.gov/permits.

5.1.5 Eagle Nest Take Permit (BGEPA)

Issue: If WSMR needs to disturb, relocate or remove an Eagle nest, an Eagle Nest Take Permit is required. The permittee must comply with any mitigation measures determined by the USFWS.

Special permits and coordination with the USFWS and state agencies are required for any activities potentially affecting eagles, including project construction, project operation, and right-of-way (ROW) maintenance. Both active and inactive eagle nests are protected and may not be disturbed without first obtaining an Eagle Nest Take Permit from the USFWS. However, these permits are highly specific, of short duration, and handled on a case-by-case basis. Typically, both the federal and state agencies will only authorize the removal or relocation of an active eagle nest under emergency conditions (i.e., threat to human health or safety).

Disturbance: The USFWS regulations set forth in section § 22.26 (of BGEPA) govern the issuance of permits to take Bald Eagles and Golden Eagles, where the taking is associated with (but not the purpose of) the activity, and cannot practicably be avoided. Most take authorized under this section is in the form of disturbance; however, permits may authorize non-purposeful take that may result in eagle mortality.

Nesting: The USFWS regulations set forth in section § 22.27 establish the issuance of permits for removing eagle nests where (1) it is necessary to alleviate a safety emergency to people or eagles, (2) it is necessary to ensure public health and safety, (3) the nest prevents the use of a human-engineered structure, or (4) the activity or mitigation for the activity will provide a net benefit to eagles. Only inactive nests may be taken except in the case of safety emergencies. Inactive nests are defined by the continuous absence of any adult, egg, or dependent young at the nest for at least 10 consecutive days leading up to the time of take.

The removal or relocation of an eagle nest is addressed on a case-by-case basis and would require close coordination with the federal USFWS. The USFWS will only authorize take of eagles if it can be determined that the take (1) is compatible with the preservation of the eagle and (2) cannot practicably be avoided.

Individual or Programmatic Permits: The eagle regulations allow applications for either individual or programmatic permits to take eagles. Individual take is defined as a one-time occurrence. Programmatic take is defined as "take that (1) is recurring but not caused solely by indirect effects and (2) occurring over the long term or in location or locations that cannot be specifically identified." A programmatic take permit would only be issued when an applicant has developed comprehensive measures to reduce take to the degree practicable and would be valid for 5 years. This tenure has been proposed to be increased.

On April 13, 2012, the USFWS issued a Proposed Rule (Federal Register, Vol. 77, No. 72, Pages 22267-22278) to revise regulations governing the issuance of permits under the BGEPA to facilitate development of renewable energy and other projects, while ensuring that those operations minimize and avoid impacts to bald and golden eagles. These changes would extend the maximum term for programmatic permits from 5 to 30 years, if the permits incorporate specific adaptive conservation measures that may be necessary to ensure the preservation of eagles. The USFWS also proposed to increase the fees associated with these permits and by that publication date is inviting ideas from the public on how the permit program can be improved.

Authorization of a programmatic permit is applicable to entities that may take eagles in the course of otherwise lawful activities on an ongoing, operational basis. Facilities, such as WSMR, also can work with the USFWS to develop and implement additional measures to reduce take to the level where it is essentially unavoidable. The USFWS cites the example of an appropriate use of a programmatic permit to take eagles: "Utilities that kill eagles through collisions and electrocutions from contact with power lines."

Both advantages and disadvantages exist for the programmatic permit process. Advantages include the reduction in liability and application of take thresholds. Disadvantages include the fact that the process is more complex and would not indemnify an entity from taking non-eagle species such as hawks and owls. Records relating to the activities conducted under this permit must be maintained for a minimum of 5 years.

5.2 New Mexico Permits

New Mexico maintains state permit processes applicable to bird-related actions. State laws do not necessarily prohibit or allow the same actions as federal laws. As a result, state permits with titles similar to federal permits may be more or less restrictive. The general activities allowed for each type of permit are listed in Table 5-1. WSMR maintains a state permit for "Taking Protecting Wildlife for Scientific and/or Education Purposes", which includes provisions for salvaging dead birds.

- Scientific/Education Permit is required by the NMDGF to dispose of a bird carcass, remove or relocate an active bird nest, or transport an injured bird to a wildlife rehabilitator. Euthanasia is not allowed.

- The Scientific/Education Permit application form is provided in Appendix C and is available online at:

http://www.wildlife.state.nm.us/apps_permit/documents/Scientific_Education%20Permit%20Application.pdf

- Submittals can be forwarded to the NMDGF either electronically (per instructions) or mailed to:

New Mexico Department of Game and Fish
Field Operations Division
P.O. Box 25112
Santa Fe, NM 87504-5112

Permits are authorized on a calendar year, and may be authorized up to 3 years. A year-end report is due to the NMDGF no later than 31 January following the end of each permitted year.

5.3 Permittee Responsibility

Activities involving possession of bird carcasses, potential disturbance of birds, or removal of nests must follow the guidelines and procedures in this section and in Chapter 6.0 *Management Procedures and WSMR Reporting Systems*. The Environmental Division is responsible for obtaining the necessary permits or guidance from the applicable agencies. All WSMR personnel and contractors are responsible for knowing and complying with the WSMR APP. If utilities become privatized at WSMR, permit responsibilities for birds associated with power lines will become the responsibility of the private utility.

6.0 MANAGEMENT PROCEDURES AND WSMR REPORTING SYSTEMS

Avian mortality and injury tracking can help identify areas with the potential for avian electrocution and collision. These areas can then be targeted and the appropriate corrective measures can be taken to reduce potential for bird fatalities. These internal processes are designed to ensure that incidents are properly documented, that the appropriate agencies are contacted, that applicable permits are obtained in a timely manner (see Chapter 5.0 *Permit Compliance*), and that hazardous sites are remediated promptly. The Environmental Division of the Department of Public Works (DPW), U.S. Army Garrison White Sands, is responsible for coordinating with the applicable regulatory agencies and electric cooperatives that provide service to WSMR.

WSMR has developed the following management procedures to streamline the reporting and communication processes between personnel in the field and the Environmental Division. The Environmental Division is the main contact point for reporting animal-caused outage issues, dead or injured birds, and nesting at WSMR's distribution and substation systems. These procedures are designed in compliance with federal and state regulatory requirements.

Applicable laws are discussed in Chapter 2.0 *Regulatory Context*. If permits are warranted, they are discussed in Chapter 5.0 *Permit Compliance*.

6.1 Injured Birds

If an injured bird is encountered, the Environmental Division will be contacted as soon as possible. The personnel in the field are to record the applicable details and obtain an exact location to ensure the Environmental Division can relocate the injured bird. Personnel in the field may be instructed to (1) transport an injured bird, (2) stay on site until Environmental Division personnel arrive, or (3) coordinate with the Environmental Division to take them back to the site.

According to the U.S. Fish and Wildlife Service (USFWS), "any person who finds a sick, injured, or orphaned migratory bird may, without a permit, take possession of the bird in order to immediately transport it to a permitted rehabilitator" (USFWS 2004). This often is referred to as the "Good Samaritan Clause." The bird should be placed in a box in a warm, dark, quiet spot, and should not be disturbed or offered food. Once the bird is secured, it may be transferred to a licensed veterinarian or rehabilitator. A call may be placed to a local wildlife agency or humane society to find the nearest permitted migratory bird rehabilitator who can take and treat the bird.

The Environmental Division will initiate contact with the USFWS and arrange for transportation to the NMDGF or a federally licensed and trained rehabilitator, if warranted. The Environmental Division will either respond in person or relay direction to personnel in the field.

Figure 6-1 outlines the procedures for addressing injured birds at WSMR. WSMR advises using extreme care when handling any injured birds. If feasible, contact the Environmental Division to capture the bird. For eagles, stay with the injured bird and contact the Environmental Division to assist.

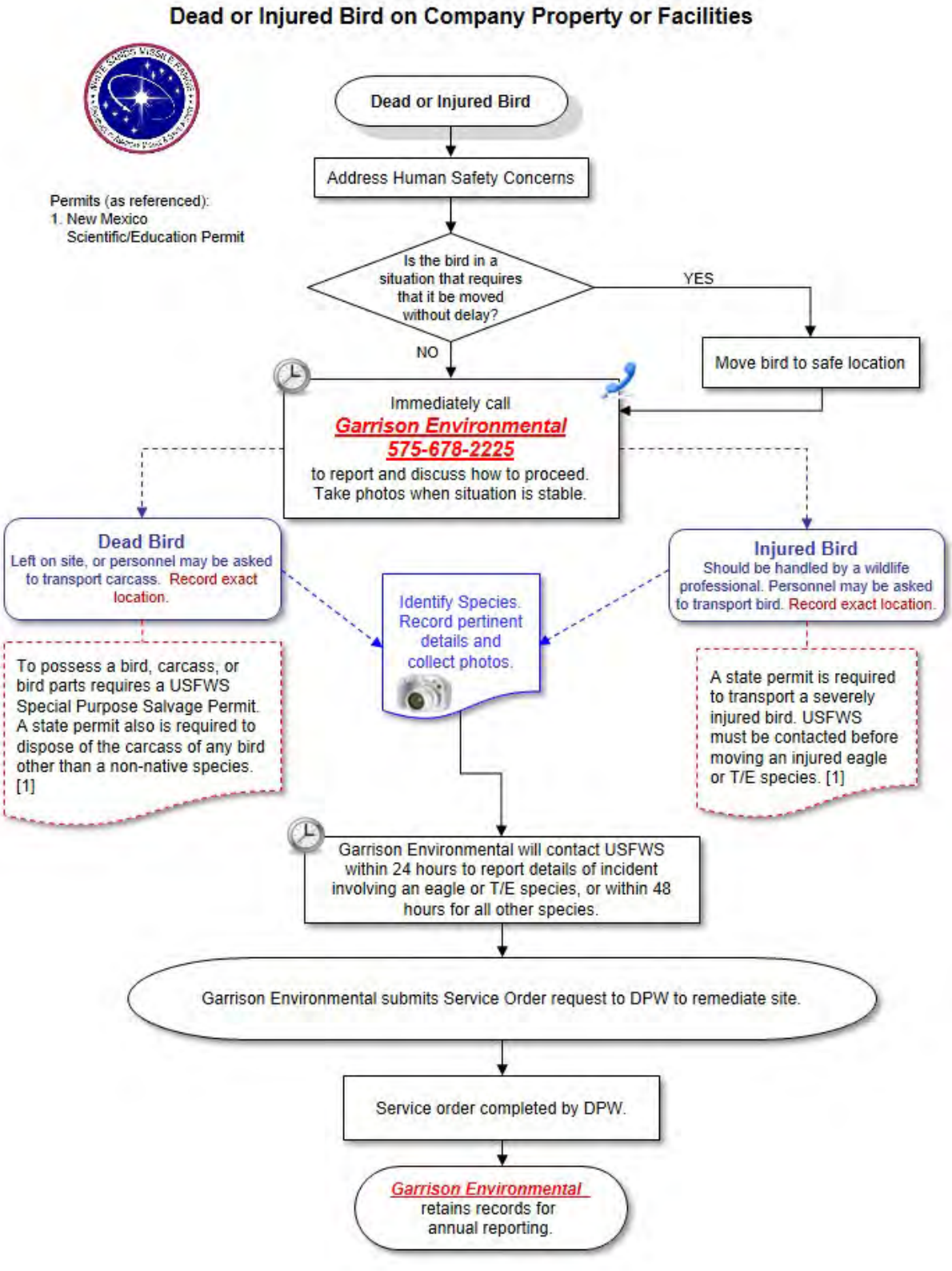


Figure 6-1. Dead or injured bird management procedures.

Raptors (e.g., hawks, owls, eagles, falcons) and large wading birds (e.g., egrets, herons) can be especially difficult and dangerous to handle. These species have powerful and dangerous defenses, such as sharp talons and beaks that can cause eye injuries or other serious harm to personnel. Wild birds are unpredictable and will aggressively defend themselves. Even a seriously injured bird may be dangerous.

While awaiting professional assistance, personnel may cover the bird (or at least its head) with a cloth. This minimizes stress on the bird while still allowing it to breathe. This is done on large species only if personnel is wearing heavy gloves and eye protection and can cover the bird while maintaining a safe distance from the animal. Handle and look at the bird as little as possible, and minimize loud noises or voices. If an injured bird must be moved away from energized equipment, gently pick the bird up by first wrapping it with a heavy cloth to prevent being bitten or struck with a talon or beak. Place the bird in a cardboard box or similar container with a lid. The container should be ventilated, and towels or paper towels should be placed on the bottom of the container if available. After the bird is contained, do not disturb the bird unless directed to do so by the Environmental Division, the wildlife rehabilitator, or the federal or state agency representative. If the bird is injured at a WSMR facility or anywhere on WSMR, a WSMR *Bird Incident Tracking Form* (Appendix E) is completed by the Environmental Division within 48 hours of discovery of the injured bird. Additionally, the Environmental Division will contact the USFWS within 24 hours to report details of incident involving an eagle or federally listed species or within 48 hours for all other species.

6.2 Carcass Reporting and Management

Figure 6-1 also outlines the procedures for reporting bird fatalities found at WSMR. If a carcass is detected, personnel in the field will contact the Environmental Division as soon as possible, and the Environmental Division will complete a *WSMR Bird Incident Tracking Form* (Appendix E). Field personnel are to contact the Environmental Division and record the applicable details (e.g., date, time, exact location). Personnel in the field may be instructed to (1) transport a dead bird, (2) stay on site until Environmental Division personnel arrive (particularly for eagles), or (3) coordinate with the Environmental Division to take them back to the site of the bird fatality.

It is critical to describe the location in sufficient detail so the carcass can be relocated. When possible, field personnel should take photos of the bird with enough detail to aid in identifying the bird species and photos of the structure or facility potentially associated with the bird fatality. If photos of the carcass are not possible and the bird species is unknown, an overall description of the bird size and appearance should be included. If the bird has a leg or wing band, the band number should be recorded.

Personnel in the field may be instructed not to touch or move a dead raptor, and it is not lawful to collect feathers, talons, or other body parts. WSMR discourages its personnel from handling carcasses unless directed to do so by the Environmental Division or a federal or state wildlife representative. Personnel should not take possession of any dead bird without first notifying the Environmental Division for guidance on proper procedures. It is unlawful to possess any bird carcass or parts

including (but not limited to) feathers, feet, talons, or other body parts. WSMR's *Special Purpose Salvage Permit* authorizes certain personnel at WSMR to possess birds (see Section 5.1.1), and is required to authorize removal of dead birds. New Mexico requires a permit to dispose of a game bird carcass. Examples of game bird species occurring at WSMR include wild turkey and Scaled Quail (*Callipepla squamata*) (Section 4.3 *Game Birds*).

If a bird or mammal carcass is tangled in electrical equipment and it must be removed to restore power, it may be removed by lineman to protect human safety. In the event a bird carcass does not present an operational issue, personnel in the field will first attempt to contact the Environmental Division to document the incident before removing the carcass.

The Environmental Division reports all bird electrocution injuries and fatalities to the USFWS Office of Law Enforcement. All eagle injuries or mortalities are reported, regardless of the cause of injury or mortality.

6.2.1 Carcass Disposal

As stated, WSMR personnel may not take possession of any migratory bird (alive or dead), any bird parts, eggs, or portion of an egg. If disposal of a bird carcass or egg is necessary, the WSMR employee must contact the Environmental Division (see Section 5.1.1 *Special Purpose Salvage Permit*). The Environmental Division then will coordinate with the appropriate regulatory agencies. Any instruction from the agency regarding handling a carcass is recorded on the *WSMR Bird Incident Tracking Form* with the date, time, name of agency employee providing instruction, and exact instructions given. The Environmental Division then coordinates implementation of the agency's direction. Typically, the Environmental Division delivers carcasses to the USFWS Office of Law Enforcement in Las Cruces, unless directed to do otherwise by the USFWS enforcement personnel.

6.2.2 Permits Required for Carcass Disposal

Chapter 5.0 *Permit Compliance* outlines the various federal and state permits available for dead or injured bird management at WSMR. Depending on the species, carcasses may be disposed of only after obtaining the appropriate permit.

6.2.2.1 Eagles

Eagle carcasses may not be disposed of without a *Special Purpose Salvage Permit* (see Section 5.1.1) and typically a permit from the state of New Mexico (see Section 5.2 *New Mexico Permits*). Even with a permit, USFWS notification and coordination is required within 24 hours. If an eagle carcass is in relatively good condition, the USFWS may request the carcass be transported and stored in a freezer until it can be collected by the USFWS for delivery to the National Eagle Repository in Denver, Colorado. The USFWS established the National Eagle Repository in the early 1970s to provide Native Americans with the feathers of Bald Eagles and Golden Eagles requested for religious purposes.

6.2.2.2 Federally and State-Listed Species

Carcasses of T/E species may not be disposed of without a *Special Purpose Salvage Permit* (see Section 5.1.1) and typically a permit from the state of New Mexico (see Section 5.2 *New Mexico Permits*).

6.2.2.3 Migratory Birds

Carcasses of migratory species may not be disposed of without a *Special Purpose Salvage Permit* (see Section 5.1.1).

6.3 Corrective Measures

If a bird is discovered injured or dead at WSMR, the Environmental Division works with the DPW to implement the applicable retrofitting approach and documents the corrective actions. Other nearby similar pole or line configurations are also evaluated for possible retrofitting. Initially, field crews record the actions taken to correct the hazard. If temporary repairs are made, suggestions for a permanent solution are documented. Forms are filled out completely because effective retrofitting requires detailed knowledge of the devices contacted and the species or type of bird affected. If the bird species is unknown, photos and/or an overall description of the bird aid the Environmental Division or wildlife biologists in identifying the affected bird species and support the final decision on the approach to retrofitting a structure or line segment. Those working on WSMR's system are informed of the applicable retrofitting procedures to reduce electrocution risks to birds. WSMR intends to prioritize the remediation of hazardous poles in areas of good eagle habitat or in areas where eagles are known to occur.

6.4 Personnel Safety

WSMR employees are aware there are many diseases that can be transmitted by contact with wildlife. In the event it is necessary to briefly handle carcasses to prevent or clear a system outage or to read a band number and permission is obtained from either the Environmental Division or the applicable agency representative, WSMR personnel follow several safety precautions. The employee handling a carcass wears protective clothing including gloves that can be disinfected or discarded. Coveralls, rubber boots, and latex or rubber gloves are recommended, if available. Gloves or an inverted plastic bag are used to pick up a carcass (only if asked to do so by the Environmental Division). Employees do not eat, drink, or smoke while handling carcasses, and wash hands with soap and water or disinfect with alcohol after disposing of a carcass. All work surfaces and equipment exposed to a carcass also are disinfected. Under no circumstances will Environmental personnel attempt to remove a carcass entangled on a pole, ground bank, or substation. Only qualified high-voltage personnel will remove carcasses from electrical equipment or structures.

6.5 Record Keeping

The Environmental Division maintains reports encompassing the WSMR-wide bird injury, mortality, and nest management activities. A *WSMR Bird Incident Tracking Form* is filled out for each incident (Appendix E). These records provide a basis for future retrofit evaluations and coordination with the USFWS.

6.5.1.1 Game Birds

In New Mexico, carcasses of non-migratory game birds such as quail and wild turkey may not be disposed of without a state permit. As with other bird species, if a WSMR employee finds a carcass of a game species on or near a WSMR facility, that employee records the applicable information on the *WSMR Bird Incident Tracking Form* and contacts The Environmental Division. The Environmental Division contacts the appropriate state agency representative.

6.5.1.2 Non-Native Species

Carcasses of non-native species may be disposed of without any federal or state permits (see Section 4.2 *Non-Native Species)*.

6.6 Nest Management

Federal laws protect active bird nests (with eggs or nestlings) for species protected under the MBTA, and WSMR follows the USFWS Region 2 Interim Empty Nest Policy (Appendix D). Additionally, the BGEPA protects eagle nests and the ESA protects nests of federal T/E species. Under both BGEPA and ESA, active or inactive nests are protected.

Many birds nest on distribution structures, which often results in operational problems and increases the risk of outages, pole fires, and bird fatalities. When necessary, WSMR verifies the species and conducts behavior observations to determine activity in the area.

Nest removal typically does not solve the problem because many species will rebuild at the same location. However, there are viable solutions to minimize nest problems including erecting nest discourager devices on a structure, relocating nests, installing artificial nesting platforms, and using alternative structure designs (see Chapter 11.0 *Nest Management)*.

The purpose of this section is to ensure WSMR's personnel comply with federal and state requirements pertaining to migratory bird nests (including those of eagles). Following these guidelines helps ensure that a project is not delayed due to failure by WSMR's personnel to comply with such requirements. Appendix D contains a copy of both the USFWS Nest Destruction Memorandum and the USFWS Region 2 Interim Empty Nest Policy, which provide additional guidance for destruction of nests including those of colonial, ground, and cavity nesting birds.

6.6.1 Nest Assessment and Reporting

When personnel in the field encounter a nest that is causing or may cause a construction or operational problem, they should notify the Environmental Division as soon as possible with the detailed location and circumstances. The Environmental Division will in turn complete the *WSMR Bird Incident Tracking Form* (Appendix E). A reporting form is required even if the nest does not pose an immediate operational or maintenance problem. High-voltage personnel may deconstruct and remove empty nests, unless it is large and potentially an eagle nest. Except in an emergency, an employee cannot remove an active nest unless directed to do so by the Environmental Division, which holds federal permits for these activities. Section 6.6.3 *Nest Removal, Relocation, and Destruction* defines emergency and non-emergency scenarios.

If the nest poses an operational or maintenance problem, the following is determined:

1. Is the nest active (i.e., containing eggs or young)?

2. What is the nesting species (e.g., is it a Golden Eagle)?

3. Does the nest pose an emergency situation (i.e., threat to human health and safety or risk of a pole fire)?

It is important to identify the species and whether the nest is active (i.e., containing eggs or young) since eagles and T/E species have special protection extending to inactive nests. The required procedures for personnel in the field and nest management are presented in Figure 6-2.

6.6.2 Nest Identification, Protection, and Removal Protocols

It is important to accurately identify the species involved. If the species is identified incorrectly, it can result in actions that are in violation of federal and state laws. If uncertain about the identification of a nest or bird, contact the Environmental Division. A biologist will assess the site to determine species and nest activity. The following sections describe the options for nest management based upon the species and whether the nest is active.

6.6.2.1 Federally and State-Listed Species, and Eagle Nests

WSMR does not possess federal permits to remove or relocate the nest of a species listed under the ESA (Section 5.1.4 *Recovery Permit)*, and most birds that do nest on structures are still protected by the MBTA (Section 6.6.2.2 *Migratory Birds*).

Golden eagles occur throughout WSMR. They usually nest on cliff ledges, but may occasionally nest on distribution or transmission poles. If it is necessary to remove an eagle nest from a power structure, WSMR (or the responsible Cooperative) must apply for and receive a federal Eagle Nest Take Permit to remove the nest. Permit application fees may apply, and permits may include required surveys or mitigations.

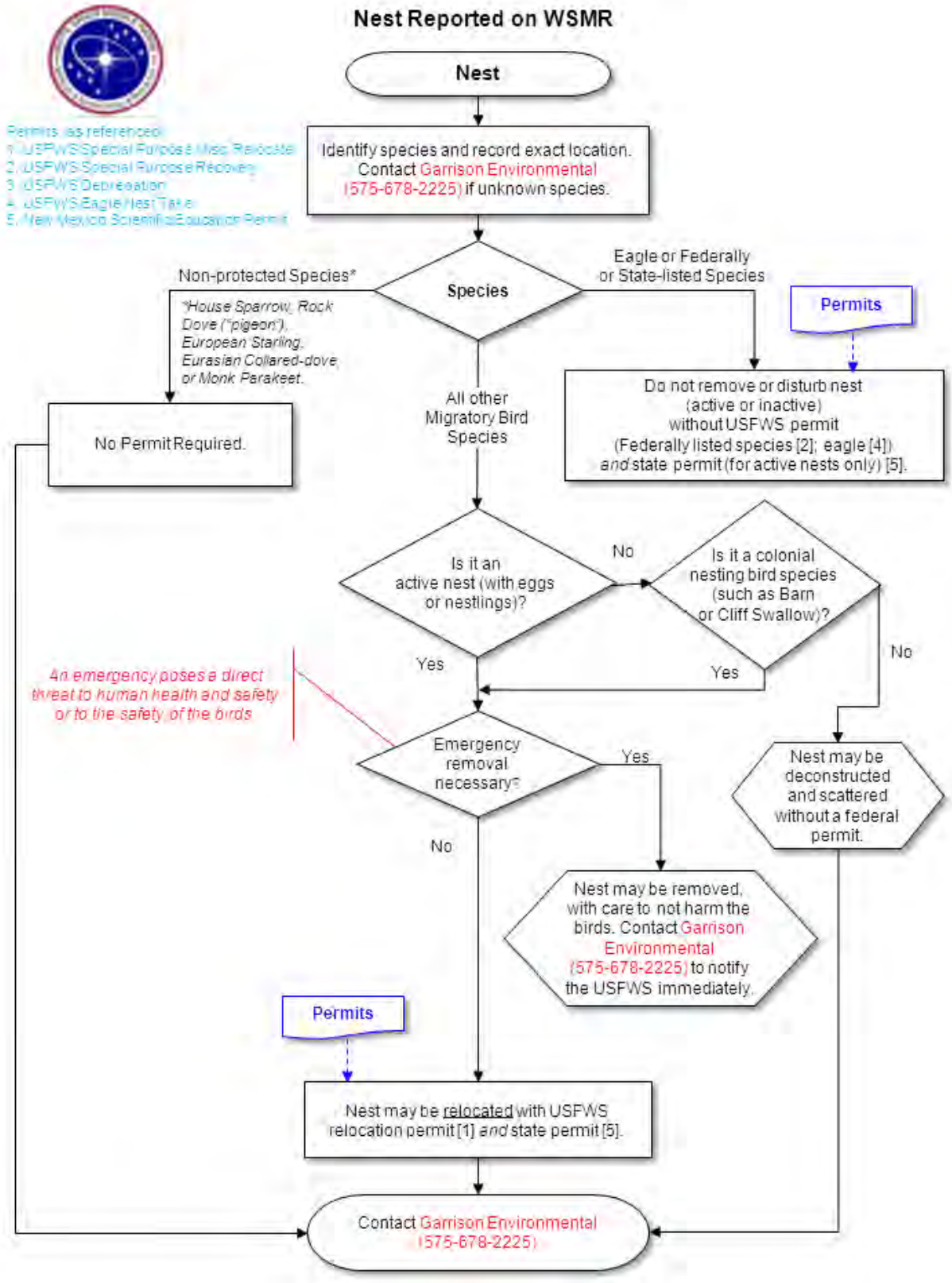


Figure 6-2. Nest management procedures.

6.6.2.2 Migratory Birds

Most nests encountered within WSMR will be those of migratory species and are protected by the MBTA. Nests of migratory birds are protected under the MBTA only when active (with eggs or nestlings). If the nest is inactive (without eggs or nestlings), it may be removed without a federal permit unless it is a Golden Eagle's nest, a federally or state-listed species' nest, or a colonial nesting species (such as a barn swallow) (see Appendix C). When warranted, WSMR removes and deconstructs inactive nests.

It is important to note that a federal permit, the Special Purpose Relocate Permit (see Section 5.1.2), is required to relocate an active migratory bird nest. When it is not possible to relocate an active nest, a Depredation Permit is required to destroy the nest (see Section 5.1.3). If a nest is active, a federally licensed wildlife rehabilitator would need to be present to accept the nest, eggs, or nestlings.

6.6.2.3 Woodpeckers and Other Cavity Nesters

Woodpeckers and other cavity nesters are migratory birds and, therefore, are protected by the MBTA. If a pole with holes or cavities is to be replaced, an inspection is performed to determine whether an active nest is present. During the pole inspection, if birds are present or an active nest is determined, personnel in the field should contact the Environmental Division for the applicable procedures.

6.6.2.4 Non-Native Species

Nests of non-native species are not regulated by federal or state law. Unprotected non-native species include the House Sparrow, European Starling, Rock Pigeon, Eurasian Collared-dove, and Monk Parakeet (see Section 4.2 *Non-Native Species* and Table 5-1).

6.6.3 Nest Removal, Relocation, and Destruction

After determining the species and status of a nest site, the response protocol is based on the species involved, federal permit requirements, and whether the nest is likely to cause an outage or pole fire (i.e., whether the situation is an emergency or threat to human health and safety).

Emergency – It is WSMR's policy that a nest may be removed or trimmed to address an emergency. Immediately thereafter, the Environmental Division notifies the appropriate state and federal agencies. An emergency is a situation where human health or safety is at risk and immediate corrective action is necessary. An emergency includes actual or potential electric outages or fires to critical facilities.

Non-emergency – In a non-emergency situation, a permit to remove an active nest is obtained by the Environmental Division. Non-emergency situations include all other circumstances where immediate corrective action is not necessary (Figure 6-3). A description of permits and how they are obtained is described in Chapter 5.0 *Permit Compliance*. Copies of the applicable permit must be present at the site during any nest removal or relocation.

Figure 6-3. Red-tailed Hawk safely nesting on a distribution pole – non-emergency.

Personnel Safety – An employee should not remove a nest unless directed to do so by the Environmental Division, except for emergency situations described above. Parasites and diseases can be transmitted through contact with nests. If instructed by the Environmental Division to handle a nest, WSMR personnel or contractors should wear disposable gloves or use an inverted plastic bag to handle nests. Paper breathing filters also are recommended because dried bird feces may be dispersed into the air when a nest is moved. A *Lineman's Guide to Avian Diseases* is included in Appendix F.

Disposal Method – All removed inactive nests should be disposed of by scattering the nesting material off site to discourage birds from re-nesting at the same location. If active nests need to be removed during emergency situations, the nest is not disposed of until the USFWS is notified and instructions are given.

Public Awareness – WSMR personnel and contractors should consider public reaction to nest removal or relocation and act in an appropriate manner. All calls or inquiries from press or news media are directed to the WSMR Public Affairs Office.

6.6.4 Nest Evaluation Protocol

During projects that involve rebuilding in existing ROWs or new construction in sensitive habitats, WSMR (or private utility) will conduct a nest survey prior to construction. Surveys document nesting raptor species, surrounding habitats, whether a nest is active (i.e., containing eggs or young), what species is involved, and the level of human use in the proximity of the nest. Other variables also are recorded to assist in tracking, including pole numbers, surrounding habitats, whether or not the nest is on the structure or in an adjacent tree or shrub, and the GPS location of the structures and nests. Nests are photographed and mapped. This information assists in tracking nesting at WSMR, identifying which nests could be of concern to project operations, and providing baseline information for potential permitting and compliance activities.

7.0 WSMR CONSTRUCTION STANDARDS

As outlined in the APP guidelines developed by APLIC and the USFWS (2005), the design and installation of new power line facilities, designed to avian-friendly standards, are important. Construction standards for new construction in combination with identifying and implementing suggested retrofits for existing utility facilities are both key to incrementally addressing avian issues within a system for both electrocution and collision risks. For WSMR, the focus is on reducing electrocution risk to birds within the power grid system; however, WSMR is committed to incorporating both the *Suggested Practices for Avian Protection on Power Lines: The State of the Art in 2006* (APLIC 2006) and *Reducing Avian Collisions with Power Lines: The State of the Art in 2012* (APLIC 2012), respectively, into their new construction and retrofitting standards.

Chapter 8.0 *Distribution Electrocutions* and Chapter 9.0 *Substation Electrocutions* outline the detailed measures to reduce the electrocution risks to birds. Additionally, Chapter 11.0 *Nest Management* summarizes approaches to minimizing nesting issues on power line structures. The measures detailed in these chapters reflect recommendations provide to WSMR for their respective standards reviews. The following summaries may be redundant with aspects of these chapters and associated approaches, but attempt to outline the overall processes that should be followed when developing internal standards to be followed by WSMR and associated contractors or private utilities.

7.1 New Construction

New facilities will be constructed using approved avian-friendly designs. If a new utility configuration is needed, it will follow APLIC's *Suggested Practices* (2006) to minimize avian electrocution risks.

7.2 Retrofitting Standards

Existing power lines may require modification or retrofitting in areas with potential avian electrocution risks on electrical infrastructure, especially if a historical electrocution fatality has been recorded (APLIC and USFWS 2005). When possible, lines should be retrofitted to meet new construction standards as they pertain to avian-friendly construction. If construction standards have not been developed for that specific application, retrofitting approaches to minimize the risk of bird electrocution or nesting should be developed, as needed. These measures are detailed in Chapter 8.0 *Distribution Electrocutions*, Chapter 9.0 *Substation Electrocutions*, and Chapter 11.0 *Nest Management.*

7.3 Site Cleanup

Site cleanup is important to minimize future bird-related issues. After work is completed during project construction or project maintenance activities, extra materials such as wrap ties, jumpers, nuts, bolts, and broken insulators should be removed from

the ground and either disposed of or salvaged. Crows and hawks often use shiny material (e.g., wire) in their nests. When these birds construct nests on distribution poles, metal nesting material can cause operational problems. During the Risk Assessment surveys at WSMR, it was observed that old pole and equipment materials were not often removed and cleaned up from a site following structure rebuild or replacement.

7.4 Inspection

After new power lines are constructed or existing power lines are retrofitted, the Environmental Division will review the measures used in the field and compare with the APP's overall directives. If approaches are lacking or corrective procedures are not effective, the Environmental Division will readdress the measures with the applicable WSMR personnel or contractors to make the appropriate adjustments. A follow-up inspection should be conducted, if additional measures are needed.

8.0 DISTRIBUTION ELECTROCUTIONS

The following sections provide guidelines for both new construction and how to retrofit existing structures to reduce the risk of electrocution to birds and other wildlife. These approaches can be incorporated into WSMR's new construction standards and retrofitting approaches, as applicable. WSMR and its contractors also should periodically review new and emerging technologies, devices, and electrical cover-up materials to better understand what dynamic and evolving technologies are becoming available. Appendix G contains a summary of manufacturers of associated equipment and devices.

To minimize electrocution risk to birds, labor costs, and inconvenience to WSMR range customers, an emphasis was placed on choosing products that are safe to install "hot." However, there are options to these approaches, depending on WSMR's focus, labor vs. materials costs, issues to be resolved, schedule, and budget. New-construction specifications and retrofit approaches are based on "insulation" vs. "isolation," as outlined in *Suggested Practices for Avian Protection on Power Lines: The State of the Art in 2006* (APLIC 2006). Isolation refers to "providing a minimum separation of 60 inches [horizontally] between phase conductors or a phase conductor and a grounded hardware / conductor" and "may be most applicable for new or rebuilt structures in areas where avian electrocution risk is a concern" (APLIC 2006). Insulation refers to "covering phases or grounds where adequate separation is not feasible" (APLIC 2006).

*Caution: Raptor protection measures using insulation are **not** designed to protect linemen. Many products are not rated for the full line voltage and are designed to protect birds from incidental contacts only.*

8.1 Tangent Structures

The most common distribution units located in rural areas are tangent structures. Tangent structures are structures where the wires are supported by pin insulators. They are typically used for straight line conductor pathways. Typically, the main electrocution risk issue associated with tangent structures is inadequate spacing between energized conductors. On some configurations there may be issues between the separation between the primary wires and any groundwires or neutral wires. There are several options for making tangents avian-friendly either through new construction techniques or by retrofitting existing lines. The majority of distribution power lines at WSMR have an overhead neutral wire (OHN), with an associated groundwire. Therefore, the retrofit recommendations should be sure to address the phase-to-ground contact points, as well.

8.1.1 Single-Phase Tangent Structures

Figure 8-1 illustrates a typical single-phase tangent structure constructed on a wood pole. Single-phase lines usually are constructed without crossarms and support a single energized phase conductor on a pole-top insulator. Single-phase structures without pole-top grounds or pole-mounted equipment generally provide adequate separation for all animals.

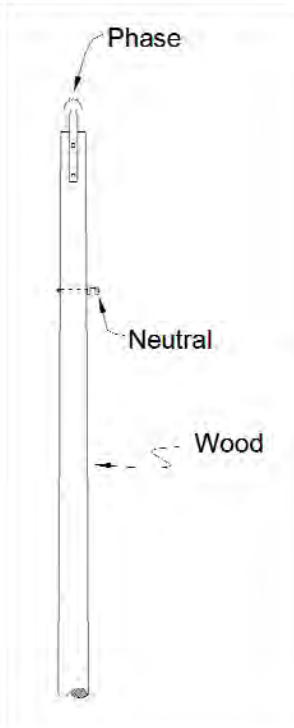


Figure 8-1. Typical distribution single-phase tangent pole configuration.

8.1.2 Three-Phase Tangent Structures

The most common three-phase structures are tangent units. These units may be constructed with the center phase mounted up on the pole top (ridge-pinned) or all the phase wires may be mounted on the crossarm (flat-top).

8.1.2.1 Ridge-Pinned Unit

A common ridge-pinned distribution unit is a three-phase tangent structure constructed with an 8-foot crossarm supporting two conductors (Figure 8-2). A single energized phase conductor typically sits on a pole-top insulator. Distribution three-phase tangent structures, without pole-top grounds or pole-mounted equipment, provide adequate separation for all but the largest raptors since this provides 48 inches

of phase separation (Figure 8-3). The 22-degree angle between the outer and center phase wires provides additional protection. However, this separation is not adequate to protect eagles (Figure 8-4); therefore, in areas where eagles occur, additional protection to minimize the electrocution risk is recommended.

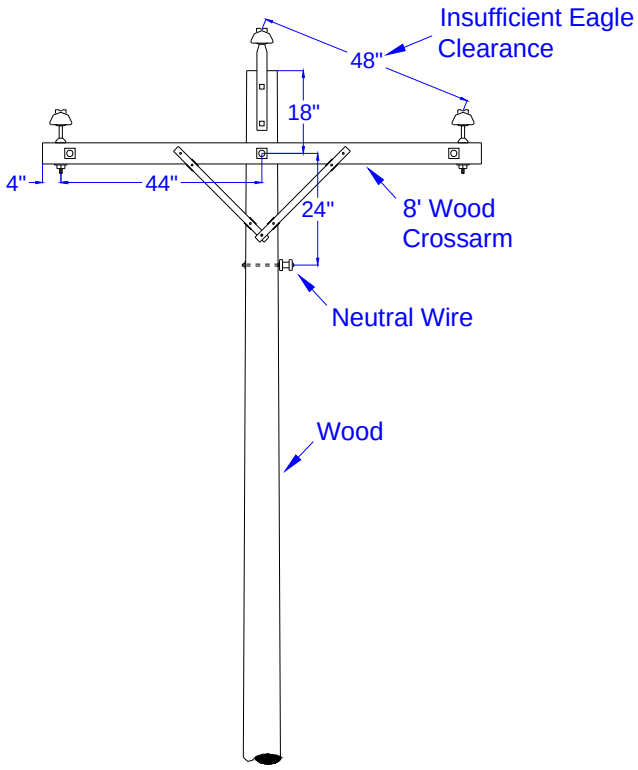


Figure 8-2. Typical three-phase pole with ridge-pinned construction.

Figure 8-3. Typical tangent structure provides adequate separation (40 inches) for hawks.

Figure 8-4. Typical tangent structure provides inadequate separation (60 inches) for eagles.

8.1.2.2 Flat-Top Unit

Flat-top construction often is used where additional ground clearances are required (e.g., road and railroad crossings). Unlike ridge-pinned construction, flat-top construction (Figure 8-5) provides less than 40 inches of separation between phases and the neutral (the minimum safe distance for hawks). Accordingly, these configurations place both eagles and smaller raptors at risk.

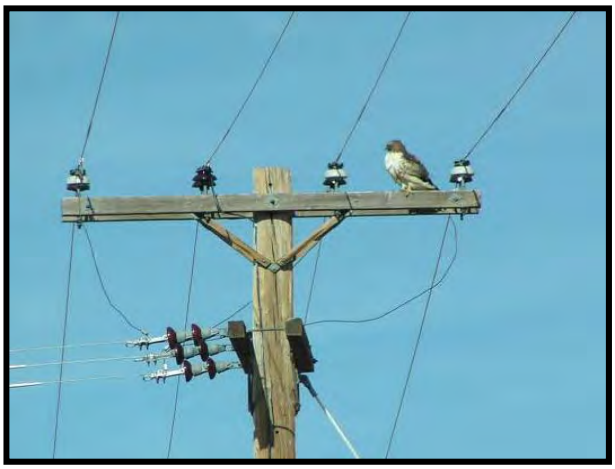


Figure 8-5. Flat-top unit provides inadequate separation (40 inches) for hawks.

8.1.3 New Construction

The following suggestions are provided for new construction design standards. In areas where eagles occur (e.g., throughout WSMR), new three-phase tangent structures with 8-foot crossarms can be framed to provide sufficient clearance, bringing the total phase-to-phase separation to at least 60 inches, as recommended in APLIC (2006). This additional clearance required for eagles can be obtained by lowering the crossarm 24 inches on new construction (Figure 8-6).

If large conductors are used (mounted 8 inches from the crossarm end), the 8-foot crossarm would need to be dropped an additional 6 inches (48 inches from the top of the pole) to maintain 60 inches of separation.

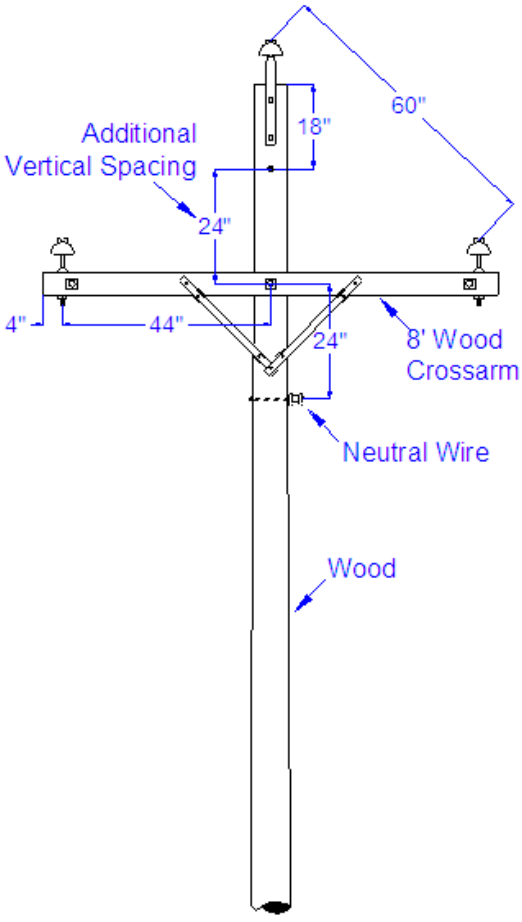


Figure 8-6. Eagle-friendly three-phase pole configuration using an 8-foot dropped crossarm.

Dropping a crossarm an additional 24 inches may require shorter spans or taller poles to maintain ground clearances, adding to the structure cost. A common alternative to dropping the arm is to use a 10-foot crossarm (Figure 8-7). This provides the recommended 60 inches of separation without using taller poles and is the most economical method to make a structure avian friendly for new construction.

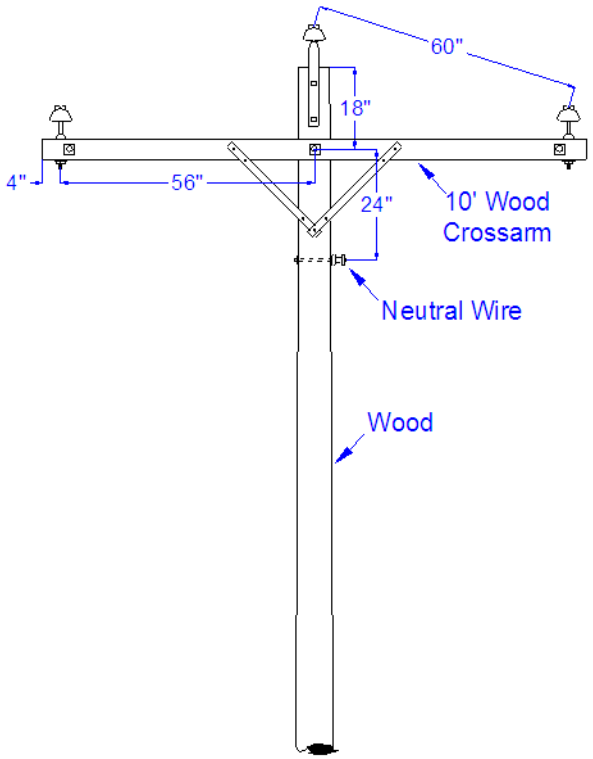


Figure 8-7. Eagle-friendly three-phase pole configuration using a 10-foot crossarm.

If large conductors are used (mounted 8 inches from the crossarm end), the 10-foot crossarm also would need to be dropped an additional 6 inches (24 inches from the top of the pole) to maintain 60 inches of separation.

8.1.4 Retrofitting Horizontal Tangent Structures

A retrofitting option available to three-phase tangent structures includes installing conductor covers on exposed tangent phase wires. A typical three-phase ridge-pinned tangent unit requires a single unit on the center phase (Figure 8-8), while a typical flat-top tangent unit requires two sets of conductor covers (Figure 8-9).

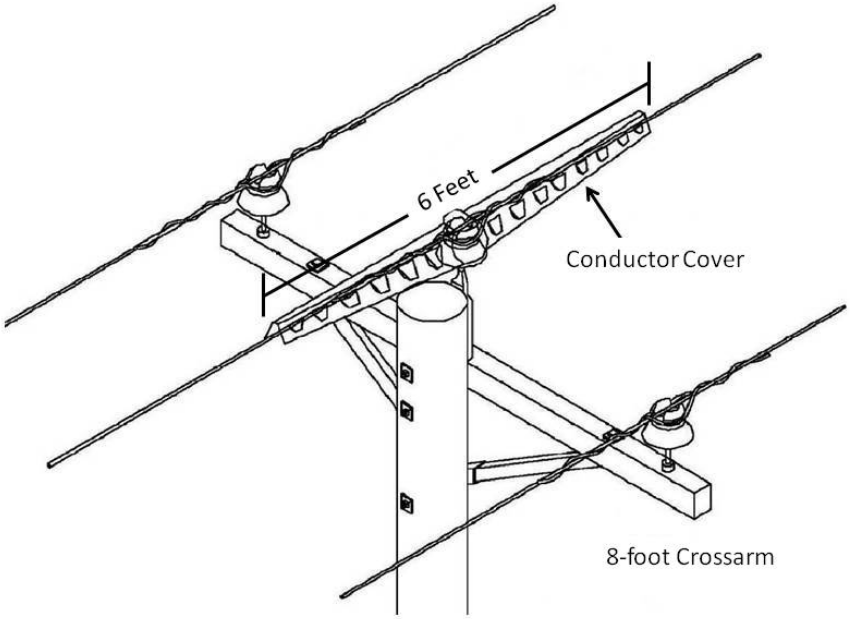


Figure 8-8. Retrofitting a typical ridge-pinned tangent structure.

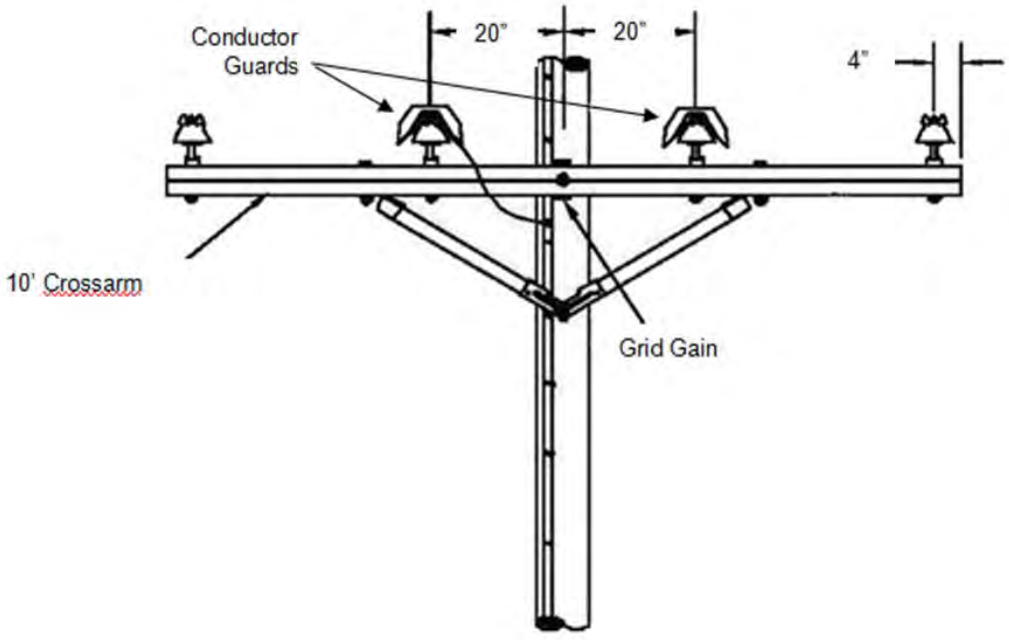


Figure 8-9. Retrofitting a typical flat-top tangent structure.

There are numerous conductor covers with varying properties (Table 8-1). Some conductor covers can be installed with hot sticks and will accommodate small line angles.

Table 8-1. Conductor cover manufacturers.

MANUFACTURER	MATERIAL	PHONE	WEBSITE
DMX Industries	Polymer	1-314-385-9396	N/A
EcoElectrical	PVC w/ Silicone Coating	1-775-853-8623	www.ecoelectrical.com/
Exensor Technology	Plastisol	+44 (0)1420 488646	www.exensor.co.uk/
Kaddas	ABS Plastic	1-801-972-5400	www.kaddas.com
Midsun Group	Silicone	1-860-378-0100	www.midsungroup.com/
Power Line Sentry	Prototype	1-970-599-1050	www.powerlinesentry.com
Preformed Line Products	Linear Low-density Polyethylene	1-440-461-5200	www.preformed.com/
Salisbury	Polymer	1-877-406-4501	www.salisburybyhoneywell.com/
TE Connectivity	Polymer	1-336-689-7348	www.te.com

PVC=polyvinyl chloride, ABS=acrylonitrile butadiene styrene

Products are selected to comply with WSMR's safe work practices and that are easy to install. The appropriate material properties are reviewed, selected, and included in this summary table to ensure the devices will provide a long-term solution.

In areas where airborne contamination is a concern (e.g., dust, pollution, pollen), a product that completely covers the insulator may cause flashovers because rain cannot wash the insulator. Covering an insulator also makes inspection difficult. Exensor Technology, Salisbury, Midsun Group, and Preformed Line Products make units that do not fully cover the insulator (Figure 8-10, Figure 8-11, Figure 8-12, and Figure 8-13).

Figure 8-10. Exensor Technology conductor cover.

Figure 8-11. Salisbury conductor cover.

Figure 8-12. MidSun group conductor cover.

Figure 8-13. Preformed Line Products conductor cover.

When using conductor covers, the conductor must be covered with additional insulating hose for a minimum of 3 feet on either side of the insulator (Figure 8-14). Most conductor covers (DMX Industries, EcoElectrical, Kaddas, TE Connectivity, and Power Line Sentry) are available with snap-on or bolt-on wings to cover the conductor (Figure 8-15, Figure 8-16, Figure 8-17, Figure 8-18, and Figure 8-19).

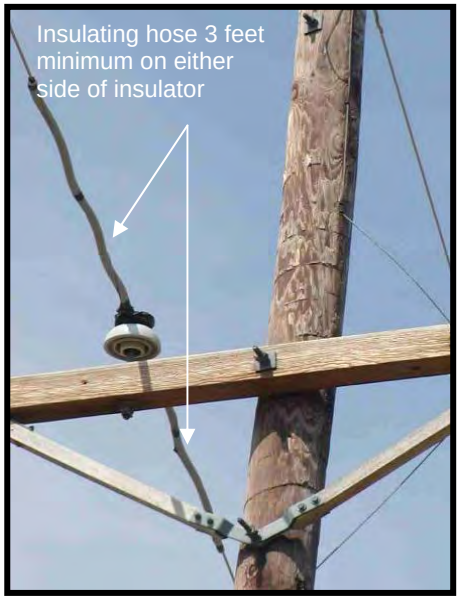


Figure 8-14. Conductor cover with additional insulating hose.

Figure 8-15. DMX industries conductor cover.

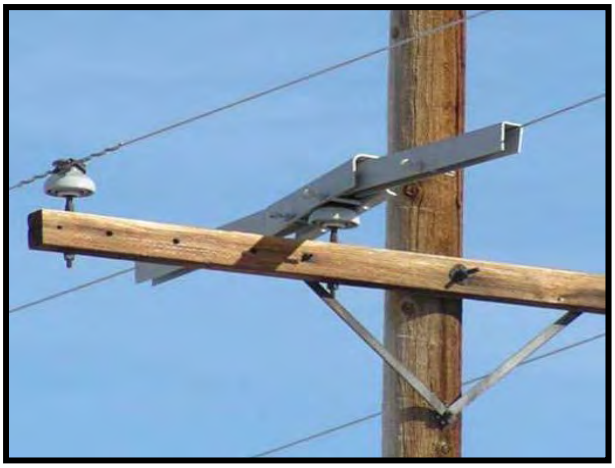


Figure 8-16. EcoElectrical conductor cover.

Figure 8-17. Kaddas conductor cover.

Proper installation is critical for devices to perform correctly. For example, the ends of the Kaddas Bird Guard cover (Figure 8-17) must be trimmed to fit the conductor. Failure to properly trim the ends may result in the covers coming off in strong winds. Also, they must be snapped together at multiple contact points rather than a

single contact point. Where wind vibration is a concern, some utilities also fit armor rods over the conductor prior to fitting conductor covers.

Rigid covers do not easily accommodate line angles; therefore, special units are needed. Specific guards, such as the EcoElectrical (Figure 8-16), TE Connectivity (Figure 8-18), and Power Line Sentry (Figure 8-19), units, are constructed to accommodate line angles. Additionally, certain guards may fit tightly to the wire and do not easily fit over hot line clamps or stirrups. The TE Connectivity cover (Figure 8-18) is flexible and has sufficient space to accommodate a hot line clamp. A variety of conductor covers are available, based on the conditions and line configurations. Table 8-2 provides product comparison for a number of conductor covers.

Figure 8-18. TE Connectivity conductor cover.

Figure 8-19. Power Line Sentry conductor cover.

Table 8-2. Conductor cover properties.

MANUFACTURER	FIGURE NO.	FLEXIBLE ?	EXTENDS BEYOND TOP INSULATOR SHED?	ACCOMMODATES HOT LINE CLAMPS?
DMX Industries	Figure 8-15	≈	✓	
EcoElectrical	Figure 8-16	✓		
Exensor Technology	Figure 8-10	✓		
Kaddas	Figure 8-17		✓	
Midsun Group	Figure 8-12	✓		
Power Line Sentry	Figure 8-19	✓		
Preformed Line Products	Figure 8-13	≈		
Salisbury	Figure 8-11	✓		
TE Connectivity	Figure 8-18	✓	✓	✓

✓ Yes. ≈ Partial

8.1.5 Retrofitting Vertical Distribution Structures

Vertical three-phase tangent structures typically provide adequate phase-to-phase separation for even the largest birds. Birds commonly perch on the highest portion of a structure, although many birds also will perch on horizontal post insulators. When the top of the pole supports an OHN, this also provides a safe perching location (Figure 8-20). However, armless structures with horizontal post insulators can pose electrocution hazards to birds when birds perch on insulators (1) mounted to a wood pole with an exposed groundwire, (2) where the groundwire is bonded (attached) to the base of the insulators (Figure 8-21), or (3) mounted to a steel pole. Bonding can increase electrocution risk to perching birds, since the equipment or hardware is connected and possibly grounded, increasing the phase-to-ground contact potential. Bonding is used to tie together metal hardware so there is no potential difference between them. By running a wire (bonding wire) from one metal component to another, stray electricity will equalize through the wire; therefore, one metal component will not have a greater voltage than another metal component on the structure. Grounding on the other hand is used to provide stray electrical current an outlet, which is earth. Bonding is often grounded, but may not be mandatory.

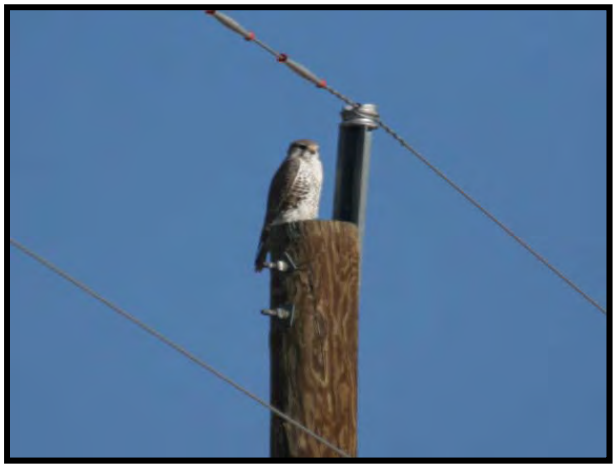


Figure 8-20. Prairie Falcon on pole top (safe location).

Figure 8-21. Vertical tangent unit (hardware is bonded).

Vertically configured steel poles can be particularly hazardous to raptors because the entire pole serves as a path to ground. Consequently, a phase-to-ground contact can result from a bird contacting one energized conductor and the pole at either distribution or transmission voltages.

Multiple solutions using either isolation (i.e., spacing and perch management) or insulation (i.e., cover-up materials) exist to minimize the phase-to-ground electrocution risk associated with such perching. The following discussions outline these options and the preferred approaches.

On a vertical configuration with a groundwire, the proximity of the groundwire to the supporting energized conductors may allow a bird to simultaneously touch an energized conductor and the groundwire. In such situations the groundwire should be covered (Figure 8-22). In eagle habitat, the groundwire should be covered at least 40 inches above and 10 inches below the insulator. Both wood and plastic moldings are available for covering the groundwire (Table 8-3).

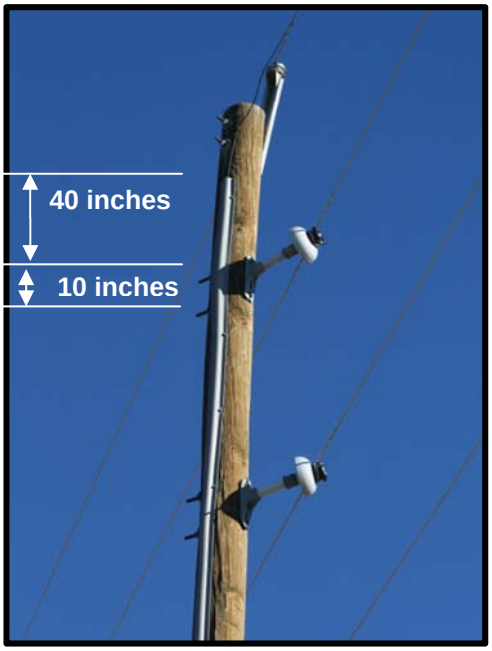


Figure 8-22. Groundwire molding.

Table 8-3. Groundwire molding manufacturers.

MANUFACTURER	MATERIAL	PHONE	WEBSITE
Joslyn	Plastic	1-773-625-1500	www.joslynmfg.com
Osmose	Polyethylene	1-800-877-7653	www.osmose.com
Virginia Plastics	PVC	1-888-224-1751	www.vaplastics.com

PVC=polyvinyl chloride

As an alternative, on some configurations the groundwire can be routed in a quadrant, which precludes an incidental contact (Figure 8-23). In general, it is a good practice to simply cover all groundwires so if the pole is ever modified, the groundwire will already be addressed.

If the bases of the insulators are bonded to a groundwire, several mitigating solutions are available, including “insulating” or covering each conductor with a conductor cover (Figure 8-24). On a steel distribution structure, all three conductors may require covering, depending on the distance between potential phase-to-ground contacts (Figure 8-25). Refer to Section 8.1.4 *Retrofitting Horizontal Tangent Structures* for a list of conductor cover manufacturers (see Table 8-1)

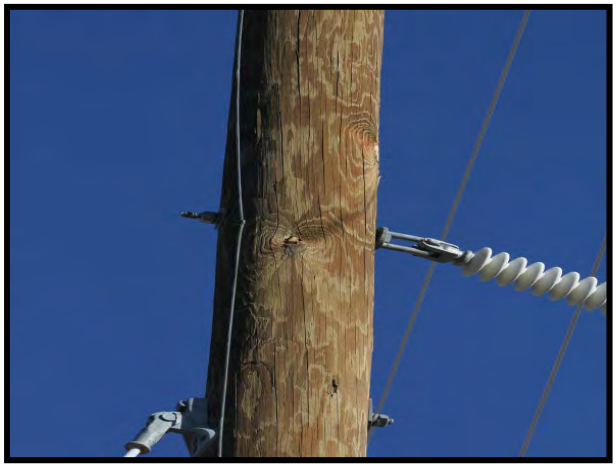


Figure 8-23. Groundwire routed away from hardware.

Figure 8-24. Covering each phase with a conductor cover (Kaddas).

Figure 8-25. Horizontal post insulators covering each phase (TE Connectivity).

Another mitigation measure includes “isolating” the grounded bases to minimize the potential for perching birds to make a phase-to-ground contact. Bases can be isolated by either installing isolating disks (Figure 8-26) or perch discouragers (Figure 8-27).

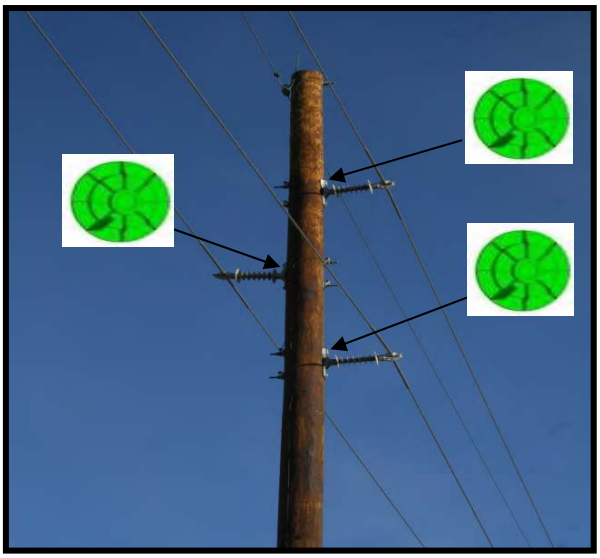


Figure 8-26. Isolating each phase with an isolating disk (Salisbury).

Figure 8-27. Isolating each phase with a perch discourager (Power Line Sentry).

Refer to Table 8-4 for a list of isolating disk manufacturers and refer to Section 8.14.2 *Perch Discouragers* for a list of deterrents that can be mounted vertically on the pole.

Table 8-4. Manufacturers of isolating disks.

MANUFACTURER	MATERIAL	PHONE	WEBSITE
Salisbury	Polyurethane	1-877-406-4501	www.salisburybyhoneywell.com
TE Connectivity	Polymer	1-336-689-7348	www.te.com

8.2 Three-Phase Deadend Structures

A deadend is a point on a distribution line where conductors terminate. A double deadend has conductors terminating from two directions. Jumpers are used to connect these two sets of conductors. The arrangement of primary jumpers will affect the electrocution risk to perching birds (i.e., bird-friendly or potentially lethal). For example, a three-phase double deadend structure can be configured with the outer phase jumpers placed either over (Figure 8-28) or under (Figure 8-29) the crossarms. To minimize avian electrocution risk, placing jumpers under the crossarms is preferred (Figure 8-29), because it precludes large birds from making a phase-to-phase contact between the center and outer phase jumpers. Where maintenance safety concerns require jumpers to be placed over the crossarm (Figure 8-28), all three primary jumper wires should be covered with insulation material to allow incidental contact by perching birds.

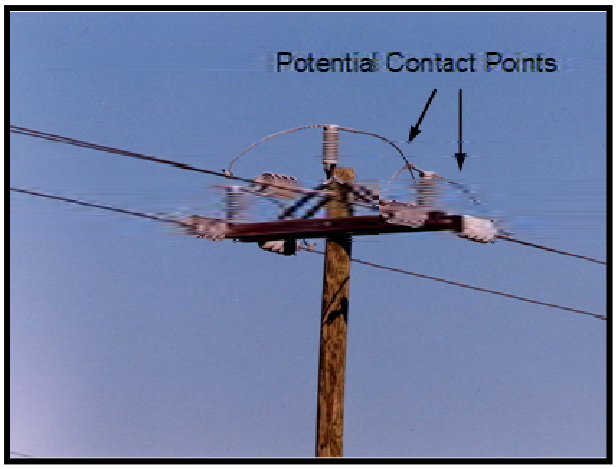


Figure 8-28. Three-phase double deadend with exposed jumpers over the crossarms (potentially lethal).

Figure 8-29. Three-phase double deadend with jumpers passing under the crossarms (bird-friendly).

8.2.1 New Construction

In areas where eagles occur, additional clearance is needed to reduce the risk of bird phase-to-phase contact when taking off and landing between conductors or between conductors and jumper wires. New three-phase deadend structures with 10-foot crossarms should be framed to 60 inches of phase-to-phase separation, as recommended in APLIC (2006).

This additional clearance required for eagles is achieved by mounting the center phase on the pole 24 inches above the 10-foot crossarm center (Figure 8-30 and Figure 8-31). This recommendation is assuming the outer phases are installed 5 inches from the crossarm end.

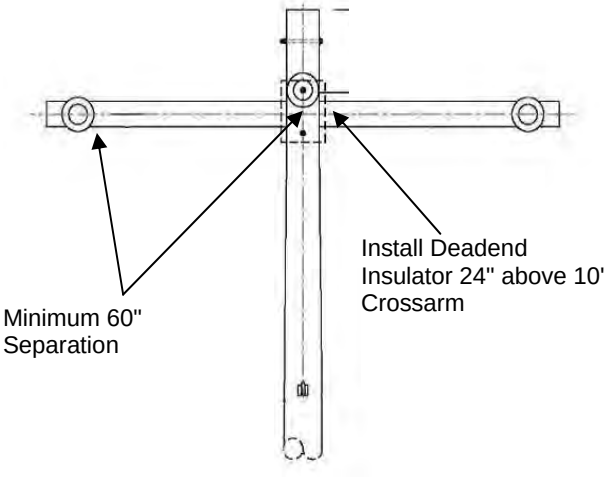


Figure 8-30. Three-phase deadend structure framed as eagle-friendly. (drawing not to scale)

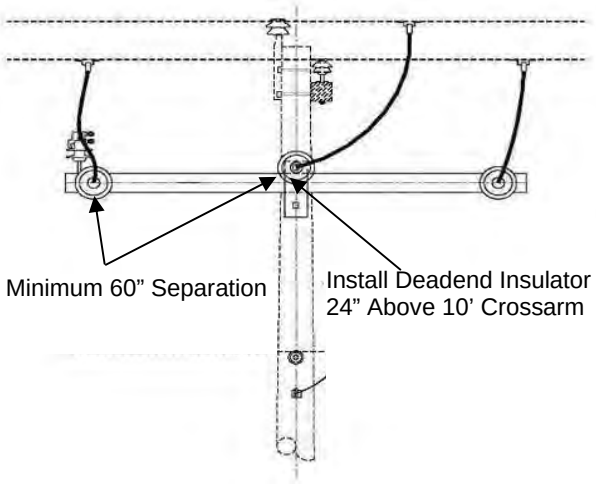


Figure 8-31. Three-phase tap deadend structure framed as eagle-friendly. (drawing not to scale)

If it is not feasible to frame a deadend with adequate separation, an alternative solution is to install insulating links. Phase deadends can be fitted with an insulated extension link to provide a minimum of 36 inches of separation for birds taking off or landing (Figure 8-32).

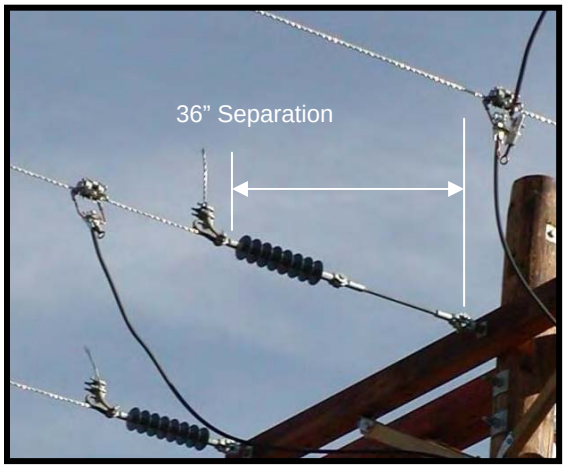


Figure 8-32. Three-phase deadend structure fitted with an insulated extended link on center phase.

Double deadend configurations require links on both sides of the crossarms (Figure 8-33 and Figure 8-34).

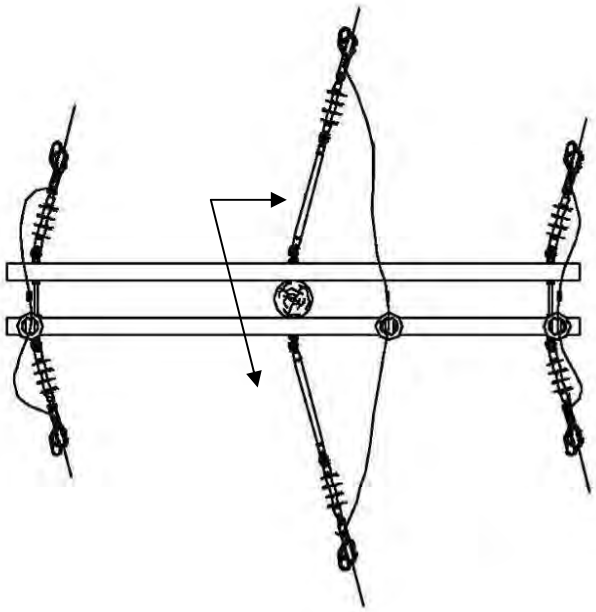


Figure 8-33. Three-phase double deadend structure fitted with two insulated extended links.

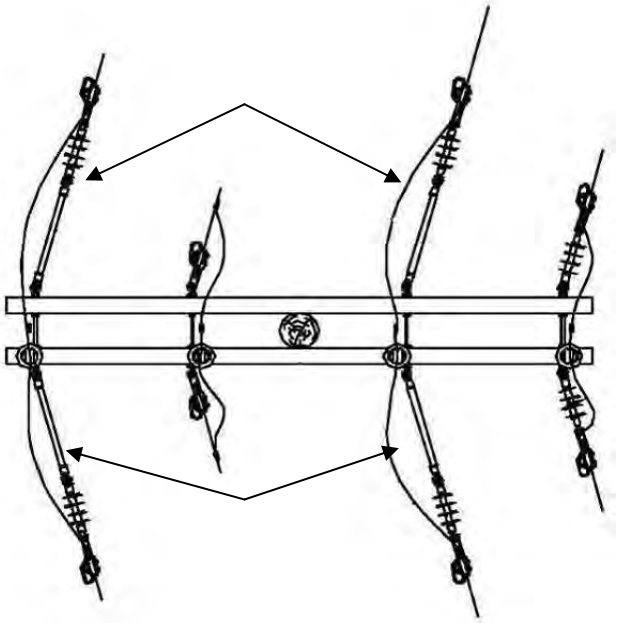


Figure 8-34. Three-phase double deadend structure fitted with four insulated extended links.

Deadend poles also require covered jumpers. Jumpers that are unnecessarily long can increase electrocution hazard and should be installed with minimal slack. Additionally, placing the neutral phase on the pole is preferable to terminating it on the crossarm.

Vertical construction is preferred at corners to eliminate jumper issues (Figure 8-35). If jumper wires are near groundwires or grounded guying attachments, the grounds should be covered with protective molding, the jumpers covered, or insulating links installed in the grounded guy wires.

Figure 8-35. Three-phase vertical structure.

8.2.2 Retrofitting

Retrofitting options applicable to three-phase deadend structures include installing conductor deadend covers on exposed phase wires. A typical three-phase deadend unit requires a single unit on the center phase (Figure 8-36).

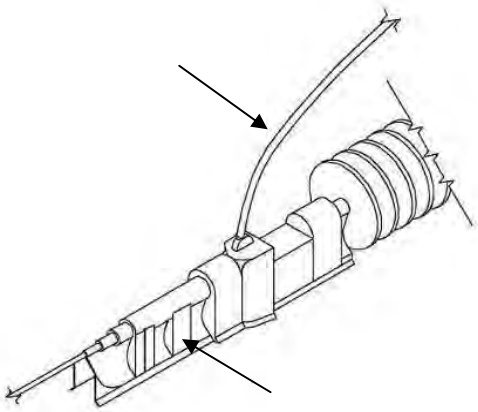


Figure 8-36. Typical deadend cover installation.

There are numerous deadend covers with varying properties (Table 8-5) and all can be installed with hot sticks.

Table 8-5. Deadend cover manufacturers.

MANUFACTURER	MATERIAL	PHONE	WEBSITE
EcoElectrical	PVC w/ Silicone Coating	1-775-853-8623	www.ecoelectrical.com
Kaddas	ABS Plastic	1-801-972-5400	www.kaddas.com
TE Connectivity	Polymer	1-336-689-7348	www.te.com

PVC=polyvinyl chloride, ABS=acrylonitrile butadiene styrene

8.3 Risers

A riser is a pole where overhead and underground systems are connected. Riser poles include protective surge arresters and fused cutouts or switches. The riser pothead is the point where overhead electrical conductors come together and transition down the pole to an underground cable. Potheads typically are supported either on metal brackets or wooden crossarms. The spacing of all of these components can be a risk to perching birds (Figure 8-37).

Figure 8-37. Unprotected riser pole.

Grounded metal pothead brackets associated with riser poles can be hazardous for birds. The brackets are relatively large and offer an attractive perch platform, particularly where trees and other natural perching structures are limited. Riser protective equipment and jumpers should be bird-friendly, as discussed in Section 8.6 *Cutouts* and Section 8.8 *Stinger and Jumper Wires*, respectively. The riser pothead should be fitted with a snap-on cover (Figure 8-38). Energized areas that cannot be covered should be wrapped with insulating tape. No exposed wire should extend beyond the bushing cover, and leads should be kept as short as possible.

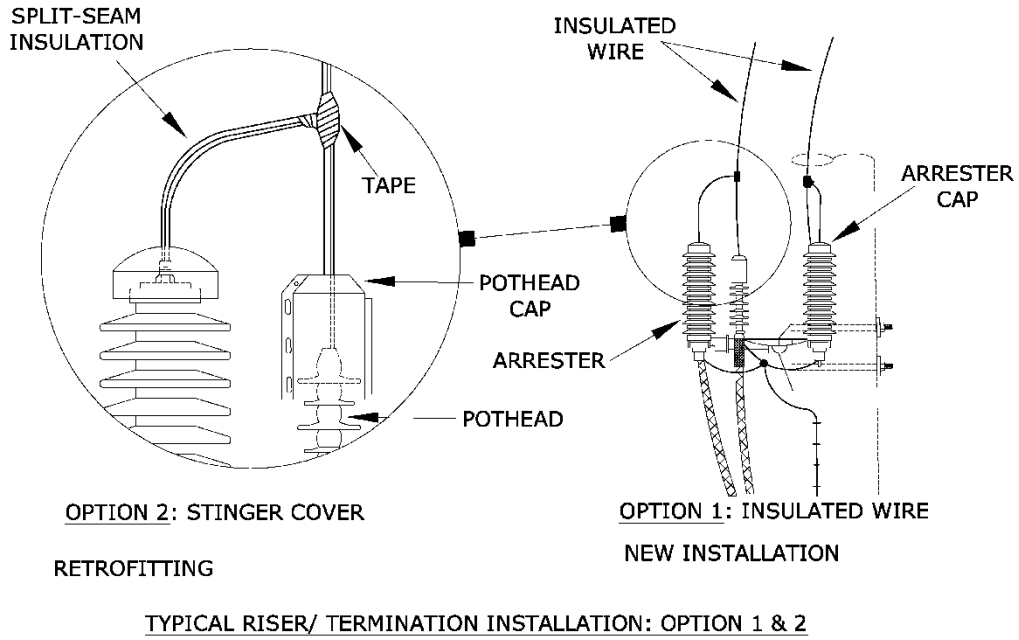


Figure 8-38. Protected riser pole with pothead covers.

Typically, riser potheads are protected by using clamshell-type bushing covers (Figure 8-39 and Figure 8-40). Refer to Section 8.4 *Transformers* for a complete list of bushing covers.

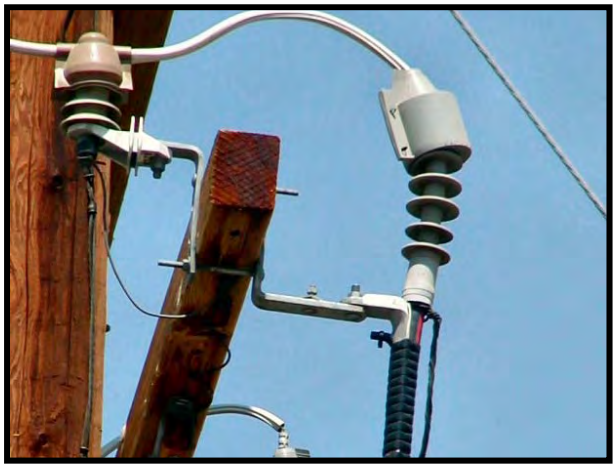


Figure 8-39. Protected riser pole (Salisbury).

Figure 8-40. Protected riser pole (Hubbell Power Systems).

Some vendors also produce covers specifically designed for potheads (Figure 8-41).

In some cases, it may be possible to configure a riser in a manner that negates the need for a pothead cover. For example, it is sometimes possible to attach a riser pothead directly to the bottom of a cutout (Figure 8-42).

Figure 8-41. Riser pothead cover (Kaddas).

Figure 8-42. Riser mounted below cutouts.

8.4 Transformers

Equipment poles can be hazardous to birds, especially if bushing contacts are exposed. Other potential hazards include cutouts, surge arresters, and uninsulated stinger wires. Outages often occur when an animal on a grounded transformer tank

either touches one energized stinger wire or bridges the distance between two energized stinger wires. Other potential hazards include phase-to-phase contacts or phase-to-ground contacts among exposed cutouts and surge arresters.

Bushing covers and insulated coverings constitute a protective system that can provide the necessary insulation level to minimize animal-caused outages. There are three options for protecting transformers as depicted in Figure 8-43.

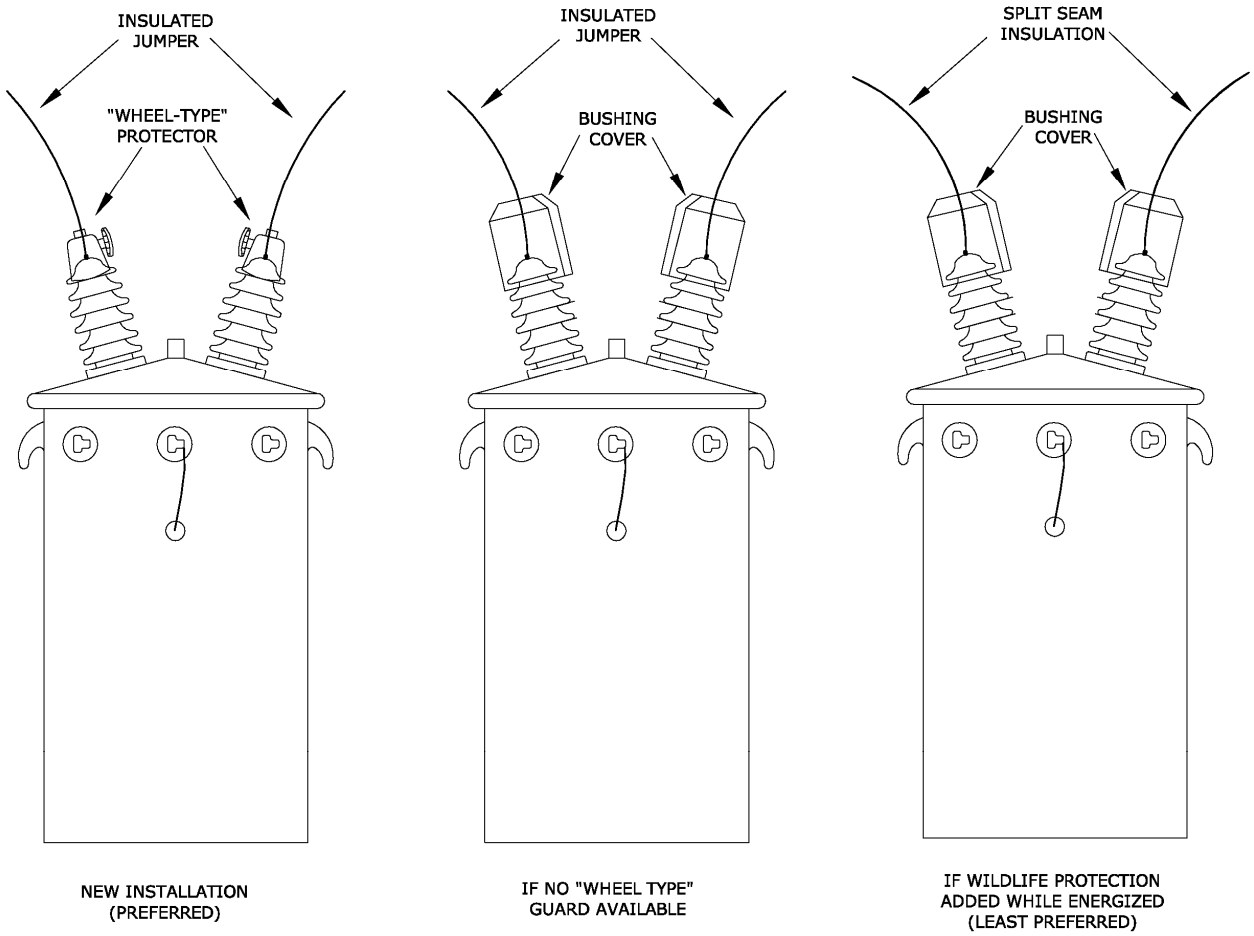


Figure 8-43. Three options for protecting transformers.

First, new transformers can be ordered with a "wheel-type" wildlife protector (Figure 8-44) installed by the manufacturer (Table 8-6).

Figure 8-44. "Wheel-type" bushing cover from the manufacturer.

Table 8-6. Wheel-type transformer protector manufacturers.

MANUFACTURER	MATERIAL	PHONE	WEBSITE
Central Moloney, Inc.	Polypropylene	1-870-247-5320	www.centralmoloneyinc.com/
Cooper Power Systems	Polypropylene	1-877-277-4636	www.cooperpower.com/
Howard Industries, Inc.	Polymer	1-601-425-3151	www.howard-ind.com
Porcelain Products Co.	Porcelain	1-832-364-0113	www.porcelainproductsco.com

If the transformer does not come with a wheel-type cover, varieties of after-market bushing covers are available (Figure 8-45, Figure 8-46, and Table 8-7). These covers generally are made of track-resistant, high-density polymers that either snap on or slide over bushings. Snap-on covers (Figure 8-46, items A, B, C, and D) allow the cover to be installed without removing the transformer stinger wire. Slide-over units (Figure 8-46, item E) require the transformer stinger wire to be removed temporarily in order to slide the cover over the bushing. For retrofitting purposes, the snap-on type is preferable. Some covers can be ordered in a fire-

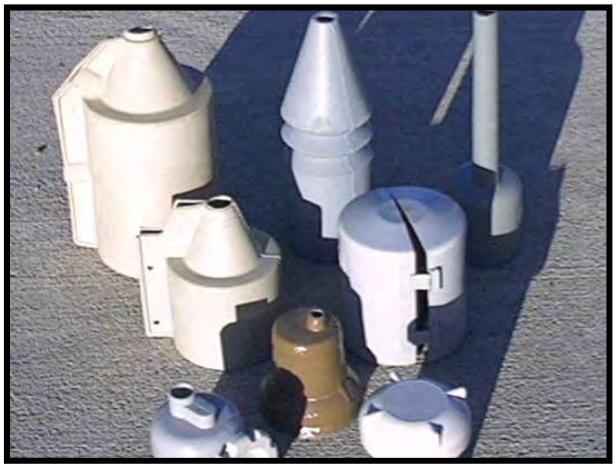


Figure 8-45. After-market bushing covers.

resistant material. A fire-resistant cover is less likely to cause a pole fire or associated wildfire, since it will not burn and drip if subjected to high temperatures. Bushing covers also can be ordered to cover both the transformer bushing and gapped arrester.

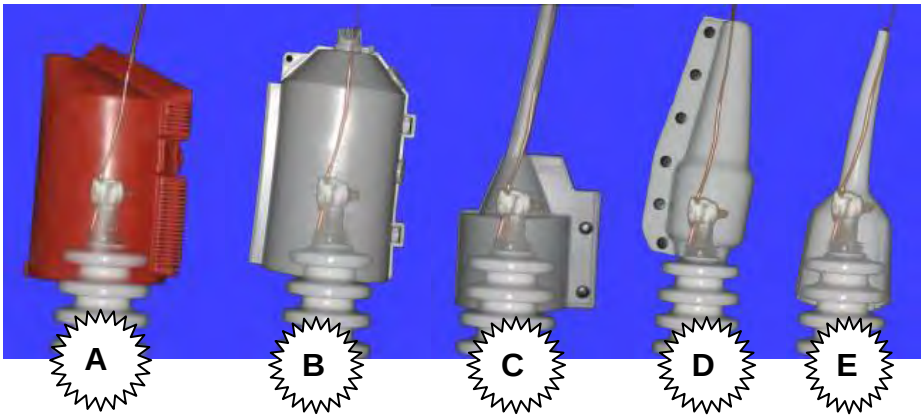


Figure 8-46. After-market bushing covers.

Table 8-7. Manufacturers of snap-on bushing covers.

MANUFACTURER	MATERIAL	PHONE	WEBSITE
Central Moloney, Inc.	Polypropylene	1-870-247-5320	www.centralmoloneyinc.com
DMX Industries	Polymer	1-314-385-9396	N/A
H.J. Arnett Industries	Polypropylene	1-800-684-9844	www.arnettindustries.com
Hendrix Wire and Cable	Polypropylene	1-603-673-2040	www.hendrix-wc.com
Howard Industries, Inc.	Polymer	1-601-425-3151	www.howard-ind.com
Hubbell Power Systems	Polypropylene	1-573-682-5521	www.hubbellpowersystems.com
InsulBoot	Arbosol PVC	1-800-262-2111	www.insulboot.com
Kaddas	Polymer	1-801-972-5400	www.kaddas.com
Midsun Group	Silicone	1-860-378-0100	www.midsungroup.com
Phoenix	Plastisol	1-905-878-2818	www.phnxmfg.com
Preformed Line Products	Plastisol	1-440-461-5200	www.preformed.com
Rauckman Utility Products	Polymer	1-618-222-7100	www.rauckmanutility.com/
Salisbury	Polyurethane and SALCOR	1-877-406-4501	www.salisburybyhoneywell.com/
TE Connectivity	Polymer	1-336-689-7348	www.te.com

Table 8-7. Manufacturers of snap-on bushing covers, continued.

MANUFACTURER	MATERIAL	PHONE	WEBSITE
Universal Thermography, Inc.	HDPE	1-888-388-4348	www.thermaguard.com
Warco, Inc.	Ethylene Propylene	1-636-433-2212	www.warcoinc.com

PVC=polyvinyl chloride, HDPE=high-density polyethylene

It is important to follow the manufacturer's installation instructions. Some covers sit on top of the bushing sheds, while others may cover one or two sheds. It is not uncommon for bushing covers to be installed improperly, which can result in flashovers. Figure 8-47 depicts the proper and improper ways to install a Hubbell Power Systems bushing cover.

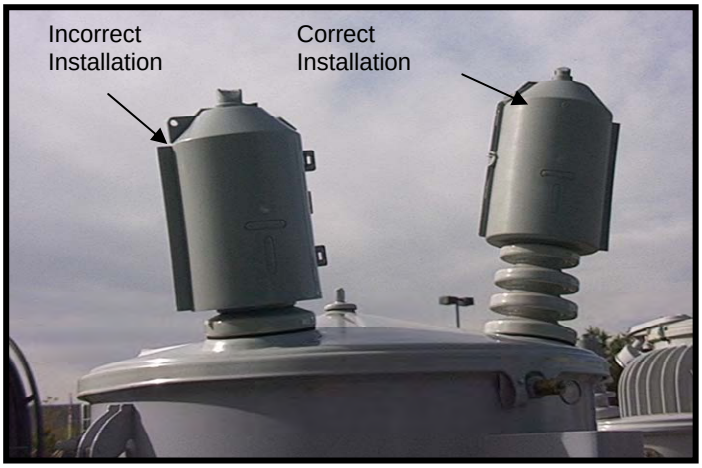


Figure 8-47. Hubbell Power Systems bushing covers installed incorrectly (left) and correctly (right) over transformer bushings.

No uniform standards exist for bushing covers, and some are more resistant to UV and environmental degradation than others. This degradation can lead to tracking problems. Therefore, when bushing covers are selected, their properties should be thoroughly reviewed and line crews instructed on the proper method of installation. All bushing covers should be installed with insulated wire for additional animal protection.

Transformers also may be fitted with barriers to reduce the risk of other animal contacts (e.g., squirrels). These barriers include both passive and active types but are not designed to minimize bird contacts (Table 8-8).

Table 8-8. Transformer animal contact barriers.

MANUFACTURER	ACTIVE OR PASSIVE	PHONE	WEBSITE
3M	Active	1-888-364-3577	solutions.3m.com/wps/portal/3M
Rauckman Utility Products	Active and Passive	1-618-222-7100	www.rauckmanutility.com/

Passive barriers are available from Rauckman Utility Products (Figure 8-48). These barriers are designed to create a barrier so if a squirrel climbs over the shield, they cannot simultaneously touch a grounded transformer lid and the upper energized portion of the bushing.

Figure 8-48. Passive barrier to deter climbing animal contact (Rauckman).

Active units attach to the energized bushing and build up an electrostatic charge. These units are designed to deliver an electrostatic charge to animals attempting to climb on a transformer bushing. According to the manufacturers, when an animal touches these guards, the animal receives an electric shock, similar to those generated by electrified livestock fences. The animal is not injured and power service is not interrupted.

There are two active units available: the 3M™ Electrostatic Animal Guard, previously known as the Guthrie Guard (Figure 8-49) and the Rauckman ZAPshield™ (Figure 8-50).

Figure 8-49. 3M™ Electrostatic Animal Guard.

Figure 8-50. Rauckman Utility Products ZAPshield™.

It is important to note these units are designed to deter climbing animals and not to minimize contacts by birds.

8.5 Capacitors, Regulators, and Reclosers

A capacitor is an electrical device that stores a charge of electricity and returns it to the line. It is used to balance the inductance of a circuit. Regulators maintain the level of voltage within a prescribed range to maintain efficient equipment operation and prevent equipment damage. Reclosers are devices sensitive to interruptions of current flow in the overhead wires. When a recloser senses an interruption, it automatically opens and then immediately closes. If problems with the current persist after a number of reclosings or "shots," the recloser will remain open, cutting the power until the recloser is reset manually. Most reclosers are set to remain open after three shots. Therefore, a recloser may mask detection of a bird electrocution by clearing an interruption. If a bird is killed in a remote location, it may remain undetected.

Capacitors, regulators, and reclosers can be lethal to animals because of exposed bushings and jumpers. These devices should have bushing covers and insulated covering (Figure 8-51) as discussed in Section 8.4 *Transformers*. Groundwires near energized items should be either insulated or isolated. No bare portion of the insulated leads should extend beyond the bushing covers.

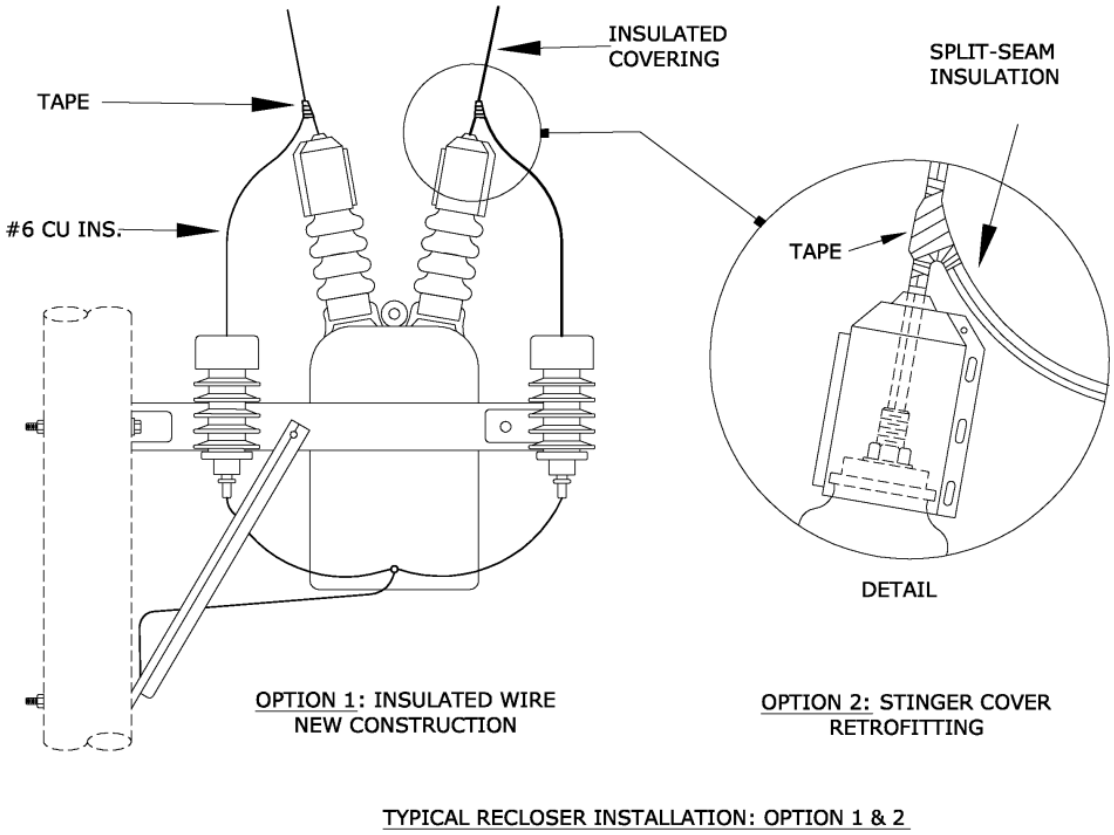


Figure 8-51. Recloser fitted with animal protection.

Capacitors always should be purchased with animal protection already installed (Figure 8-52). Animal protection consists of custom-fitted bushing covers and covered jumpers. Stinger wires and all capacitor protective devices should be animal guarded. Capacitors without animal protection can be retrofitted with after-market bushing covers and stinger wire covers.

Regulators may come equipped with horizontally mounted arresters (Figure 8-53). Salisbury and TE Connectivity manufacture several horizontal arrester covers (Figure 8-54 and Figure 8-55). Additionally, the regulator bushings and associated jumpers should be covered.

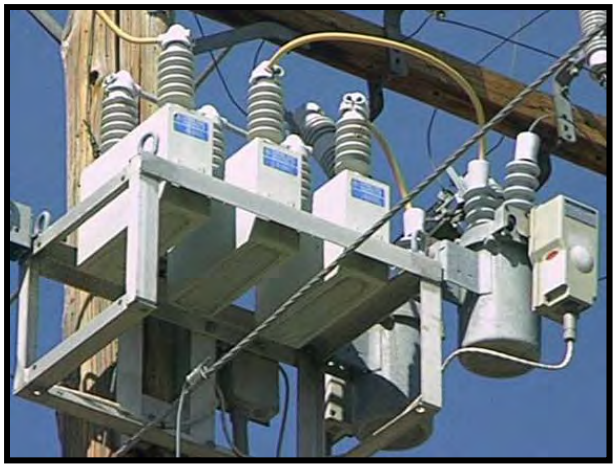


Figure 8-52. Capacitor bank factory-ordered with animal protection.

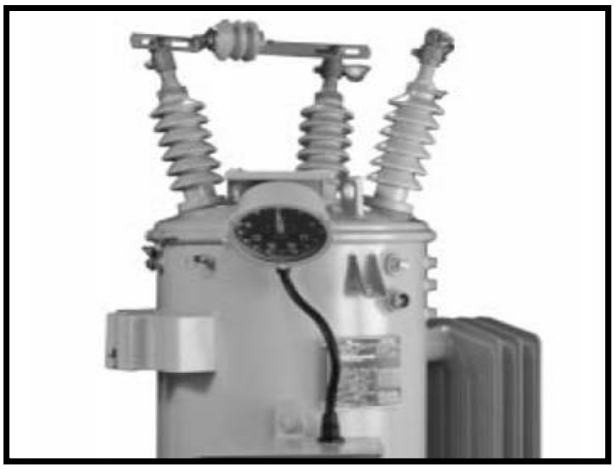


Figure 8-53. Regulator with horizontal arrester.

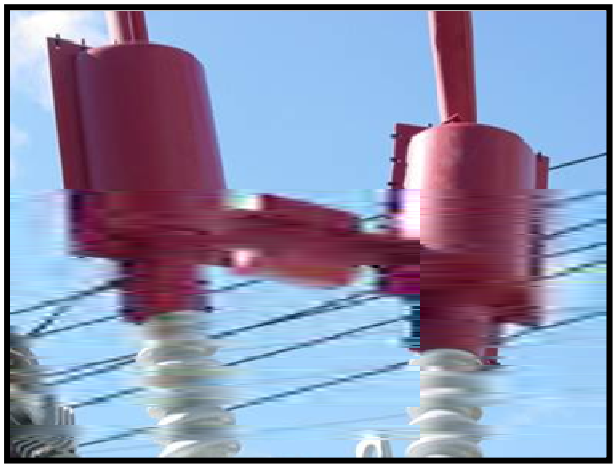


Figure 8-54. Regulator with horizontal arrester cover (TE Connectivity).

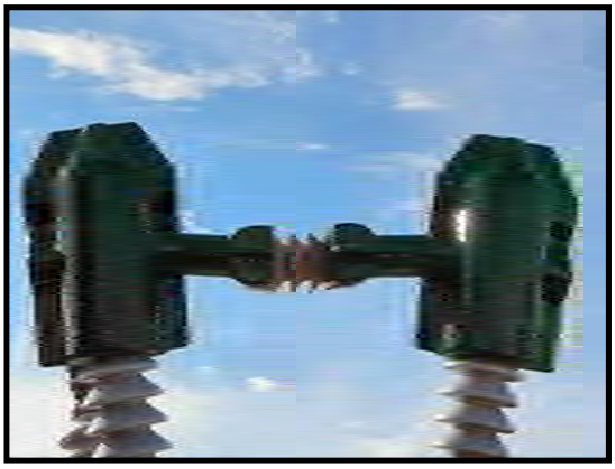


Figure 8-55. Regulator with horizontal arrester cover (Salisbury).

8.6 Cutouts

A cutout is a device used to install fuses between primary conductors; this device is often called a "fused cutout." If the fuse fails, this mechanism provides a visible open, which can be seen from the ground. The top plate of the cutout is energized and can be hazardous to animals if they are mounted near a grounded surface or near other energized equipment (Figure 8-56).

There are two approaches to reduce cutout problems using insulation and isolation. Insulation consists of covering the potential phase-to-phase or phase-to-ground contact points where a bird may perch (Figure 8-57). Isolation entails mounting cutouts in a manner that makes an animal contact more difficult.

Figure 8-56. Hawk perched between unprotected cutouts and arresters.

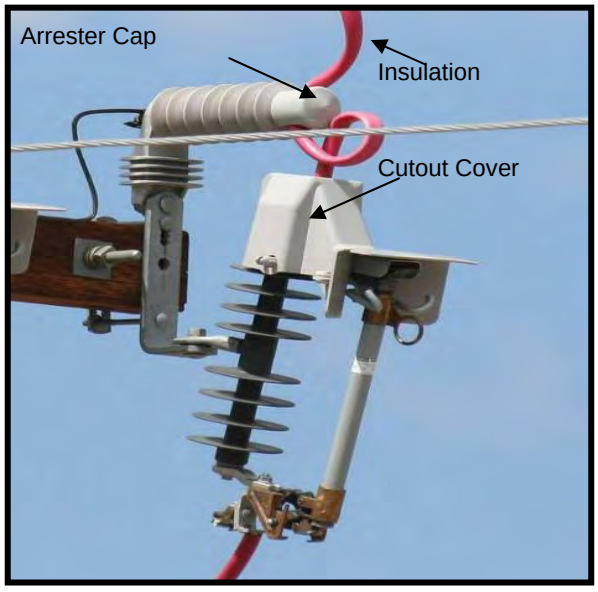


Figure 8-57. Protected cutout/arrester combination.

Table 8-9 lists manufacturers that produce several cutout covers to insulate a variety of cutouts. Cutout covers always should be used in tandem with insulated jumpers; additionally, covers for loadbreak cutouts also are available. Any conductor that cannot be covered should be wrapped with insulating tape.

Table 8-9. Cutout cover manufacturers.

MANUFACTURER	MATERIAL	PHONE	WEBSITE
EcoElectrical	PVC w/ Silicone Coating	1-775-853-8623	www.ecoelectrical.com
Kaddas	ABS Plastic	1-801-972-5400	www.kaddas.com
Midsun Group	Polymer	1-860-378-0100	www.midsungroup.com

Table 8-9. Cutout cover manufacturers, continued.

MANUFACTURER	MATERIAL	PHONE	WEBSITE
Salisbury	Polyurethane	1-877-406-4501	www.salisburybyhoneywell.com
TE Connectivity	Polymer	1-336-689-7348	www.te.com

PVC=polyvinyl chloride, ABS=acrylonitrile butadiene styrene

Some cutout covers can still leave the upper locking horns still exposed. In such cases a perch discourager should be used as a redundant protection measure (Figure 8-58) or alternative cutout covers should be installed. Examples of some available cutout covers are illustrated in Figure 8-59, Figure 8-60, and Figure 8-61).

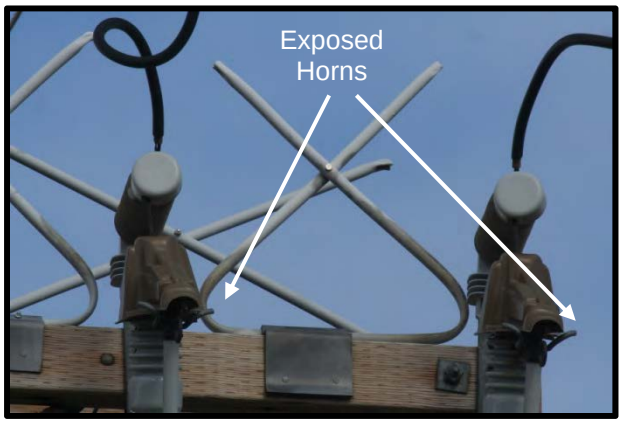


Figure 8-58. Protected cutout/arrester combination with exposed horns.

Figure 8-59. Cutout cover (TE Connectivity).

Figure 8-60. Cutout cover (Salisbury).

Figure 8-61. Cutout cover (Kaddas).

In some cases, the top of a cutout cover may not be large enough to accommodate the primary jumper wire. If a large jumper wire is forced into the existing opening, the side of the cover will flare open (Figure 8-62). This opening reduces the cover's effectiveness. In this situation, the top of the cutout cover should be hollowed out to allow for a large jumper. Additionally, it is important to make sure the jumper insulation is continuous down into the cutout cover. Even small insulation gaps (Figure 8-63) can result in electrocutions.

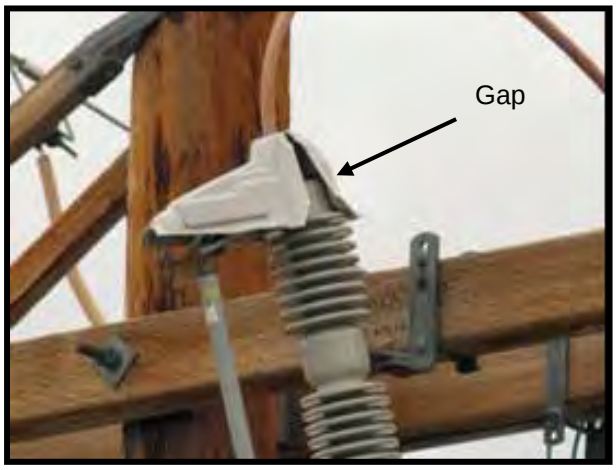


Figure 8-62. Cutout cover with gap due to large diameter jumper wire and cover with hole too small to accommodate the jumper.

Figure 8-63. Cutout cover with gap between top of cover and bottom of jumper insulation.

8.7 Surge Arresters

Arresters clear over-voltage problems such as lightning strikes. Arresters have a groundwire attached to one end leading to the ground and another end either attached or in proximity (i.e., gapped) to an energized wire. Arresters are used on some equipment poles and all underground risers and can be mounted on crossarms or directly on a transformer. All new arresters should be ordered and installed with manufacturer-supplied wildlife caps (Figure 8-64). Refer to Section 8.4 *Transformers* for additional information on the variety of available after-market bushing covers. Insulated covering should be used for arrester hot leads. No exposed wire should extend beyond the wildlife cap, and leads should be kept as short as possible.

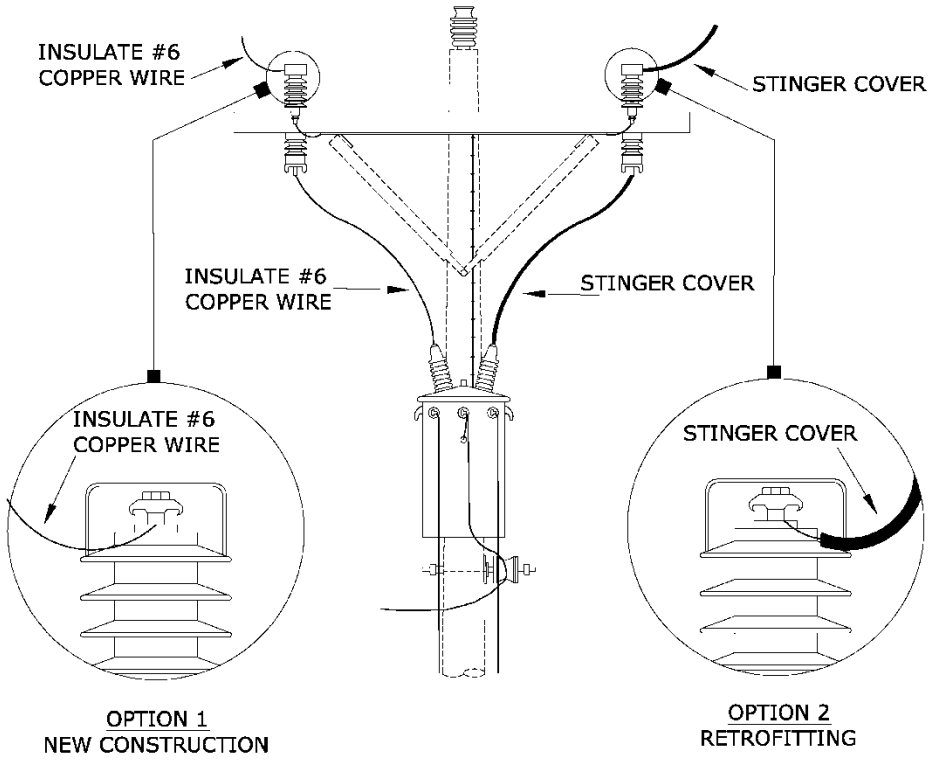


Figure 8-64. Installing new and retrofitting surge arresters.

Transformer mounted arresters also should be installed with manufacturer-supplied wildlife caps and insulated covering (Figure 8-65).

Figure 8-65. Transformer mounted surge arrester with wildlife cap.

Older gapped arresters (Figure 8-66) can cause problems if small birds, climbing animals, or even insects span the open gap. When gapped arresters are present, a transformer bushing cover with a side knockout (Figure 8-67) can be used to provide an adequate opening for the spark gap rod, and the bushing cover opening must be

aligned with the spark gap rod. However, problems may arise if the bushing cover rotates or shifts in place from wind.

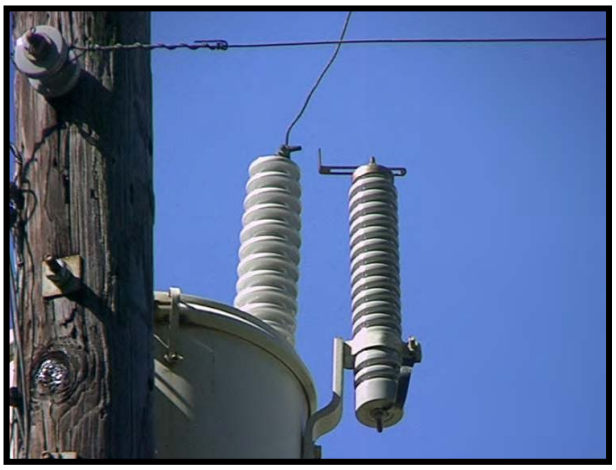


Figure 8-66. Transformer with gapped arrester.

Figure 8-67. Transformer bushing cover with knockouts for a gapped surge arrester.

Replacing the arresters with non-gapped units is the best solution, but if this is not an option, a cover that fits over both the arrester and bushing cover (Figure 8-68) could be considered. The position of an arrester can be modified to reduce potential contacts. Installing arresters horizontally with covered leads reduces exposure to animals (Figure 8-69). Such an installation still should include an insulated cap.

Figure 8-68. Combination transformer bushing and gapped surge arrester covers.

Figure 8-69. Underarm horizontally mounted surge arrester to reduce animal exposure.

Attention should be given to the groundwire exiting the bottom of the arrester. If the groundwire is near any energized hardware, it too should be covered or routed to avoid potential phase-to-ground contacts (Figure 8-70). Any wires that cannot be covered should be wrapped with fusing tape.

Figure 8-70. Surge arrester with cap and insulated groundwire.

8.8 Stinger and Jumper Wires

Jumper wires are used on corner and tap structures to connect circuits. Equipment, such as transformers, regulators, capacitors, and reclosers are fed with a primary “stinger” wire from the main power line or conductors. When an energized jumper or stinger wire is near a grounded plane or another phase conductor, and the potential exists for an animal to bridge the gap, the wire should be covered.

New jumper construction should include insulated covering (Figure 8-71); higher-rated covered jumper wire such as 5kV polyethylene cable is preferable. Covered jumper wire is available in sizes from #4 AWG to 795 kcmil. Although these insulated jumpers do not protect for the full-line voltage, they do provide protection to allow brief or incidental animal contact.

When retrofitting, it may not be practical to install insulated wire on deadends and tap units. In these situations, split-seam insulation can be installed over existing wire without disconnecting the lead wire (Figure 8-72). Midsun Group, Salisbury, and 3M manufacture split-seam jumpers (Table 8-10).

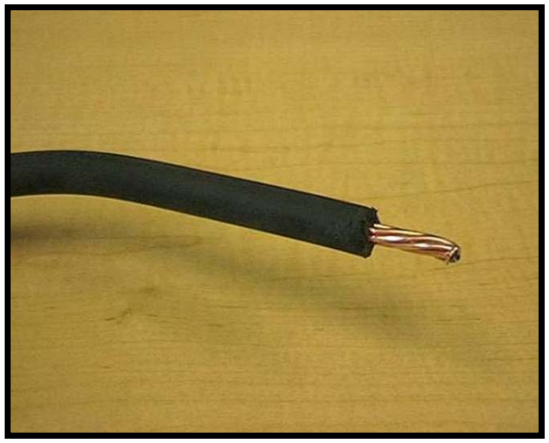


Figure 8-71. Insulated jumper wire for new installations.

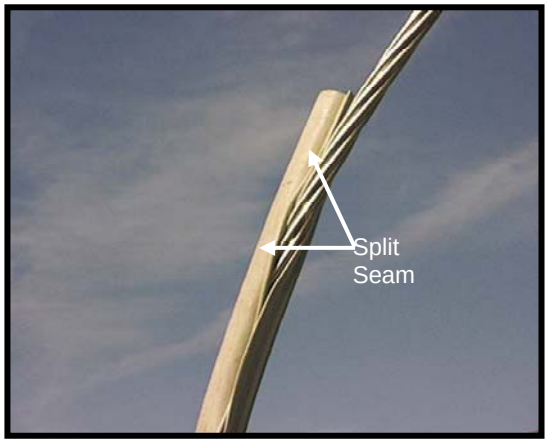


Figure 8-72. Split-seam stinger retrofit (Salisbury insulating SALCOR cover material).

Table 8-10. Manufacturers of split-seam jumpers.

MANUFACTURER	MATERIAL	PHONE	WEBSITE
3M	Silicone	1-775-853-8623	solutions.3m.com/
Midsun	Vulcanized silicone	1-801-972-5400	www.midsungroup.com/
Salisbury	SALCOR Elastomer	1-877-406-4501	www.salisburybyhoneywell.com/
TE Connectivity	Polymer	1-888-264-1722	www.te.com

To protect animals from electrocution, equipment such as cutouts, arresters, and bushings must include insulated stingers and properly mounted covers. No bare portion of the insulated leads should extend beyond the wildlife covers. If gaps exist, they should be covered with insulated fusing tape.

Primary jumpers normally are fastened to pin-type insulators for support, and distribution metal ties made of aluminum-covered steel typically secure the jumpers in the top groove of the pin insulator. If the jumper is not covered completely as it passes over the top of the supporting pin insulator, there is still the potential for phase-to-phase or phase-to-ground contact (Figure 8-73). One solution is to use a vise-top insulator using a nylon insert (Figure 8-74). This approach allows covered jumpers to be supported without a wrap tie.

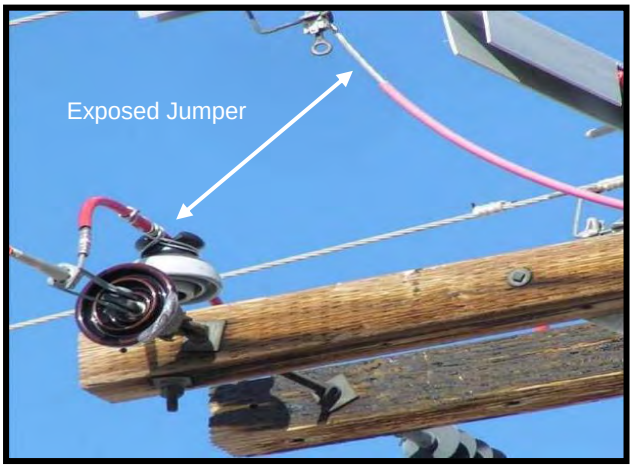


Figure 8-73. Covered jumper with an exposed contact point.

Figure 8-74. Covered jumper supported with a vice-top insulator (Hendrix).

Another option is to cover the pin insulator with a cover (Figure 8-75). Pin covers are available from the manufacturers listed in Table 8-11.

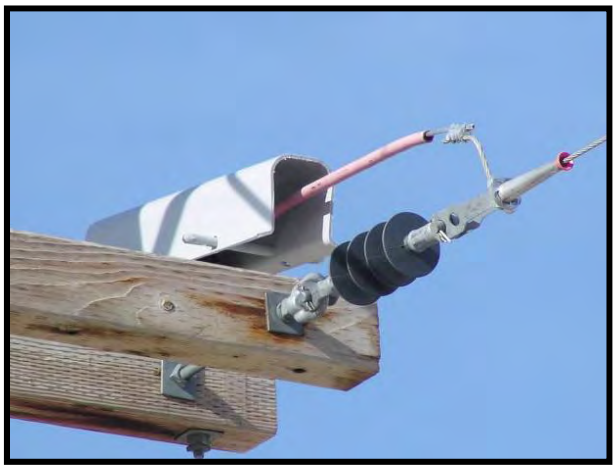


Figure 8-75. Covered jumper isolated with a pin cover.

Table 8-11. Pin insulating manufacturers.

MANUFACTURER	MATERIAL	PHONE	WEBSITE
EcoElectrical	PVC w/ Silicone Coating	1-775-853-8623	www.ecoelectrical.com
Hendrix Wire and Cable	Nylon	1-603-673-2040	www.hendrix-wc.com
Kaddas	ABS Plastic	1-801-972-5400	www.kaddas.com
TE Connectivity	Polymer	1-336-689-7348	www.te.com

PVC=polyvinyl chloride, ABS=acrylonitrile butadiene styrene

8.9 Pole-Top Grounds

Poles located in areas with few trees are attractive to raptors. Utility poles in these areas also are vulnerable to lightning strikes. Lightning can cause extensive damage to utility structures and equipment. Past construction practices attempted to limit lightning damage by running groundwires to the pole tops (Figure 8-76). A copper wire was placed down the pole and bonded to a ground rod or butt plate buried at the pole base. The groundwire also was tied into the neutral conductor. Under these conditions, lightning would travel down the groundwire to the earth, instead of passing through equipment or the pole, destroying it in the process.

Figure 8-76. Exposed pole-top groundwire

Sometimes metal hardware, such as crossarm braces and guy wires, are bonded to overhead groundwires to eliminate leakage currents. These grounding practices can result in reduced phase-to-ground distances and be lethal to large perching birds. Pole-top grounds extending above the pole can be particularly hazardous and a bird can be electrocuted when perched on an insulator if its tail touches the pole-top groundwire. Pole-top grounds can be gapped and still provide adequate lightning protection. The gaps break the pathway to earth, thereby reducing the risk for perching raptors.

This approach can be accomplished by placing two 4-inch gaps in the pole groundwire (Figure 8-77). Lightning will spark over the gaps while still allowing raptors to perch safely on the pole top. The groundwire should be at least 12 inches from the pole top, since an eagle's tail feathers can reach 10 inches below a perch. The preferred method of pole protection is to simply remove the pole-top grounds above the neutral and install surge arresters with proper animal guards and covered stinger wires.

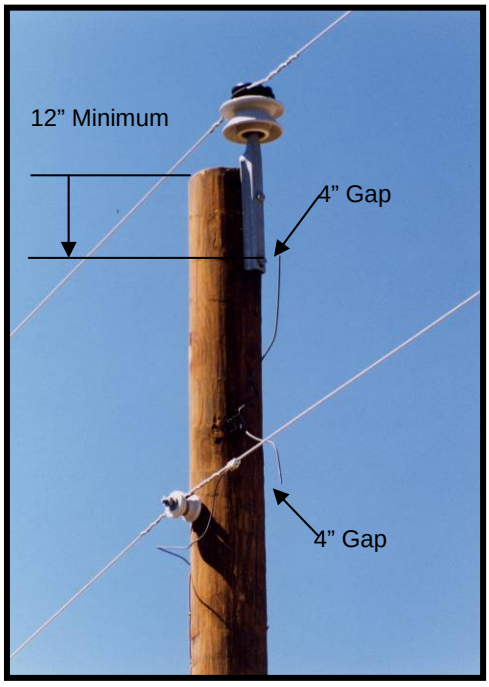


Figure 8-77. Pole with a pole-top ground properly gapped to reduce the risk of raptor electrocutions.

8.10 Brackets

Metal brackets for risers, cutouts, and arresters can pose a risk to animals when they are bonded to earth through groundwires (Figure 8-78 and Figure 8-79). An animal on a conductive grounded bracket needs only to touch one energized jumper wire to complete a pathway to ground.

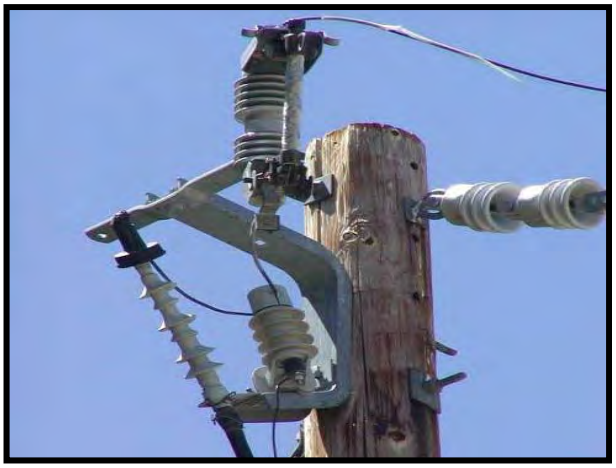


Figure 8-78. Single-phase grounded metal bracket with unprotected cutout/arrester.

Figure 8-79. Three-phase grounded metal bracket with unprotected potheads/arresters and jumpers.

For new construction, metal brackets can be replaced with nonconductive fiberglass brackets (Figure 8-80) or fiberglass arms (Figure 8-81). Either of these is preferable over metal because they are insulated. If possible, the metal ends of the brackets should not be bonded to ground.

Figure 8-80. Single-phase ungrounded fiberglass bracket.

Figure 8-81. Three-phase ungrounded fiberglass bracket with protected cutouts/arresters and jumpers.

For retrofitting, it may not be economical to replace brackets. Instead, it may be more practical to cover exposed wires with insulation and install wildlife protectors on exposed cutouts, bushings, potheads, and arresters, as discussed in Section 8.6 *Cutouts,* Section 8.4 *Transformers,* Section 8.3 *Risers,* and Section 8.7 *Surge Arresters*, respectively. Both conductive and nonconductive brackets supporting multiple phases should use insulated jumper wires if there is not adequate separation between jumpers.

8.11 Guying

Steel guy wires typically are attached to poles with a thimble eyebolt. Guy wires create a grounded path to earth because they are directly attached to anchors imbedded in the ground. This configuration can be hazardous if a guy pole attachment is located near energized wires or hardware. Grounded guy wires can be particularly hazardous on deadend structures because guy wires tensioning the upper set of crossarms typically pass near energized jumpers on the lower set of crossarms (Figure 8-82).

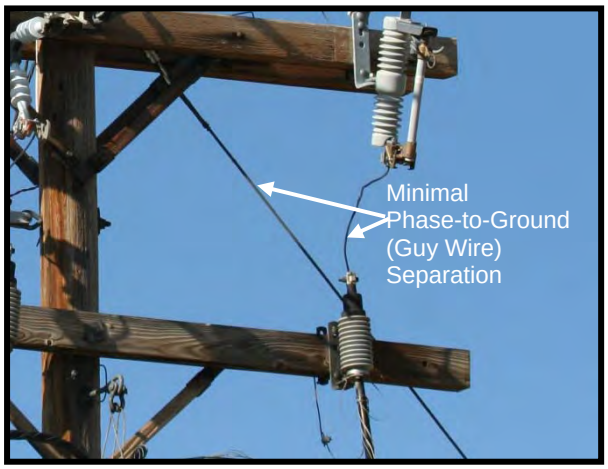


Figure 8-82. Guy wire with inadequate separation.

Installing fiberglass strain rods (Figure 8-83) or insulating links (Figure 8-84) in down guys provides protection by eliminating a pathway to ground. Insulating links also have the advantage of reducing cathodic anchor rod deterioration.

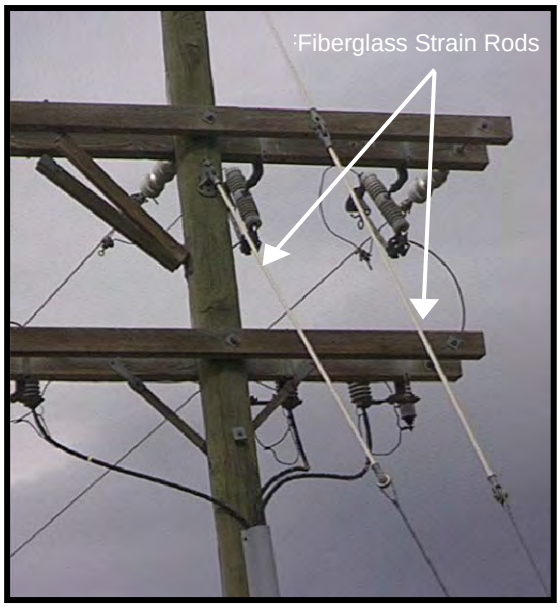


Figure 8-83. Fiberglass strain rods to prevent a pathway to ground.

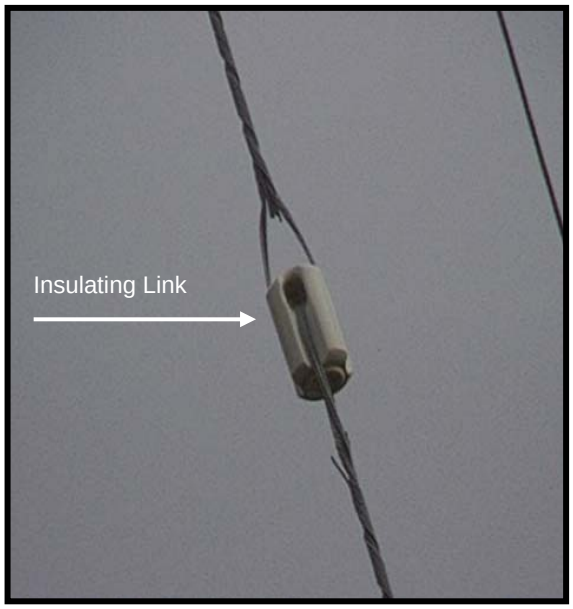


Figure 8-84. Insulating link to prevent a pathway to ground.

If the base of the guy attachment is grounded (Figure 8-85) then all energized hardware must be evaluated for proper phase-to-ground clearances and covered accordingly.

Figure 8-85. Guy wires attached to grounded pole bands.

8.12 Regulator By-Pass Switches and Disconnect Switches

System switches are difficult to insulate, since devices may interfere with a switch operation. Switch barriers provide one option to isolate birds from potential contact points (Figure 8-86 and Figure 8-87). Mounting switches on nonconductive surfaces such as fiberglass arms minimizes potential contacts, and it also is important to cover all exposed jumper wires (Section 8.8 *Stinger and Jumper Wires*). Salisbury, Midsun Group, and TE Connectivity manufacture several switch barriers (Table 8-12).

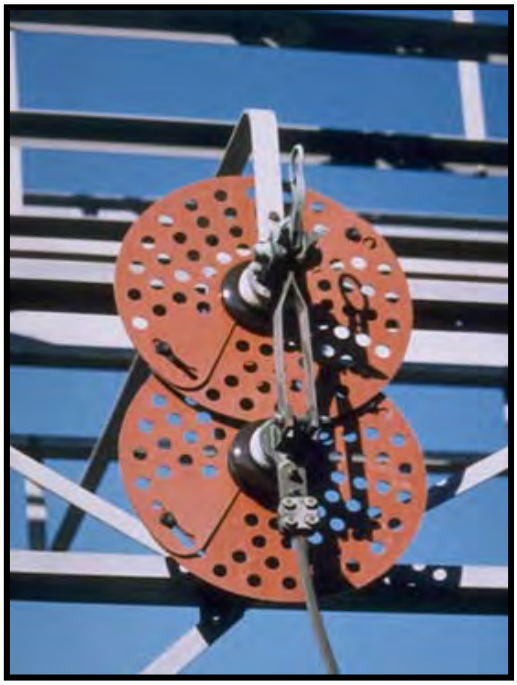


Figure 8-86. Switch barrier (TE Connectivity).

Figure 8-87. Switch barrier (Salisbury).

Table 8-12. Manufacturers of switch barriers.

MANUFACTURER	MATERIAL	PHONE	WEBSITE
Midsun Group	Silicone, Polycarbonate	1-860-378-0100	www.midsungroup.com/
Salisbury	Polyurethane	1-877-406-4501	www.salisburybyhoneywell.com
TE Connectivity	Polymer	1-336-689-7348	www.te.com

8.13 Three-Phase Switchgear

Since switches are difficult to retrofit because of their moving parts, another option is to install isolating plates to prevent contact, while also covering all exposed jumpers (Figure 8-88, Figure 8-89, and Table 8-13).

Figure 8-88. Switch with isolating plate.

Figure 8-89. Switch with isolating plates.

Table 8-13. Manufacturers of isolating plates.

MANUFACTURER	MATERIAL	PHONE	WEBSITE
Midsun Group	Silicone, Polycarbonate	1-860-378-0100	www.midsungroup.com/
Salisbury	Polyurethane	1-877-406-4501	www.salisburybyhoneywell.com
TE Connectivity	Polymer	1-336-689-7348	www.te.com

New switches can be purchased with fiberglass support arms rather than steel arms. At least one switch manufacturer, S&C Electric Company, produces a unit with wildlife protection installed on the interrupter (Figure 8-90). Custom switchgear that may be mounted upside-down to reduce animal contacts also is available from several companies (Table 8-14).

Figure 8-90. Switch with built-in animal protection.

Table 8-14. Manufacturers of animal-friendly switches.

MANUFACTURER	PHONE	WEBSITE
Bridges Electric, Inc.	1-800-743-6367	www.energy.siemens.com
Chance	1-573-682-5521	www.hubbellcatalog.com/hps
S&C Electric Company	1-410-266-8484 (DC) 1-570-619-7944 (DE/MA) 1-609-490-1667 (NJ) 1-804-320-8005 (VA)	www.sandc.com/

8.14 Perch Management

Perch management (i.e., using an isolation approach) is designed either to encourage perching in safer areas of a structure or deter birds from perching in dangerous or high-risk areas with inadequate separation (Figure 8-91).

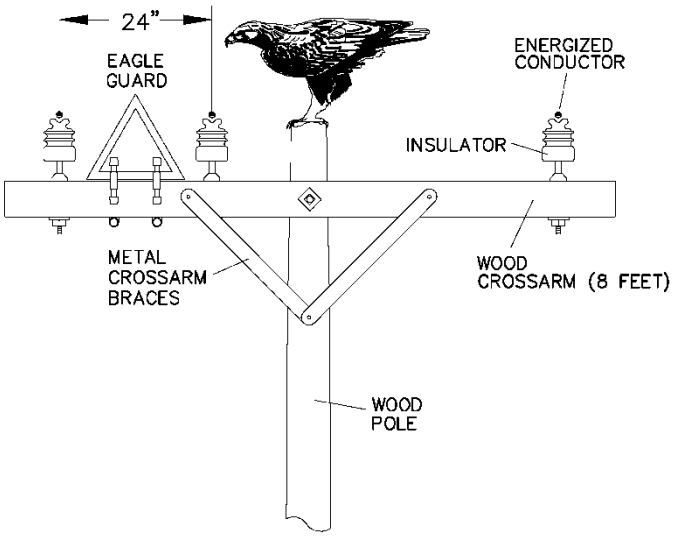


Figure 8-91. Eagle on a three-phase tangent structure with inadequate separation.

Perch management generally is discouraged by the USFWS for reducing avian electrocution risks and should be employed only when there is no other alternative or as a redundant approach for specific high-risk scenarios. Certain poles may be more desirable to birds for perching or hunting due to factors that are not apparent to humans, so allowing a bird to continue to use a particular pole may enhance conservation. Also, simply displacing a bird to perch on another hazardous pole will not reduce hazards to the bird. Perch management alone may be acceptable in temporary emergency situations where proper separation or insulation is not possible. Perch management is appropriate in the following situations:

1. When used along with insulation as a redundant form of protection.

2. When insulation is not feasible (e.g., horizontally mounted switches).

3. To deter perching in areas where increased predation of sensitive species by raptors is an issue, and only when specifically recommended by a state or federal management agency.*

**When perch management is used for this purpose it should be placed only on equipment that is raptor friendly prior to installation of the perch management device. Extreme care should be used to ensure that perch management does not increase the chance of electrocution of birds.*

8.14.1 Elevated Perches

Perch encouragement typically is achieved with elevated perches designed to attract birds to the highest point on the structure. Elevated perches are particularly important on structures located at topographical high points near a prey base; there are commercially available units from Aluma-Form and Hughes Brothers (refer to Table 8-15, Figure 8-92, and Figure 8-93). Perch discouragers can be used in tandem with elevated perches and should be installed properly so they do not create future operational problems.

Table 8-15. Perch manufacturers.

MANUFACTURER	MATERIAL	PHONE	WEBSITE
Aluma-Form	Wood	1-901-362-0100	www.alumaform.com/
Hughes Brothers	Fiberglass	1-402-643-2991	www.hughesbros.com/index.html

Figure 8-92. Elevated perch (Aluma-Form).

Figure 8-93. Elevated perch (Hughes Brothers).

Even with elevated perches, birds sometimes will perch lower on the structure to seek shelter from adverse weather (Figure 8-94). Elevated perches must be firmly attached; perch management is not a substitution for providing proper raptor protection (Figure 8-95).

Figure 8-94. Raptor perching below an elevated perch.

Figure 8-95. Improperly installed elevated perch and unprotected pole.

When custom elevated perches are developed, they can be designed so birds cannot access the area beneath the perch (e.g., to escape heat or rain). Bald eagles range in height from 18 to 28 inches. Accordingly, bald eagle perches should be located approximately 16 inches above a crossarm (Figure 8-96). Perch installation must adhere to NESC and all other pertinent safety requirements. As previously mentioned, all exposed contacts on the pole also should be addressed.

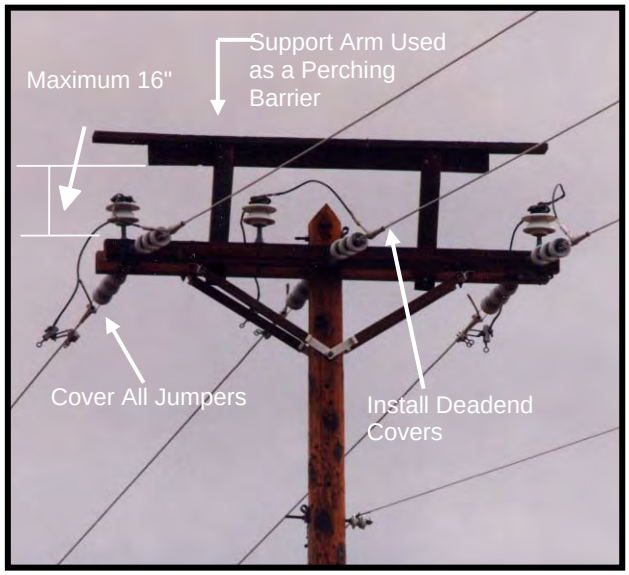


Figure 8-96. Elevated perch on a three-phase tangent structure.

8.14.2 Perch Discouragers

Perch discouragers are designed to manage where birds perch on a structure, deterring the birds from landing on areas that present a high electrocution risk. They also may be used to keep birds from defecating on suspension insulators and equipment. Perch discouragers constructed of a variety of materials are available from several manufacturers (Table 8-16). Some devices can be installed "hot" with hot sticks; others must be bolted to the structure. In general, perch discouragers that can be installed hot cost more than discouragers requiring more labor to install. Two unique designs (by Power Line Sentry and Kaddas) function to preclude perching under the perch discourager (Figure 8-97 and Figure 8-98).

Table 8-16. Perch discourager manufacturers.

MANUFACTURER	MATERIAL	PHONE	WEBSITE
EcoElectrical	PVC w/ Silicone Coating	1-775-853-8623	www.ecoelectrical.com
Hendrix Wire & Cable	Polypropylene	1-603-673-2040	www.hendrix-wc.com
Hughes Brothers	Fiberglass	1-402-643-2991	www.hughesbros.com
Kaddas	PVC	1-801-972-5400	www.kaddas.com
Mission Engineering	HDPE	+27 11 334-0882	www.mission-eng.co.za
Pacer Industries	PVC	1-208-733-8074	N/A
Power Line Sentry	Electrical PVC	1-970-599-1050	www.PowerLineSentry.com
Zena	Polyethylene	1-970-663-3980	www.zenadesign.com/

PVC=polyvinyl chloride, HDPE=high-density polyethylene

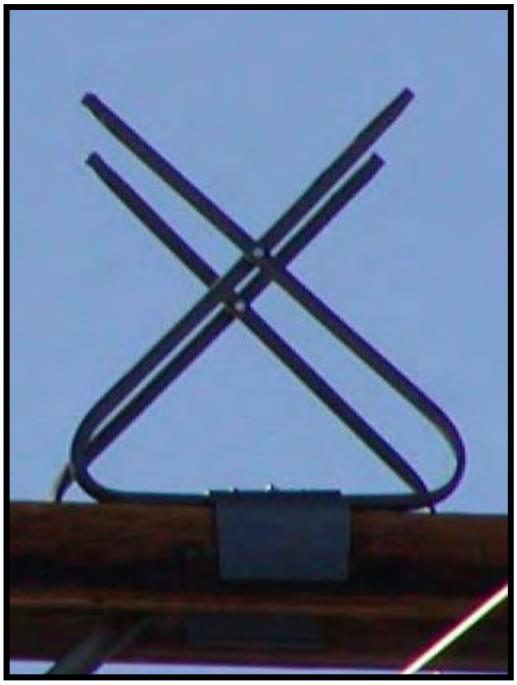


Figure 8-97. Power Line Sentry "Raptor Guard" perch discourager design to deter perching within the triangle.

Figure 8-98. Kaddas perch discourager design to deter perching within the triangle.

Some discouragers must be mounted on the horizontal crossarm surface. This may not be possible when cutouts, arresters, or other equipment are present. In those situations, a unit that mounts on to the vertical crossarm surface is required.

Perch discouragers do not always keep birds off structures (Figure 8-99). The goal of a perch discourager is to manage where a bird perches on a structure. This approach is most successful if other, safer portions of the pole remain available to the bird for perching. A perch discourager is simply a tool to manage where birds can land on a structure (Figure 8-100).

Figure 8-99. Bird perching on a perch discourager.

Figure 8-100. Perch discourager shifting a raptor to the pole top.

For new construction, adequate conductor separation is recommended and a better approach, rather than using perch discouragers. Placing perch discouragers on top of some poles can contribute to electrocutions, since birds may choose to roost lower on the pole near energized equipment. Perch discouragers also may simply shift problems on to other more dangerous structures in the vicinity (Figure 8-101).

Perch discouragers should be sized properly to discourage birds from perching under or adjacent to the discouragers (Figure 8-102), and should be purchased with a protective coating to prevent UV deterioration. Makeshift discouragers without UV protection often are inappropriate and deteriorate prematurely, becoming ineffective (Figure 8-103).

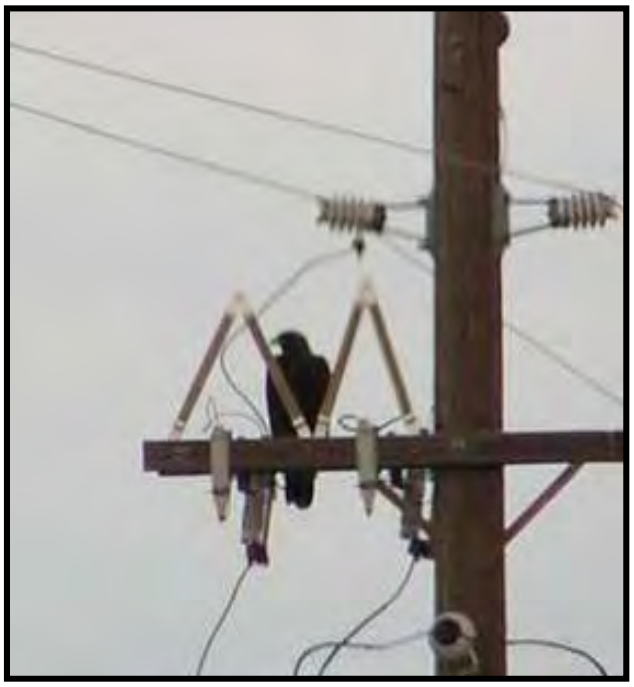


Figure 8-101. Perch discourager shifting a bird to a more problematic area.

Figure 8-102. Raptor perching under a perch discourager.

Figure 8-103. Inappropriate use of a traffic cone as a perch discourager.

Like all utility components, perch discouragers should be installed according to the manufacturers' specifications and using NESC clearances to avoid potential electrical problems. Discouragers placed too close to conductors can lead to flashovers under certain environmental conditions (Figure 8-104). Conversely, providing too much space may allow birds to land in critical areas (Figure 8-105).

Figure 8-104. Flash marks on discourager.

Figure 8-105. Eagle perched next to a discourager (hazardous).

Tests with captive birds reveal that hawks can defeat a perch discourager when more than 5 inches of separation exist between an insulator and a perch discourager (Figure 8-106). Eagles can defeat a perch discourager when more than 10 inches of separation occurs between a discourager and insulator (Figure 8-107). Accordingly, if the goal is to keep hawks and eagles off of structures, this separation should not be increased beyond 5 inches. However, this must be driven by the proper NESC electrical separation. It is critical to note when a pole configuration has multiple arms, multiple discouragers must be used. Figure 8-108 provides specific installation diagrams for a variety of pole configurations using a variety of perch discouragers.

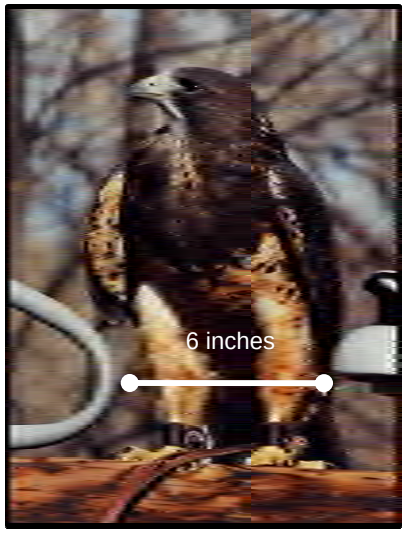


Figure 8-106. Example of improper use of a perch discourager to minimize hawk perching - maximum 5-inch spacing.

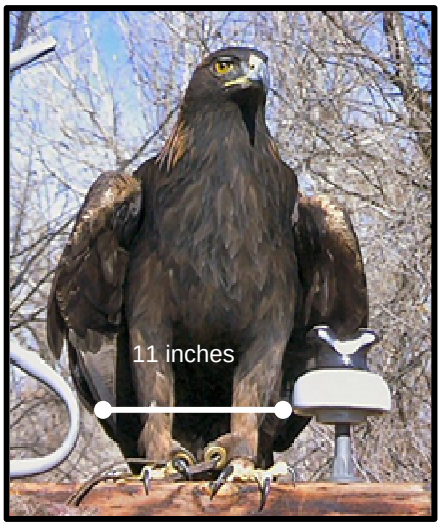


Figure 8-107. Example of improper use of a perch discourager to minimize eagle perching - maximum 10-inch spacing.

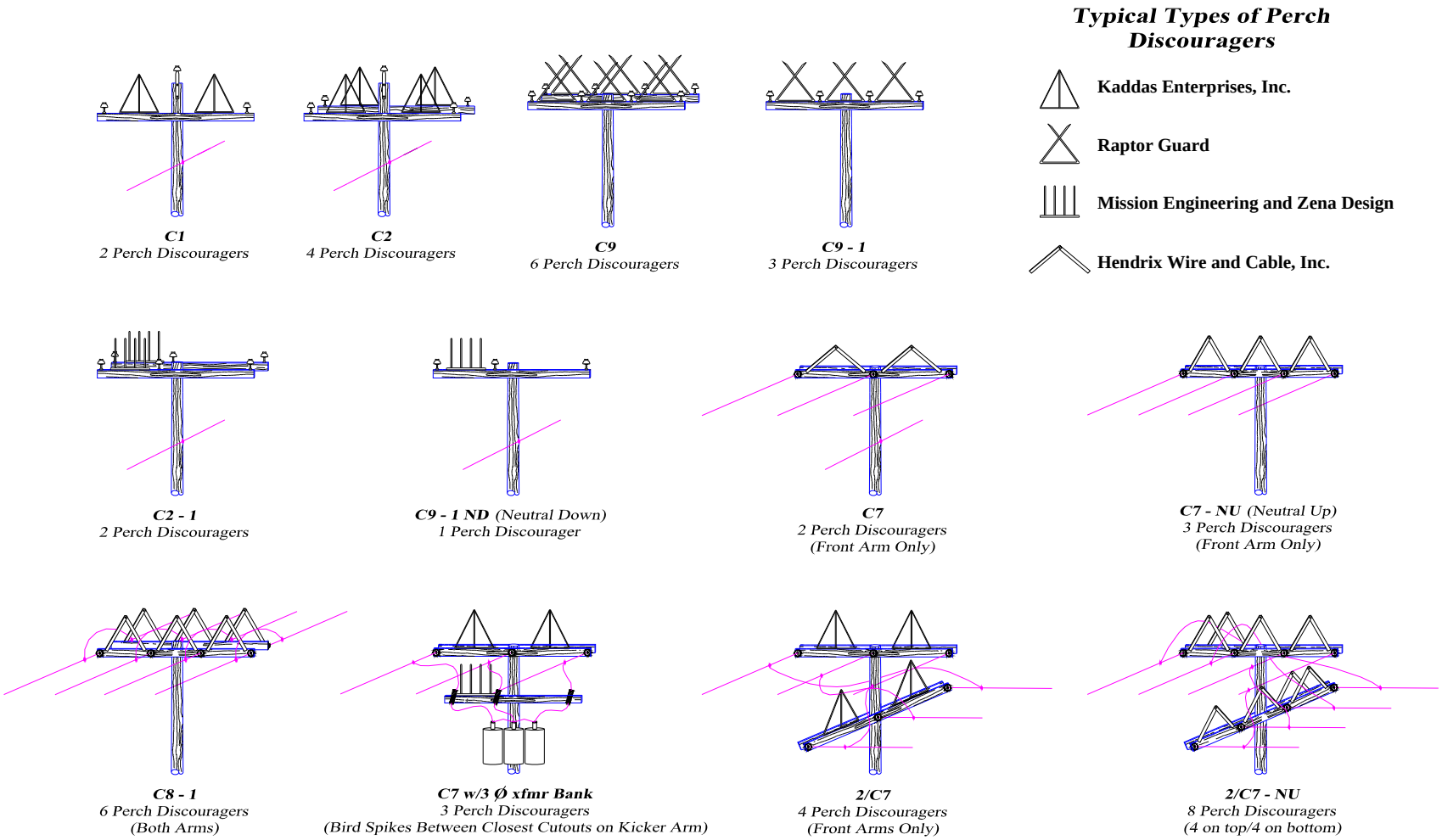


Figure 8-108. Correct perch discourager installation for different configurations using a variety of products*.

* These products should be used only if the structure has been properly protected to minimize the risk of bird electrocution.

Some types of bird spikes can be effective perch discouragers. Spikes can be placed in hard-to-reach areas and they come in a variety of sizes and materials (e.g., metal, plastic polymers) to deter a wide range of bird species from perching on utility structures. However, spikes must be sized properly and installed in the right locations to effectively deter birds. Small spikes will not deter large birds from perching, and small birds may nest in them (Figure 8-109). Small, plastic spikes break easily, reducing their effectiveness. Finally, the potential risks to personnel climbing and working around sharp spikes also can be significant. Spikes should be used only as extra protection after all energized parts have been insulated or covered.

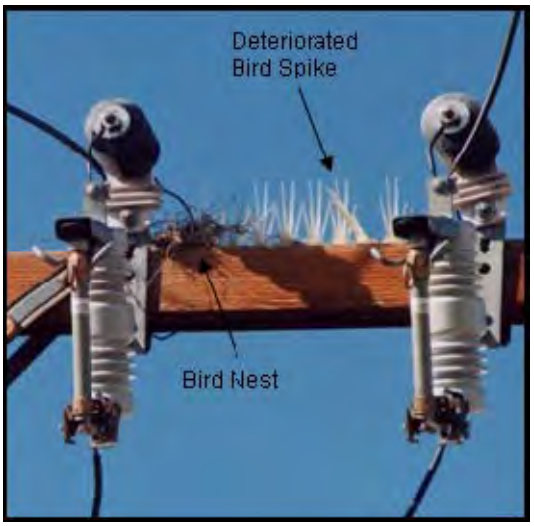


Figure 8-109. Bird nesting in small plastic spikes.

Figure 8-110 provides examples of suitable bird spikes produced to manage raptor perching on utility structures. As mentioned in Chapter 11.0 *Nest Management*, perch discouragers are not an effective tool to deter nesting (Figure 8-111 and Figure 8-112).

Figure 8-110. Example of improper use of bird spikes for perch management.

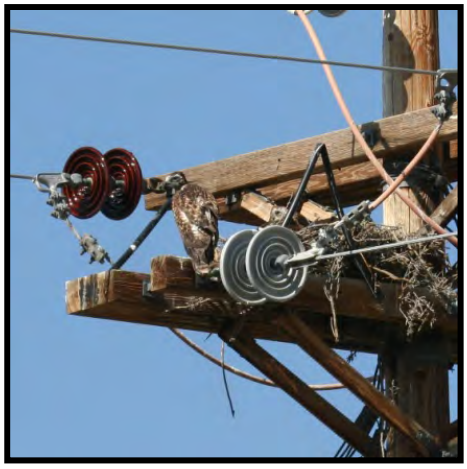


Figure 8-111. Hawk nest between perch discouragers.

Figure 8-112. Osprey nest start in bird spikes.

Installing a raptor effigy is a traditional method of attempting to frighten unwanted birds (Figure 8-113 and Figure 8-114). The best results usually are obtained from devices that are most lifelike and have motion. Motion, coupled with loud startling sounds or recorded distress calls, will enhance effectiveness. However, habituation to predator decoys is inevitable and effectiveness diminishes with time. Accordingly, predator decoys should not be used as a substitute for avian protection.

Figure 8-113. Plastic falcon on primary meter pole.

Figure 8-114. Plastic owl unsuccessfully preventing Osprey nesting.

9.0 SUBSTATION ELECTROCUTIONS

When possible, substation structures should be designed to provide adequate separation for the animals commonly encountered. According to the 1993 Institute of Electrical and Electronics Engineers (IEEE) *Guide for Animal Deterrents for Electric Power Supply Substations* (IEEE 1993), the most effective method to minimize animal-caused outages is to increase clearances. Unfortunately, this is not always possible. Some substation equipment, such as switches and reclosures, are constructed with inadequate separation, requiring additional cover-up devices to mitigate potential problems.

Methods used to protect substations from animal-caused outages generally fall in one of the following categories:

- Separation: Build adequate clearances between energized equipment into new equipment (new construction).

- Insulation: Insulate equipment with inadequate separation (new construction and retrofitting existing structures).

- Reduce Access: Minimize access to substations using a variety of climbing and digging barriers (new construction and retrofitting existing structures).

- Vegetation Management: Regular maintenance of vegetation at substations should minimize the attractiveness of substations to wildlife. Nest management also is a critical maintenance component.

Parallel to the corrective strategies developed to reduce electrocutions on distribution lines, the overall methods to reduce animal-related substation outages include “isolation” and “insulation.” In contrast with the approaches to mitigate electrocution risk on distribution lines, isolation rather than insulation is the preferred and most effective method to mitigate electrocution risk for substations (IEEE 1993). Isolation consists of providing enough clearance to reduce the risk of an animal from being able to physically bridge the phase-to-phase or phase-to-ground distance. Where appropriate, insulation employing cover up devices or materials on equipment can be used for substations.

Installation of all coverup must adhere to the NESC and all other pertinent safety requirements. Animal protection measures using insulation are **not** designed to protect linemen. Many products are not rated for the full line voltage and are designed to protect animals from incidental contacts only.

*Caution: Raptor protection measures using insulation are **not** designed to protect linemen. Many products are not rated for the full line voltage and are designed to protect birds from incidental contacts only.*

It is important to recognize that uniform standards do not exist for animal covers, and some are more susceptible to UV and environmental degradation than others. This degradation can lead to tracking problems. When possible, tight, form-fitting products should be sought, as small mammals or birds can cache food in accessible spaces. When products are selected, their properties should be thoroughly reviewed by electrical engineering staff. Substation crews should also be instructed on the proper method of product installation.

In December 2010, IEEE approved two new power engineering standards offering guidelines to protect power lines, substations, and related devices from birds and other wildlife while also ensuring fewer costly power interruptions. The first new standard is IEEE 1651™ *Guide for Reducing Bird-Related Deaths* (IEEE 2010a). This document describes methods, techniques, and designs to mitigate bird-related power interruptions and equipment damage resulting from avian interactions with electric facilities. This standard addresses a wide range of situations including electrocutions, collisions, nesting problems, and outages caused by fecal contamination and streamers. Topics include bird impacts to transmission lines, distribution lines, and substations, as well as woodpecker issues.

The second new standard is IEEE 1656™ *Guide for Testing the Electrical, Mechanical, and Durability Performance of Wildlife Protective Devices on Overhead Power Distribution Systems Rated up to 38kV* (IEEE 2010b). This standard applies to wildlife protective products installed on overhead electrical distribution systems and provides test recommendations for products that are in direct contact or in the proximity of energized parts and conductors.

Although there are hundreds of insulating products available to mitigate animal-caused outages, a few vendors have focused their efforts on substations: Kaddas, Midsun Group, Salisbury, and TE Connectivity (Table 9-1). These vendors offer a variety of custom covers and barriers. Additional products include heat and cold shrink wraps and fusing tapes available for nonstandard equipment shapes. These materials are available in flat sheets, tubing, and tapes to allow custom form fitting.

Table 9-1. Substation protection vendors.

MANUFACTURER	PHONE	WEBSITE
Kaddas	1-801-972-5400	www.kaddas.com/
Midsun Group	1-860-378-0100	www.midsungroup.com/
Salisbury	1-877-406-4501	www.salisburybyhoneywell.com
TE Connectivity	1-336-689-7348	www.te.com

9.1 Equipment

This section describes specific retrofits for common substation equipment. Installation of all cover-up devices must adhere to the NESC and all other pertinent safety requirements.

Transformers are one of the most problematic items associated with animal-caused outages (EPRI 2001). Transformer outages may occur when an animal on a grounded transformer tank touches an energized conductor or bridges the distance between two energized phases. Bushing covers along with bus/jumper insulation provide the necessary insulation to minimize animal-caused outages. Transformers should be installed with bushing covers (Figure 9-1) or wrapped with insulating material (Figure 9-2). Roof-top bushings sit on top of switchgear and also can be covered with bushing covers. No bare portion of the covered leads should extend beyond the bushing covers. Fusing tape should be used to cover any such gaps.

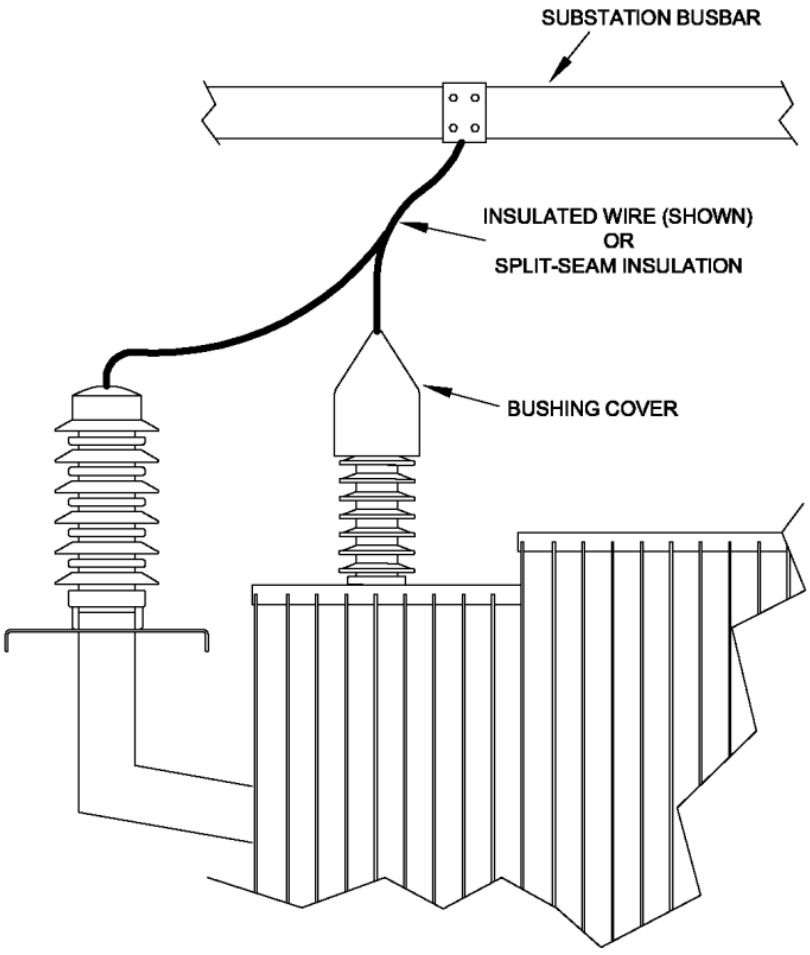


Figure 9-1. Bushing cover.

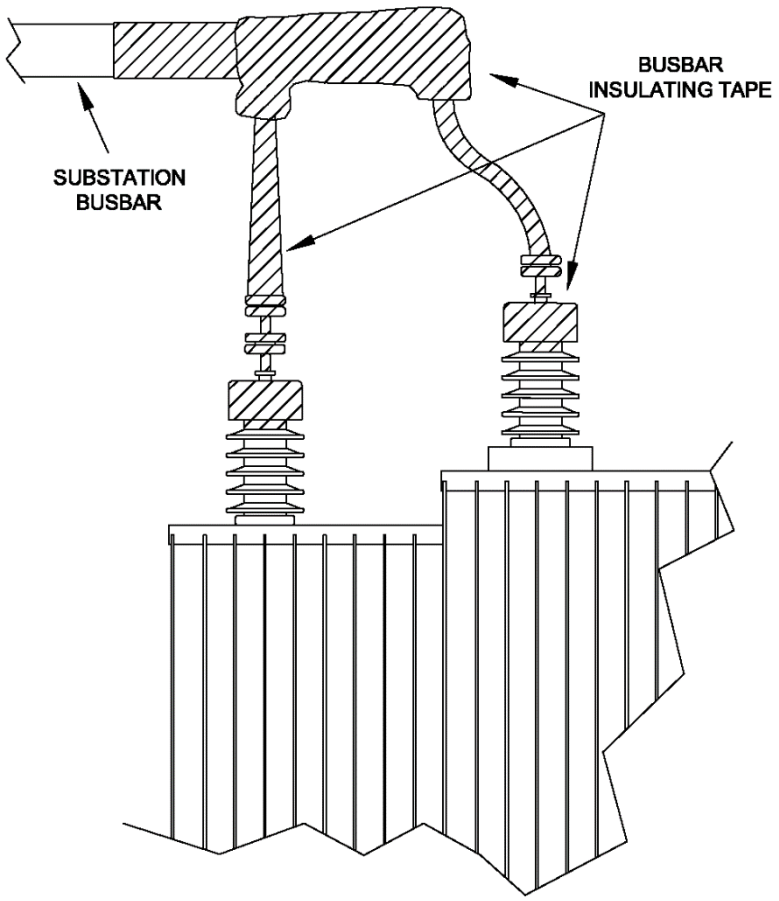


Figure 9-2. Shrink-fit insulation.

9.1.1 Power Transformers

Substation transformer oil must remain stable at high temperatures and over an extended period. Therefore it is critical to ensure bushing covers allow oil indicators to be visible from the ground. There are a variety of bushing covers available and they must be installed per the manufacturer's instructions. The sheds of bushings are designed to wash themselves of contaminants during precipitation. To allow for contaminant washing, it is important not to cover more sheds than specified (typically the first skirt of a bushing). Lastly, all arresters should have caps installed.

A variety of bushing covers are available. These covers are generally made of track-resistant, high-density polymers that either snap on or slide over bushings. Snap-on covers allow installation without removing the transformer jumper wire. Slide-over units require the wire to be temporarily removed in order to slide the cover over the transformer bushing. Covers can be ordered with a fire-resistant material.

For some utilities, it is important to be able to conduct thermal scans on their equipment. TE Connectivity (Table 9-1) offers bushing covers that allow for visible inspections, while reducing the risk that wildlife may contact energized equipment (Figure 9-3).

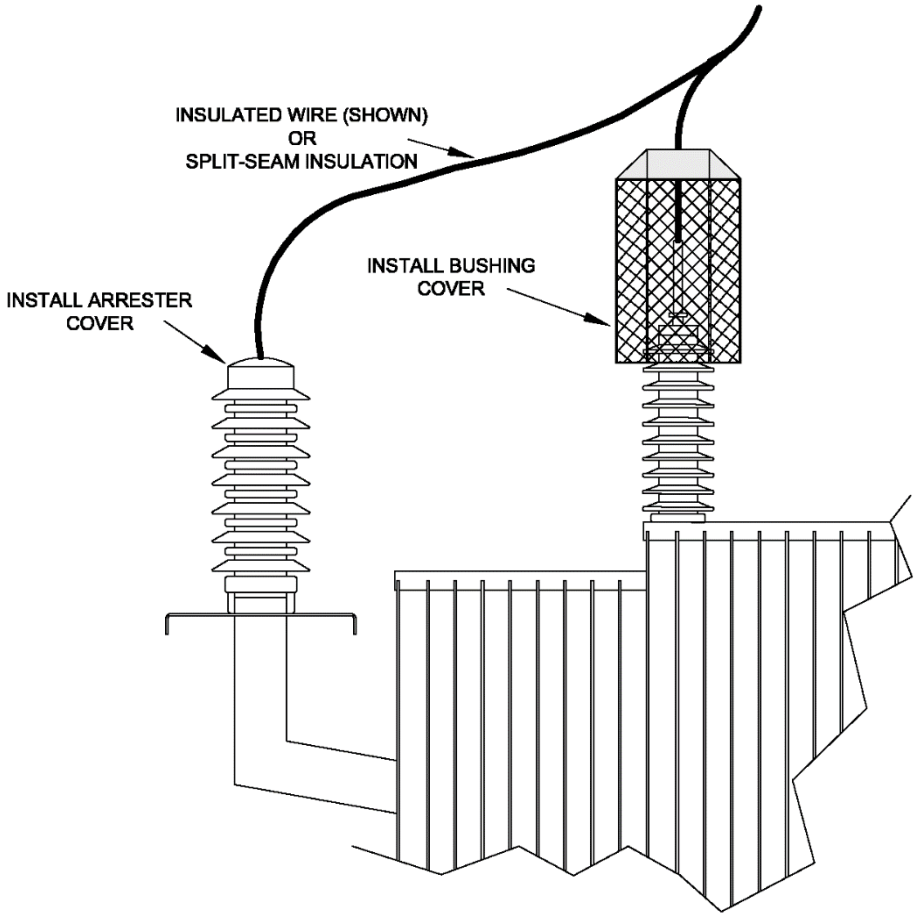


Figure 9-3. Bushing cover allowing thermal imaging.

Manufacturer's installation procedures must be followed. It is not uncommon for bushing covers to be installed improperly. Incorrectly installing bushing covers below the proper insulator skirt can result in flashovers.

9.1.2 Busses

Buswork faults usually occur when an animal simultaneously contacts the energized bus and a grounded bus support. New substations should be constructed so that bus supports extend at least 40 inches from grounded surfaces to minimize contacts from climbing animals, such as raccoons. The distance of the busbars can be increased using fiberglass extensions (Figure 9-4). It also is possible to use larger insulators to increase phase-to-ground separation. Phase-to-phase separation of 60 inches also is recommended to protect wing-to-wing contacts by eagles. Insulation can be used to provide protection if adequate spacing is not possible (Figure 9-5).

Figure 9-4. Substation bus supports for animal protection.

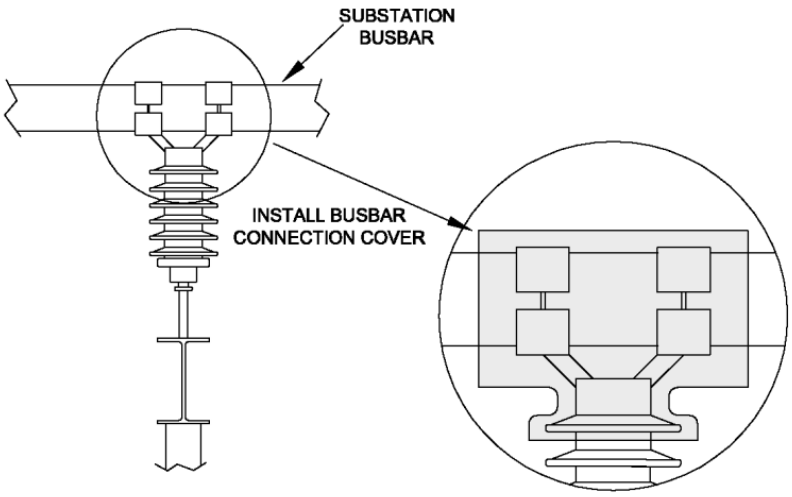


Figure 9-5. Busbar insulation.

Insulation is available either as shrink-to-fit (Figure 9-6) or as form-fitted (Figure 9-7).

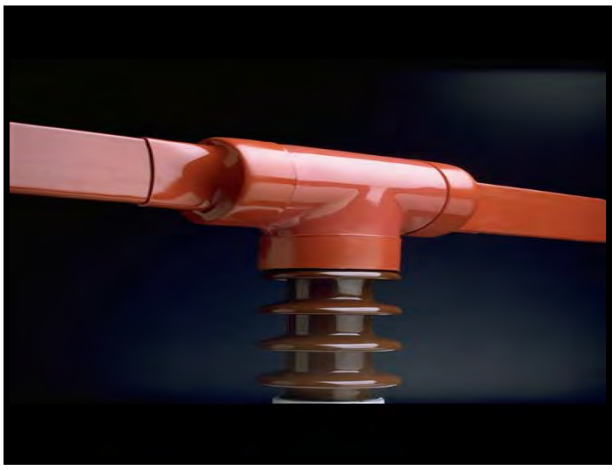


Figure 9-6. Shrink-to-fit bus insulation (TE Connectivity).

Figure 9-7. Form-fitted bus insulation (Salisbury).

9.1.3 Other Equipment

Regulators, reclosers, and capacitors can be lethal to animals due to exposed bushings and jumpers. For some utilities, breakers/reclosers account for a substantial portion of total annual animal-caused consumer interruption time (EPRI 2001). Regulators, reclosers, and capacitors should include bushing covers (Figure 9-8) as discussed in Section 9.1.1 *Power Transformers*.

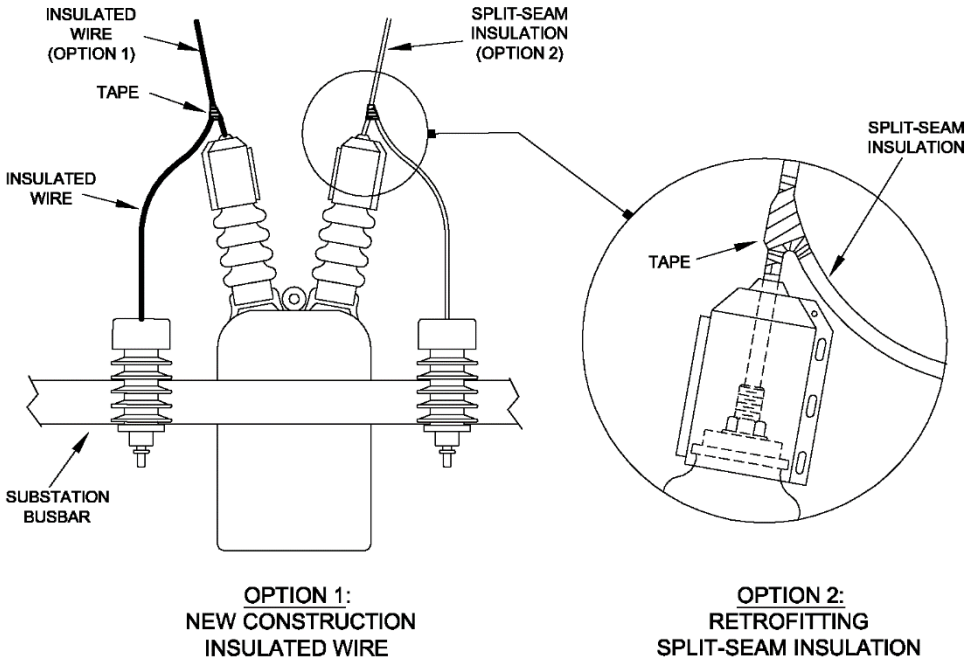


Figure 9-8. Recloser fitted with animal protection.

Jumper wires feeding the equipment also must be covered. No bare portion of the covered leads should extend beyond the bushing covers.

Capacitors come in many shapes that are difficult to cover with after-market products. Accordingly, capacitors should be purchased with animal protection already installed. Jumper wires and all protective devices (arresters, fused cutouts, etc.) also should be animal guarded in a similar fashion.

9.1.4 Risers

Grounded steel pothead brackets associated with riser poles at substation getaways can be problematic. The riser pothead should be fitted with a snap-on "clamshell" type cover (Figure 9-9). Any conductors that cannot be covered should be wrapped with insulating tape. No exposed conductor should extend beyond the bushing cover, and leads should be kept as short as possible. Riser conduits should be sealed with expanding foam and putty or duct seal.

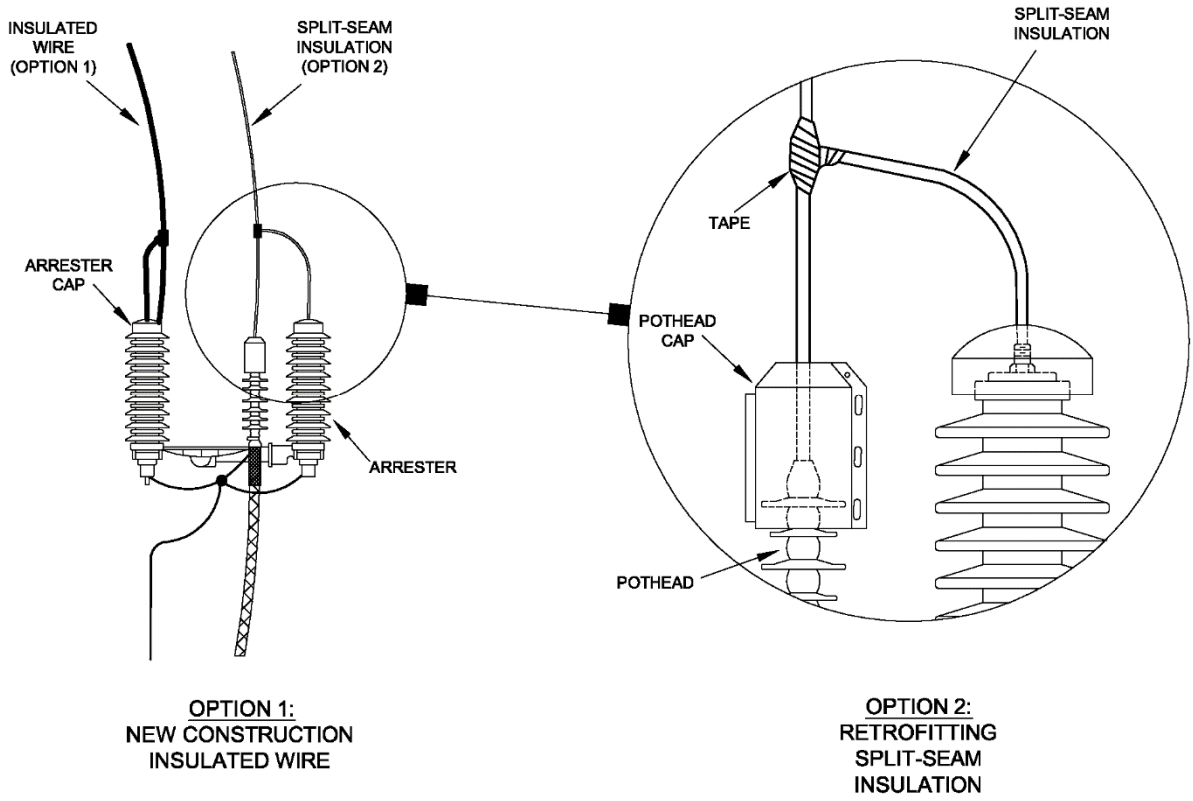


Figure 9-9. Protected riser pole with pothead covers.

9.1.5 Arresters

Arresters should be installed with protective arrester caps (Figure 9-10). Insulated covering should be used for arrester hot leads. No exposed wire should extend beyond the arrester cap, and leads should be kept as short as possible. Transformer mounted arresters should be installed with manufacturer-supplied wildlife caps and jumper covering.

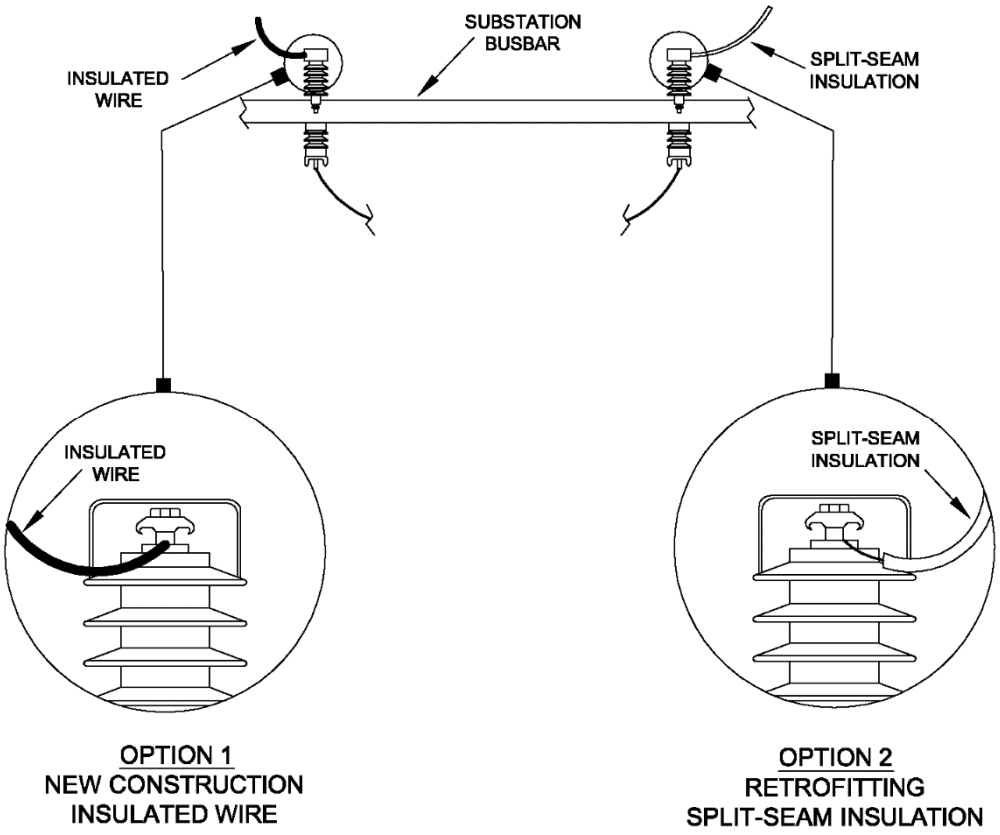


Figure 9-10. Surge arrester with arrester cap.

Groundwires associated with surge arresters should be routed to avoid potential phase-to-ground contacts. If the groundwire is near any energized hardware, it also should be covered.

9.1.6 Cutouts

Cutouts often are installed on metal brackets. If the metal bracket is grounded, it can easily allow an animal to bridge the distance between a cutout and ground. Cutouts should be covered if they cannot be effectively isolated (Figure 9-11). The Midsun Group, Kaddas, and TE Connectivity manufacture several cutout covers to insulate the top of various cutouts (Table 9-1). Cutout covers always should be used in tandem with covered jumpers.

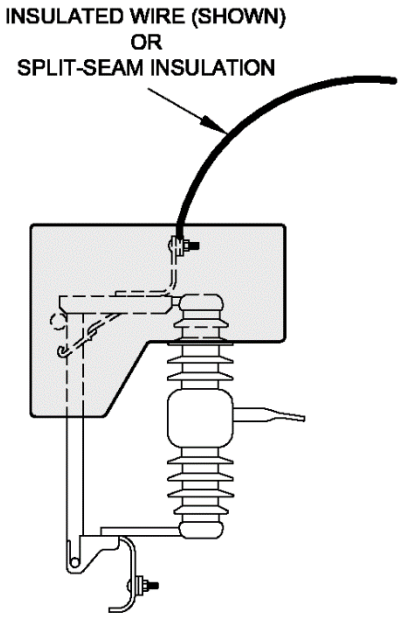


Figure 9-11. Cutout with an insulating cover.

9.1.7 Regulator By-Pass Switches and Disconnect Switches

Although switches are difficult to insulate, barriers are an effective way to isolate potential contact points (Figure 9-12). Additionally, mounting switches on nonconductive surfaces such as fiberglass arms minimizes potential contacts, and associated jumpers and bus work also should be covered. Salisbury, Midsun Group and TE Connectivity manufacture several switch barriers (Table 9-2), and examples of two switch barriers are shown in Figure 9-13 and Figure 9-14.

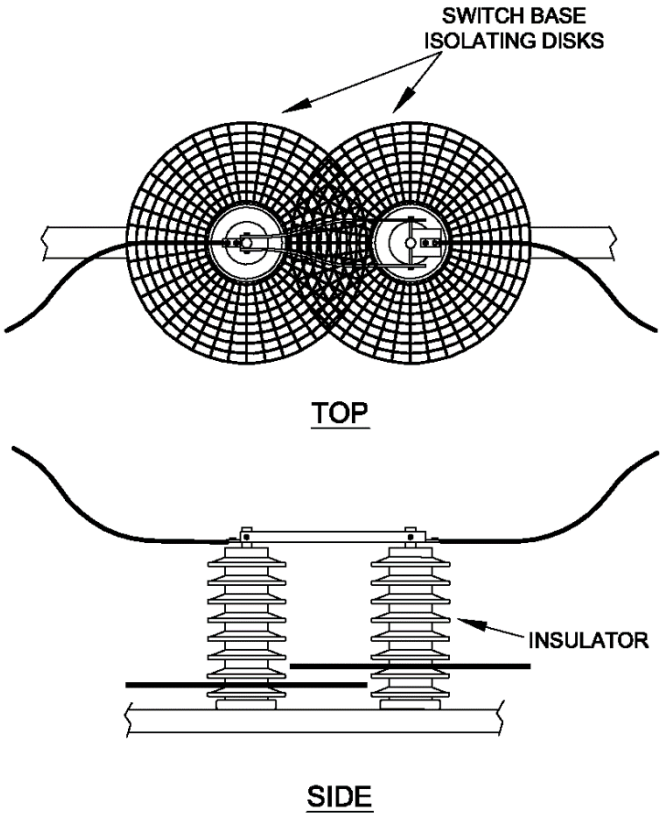


Figure 9-12. Switch barrier.

Table 9-2. Manufacturers of switch barriers.

MANUFACTURER	MATERIAL	PHONE	WEBSITE
Midsun Group	Silicone, Polycarbonate	1-860-378-0100	www.midsungroup.com/
Salisbury	Polyurethane	1-877-406-4501	www.salisburybyhoneywell.com
TE Connectivity	Polymer	1-336-689-7348	www.te.com

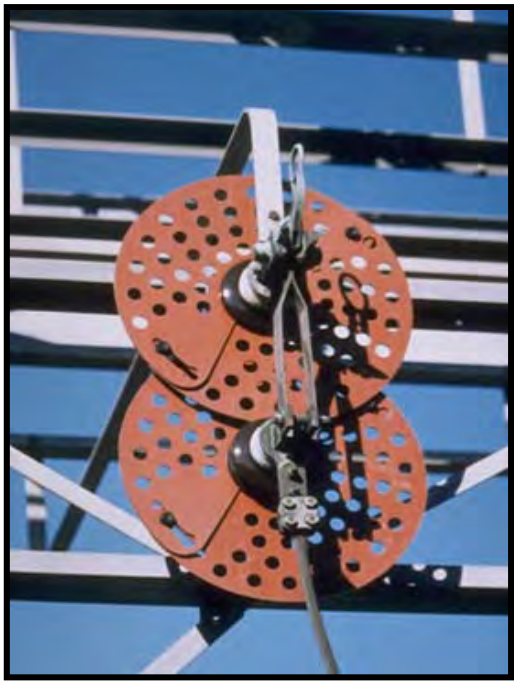


Figure 9-13. Switch barrier (TE Connectivity).

Figure 9-14. Switch barrier (Salisbury).

9.1.8 Three-Phase Switchgear

As discussed in Section 9.1.7 *Regulator By-Pass Switches and Disconnect Switches,* equipment switches are difficult to retrofit because of their moving parts. Figure 9-15 and Figure 9-16 show use of isolating plates on switches to prevent ground contact points while also covering all exposed jumpers. Table 9-3 provides manufacturer information of isolating plates for this application.

Figure 9-15. Switch with isolating plate.

Figure 9-16. Switch with isolating plates (Salisbury).

Table 9-3. Manufacturers of isolating plates.

MANUFACTURER	MATERIAL	PHONE	WEBSITE
Midsun Group	Silicone, Polycarbonate	1-860-378-0100	www.midsungroup.com/
Salisbury	Polyurethane	1-877-406-4501	www.salisburybyhoneywell.com
TE Connectivity	Polymer	1-336-689-7348	www.te.com

New switches can be purchased with fiberglass support arms rather than steel arms. At least one switch manufacturer, S&C Electric Company, produces a unit with wildlife protection on the interrupter (Figure 9-17 and Figure 9-18). Custom switchgear that may be mounted upside-down to reduce animal contacts also is available from several companies (Table 9-4).

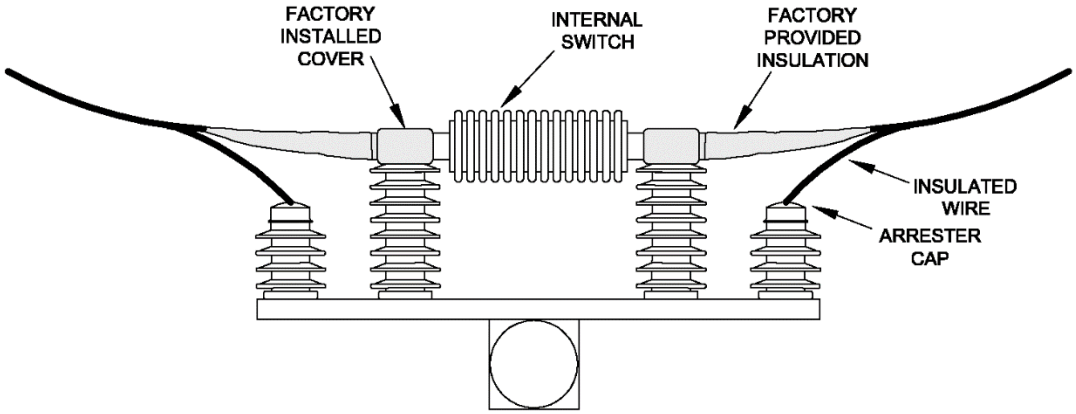


Figure 9-17. Switch with built-in animal protection.

Figure 9-18. Switch with built-in animal protection (S&C Electric Company).

Table 9-4. Manufacturers of animal-friendly switches.

MANUFACTURER	PHONE	WEBSITE
Bridges Electric, Inc.	1-800-743-6367	www.energy.siemens.com
Chance	1-573-682-5521	www.hubbellcatalog.com/hps
S&C Electric Company	1-410-266-8484 (DC) 1-570-619-7944 (DE/MA) 1-609-490-1667 (NJ) 1-804-320-8005 (VA)	www.sandc.com/

9.1.9 Jumpers

When an energized primary jumper is near a grounded plane or another phase conductor and the potential exists for an animal to bridge the gap, the jumper should be covered. New jumper construction should include at least 5kV-rated insulated covering (Figure 9-19). Although 5kV-rated covering does not protect for the full line voltage, it does provide enough insulation to allow brief animal contact without causing a flashover. However, prolonged contact with protected parts may cause insulation failure and allow for a short-circuit. No bare portion of the covered leads should extend beyond any wildlife caps.

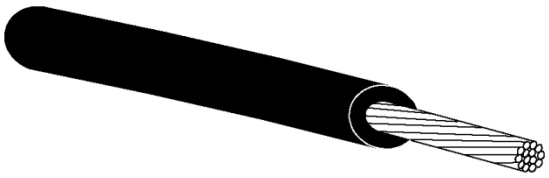


Figure 9-19. Covered jumper wire for new installations.

Split-seam insulating hosing also is available (Figure 9-20). A split-seam hose can be installed over existing wire without disconnecting the lead wire. If a split-seam hose is used, a hose that overlaps the seam gap is recommended.

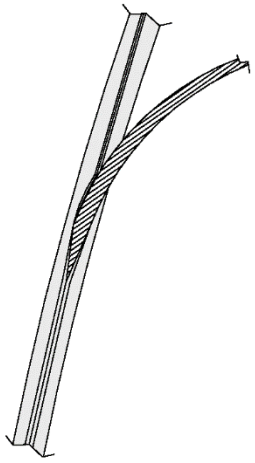


Figure 9-20. Covered jumper wire for retrofitting.

9.2 Fencing and Perimeter Design

Fencing barrier systems are recommended if the primary substation problems are attributed to snakes or mammals. These options consist of both passive barriers and electric barriers. Barriers can be implemented at the substation perimeter or within the substation around the base of susceptible equipment such as breakers/reclosers and power transformers.

Fence barriers include smooth polycarbonate, sheet metal, or aluminum barriers extending down 36 inches from the top of the fence, on the outside. Fence material also should be extended below the ground 12 inches to deter animals from burrowing and should be installed around corner posts, if possible.

All openings around gates and posts should be covered with expanded or custom fencing barrier material to restrict access. Using smaller mesh fabric also can minimize the risk of snakes and other small animals from gaining access through a fence. To discourage snakes from climbing over a fence a fine mesh ¼-inch fabric should be installed along the bottom of the exterior of a substation fence to a height of 36 inches, with the top curled back. It is important to regularly maintain the fence and trim vegetation around the substation to make the substation surroundings less attractive to animals.

Another barrier approach is to place fencing around susceptible equipment within a substation. This allows animals into the substation but restricts access to critical equipment. There are both passive and active systems available in a modular design.

The passive system employs smooth surfaces that animals cannot climb. The active system delivers an electric shock. A modular design allows sections of fencing to be set up with minimal effort and includes a gate for lineman access. These systems will not protect birds nor deter animals from entering the substation yard, which may attract predators into the substation.

The Kinectrics PowerKage and Vanquish Animal Deterrent System are non-electric fences designed to minimize ground access to electrical equipment at substations by squirrels, raccoons, snakes, and other animals. These passive systems employ smooth surfaces that animals cannot climb (Figure 9-21). Structural steel fence components and wire mesh are welded into a single unit and galvanized; upper fence components consist of heavy gauge plastics. Gates provide for easy entry/exit for electrical equipment maintenance and inspection purposes. In the event of an emergency, a human can easily scale the 4-foot fence. The upper section of fence extends out to discourage animals from climbing over it.

Figure 9-21. Kinectrics PowerKage.

The active TransGard System uses an agricultural-type pulsating DC voltage system that deters animals using a nonlethal electric shock (Figure 9-22).

These modular designs allow sections of fencing to be set up with minimal effort and include a gate for lineman access. No shutdowns are typically necessary during installation because no digging is required to install the on-the-ground support system. The active TransGard System uses pulsating DC voltage (low current) and the galvanized wire grids alternate between positive and negative charges.

Figure 9-22. TransGard fence.

Any animal attempting to breach the fence comes into contact with both fields and receives a shock that deters it from climbing any further. Adjacent to the control center, a weather-resistant control box contains the fence energizer. The main on/off switch and voltage meter are located on the outside front of the control box. The TransGard System is engineered to function in severe weather conditions including flooding, ice, and deep snow. The elevated gate design and removable step plate allow for deep snow entry.

Table 9-5 provides the manufacturer information for these fences to deter animals from accessing substation areas.

Table 9-5. Manufacturers of animal fencing.

MANUFACTURER	PHONE	WEBSITE
Kinectrics	1-416-207-6000 ext. 6001	www.kinectrics.com/Solutions/Pages/PowerKage-Non-Electric-Fence.aspx
Transgard Systems	1-717-227-2600	www.transgardfence.com/
Vanquish Fencing	1-215-295-2863	www.vanquishfencing.com/products/

9.3 Substation Getaways

Squirrels often use distribution power lines to move about their territories. These overhead lines can provide easy access to substations. There are several key dimensions to consider when excluding squirrels: a squirrel can jump up to 6 feet high, can leap 8 feet horizontally, and will drop up to 10 feet below a point.

An effective standard for substation perimeter design is to avoid placing other structures within 10 feet of the substation perimeter, and to install climbing deterrents in cases where this standard cannot be met. It is preferable to equip the substation with underground getaways. If this is not possible, overhead distribution lines can be fitted with a Critter Line Guard, which is a series of free-spinning, hollow polypropylene rollers that attach to a power line (Figure 9-23) (Table 9-6). At each end are plastic wheels that create a barrier for squirrels traveling along the line. When the squirrel jumps over the barrier, it lands on the roller and is spun off the line.

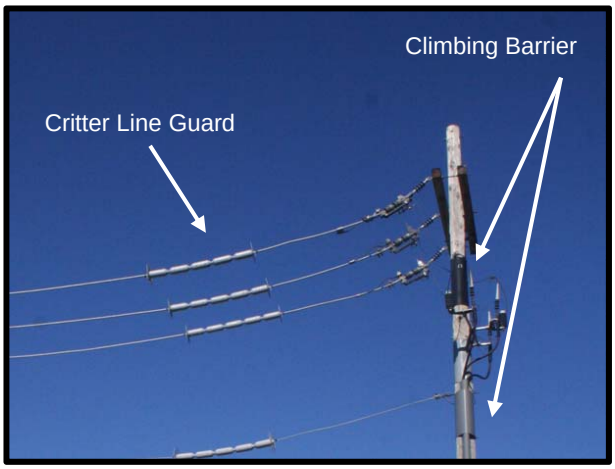


Figure 9-23. Substation getaway pole.

Table 9-6. Manufacturers of animal getaway barriers.

MANUFACTURER	PHONE	WEBSITE
Critter Guard	1-573-256-2110	www.critterguard.org/

It is critical to ensure the rollers remain in good condition and do not bind to the wire, as these can fail in time. The supporting pole outside the substation also should be fitted with smooth climbing wraps at least 6 feet long. Climbing wraps can be constructed out of either plastic or metal. Additionally, nearby foliage must be properly trimmed back 10 feet away from the pole so that squirrels cannot jump into the substation. It is important to note that deploying getaway barriers is a key component of protecting a substation but should not be used as a stand-alone measure.

10.0 COLLISIONS

Although no collision risks were identified specific to WSMR during the field review in November 2012 (see Chapter 14.0 *Risk Assessment Protocol*), collision risk factors for birds and power lines have been included in the WSMR APP for potential future use and reference. As discussed in Section 3.3 *Collisions*, bird collision risks vary in place and time. Future habitat changes (e.g., increase in expanse and depth of regional playas) could attract birds and potentially increase the collision risk in specific areas of WSMR where power lines bisect these habitat use areas.

Power lines are one of many man-made structures that pose a collision risk to birds (Figure 10-1, Figure 10-2, and Figure 10-3) (see Section 3.3 *Collisions)*. Not all power lines comprise an equal collision risk; most avian collisions occur in localized areas where biological, land-use, topographic, weather, and line configuration factors combine to increase the risk of collision. This chapter provides approaches for minimizing collision risks to birds.

Figure 10-1. Aviation markers improve visibility of transmission lines during inclement weather.

Figure 10-2. Flock of Sandhill Cranes crossing a marked distribution line en route to a feeding area.

Figure 10-3. Distribution line bisecting a water source used by birds as a movement corridor.

10.1 Overhead Static Wires

OHS (i.e., shield wires) are frequently located above transmission conductors. These wires are grounded and are used to prevent lightning from striking the transmission conductors. OHS usually are smaller in diameter than transmission conductors, and a number of observations and collision reports emphasize that reduced or smaller static wires are more likely to cause bird collisions (APLIC 2012; Pandey et al. 2007). Observations have reported birds flaring to avoid the larger phase conductors, only to collide with the less-visible OHS (Crowder 2000).

Faanes (1987) reported that 85% of 46 and 93% of 102 observed avian collision with a transmission line involved the OHS, depending on the year. Murphy et al. (2009) reported 65% of 71 observed avian collisions involved the OHS. Pandey et al. (2008) using the *Bird Strike Indicator* to remotely monitor overhead wires identified 68% of 154 avian collision s involving the OHS (Figure 10-4). The average value is 78%.

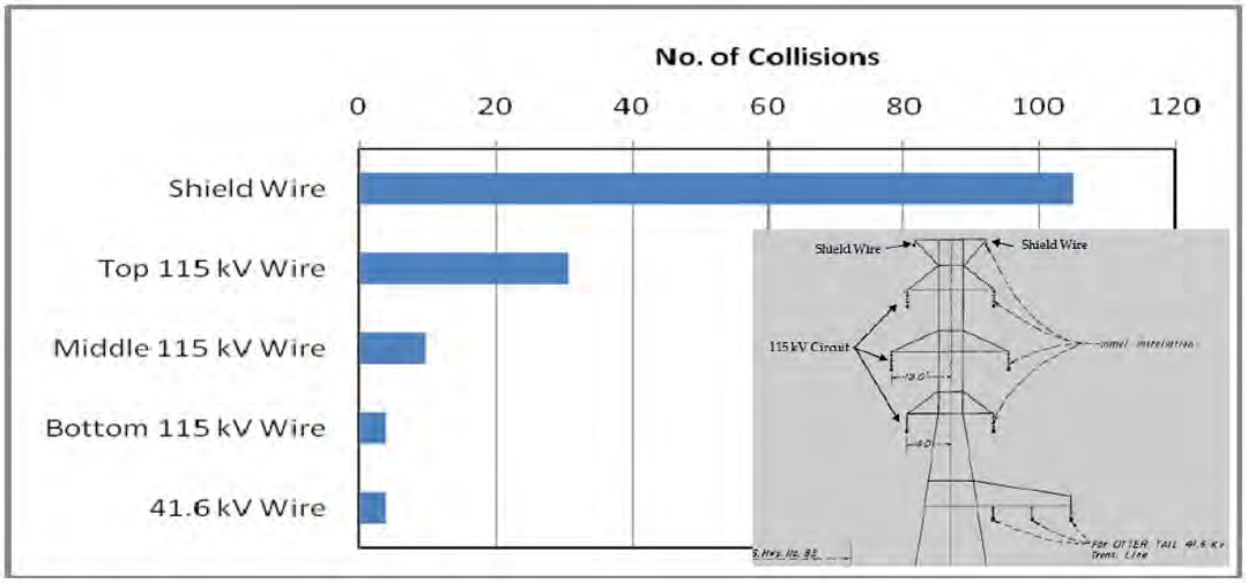


Figure 10-4. Distribution of collisions recorded by Pandey et al. (2008) using the *Bird Strike Indicator* (reprinted with permission of the authors).

Parallel to OHS on transmission voltages and relative to WSMR, the use of the OHN wires on the distribution power lines also could increase the collision risk, depending on a number of site-specific factors.

10.2 Wire Marking

One of the most effective ways to reduce avian mortality from power line collisions is to make wires more visible (Beaulaurier 1981) to birds. Wire marking devices increase the line profile, particularly on the OHS.

Figure 10-5. Birds perched next to spinning diverter.

Wire-marking devices have been tested using the Sandhill Crane as a surrogate research species for the less common but federally endangered Whooping Crane. These tests identified a variety of markers that reduced collisions by up to 61% (Morkill 1990; Morkill and Anderson 1991, 1993; Brown and Drewien 1995). Additional studies have been conducted, many published in peer-reviewed scientific literature. The most robust studies normalized the number of collision fatalities by the number of bird crossings. Among these studies, wire marking reduced mortality by 55% to 94%, with mean mortality reduction of 78% (Barrientos et al. 2011). Markers are to be used to make the lines more visible and do not act to haze birds (Figure 10-5).

From an engineering perspective, wire marking is not always an option for all power lines. Devices that enlarge the wire may be prone to wind or ice loading, increasing the risk of wire breaks and power outages from line tension and stress loads. Attached devices may damage the conductors from abrasion. Also, applying marking devices to conductors is limited by voltage levels, and corona discharge may be an issue (see Section 10.3 *Corona*). Wire marking has not proved to be a perfect solution and there is no broad agreement among biologists and researchers on its success. However, the effectiveness of some marking methods targeting specific species has shown to reduce the incidence of bird collisions with overhead lines in certain areas, and marking is particularly justified if spans are determined to be dangerous to threatened, endangered, or otherwise vulnerable species.

Although several products are available to mark power lines, there have been few studies testing their effectiveness or comparing products. Differences in study sites, target species, and methodologies prevent comparing effectiveness rates of different devices across multiple studies (Barrientos et al. 2011). As with any other device installed on a power line, wire-marking devices should be assessed for long-term effectiveness, durability, and potential effects to the line operation.

Two types of marking devices exist. “Active” marking devices consist of markers with moving parts, such as the Flapper, BirdMARK, and FireFly. “Passive” marking devices do not have moving parts and include the Bird Flight Diverter (BFD), Swan Flight Diverter (SFD), and Spiral Vibration Damper (SVD). The following sections present discussions of the various wire-marking products available and their advantages and disadvantages. Table 10-1 lists product and manufacturer information.

Table 10-1. Bird collision devices and manufacturers.

MANUFACTURER	DEVICE	DESCRIPTION	PHONE	WEBSITE
Kaddas	Flapper	Swinging Plate	1-801-972-5400	www.kaddas.com/
P&R	BirdMARK/ Firefly	Swinging Plate	1-503-292-8682	www.pr-tech.com
P&R	Firefly HW	Plate	1-503-292-8682	www.pr-tech.com
Power Line Sentry	BFD	Swinging Plate	1-970-599-1050	www.powerlinesentry.com
Preformed Line Products	BFD	Coiled Solid PVC Wire Marker	1-440-461-5200	www.preformed.com/
Preformed Line Products	SFD	Coiled Solid PVC Wire Marker	1-440-461-5200	www.preformed.com/
Preformed Line Products	SVD	Vibration Dampers	1-440-461-5200	www.preformed.com/
TE Connectivity	AFD	Swinging Plate	1-336-689-7348	www.te.com

AFD=Avian Flight Diverter, BFD=Bird Flight Diverter, HW=High Wind, PVC=polyvinyl chloride, SFD=Swan Flight Diverter, SVD=Spiral Vibration Damper,

10.2.1 Flapper

The Flapper (Figure 10-6) was designed in South Africa in partnership with Preformed Line Products, Eskom, and the Endangered Wildlife Trust (EWT). The Flapper is distributed by Kaddas and is designed to securely grip wires up to a diameter of 0.75 inch with a locking plastic jaw. The Flapper can be installed and removed from the ground (Figure 10-7); has been UV light-stabilized; and is available in red, white, and black. Black and white flappers provide maximum contrast.

Figure 10-6. White flapper.

Figure 10-7. Flapper installation.

Eskom experienced problems with the Flapper shifting in some the earlier versions (van Rooyen pers. comm. 2000). The EWT recommends two modified ways of attaching the flapper to mitigate this problem:

- Attach the flapper disk (not the clip) to a helical holder (essentially a metal wire pigtail), then wind the holder around the conductor or groundwire. Eskom has used this attachment method for several years on small (0.9-inch-diameter) conductors with no shifting.

- Attach a spiral onto the conductor and then attach the flapper by its hook to the spiral. This has the advantage of making the line even more visible as the device is now bigger. According to Eskom, spirals have not shifted since implementing these measures.

There are two versions of the Flapper. One is attached with a ratcheted clamp and the other is installed with a breakaway, nonmetallic composite screw. Both devices can be installed using a hot stick. According to the manufacturer, a properly applied unit will not move on the line, although it is recommended using silicone adhesive on the clamp to minimize the potential for any movement.

The Flapper is available with a luminescent paint that glows in low light situations. The device color plays an important role in reducing collisions (Kreithen 1996). Device color and effects to reducing avian collision risk are discussed in Section 10.4.1 *Marker Type*.

The advantage of the Flapper is the swinging plate's movement makes a line more visible than simply increasing its profile. The effectiveness of the Flapper has been tested in South Africa, showing a reduced collision rate between bustards/cranes and power lines (van Rooyen pers. comm. 2000, Anderson pers. comm. 2001). In some areas, however, a marking system resembling a target might result in increased vandalism. The potential for devices slipping on hard-to-access OHS also is a concern.

10.2.2 BirdMARK and FireFly Bird Flight Diverters

The BirdMARK BFD (Figure 10-8) is distributed by P&R Industries and is designed to securely grip wires up to 2.5 inches in diameter with a strong spring-loaded clamping jaw. The clamping jaw also is used with several other P&R products designed specifically for power lines.

Figure 10-8. BirdMARK device.

The BirdMARK can be installed and removed from the ground without interrupting power. The manufacturer claims the BirdMARK will stay in position even in a Force 8 gale. The swinging roundel is available in either orange or red-and-white.

As discussed for the Flapper, the advantage of the BirdMARK is the swinging plate's movement makes a line more visible than simply increasing its profile. As with the Flapper, the BirdMARK's target-like appearance may result in increased vandalism. To date, no published studies on the effectiveness of the BirdMARK have been conducted to date, although it appears the device should be similar in effectiveness as the Flapper.

In addition to the BirdMARK, P&R Industries manufactures the FireFly. The FireFly uses the same clamp but the circular plate has been replaced with a rectangular plate. The rectangular plate includes a reflective and fluorescent reflective plate (Figure 10-9 and Figure 10-10). The FireFly was tested at Staten Island, California and reduced avian collisions by 60% on a 12kV three-phase power line (Yee 2008). The diverters also reduced collisions at adjacent unmarked buffer spans. In a Nebraska study of Sandhill Crane collisions, 69kV power lines fitted with the FireFly diverter showed a 33% to 50% reduction in bird collisions (Murphy et al. 2009). An active marker was reviewed at the Aberdeen Proving Ground in Maryland where Bald Eagle collisions had been recorded. Marker efficacy at one location did not mitigate eagle collisions adequately, resulting in the line being undergrounded (Mojica et al. 2009).

This product also has an alternative non-swiveling plate to minimize wear in high-wind areas and is referred to as the FireFly HW. The manufacturer recommends using the static unit in all areas with winds above 20 miles per hour (mph).

Figure 10-9. FireFly during the day.

Figure 10-10. FireFly at night.

10.2.3 Bird Flight Diverter (BFD) – Preformed Line Products

The BFD was developed in Europe during the 1970s (Figure 10-11). The BFD is made from a high-impact, standard polyvinyl chloride (PVC) and is UV stabilized.

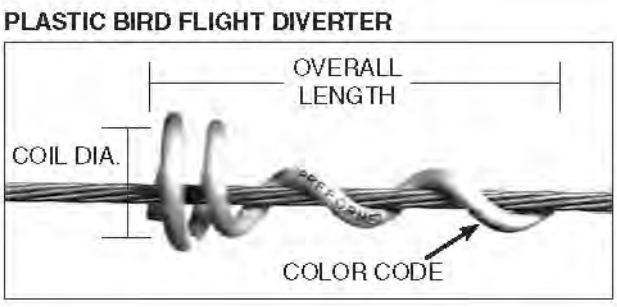


Figure 10-11. BFD manufactured by Preformed Line Products.

The Preformed Line Products BFD is available in a variety of colors and sizes to accommodate a conductor ranging from 0.175 inch to 1.212 inches (Figure 10-12).

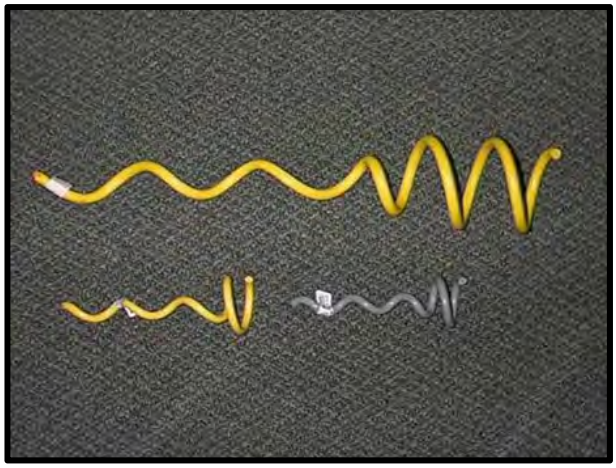


Figure 10-12. BFDs for various wire sizes.

The BFD has been effective when installed on OHS in Europe, where typical spacing ranges from 16 to 33 feet. In North America, BFDs spaced 20 feet apart were shown to be effective in reducing waterfowl collisions with OHS (Crowder 2000). The BFD is believed to be effective because its profile increases line visibility.

The Ventana Wildlife Society (2009) tested yellow BFDs at the San Luis National Wildlife Refuge Complex in California. They concluded BFDs spaced every 15 feet, staggered between phases, resulted in 48% fewer bird collisions at the marked 12kV lines than at control sections.

Although the colors may fade after long periods of exposure, the BFDs should not become brittle or lose their elastic properties. As described in van Rooyen (pers. comm. 2000), Eskom used the Preformed Line Products BFD in South Africa for years with no reports of mechanical failure, although some red PVC devices have faded.

10.2.4 Swan Flight Diverter (SFD)

The SFD is similar to the BFD but includes three 7-inch spirals (Figure 10-13). The SFD also is made from a high-impact, standard PVC and is UV stabilized. The Preformed Line Products SFD is available in a variety of colors and sizes to accommodate conductors ranging from 0.175 inch to 1.212 inches.

The SFD has been shown to be effective when installed on OHS in North America. In the early 1990s, Xcel Energy's Northern States Power (NSP)-Wisconsin addressed a problem where endangered Trumpeter Swans were colliding with a power line during the

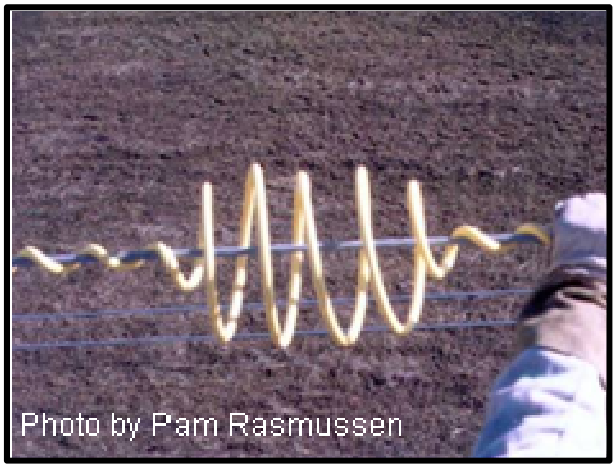


Figure 10-13. SFD being placed on a static wire.

winter months over a small bay on the St. Croix River in Hudson, Wisconsin. Yellow SFDs were installed to increase the OHS visibility in low light conditions. The SFDs were installed in May 1996, using a 50-foot spacing staggered on each parallel wire, resulting in an appearance of 25-foot spacing. No additional collisions or deaths have been documented on the marked overhead wires at this location (Rasmussen pers. comm. 2011).

The Ventana Wildlife Society (2009) tested gray SFDs at the San Luis National Wildlife Refuge Complex in California. Their results indicated a 38% reduction in bird collisions along the marked 12kV lines, as compared to the control sections, with SFDs spaced every 15 feet and staggered between phases. The study area supported numerous American Coots; coots comprised approximately half of all detected carcasses. This species often flies at night, inferring the effectiveness of this type of marker may be limited for nocturnal species.

In Indiana, the SFD also has been shown to be effective in reducing waterfowl collisions with OHS (Crowder 2000). The spacing of the SFDs in Crowder's 1998-2000 study was 20 feet (Figure 10-14). The close spacing was required to compare the effectiveness of the SFD to the BFD.

As described for BFDs, the colors may fade after long periods of UV exposure but the SFDs have not shown to become brittle and break or lose their elastic properties.

Figure 10-14. SFDs installed at 20-foot intervals in Indiana.

10.2.5 Spiral Vibration Damper (SVD)

SVDs are manufactured from solid PVC into a helix (Figure 10-15). The purpose of the damper is to reduce high-frequency aeolian vibration. The SVD is designed to provide the action/reaction motion to oppose the natural vibration of cable by gripping a conductor tight at one end and loosely on the other. The vibration often is inducted by low velocity winds of 3 to 8 mph.

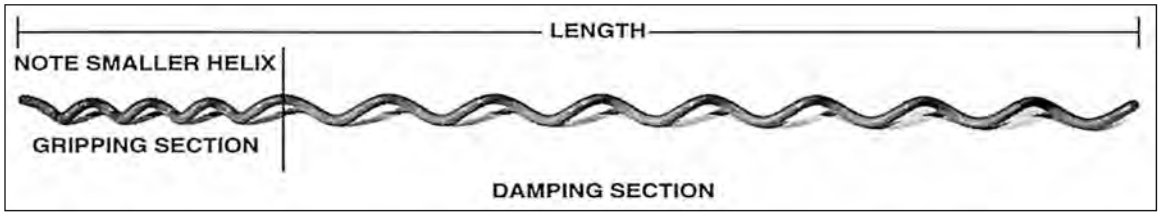


Figure 10-15. Spiral Vibration Damper.

The Preformed Line Products SVD is made from a high-impact, standard UV-stabilized PVC. The SVD also is available in a variety of colors, and different sizes are available to accommodate conductors ranging from 0.175 to 0.76 inch.

In an effort to mitigate both Sandhill Crane and Whooping Crane line collisions in Colorado's San Luis Valley, SVDs were installed on specific line spans. Wire coverage was 27.5% per span, reducing collisions by 61% (APLIC 1994). The colors also may fade after long periods of UV exposure but the SVDs have not been shown to become brittle or lose their elastic properties, making them appropriate for OHS and lines below 230kV.

Tri-State Generation and Transmission Association has used the Preformed Line Products SVDs since 1985 without any failures (Dille pers. comm. 2007). The dampers are easy to install; however, after several years the devices may break if removed.

10.2.6 Bird Flight Diverter (BFD) – Power Line Sentry

The Power Line Sentry Bird Flight Diverter (Figure 10-16) incorporates reflective material along the outside edges of the device and a glow-in-the-dark material at the center. This material may glow for up to 24 hours, thus maximizing effectiveness during dawn hours when birds may be moving in low light conditions. The design incorporates a cross section and color array that contrasts with the sky at all angles to maximize device visibility. Each device is 6 inches long, weighs 4.25 ounces, and may be installed using a hot stick.

Figure 10-16. Power Line Sentry BFDs.

10.2.7 TE Connectivity Avian Flight Diverter

The TE Connectivity (formerly Tyco Electronics) BCIC Avian Flight Diverter (AFD) (Figure 10-17) can be installed via a hot stick and incorporates a high reflectivity strip and a glow-in-the-dark strip on each side. Illumination may last up to 12 hours. A shear bolt incorporated in the device is designed to facilitate quick and effective tensioning to factory specifications during deployment and can be easily removed from lines if needed.

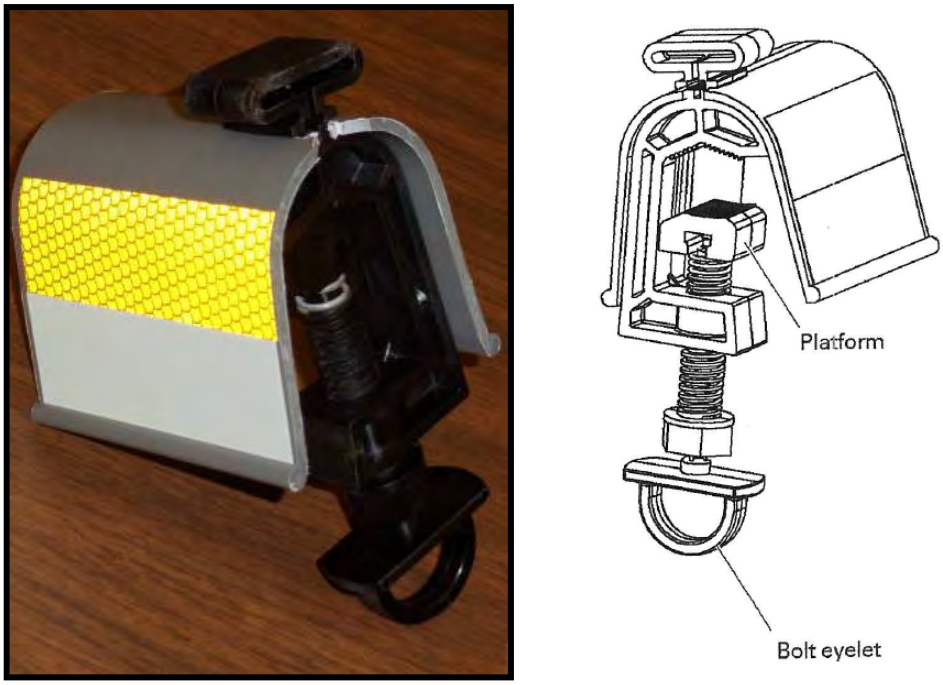


Figure 10-17. TE Connectivity BCIC AFD.

10.3 Corona

Figure 10-18. UV corona discharge from a flapper device mounted on an energized 345kV transmission conductor.

Although marking overhead lines may reduce the avian collision risks, engineering and maintenance issues also may be associated with placing devices on energized wires, depending on a number of factors. One of the issues associated with marking devices is corona discharge (Figure 10-18). Corona discharges occur when surface electric field intensity surrounding an energized electrode exceeds a critical value resulting in a localized ionization of the surrounding gas, in most cases air. Corona activity generates light (mainly in the UV spectrum), sound waves, ozone, and other by-products. Corona activity also may occur from sharp edges on energized hardware, broken conductor strands, or defective insulators.

Testing has shown that at 115kV, all marking devices have little or no corona (Hurst 2004). At 230kV, all devices have a high level of corona; this corona increases at 345kV. Given the small amount of corona emission found on devices at 115kV, it is assumed devices on energized wires will not emit significant amounts of corona in the

lower distribution and transmission voltages of 46kV to 69kV. Corona emission at the intermediate transmission voltages of 138kV and 161kV will be slightly higher than that at 115kV. Devices placed on energized wires at 230kV and above will produce high levels of corona and by-products. For these higher-voltage lines, it is recommended that marking devices be placed only on the OHS.

10.4 Wire Marking Conclusions

10.4.1 Marker Type

There are few comparative studies testing the effectiveness of the various marker devices. One study by Crowder (2000) compared the SFD and BFD in their effectiveness in reducing waterfowl collisions at an Indiana wetland. Another study in South Africa by the EWT tested the effectiveness of the Flapper and BFD for reducing bustard and crane collisions with power lines (van Rooyen pers. comm. 2000). Both studies showed all devices to be effective in reducing, but not eliminating, collisions. In Crowder's study, there was no significant difference between the SFD and BFD based upon the number of dead birds per search. The 2009 Ventana study used both SFDs and BFDs but no meaningful comparisons could be made in part due to the use of different colors.

This lack of information on marker efficacy makes it difficult to select an appropriate marking device. Currently, there are no definitive studies detailing which marker most effectively reduces collisions; although, active marking devices are generally expected to be proven more effective than passive devices. Historically, some issues have been associated with active marking devices, but it should be noted many of the active marking device designs have improved from these initial applications and concerns have been mitigated to some extent.

Passive marking devices have been shown to reduce collision rates for waterfowl, cranes, bustards, and swans. Passive PVC devices also have proven to be effective over the long term. Tri-State Generation and Transmission Association has used SVDs since 1985 without any failures, and Xcel's NSP-Wisconsin has successfully used the SFDs since 1996 with no maintenance problems. Likewise NorthWestern Energy (previously Montana Power) has used the BFDs since 1998 with no shifting or other maintenance problems.

Passive marking devices are manufactured from a high-impact PVC that possesses excellent strength and durability properties. Although these devices are available in a variety of colors and passive markers can be ordered in yellow to maximize contrast with the horizon during low-light conditions, there is a general consensus these devices work because they increase the profile of the line, not because of their color. Because the SFD has the largest profile, it is preferred over the SVD and BFD. In areas with heavy ice loading, the larger profile may not be preferable.

In summary, it is important to select mitigating measures requiring minimal maintenance to reduce the potential for future disturbance and to note this selection is specific to the geographic area and any associated limitations. Until test data are available proving that active marking devices are aerodynamically stable and static, passive devices should be used in hard-to-access areas. Active devices show great

potential for reducing collisions, but they should be tested on less-critical lines with easy access.

10.4.2 Marker Spacing

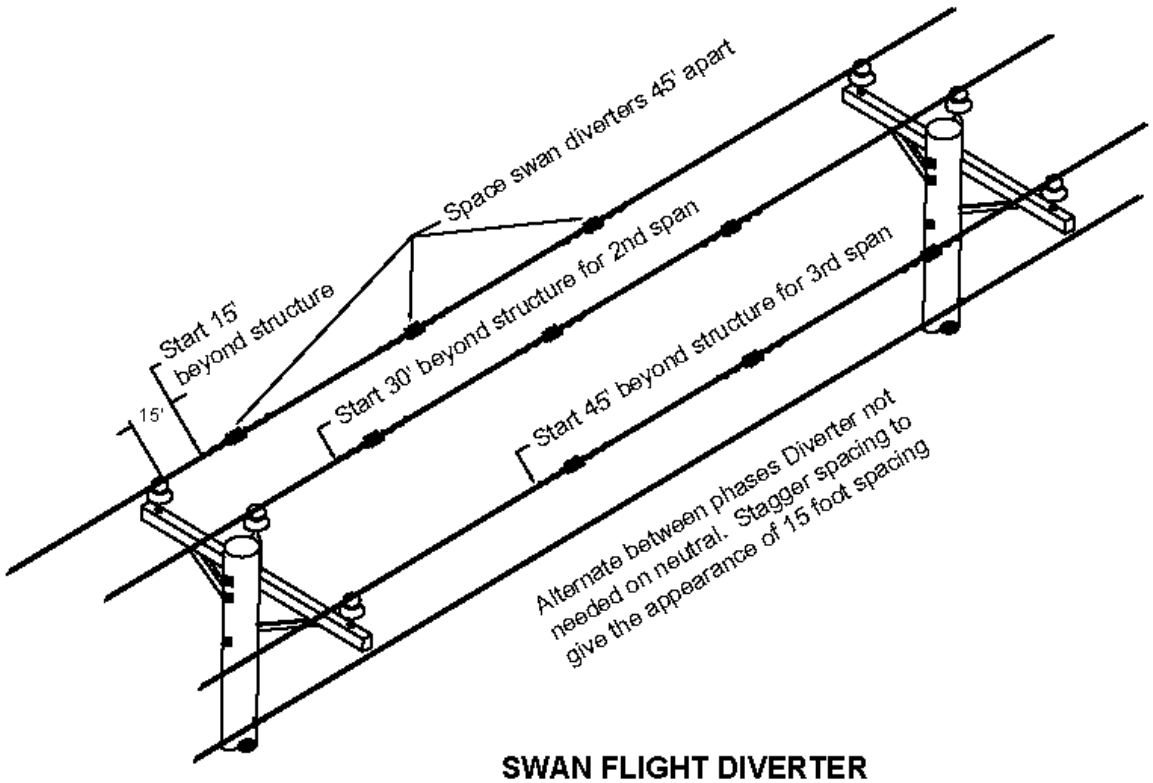
The space between wire markers varies depending upon a number of factors including the size of marker, bird species, and extent of the bird use area. The optimal way to install markers is to stagger them to minimize the number of devices required. According to APLIC (2012), collision studies determined the following:

- The BFD reduced collisions from 86% to 89% when spaced 16 feet apart, and 57% to 58% when spaced 33 feet apart.
- The larger BFD (Catalog BFD-7) reduced collisions 65% to 74% when spaced 50 feet apart.
- The SVD reduced collisions 61% when 27.5% of the span was covered.

It is important to note the reported collision reduction levels are compiled from a variety of sources and are not directly comparable due to varying methodologies, environments, and bird species. It also is important to consider the bird species, when selecting a product. If the species at risk is nocturnal or moves during periods of low light, the device will need to be visible in low light.

One process developed to address bird collisions entails using SFDs to give the appearance of 15-foot spacing. The optimal diverter placement is to stagger the devices midway between each other on alternating lines to reduce the number of markers required. For example, for three wires, the diverters are spaced 45 feet apart and staggered to give the illusion of a device every 15 feet (Figure 10-19); for two OHS, the SFDs would be placed 30 feet apart, also simulating a 15-foot distance (Figure 10-20).

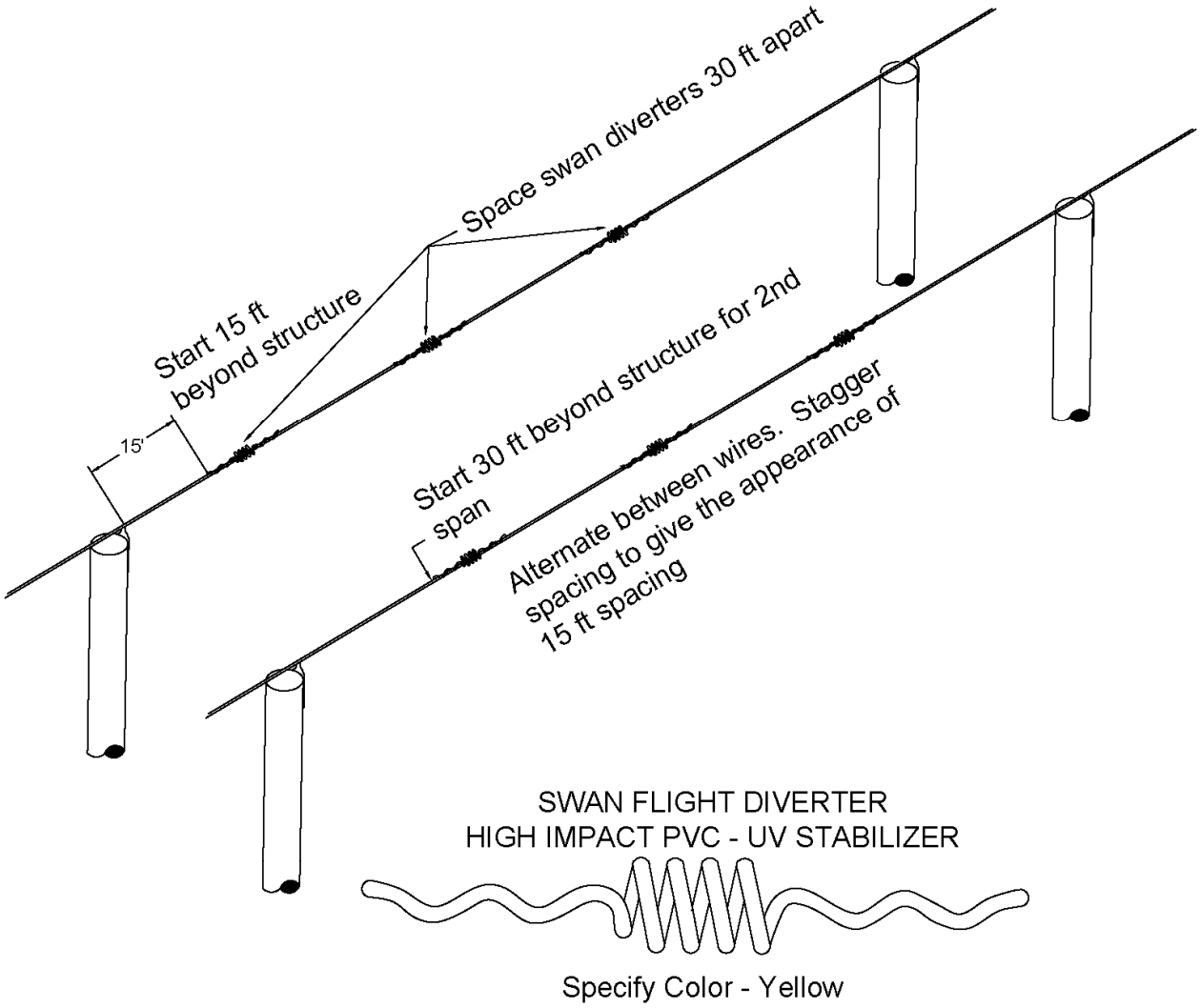
A significant portion of the cost associated with installing any marker is achieving the proper device placement. When stringing the conductors, it is advantageous to paint the conductor at intervals for diverter placement rather than to perform measurements subsequent to wire stringing. This is more critical when installing markers with a helicopter or tall crane than when using a bucket truck or pull cart.



NOTES:

1. Use Swan Flight Diverters to increase visibility of line in problem areas.
2. Place Swan Flight Diverters on all phase conductors for flat construction. Space 45 feet apart and alternate between conductors. The overall effect is to present the illusion of a swan flight diverter every 15 ft.
3. For vertical construction place a Swan Flight Diverters on top conductor only and space 15 feet apart.
4. Follow all manufactures instructions for installation.
5. If ice loading is a concern, smaller bird flight diverters may be substituted.

Figure 10-19. SFD placement for three wires.



NOTES:

1. Use Swan Flight Diverters to increase visibility of line in problem areas.
2. Place Swan Flight Diverters on both static wires. Space 30 ft apart and alternate between conductors. The overall effect is to present the illusion of a swan flight diverter every 15 ft.
4. Follow all manufactures instructions for installation.
5. If ice loading is a concern, smaller bird flight diverters may be substituted.

Figure 10-20. SFD placement for two static wires.

10.4.3 Engineering Considerations

Given current pressures to ensure electrical reliability and minimize regulatory scrutiny, it is important to complete due diligence in an attempt to minimize avian collision risks with overhead lines. Therefore, it is beneficial to implement solutions with a proven track record or thoroughly test potential products and approaches before implementing them on critical facilities and, thereby, reduce the potential for forced or scheduled outages.

Prior to installing diverters, a structural analysis on the line where marking is proposed should be performed. If the static wire or structures cannot safely support the additional load plus appropriate safety factors for all design conditions, then alternate solutions must be evaluated. Alternate solutions may consist of reducing the number of diverters or delaying installation until that particular segment of line is rebuilt (for routine replacement or capacity upgrade) (Figure 10-21).

Figure 10-21. Installing SFDs with a helicopter.

Worker safety also is considered when selecting methods of access to the site and installation If worker safety cannot be maintained, then diverters are not installed until that particular segment of line is rebuilt (for routine replacement or capacity upgrade).

Advances in collision mitigation are ongoing, and include new products, product deployment strategies, and species of concern. WSMR personnel should periodically review new technologies and strategies to ensure that the most effective strategies are selected if collision risks are identified and devices are deployed.

11.0 NEST MANAGEMENT

Migratory birds and their nests are protected as described in Section 6.6.2.2 *Migratory Birds*. Before taking any action involving a nest, refer to the WSMR nest management procedures flowchart (Figure 6-2) and contact the Environmental Division. Chapter 6.0 *Management Procedures and WSMR Reporting Systems* details WSMR's regulatory processes and internal reporting requirements. This chapter describes how to manage nesting problems only *after* the regulatory requirements have been met.

11.1 Introduction

Nests located on power poles, particularly smaller distribution lines, cause a number of problems for utilities and for birds. Nest material, debris, excrement, and prey items can cause power outages, flashovers, equipment contamination, pole fires, bird electrocutions, and loss of eggs or young (Figure 11-1 and Figure 11-2). Some birds, including Chihuahuan Ravens, may build nests with conductive materials, such as fence wire, which increases the risk of a fire or outage. Outside the nesting season, nests deteriorate and storms may blow them off the unity structures. As deteriorating nests collapse, the debris also may cause outages.

Figure 11-1. Problem Red-tailed Hawk nest on an unprotected distribution line.

Figure 11-2. Problem Osprey nest on a distribution line.

Unfortunately, nest removal typically does not solve the problem because many species will rebuild at the same location. However, the use of artificial nest platforms along with nest relocation may effectively mitigates nesting problems on power line structures for some species. Stick deflectors (refer to Section 11.3 *Stick Deflectors*) can be used to further discourage nesting on problem structures.

Nesting issues on larger transmission structures include contamination of insulating strings, nesting debris flashovers, and outages (Figure 11-3 and Figure 11-4). Although these photos reflect use of steel lattice structures by nesting birds, the same issues and resolutions would apply to wood transmission and distribution structures.

Relocating a nest to a different part of a structure that mimics the original site is one method used to move birds away from a critical area, particularly for the larger transmission structures. Cover-up materials should be installed on insulators or conductors to provide additional protection. These two methods, combined with perch management in areas of concern, can minimize operational issues and adverse impacts to birds.

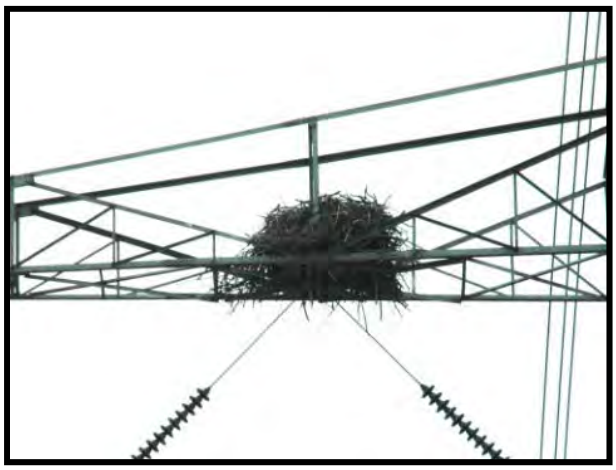


Figure 11-3. Bald Eagle nest on a transmission line structure.

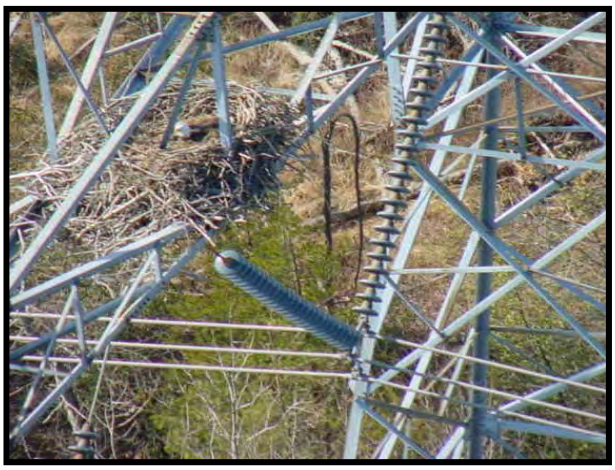


Figure 11-4. Bald Eagle nest and debris on a transmission line structure.

When nesting birds are present on utility structures, line access for maintenance can be restricted. Birds can be aggressive when defending their territory or nest (Figure 11-5) and may try to drive away workers. With their sharp beaks and talons, raptors can inflict serious injuries. It is also important to note that eagles have an elevated layer of protection making it a federal violation to even disturb eagles or their nests (without a permit).

Figure 11-5. Raptor chick defending itself in a nest.

11.2 Nest Platforms

Raptors often have a strong attachment to their nest sites and can be prevalent on power line structures. They will attempt to re-nest at sites where they successfully raised young in the past and these nests can become quite large as new nesting

material is added each year. Managing nests on utility structures is preferable to removing nests, as these birds likely will attempt to reinitiate nesting on the same or nearby structures.

Some raptor species are more problematic than others. For Osprey, constructing artificial nest platforms followed by nest relocation is the best method for such problem nests, but it is important to implement relocations carefully. If a nesting platform is rejected and results in nest failure, Ospreys may spend the remainder of the season building frustration nests on nearby poles (Figure 11-6). These frustration nests may lead to multiple outages. The following information describes how to successfully install nest platforms.

Figure 11-6. Osprey frustration nest.

If nest platforms are used, they may be installed either on an existing structure (Figure 11-7) or a non-energized pole set specifically for a platform (Figure 11-8). Installing a platform on a non-energized surrogate pole is preferable because it eliminates problems associated with falling nesting material. However, certain situations prevent the use of a surrogate pole for a nest structure installation. Under the scenario where installing a nesting platform on a utility structure is the only option, energized equipment on the nest pole must be covered and retrofitted to minimize electrocution risk to nesting birds and minimize the potential for line outages from falling nest materials or bird contamination (i.e., excrement).

Figure 11-7. Nesting platform above a retrofitted single-phase pole.

Figure 11-8 Nesting platform on a surrogate pole.

Figure 11-9 delineates a pole-top extension with an osprey nesting platform attached and in use by nesting birds. Under all scenarios, the WSMR engineering division must approve the nesting platform design along with the weight of the platform under wet conditions. If the platform is on an energized pole, all electrical and safety clearances should be addressed. Additionally, all exposed hardware and equipment in the vicinity of a nest should be retrofitted to keep young birds from becoming electrocuted when learning to fly. Young raptors often make short perch-to-perch flights before they become adept at flying. An electrocution Risk Assessment of poles should be performed near the nesting platform, with the nearest poles taking priority. Other at-risk configurations in favorable habitat also should be reviewed with the Environmental Division's input.

Figure 11-9. Osprey nesting on platform attached to pole-top extension.

If nearby poles need to be retrofitted due to possible electrocutions, insulation or using cover-up materials is the preferred method over the use of perch discouragers or isolation. Perch discouragers (Figure 11-10) make it easier for birds to accumulate sticks, particularly on single-crossarm configurations.

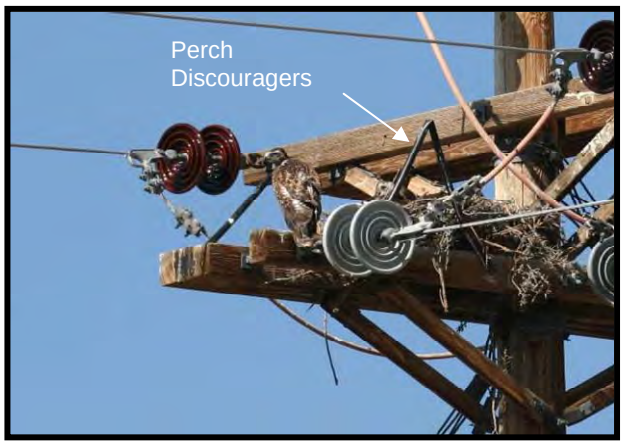


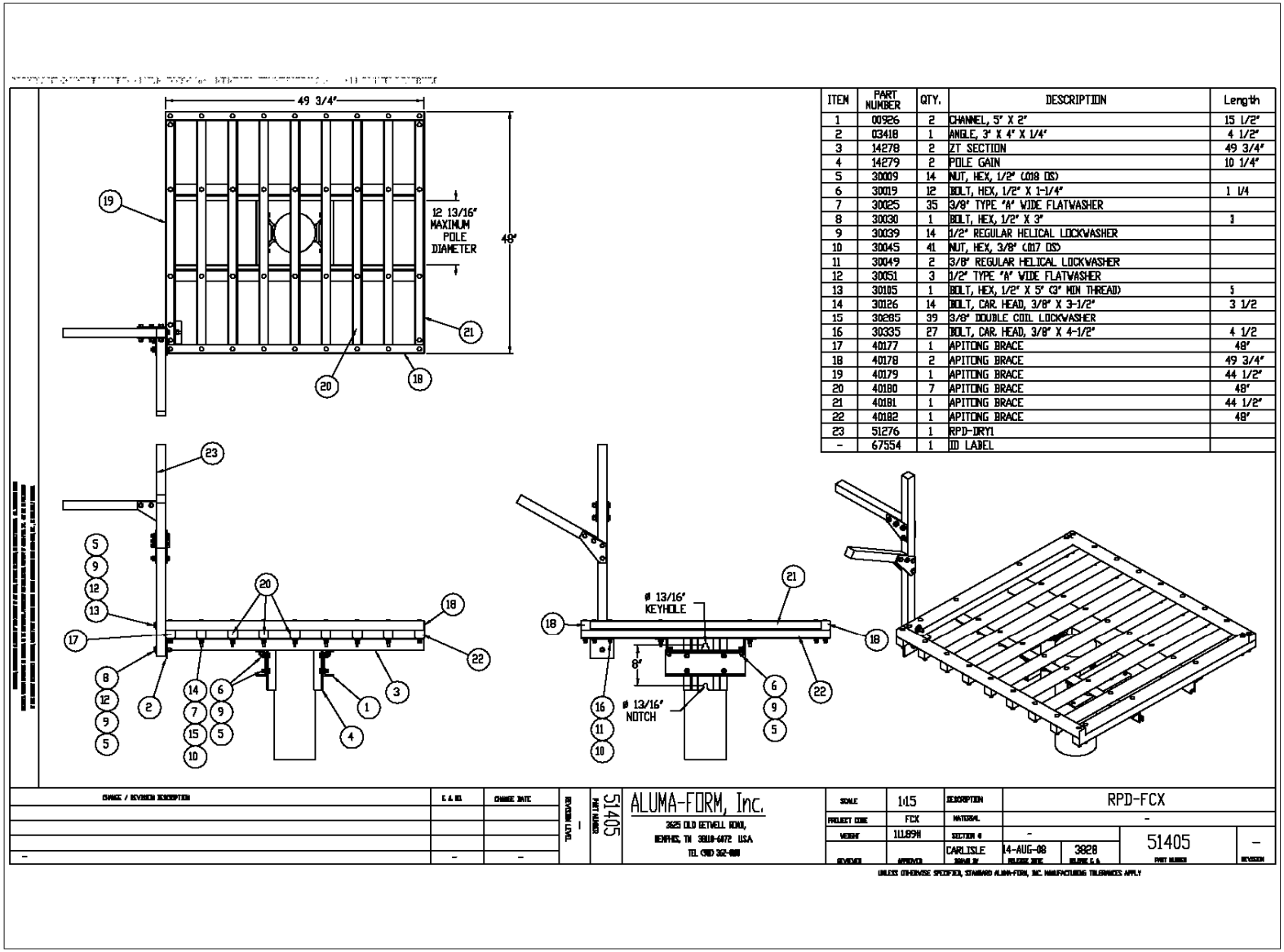
Figure 11-10. Red-tailed Hawk nest on a pole fitted with perch discouragers.

Numerous platform designs are available, depending on the bird species. For Osprey, platforms should be large enough (48 by 48 inches) to allow birds to continue adding nesting material in future years (Figure 11-11). Smaller platforms (36 by 36 inches) can be used for buteos such as Red-tailed Hawks. Larger birds, such as Golden Eagles, require larger platforms (60 by 60 inches) (Figure 11-12).

Figure 11-11. Osprey platform with an elevated perch on a surrogate pole.

Figure 11-12. Eagle nesting platform on a transmission lattice tower.

Nest platforms can be purchased (Figure 11-13) or constructed with readily available materials (Figure 11-14). These figures provide examples of readily available platforms designed for use by Osprey, which could be used for other species, such as buteos. However, platform design and size should take into account the target species.



ITEM	PART NUMBER	QTY.	DESCRIPTION	Length
1	00926	2	CHANNEL, 5" X 2"	15 1/2"
2	03418	1	ANGLE, 3" X 4" X 1/4"	4 1/2"
3	14278	2	ZT SECTION	49 3/4"
4	14279	2	POLE GAIN	10 1/4"
5	30009	14	NUT, HEX, 1/2" (.018 DS)	
6	30019	12	BOLT, HEX, 1/2" X 1-1/4"	1 1/4
7	30025	35	3/8" TYPE "A" WIDE FLATWASHER	
8	30030	1	BOLT, HEX, 1/2" X 3"	3
9	30039	14	1/2" REGULAR HELICAL LOCKWASHER	
10	30045	41	NUT, HEX, 3/8" (.017 DS)	
11	30049	2	3/8" REGULAR HELICAL LOCKWASHER	
12	30051	3	1/2" TYPE "A" WIDE FLATWASHER	
13	30185	1	BOLT, HEX, 1/2" X 5" (3" MIN THREAD)	5
14	30126	14	BOLT, CAR. HEAD, 3/8" X 3-1/2"	3 1/2
15	30285	39	3/8" DOUBLE COIL LOCKWASHER	
16	30335	27	BOLT, CAR. HEAD, 3/8" X 4-1/2"	4 1/2
17	40177	1	APITONG BRACE	48"
18	40178	2	APITONG BRACE	49 3/4"
19	40179	1	APITONG BRACE	44 1/2"
20	40180	7	APITONG BRACE	48"
21	40181	1	APITONG BRACE	44 1/2"
22	40182	1	APITONG BRACE	48"
23	51276	1	RPD-DRY1	
-	67554	1	ID LABEL	

Figure 11-13. Manufactured Aluma-Form Osprey nesting platform.

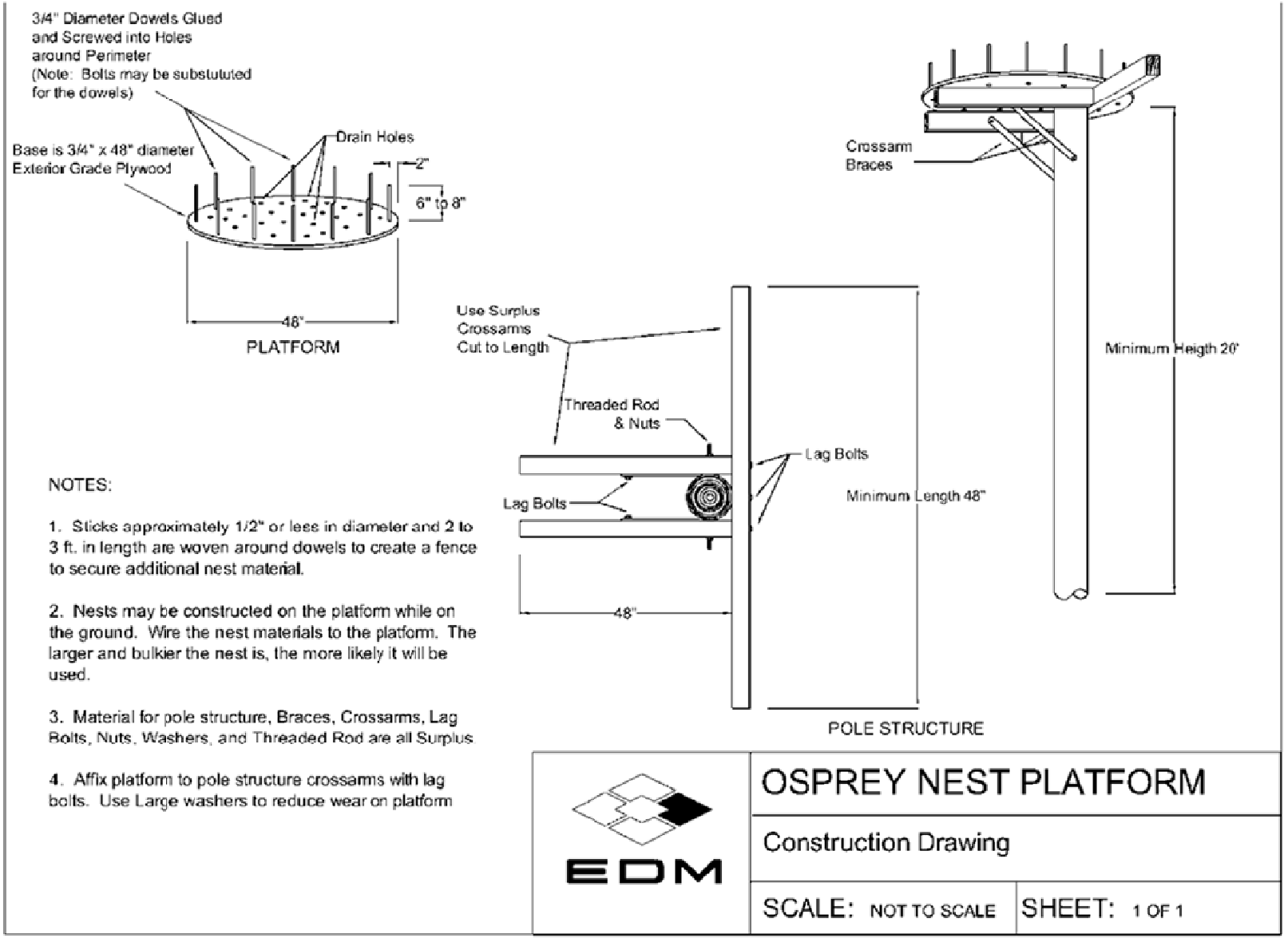


Figure 11-14. Osprey Nest Platform.

Platforms should be designed so the nesting material does not blow off in strong winds. This can be accomplished by installing small vertical pegs (Figure 11-15) or by building a lip around the edge of the platform.

Figure 11-15. Raptor platform with pegs.

When an artificial platform is installed, it should be well supported and nesting material added to entice birds to use the platform. The sticks and their arrangement should emulate the species for which the platform is designed. This will focus returning birds on the artificial nest, and not on the original structure.

The best practice is to relocate the existing nest to the new platform. This approach may require the applicable federal and state permits (refer to Chapter 5.0 *Permit Compliance*). If it is not feasible to relocate an existing nest, personnel can weave willow branches (2 to 4 feet long; ¼ to ¾ inch in diameter) around the bolts at the perimeter of the nest platform to construct an outer "fence." Then lay sticks over the fence with the butts along the inside of the fence. The small ends of the sticks should extend beyond the outside of the structure, and sticks should be placed around the fence creating a bushy wreath. After the first layer is laid, begin a second layer of sticks in the opposite direction. As more sticks are added, they will extend toward the center of the nest, and sticks can be pushed into the previous layers, locking the structure. Tying some of the larger sticks to the base of the platform also will protect the nest in high winds. The nest can be built on the ground and tied down with wire so it doesn't fall as the pole is being raised.

Any lashing material used should be trimmed so that birds cannot become entangled in any loose ends. Installing a single artificial perch on the platform perpendicular to the prevailing spring wind is recommended. Poles can be wrapped with a 5-foot predator guard wrapped around the pole to deter raccoons and other mammals

from accessing nests; however, this is not an option when poles must be climbed by linemen.

Nest relocations should be timed to avoid the critical period just before egg laying. Disturbing birds during this time may result in breeding failure. Likewise, ROW and maintenance activities should be scheduled to avoid the breeding season so nesting birds are not disturbed. The Environmental Division can provide guidance on these critical time periods. If a nest relocation is required at an active nest, eggs can become nonviable if exposed to severe weather (e.g., rain, cold, heat) for more than 15 minutes. Additionally, federal and state permits apply to this type of activity (refer to Chapter 5.0 *Permit Compliance*) and proposed nest relocations should be discussed in detail with the Environmental Division.

When a non-energized surrogate pole is installed, the nest platform should be at least as high as the old nest. Installation of nesting platforms must consider the surrounding habitat, and the Environmental Division must be consulted for guidance on how far a platform can be set from an existing nest location. It is best to keep the platform near the existing nest site. The pole with the original nest should be fitted with stick deflectors to discourage the birds from seeking out the original location (refer to Section 11.3 *Stick Deflectors*), and other energized components should be covered appropriately to eliminate hazards to birds.

When a nest is relocated on an existing structure, platforms for raptors should be placed on the pole top, if possible (Figure 11-16). It may be possible to relocate nests for non-raptors beneath the crossarms (Figure 11-17).

Figure 11-16. Raptor platform on pole top.

Figure 11-17. Raven platform below crossarms.

As part of the permit process, platform installation is coordinated with the USFWS, where applicable (refer to Chapter 5.0 *Permit Compliance*). WSMR personnel or contractors may handle a nest only if directed to do so by the Environmental Division. Parasites and diseases can be transmitted through contact with nests; therefore, personnel must wear disposable gloves or use an inverted plastic bag to handle nests. Paper breathing filters also are recommended because dried bird feces may be dispersed into the air when a nest is moved (refer to Section 6.6.3 *Nest Removal, Relocation, and Destruction)*.

11.3 Stick Deflectors

When a nest is relocated, the original nest pole should be fitted with stick deflectors to discourage re-nesting at the original location. Stick deflectors can be purchased (Figure 11-18 and Table 11-1) or constructed with readily available materials such as plastic pipe (Figure 11-19). Stick deflectors should be designed so the nesting material bounces off the structure when dropped. For this to be effective, jumpers should be placed under the crossarms to make it more difficult for birds to lodge nesting material along the jumpers. Stick deflectors should be installed close enough to the crossarms to deter birds from nesting under the deflectors, without compromising electrical clearances.

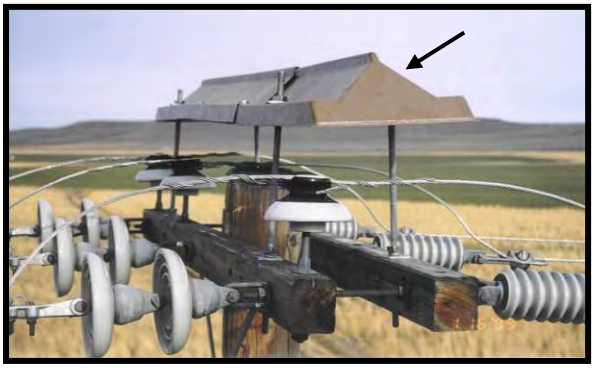


Figure 11-18. Stick deflector to keep nesting materials from attaching to the structure.

Figure 11-19. Stick deflector to keep nesting materials from attaching to the crossarm.

Stick deflectors should be securely attached to the utility structure and WSMR DPW engineering must approve of the stick deflector design along with all electrical and safety clearances. Stick deflectors should be monitored during the nesting season; sticks that have defeated the deflector should be removed immediately. Additionally, all exposed hardware and equipment on the pole should be retrofitted to protect birds from becoming electrocuted.

Table 11-1. Nest deflector manufacturers.

MANUFACTURER	PHONE	WEBSITE
Kaddas	1-801-972-5400	www.kaddas.com
Power Line Sentry	1-970-599-1050	www.PowerLineSentry.com

11.4 Alternative Construction

Poles with multiple crossarms (e.g., deadend and double deadend configurations) are often attractive to birds for nesting. Alternative framing techniques can be used in new construction to reduce these nesting opportunities.

Constructing new distribution power lines with armless vertical construction makes it difficult for nesting materials to lodge on a structure. Where crossarms are required, use of a single crossarm can eliminate a place for birds to nest. This can be accomplished by the use of a single crossarm made of specially engineered (and stronger) materials, which may eliminate the need for multiple crossarms and braces (Figure 11-20 and Figure 11-21).

Figure 11-20. Fiberglass deadend single crossarm.

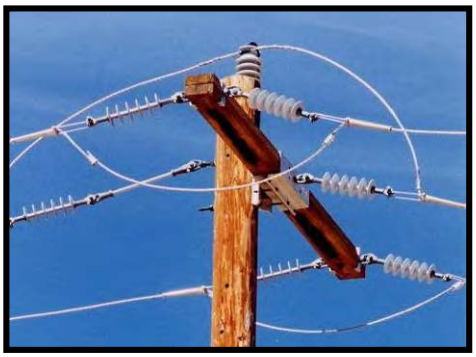


Figure 11-21. Apitong (hardwood) double deadend single crossarm.

12.0 AVIAN STREAMERS

A bird “streamer” is a long stream of excrement released by large birds and may not cause bird injury or mortality but may create a maintenance issue. Outages can result when birds foul equipment, and streamer-related outages occur when a streamer bridges the gap between energized and grounded portions of a structure. Streamer outages are usually a localized problem.

To minimize streamer outages, key areas on specific structures can be fitted with perch discouragers or cover-up materials. However, perch discouragers should not be deployed over all horizontal surfaces on a structure because doing so may force the birds intent on perching to find a method of defeating the perch discouragers. Attempts at total exclusion of birds from structures tend not to be successful (Lammers and Collopy 2005). Rather, perch discouragers should be deployed selectively to manage perching and move birds to more attractive perch areas with low streamer-related risks.

Perch discouragers should be arranged to exclude perching directly above insulators or energized equipment and should extend 3 feet in all horizontal directions. Installation of insulating or cover-up materials should then extend 3 feet beyond the areas targeted for available perches.

A variety of perch discouragers are available from a number of manufacturers. Perch discouragers include high-density polyethylene (HDPE) cones designed to enclose the end of lattice arms (Figure 12-1), bird spikes that can be installed on lattice or wood arms (Figure 12-2), and pole-top devices to deter perching on the top of steel or wood poles (Figure 12-3).

Figure 12-1. HDPE cones deployed on the arms of a lattice transmission structure (Zena Design).

Figure 12-2. HDPE spikes deployed on the arms of a lattice transmission structure (Mission Engineering).

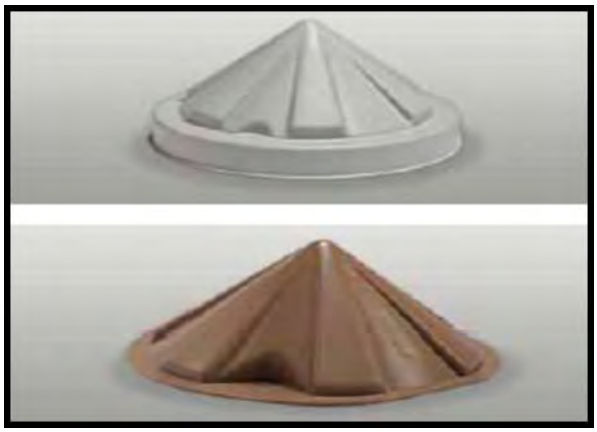


Figure 12-3. Pole caps designed to be deployed on steel (gray cap) or wood (brown cap) poles (Kaddas).

Cover-up materials to minimize effects from bird streamers on primary conductors include conductor covers for both tangent structures and double deadened structures on transmission voltages (Figure 12-4 and Figure 12-5).

Figure 12-4. Conductor cover on center phase (TE Connectivity).

Figure 12-5. Jumper cover for double deadend transmission structure (TE Connectivity).

Table 12-1 delineates the available manufacturers for perch discouragers and select cover-up materials. Transmission line applications may be customized, based on the specific need.

Table 12-1. Perch discourager and cover-up material manufacturers.

MANUFACTURER	MATERIAL	PHONE	WEBSITE
Kaddas	PVC	1-801-972-5400	www.kaddas.com
Mission Engineering	HDPE	+27 11 334-0882	www.mission-eng.co.za
Power Line Sentry	Electrical PVC	1-970-599-1050	www.PowerLineSentry.com
TE Connectivity	Polymer	1-336-689-7348	www.te.com
Zena Design	Polyethylene	1-970-663-3980	www.zenadesign.com/

PVC=polyvinyl chloride; HDPE=high-density polyethylene

13.0 AVIAN POLLUTION

When bird feces build up on the insulators from repeated defecation, it undermines the insulating qualities and increases the risk of a phase-to-ground flashover across the surface of the insulator string, particularly with wet conditions. As with bird streamers, bird pollution typically is a localized problem.

If fecal contamination is caused by a large bird (e.g., raptor) nesting on a transmission structure, WSMR may explore the possibility of relocating the nest to a different part of the structure that mimics the original nest site location (refer to Chapter 11.0 *Nest Management*). This approach would require the Environmental Division coordinating with the appropriate regulatory agencies and obtaining the applicable permits for nest relocation, as discussed in Chapter 5.0 *Permit Compliance*.

If smaller bird use of a structure is resulting in fecal contamination, cover-up materials may be employed over insulators or conductors or other key areas of specific structures. These areas can be fitted with shields or barriers to divert avian excrement away from the insulators and energized conductors. Generally, shields or barrier materials can be custom fitted to the specific structure configuration to reduce fecal contamination, as shown in Figure 13-1 and Figure 13-2.

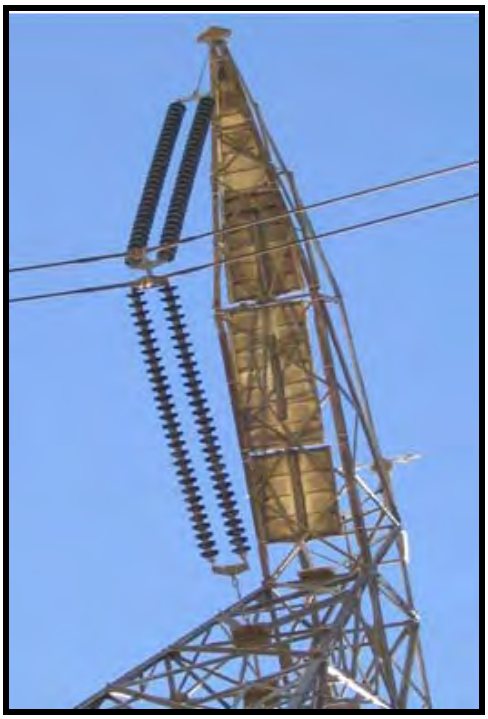


Figure 13-1. Lattice structure with contamination shields (Zena).

Figure 13-2. Fecal contamination insulated barrier (TE Connectivity).

Table 13-1 lists two manufacturers for these types of shields or barrier materials that can be applied.

Table 13-1. Shield and barrier manufacturers.

MANUFACTURER	MATERIAL	PHONE	WEBSITE
TE Connectivity	Polymer	1-336-689-7348	www.te.com
Zena Design	Polyethylene	1-970-663-3980	www.zenadesign.com/

Perch management (see Section 8.14 *Perch Management*) also can be a tool to assist in moving birds away from specific areas of a structure.

14.0 RISK ASSESSMENT PROTOCOL

NOTE: The procedures and approaches described herein are the Intellectual Property of EDM International, Inc.

The most cost-effective approach to reducing avian mortality is to focus remedial efforts on areas that pose the greatest risks to birds (APLIC and USFWS 2005). Because it is not feasible to inspect every electric distribution pole or line span within WSMR, a Risk Assessment was conducted for both the avian electrocution risk and collision risk in targeted areas.

EDM International, Inc. conducted the initial field Risk Assessment at WSMR in November 2012, developed the Draft APP document in April 2013, and finalized the APP submittal in February 2014. This APP provides WSMR with a detailed and thorough starting point to incrementally reduce the avian electrocution risks across the WSMR facility and a dynamic short- and long-term planning tool that can be updated as the APP process evolves.

As part of the field Risk Assessment and in support of this APP effort, EDM surveyed for both avian electrocution and collision risks at WSMR. No collision risks were identified specific to WSMR during field surveys in November 2012. However, collision risk factors for birds and power lines have been retained in the WSMR APP for potential future use and reference. As discussed in Section 3.3 *Collisions*, bird collision risks vary and future habitat changes (e.g., increase in expanse and depth of regional playas) could modify the variables associated with birds and potential line collision risks. Therefore, lines bisecting habitats attractive to birds could potentially increase the collision risk in specific areas of WSMR with changes in environmental conditions.

The following summaries focus on the processes used by EDM to record potential electrocution risks on the WSMR power infrastructure. Figure 14-1 depicts the overall Risk Assessment process. The following sections outline how the Risk Assessment was developed and implemented. Chapter 15.0 *Results for WSMR Electrocution Analysis* summarizes the results from the field Risk Assessment review and the patterns observed.

14.1 Overall Approach

A Risk Assessment involves identifying areas where poles and line spans may pose a relatively high risk to birds. After identifying high-risk bird use areas, risk priorities are then assigned to specific pole configurations and line spans in order to develop electrocution and/or collision retrofitting recommendations.

Developing a Risk Assessment requires integrating detailed knowledge of the types of at-risk structures and line locations (relative to bird use areas) with information on the habitats used by at-risk bird species combined with a number of other site-specific variables. The strategy to rank habitats is key because geographic location, landscape features, and the associated habitats are as important as the utility pole configurations and span locations in determining the risks of avian interactions with power lines (APLIC, 2006, 2012; Mañosa 2001).

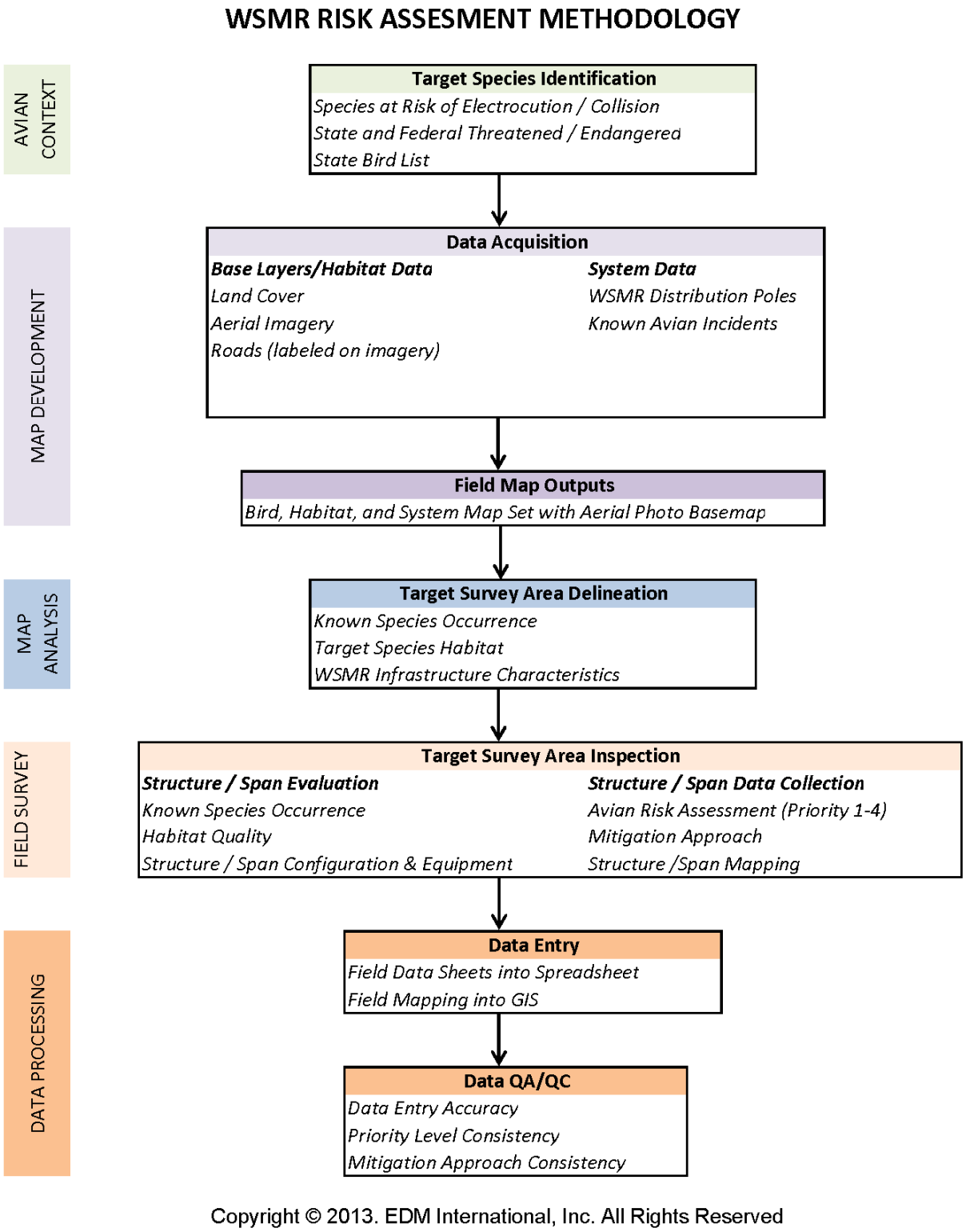


Figure 14-1. Risk assessment flowchart.

For example, nesting activity is associated with high quality habitat; therefore, structures located near known raptor nests are assigned a higher priority for raptor protection (Platt 2005) when assessing electrocution risks. The same principle applies to areas such as water bird nesting concentrations or concentrated bird foraging.

14.1.1 Identifying At-Risk Bird Species

The first step in assessing the electrocution risk on a system is to determine "at-risk" bird species within an area. About 290 avian species occur at WSMR (WSMR 2013). These species and associated concerns are defined and discussed in Chapter 3.0 *Avian Interactions* and in Chapter 4.0 *Bird Species Susceptible to Utility Interactions* and detailed in Table 4-1. Delineating at-risk bird species also was determined by reviewing historic bird electrocution data for WSMR.

14.1.2 Map Development

Risk assessment field maps were created using ESRI's ArcMap 10.1. WSMR distribution poles, locations of known bird electrocutions, and land cover types were plotted over base layers to define target survey areas for a follow-up field review. Base layers included aerial imagery and quarter quadrangle boundaries. Roads were labeled on the aerial imagery. Data layers mapped for the Risk Assessment review encompassed:

- Quarter-quadrangle boundaries (USDA-Natural Resources Conservation Service)
- Landcover (playa, outcrop/talus, and wetlands) – WSMR
- Aerial Imagery – Bing (through ArcMap)
- WSMR System Data (substations, distribution poles, transformers) – WSMR
- Known Bird Electrocutions – WSMR

An example map is depicted in Figure 14-2.

A total of 271 maps were printed by USGS quarter-quadrangle and a desktop review was performed by EDM biologists to identify target survey areas for the field portion of the Risk Assessment. The maps were used to examine pole/line locations, relative to surrounding habitat types and bird use areas. Of the 271 maps produced, 106 maps contained facilities that warranted some level of field review as part of the APP's Risk Assessment.

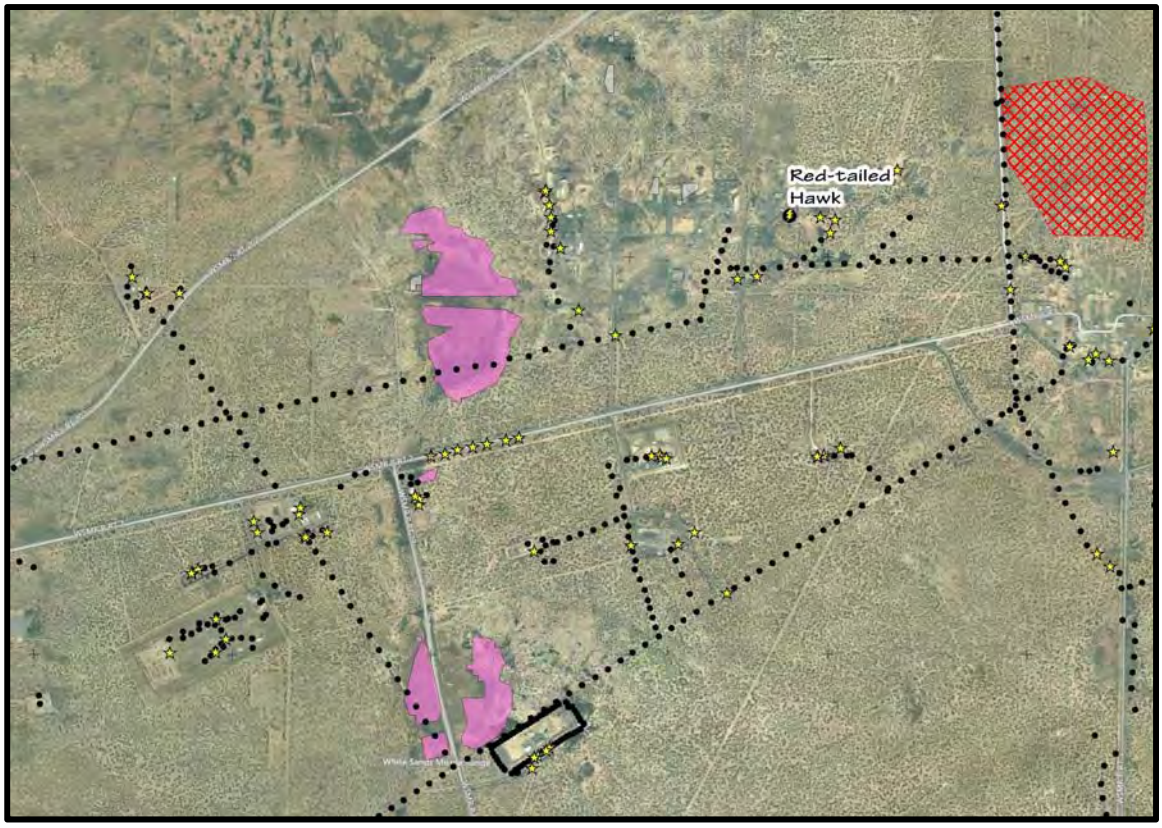


Figure 14-2. Sample map generated for the field survey effort. This map shows roads, power poles, existing buildings, historic bird electrocutions, habitat features, unexploded ordinance area (off limits to surveys), and playas.

14.1.3 Field Assessment

Following the desktop review, EDM performed field surveys in order to inspect the identified areas of concern. As part of the Risk Assessment methodology, specific poles and line spans located in these bird use areas or in/near high-quality habitats were sampled or field checked. The Risk Assessment primarily entailed viewing structures or line spans relative to habitats and known or presumed bird use areas (e.g., nests, concentration areas, foraging zones). Sites of historic mortalities also were examined. Because WSMR offers a wide variety of habitat types across the landscape, habitat features and bird sign were integral in delineating where the Risk Assessment was conducted. Approximately 80% of the WSMR electrical grid was visited during the field surveys.

WSMR is in the process of plotting all their power line structures and incorporating these data into the facility's GIS. EDM used the available GIS data to conduct the field Risk Assessment. When warranted, EDM plotted and mapped missing poles examined during the November 2012 field Risk Assessment that are not part of the current GIS database. Many of these poles were located in restricted areas (e.g., unexploded ordinance zones). The missing poles examined during the field review were then manually incorporated into the GIS files for the APP. However, it is important to state that power line structures not examined during the field Risk Assessment can still

be ranked by WSMR personnel during APP implementation. The same approach and reasoning can be applied to these unseen or unmapped areas, focusing on the associated habitat types, pole configurations, and other variables discussed below. In other words, the APP approach and data matrix can be extrapolated to assign risk factors and retrofit prioritization rankings to any areas not seen or not assessed during the November 2012 field review by following the Risk Assessment methodology.

14.2 Electrocution Risk Assessment

The following process-based approach was used to determine electrocution risk and delineate the appropriate retrofit prioritizations, using field observations and a decision flowchart.

14.2.1 Pole-Risk Classification

The first step was to identify utility configurations that comprise the greatest electrocution risk to the targeted bird species. Research on bird electrocutions has shown certain power line configurations are more lethal to birds than other configurations. This is especially true when mortality rates are adjusted for structure frequency. For example, three-phase tangent structures may be responsible for the same number of electrocutions as three-phase transformer banks. However, because three-phase transformer banks occur less frequently than tangent structures, their adjusted lethality is significantly higher. Determining at-risk structures was accomplished by examining historical patterns and the WSMR bird electrocution data followed by conducting site-specific field examinations based on the initial system review.

To facilitate consistent communication, pole configuration codes are based on the national Rural Electric Association (REA) Bulletin 50-3 Construction Drawings. A Configuration Guide for structures recorded during the field review is listed in Appendix H.

Field data were recorded on standard data sheets (see Appendix I). These formed the basis of the project data matrix used for recording and tracking. When retrofitting measures were recommended, a pole number or area number was recorded for the pole or series of poles of concern and retrofitting options were then identified. Field data for the electrocution Risk Assessment included:

- Assigned map number for each structure or area
- Photograph number
- Configuration of the primary unit(s)
- Existing equipment associated with each pole:
  - Transformer
  - Regulator
  - Recloser
  - Capacitor
  - Cutout
  - Switch

  - Arrester
  - Pothead
  - Jumper Wires
  - Pole-top Ground
  - Grounded Metal Bracket
  - Fiberglass Brackets
- Biological habitats and land use
- Topography and aspect
- Sign of bird use (e.g., whitewash, castings, prey remains, feathers, and bones)
- Any indications of previous bird fatalities associated with a structure (including species identification and approximate age, if known)
- Bird species observed in and near the structure, and the behavior of these birds (e.g., perched, flying, foraging).
- Any unusual field observation or anomaly.

After recording a pole, a ranking of High, Medium, Low, or No risk was assigned to each pole or area. The ranking was determined by first assigning a general pole configuration risk. The following utility primary configurations were used:

High-Risk Configuration

- Three-phase flat-top (four wires on the crossarm)
- Three-phase double deadend horizontal
- Three-phase angle horizontal
- Ground Banks
- Steel poles
- Three-phase vertical with older bonded hardware and limited clearances

Medium-Risk Configuration

- Three-phase flat-top (three wires on the crossarm) with neutral on the pole top
- Three-phase flat-top (three wires on crossarm) with neutral lower on the pole
- Three-phase tangent poles with three wires on the crossarm
- Three-phase deadend with neutral lower on the pole

Low-Risk Configuration

- Three-phase tangent structures with the center phase ridge-pinned
- Three-phase tangent structures with two crossarms and three phases split between these two crossarms (one phase on top arm and two phases on bottom arm)

No-Risk Configuration

- Three-phase tangent structure with 60 inches horizontal separation
- Three-phase vertical structures with 40 inches vertical separation and 60 inches horizontal separation between phase-to-ground
- Single-phase wood structure with no pole-top grounds

These units formed the starting point and the associated electrocution risk was then modified based upon other pieces of equipment. As these base configurations became more complicated, their risk increased. In cases where retrofitting measures already existed, the risk decreased. The calculation of electrocution risks is outlined in Figure 14-3, Figure 14-4, and Figure 14-5 for single-phase, two-phase, three-phase, and transmission line configurations, respectively. These flowcharts assign an overall electrocution risk to structure configurations based on a number of factors. The next step was to incorporate the poles' surrounding habitats.

14.2.2 Habitat Classification

Bird habitat comprises an important component of assessing avian risk near power lines. As discussed in Section 3.1 *Line Electrocutions*, numerous factors contribute to avian electrocution risk. In the field, it is important to look for and record signs of bird use and then evaluate the broader general habitat. Specific habitat within 100 yards of a pole should be further evaluated.

When possible, poles were field checked to identify "preferred perches," with an emphasis on three-phase lines. Since the purpose of still-hunting is to perch on the highest point with the best view of the countryside, raptors will select certain poles for perching over others. These preferred perches offer the best vantage point and, if unprotected, are more likely to be involved in electrocutions.

Habitat values were recorded, including vegetation, presence of roads or other human disturbance, vantage point (i.e., high, medium, or low), prey species present, and signs of avian use (e.g., whitewash, castings, prey remains, feathers, nest, bird fatalities, live bird sightings).

In general, the highest value was given to poles in remote areas with native vegetation or in areas of limited human influences. Poles exhibiting signs of bird use and those providing a commanding view (high aspect) are typically considered to be valued as perch sites over other poles. However, at WSMR, this varied. Poles in higher topographical areas were typically located within the creosote bush community and had little bird sign or in the pinyon pine and juniper woodlands that offered natural perch sites. Therefore, more value was placed on habitats exhibiting a greater degree of bird sign and poles in open habitats with few natural perches. The habitats that typically exhibited a greater amount of raptor sign included grasslands, some playas, wetlands, four-wing saltbush community, mesquite community, and dune habitats.

The lowest value was given to spans and poles in more disturbed habitats with little or no native vegetation, poles in areas of high human use, and low-aspect poles. Figure 14-6 outlines the process followed when assessing habitat types for avian electrocution risk.

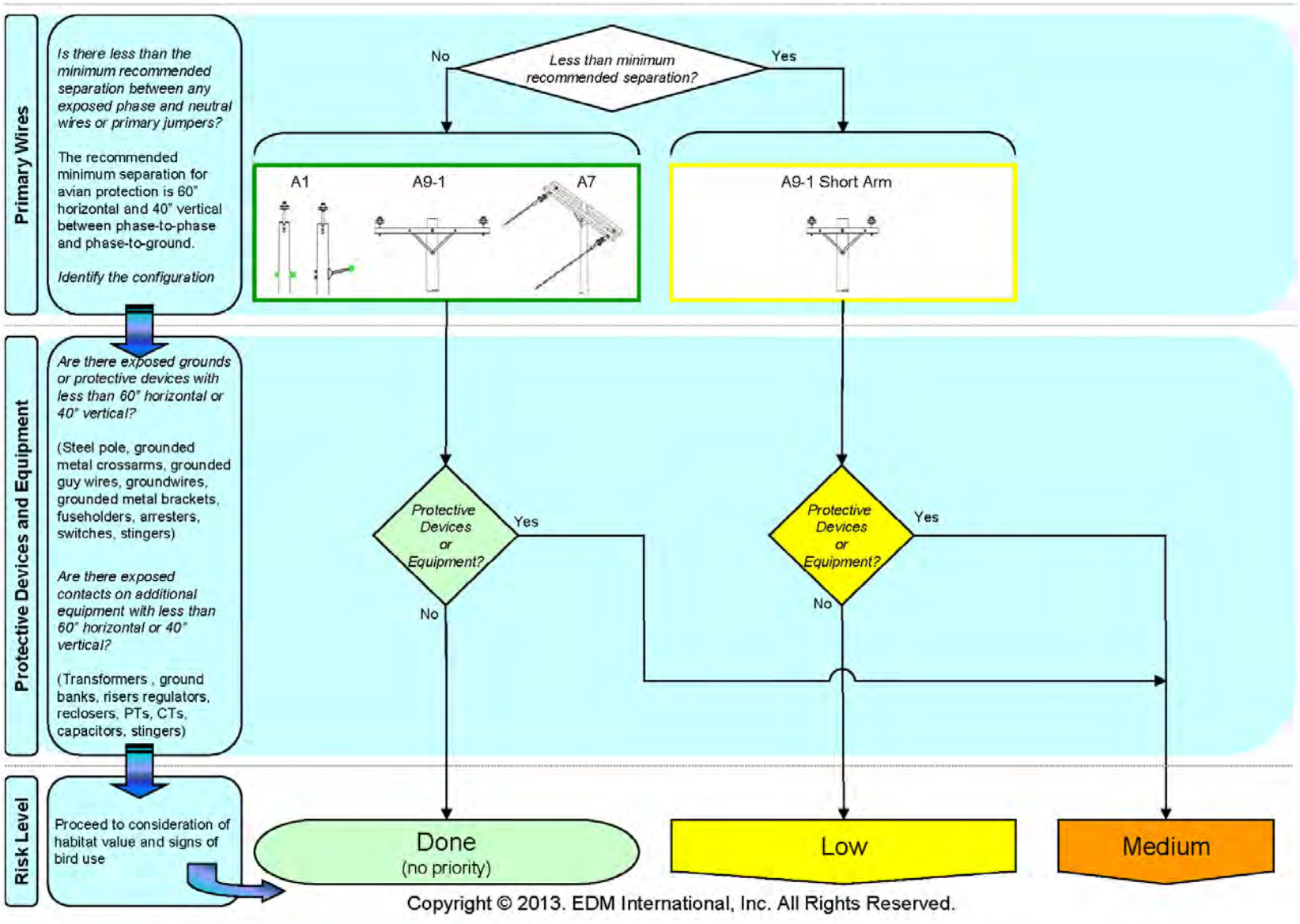


Figure 14-3. Configuration risk level for single-phase structures.

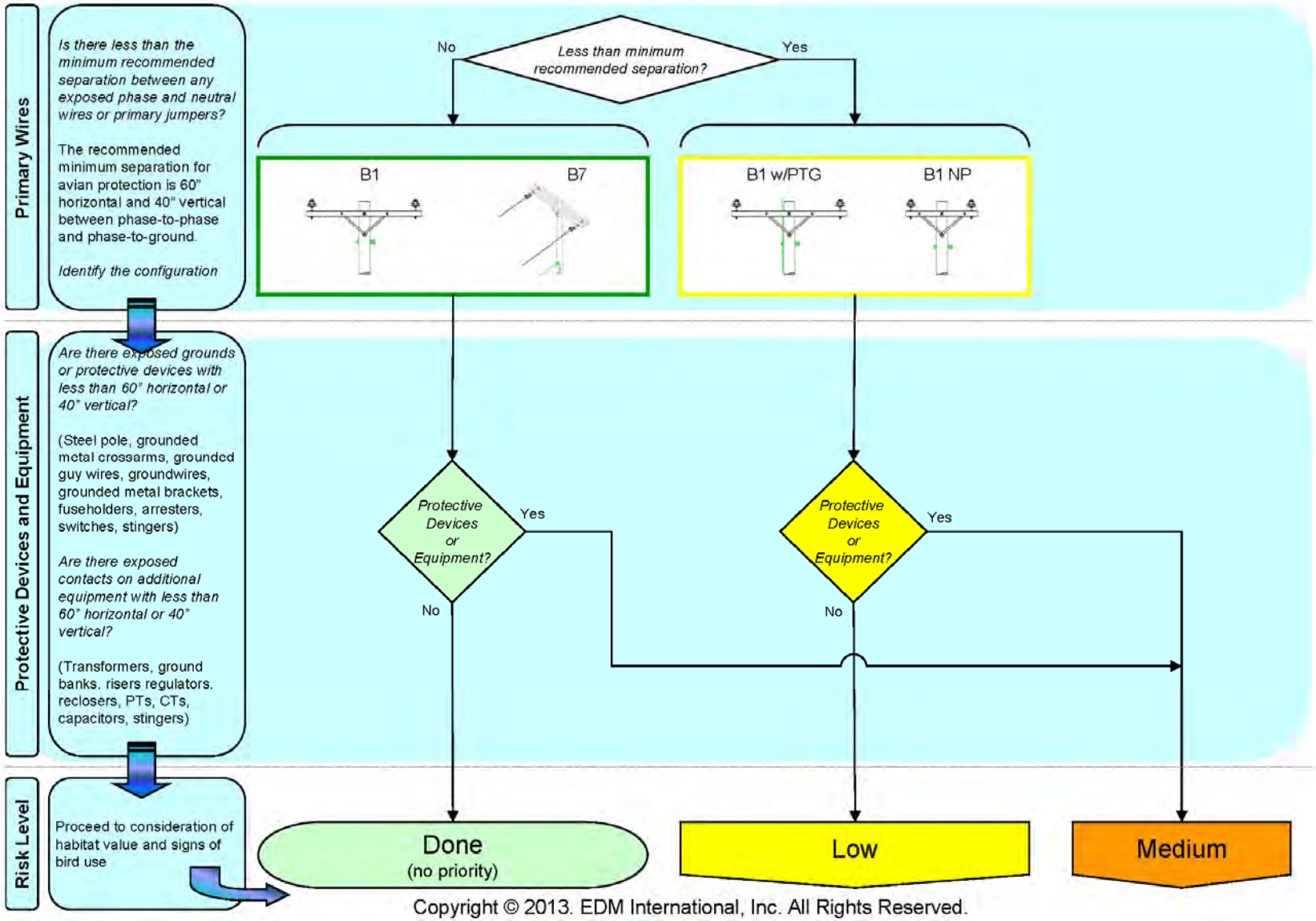


Figure 14-4. Configuration risk level for two-phase structures.

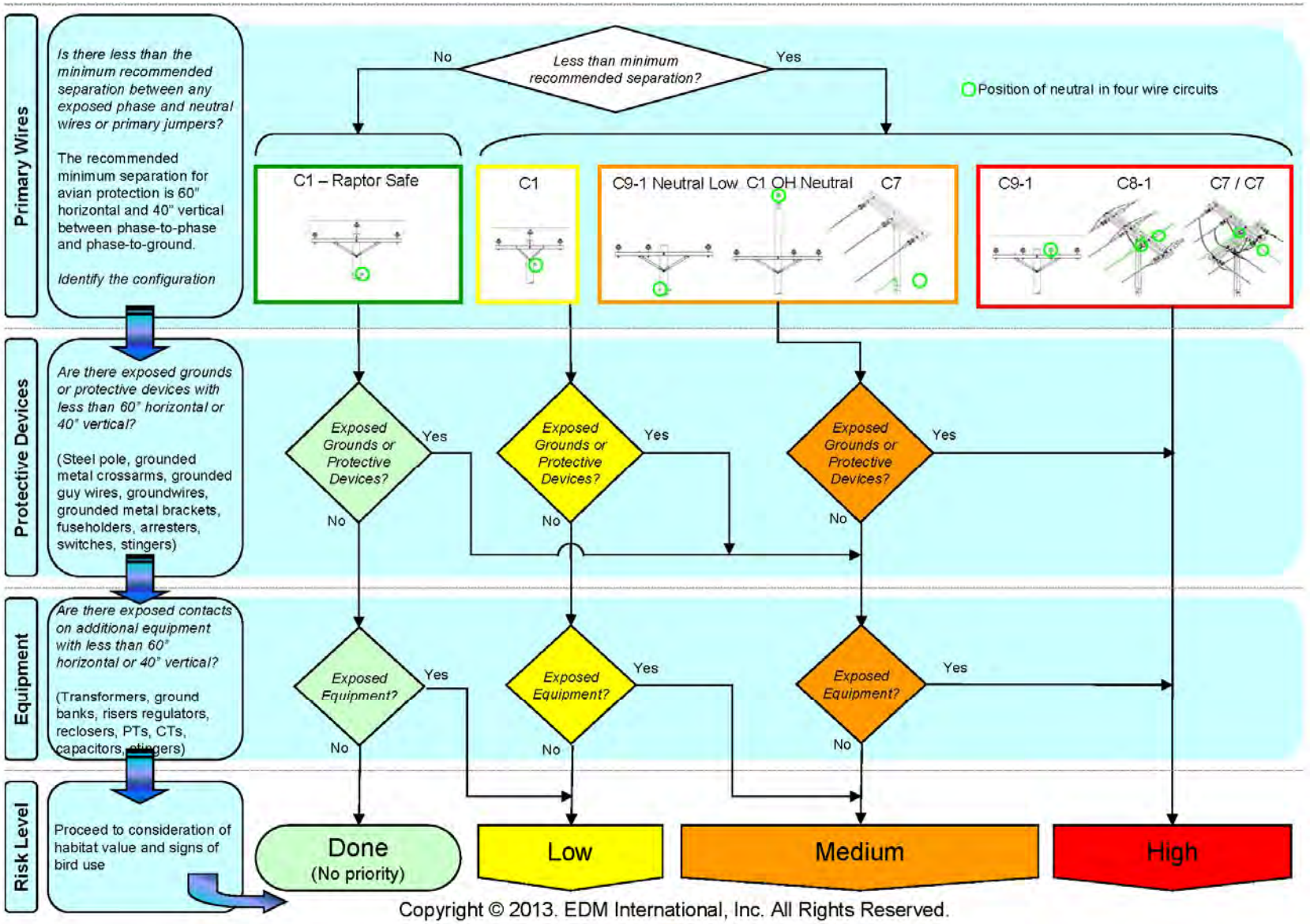


Figure 14-5. Configuration risk level for three-phase structures.

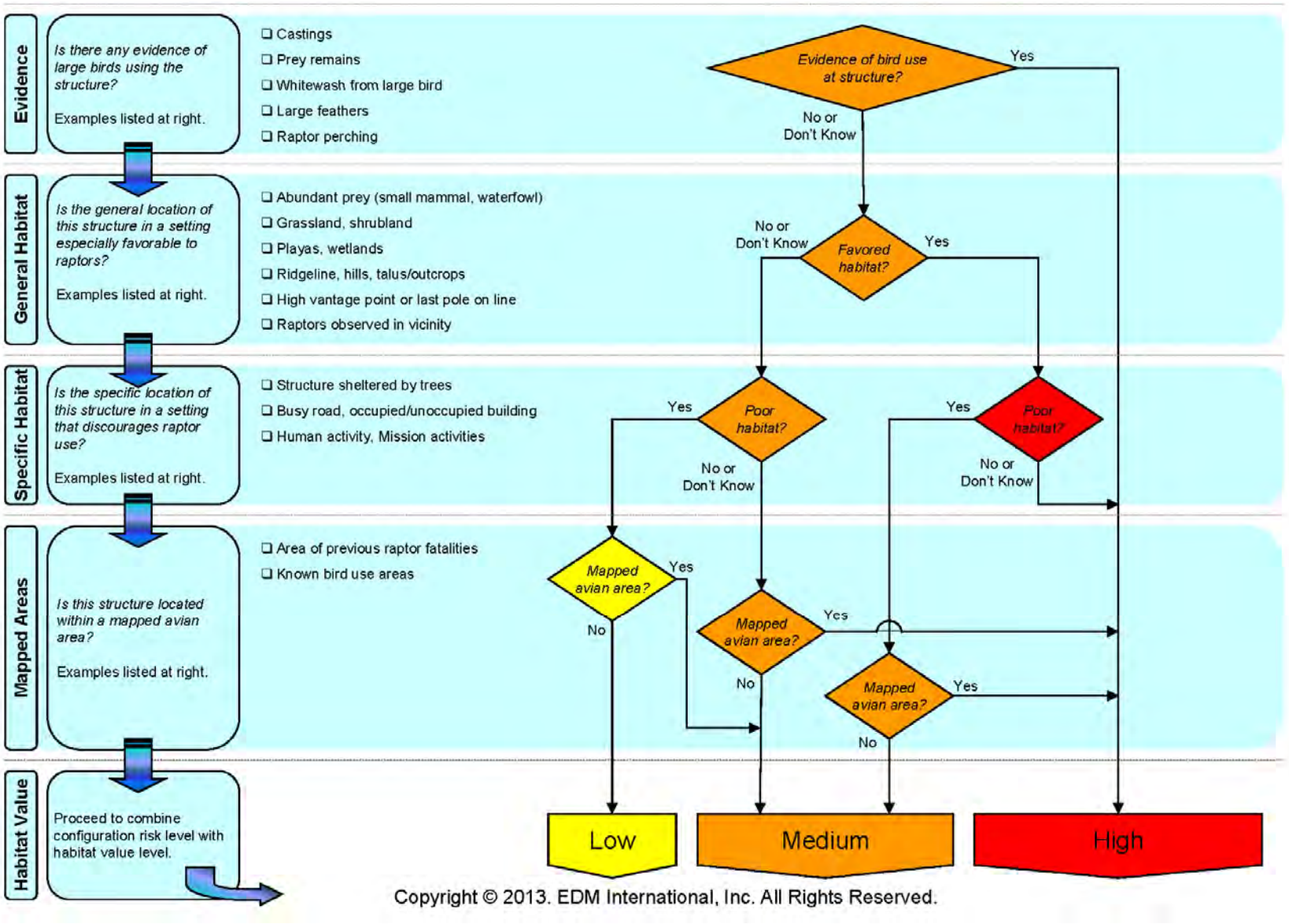


Figure 14-6. Habitat value level.

14.2.3 Identifying At-Risk Bird Species

The first step in assessing the electrocution risk on a system is to determine "at-risk" bird species within an area. A number of avian species both breed and winter at WSMR. These species and associated concerns are defined and discussed in Chapter 3.0 *Avian Interactions* and in Chapter 4.0 *Bird Species Susceptible to Utility Interactions* and detailed in Table 4-1. Delineating at-risk bird species also was determined by reviewing historic bird electrocution data for WSMR.

Because WSMR contains a mosaic of high-value habitats for raptor use, has limited public access, and a wide suite of high-risk distribution poles, it was determined that four prioritization categories should be applied during the field Risk Assessment. The Risk Assessment results are presented in the data matrix contained in Appendix J. The assigned retrofitting priorities are as follows. The process for determining retrofit priorities is shown in Figure 14-7.

Electrocution Retrofitting Priority **1** – Highest-risk Pole
Electrocution Retrofitting Priority **2** – High-risk Pole
Electrocution Retrofitting Priority **3** – Medium-risk Pole
Electrocution Retrofitting Priority 4 – Medium-risk Pole
Electrocution Retrofitting Priority 0 – No retrofit recommended

Structures with reduced clearances and located in habitats containing significant bird sign or historic bird fatalities were assigned a Priority 1 (Highest Risk). Structures with reduced clearances and considered to be high-risk poles but were located in habitats exhibiting less bird sign or structures that were not as high a risk but located in good to excellent habitat were assigned a Priority 2 (High Risk).

Structures with reduced clearance, but located in lower quality habitat, were assigned a Priority 3 (Medium Risk). Although these structure types may be potentially lethal, they did not show signs of heavy raptor usage or were typically located near roads or other human-related areas. Low-risk structures in high-quality habitat also were assigned a medium retrofitting priority due to the potential high frequency of bird use. The Priority 4 (Low Risk) was assigned to potentially hazardous structure types located in more disturbed areas with low raptor use (e.g., degraded habitat, disturbed areas, areas with high levels of human activity). The Priority 4 category could be addressed as part of WSMR's long-term maintenance plan.

In general the habitat value was used to modify the configuration risk. In good habitat the configuration risks remain the same value. In excellent habitat the configurations are elevated one class. In degraded habitat the configuration risk is demoted one class.

Some areas that contain a number of different pole configurations (e.g., restricted facilities) were assigned one priority ranking (example P2) to address equipment poles located within these areas of sub-optimal habitat. However, non-equipment poles within this same area would warrant a lower retrofitting priority (example P3). When planning retrofits for these areas, the higher risk poles could be prioritized over the lower risk poles, accordingly.

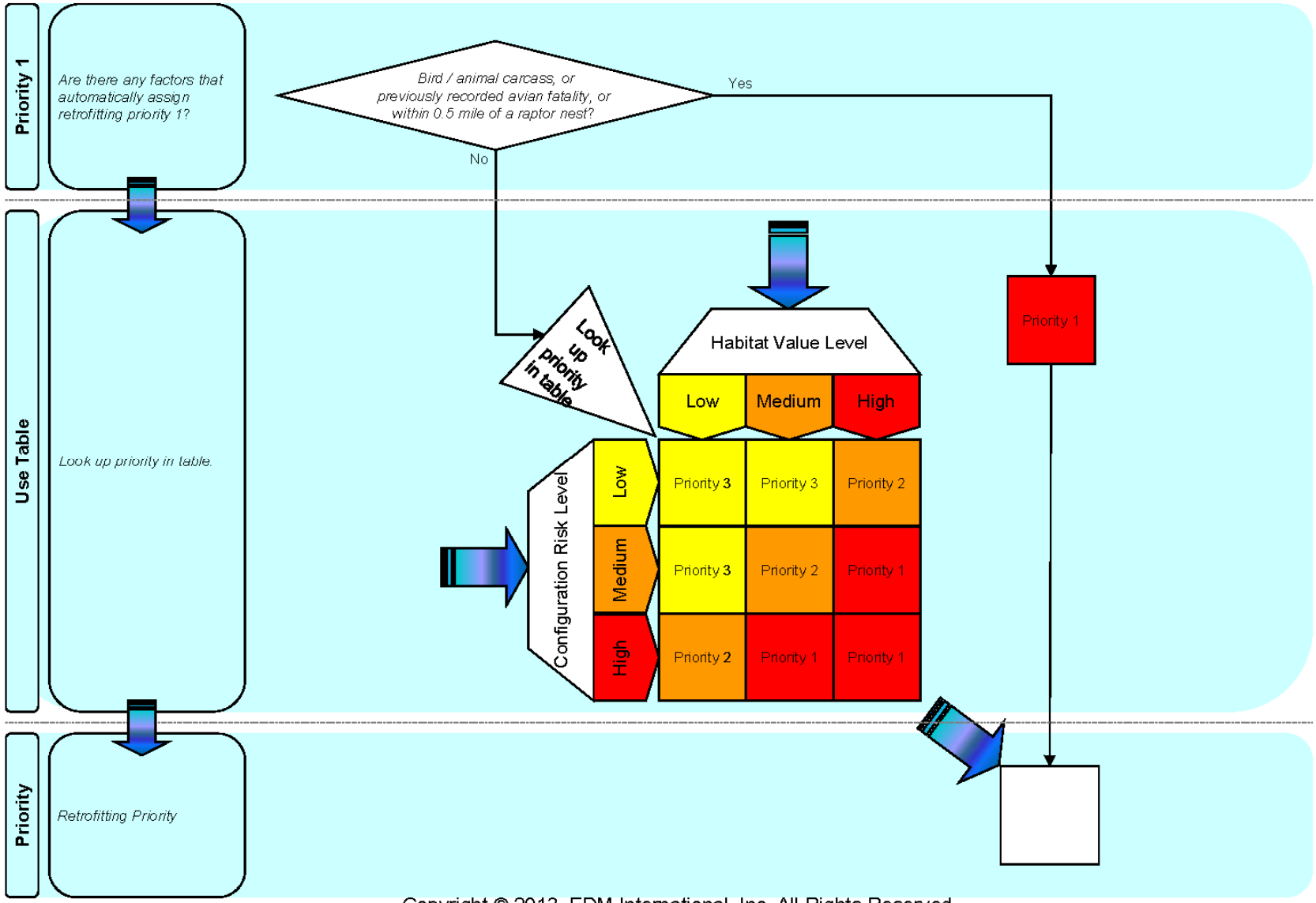


Figure 14-7. Calculating retrofit priority.

Retrofit recommendations were made based on a number of factors. These factors included the variables discussed above in conjunction with discussions with WSMR engineering to determine what approaches have historically worked well and other approaches that have not worked well due to WSMR's climate and environmental conditions. Also, since structure retrofitting typically has a variety of options to choose from, WSMR provided input on preferred retrofit approaches (e.g., installation of an extension link on deadend structures instead of a deadend cover, removing bonding and grounding instead of installing cover-up materials). The results of these discussions were incorporated into the data matrix contained in Appendix J.

14.2.4 Electrocution Risk Assessment Summary

Suggested Practices for Raptor Protection on Power Lines: The State of the Art in 1981 states: "correcting 2% of all structures can eliminate 95% of all eagle electrocutions." Even though the authors of this statement acknowledge this is likely optimistic, it does illustrate the importance of assessing the variables of pole configuration and habitat associations to optimize both proactive line design and reactive retrofitting approaches.

The WSMR APP provides an approach to identify potentially hazardous pole configurations within WSMR and can be used as a tool in operational and facility planning into the future. Since, an effective avian protection program includes both proactive and reactive approaches to bird fatalities, using these prioritization processes can facilitate operational and maintenance planning. It is important to note there is flexibility on how to approach retrofitting. WSMR has the option to balance the costs of labor vs. materials to determine the best retrofit approach. There also is flexibility in the approach to prioritizing these retrofits. A retrofit approach may include a combination of Priority 1, 2, 3, and 4 poles, if travel time to an area is a significant factor, or WSMR may choose to focus on a specific prioritization category or Mission schedule. In some cases rebuilding structures may be preferable to retrofitting the existing structures, if lines are deteriorating and scheduled for replacement. How this APP is implemented is the prerogative of WSMR, based on a number of factors (e.g., DOD policy, Mission schedule, geographic location, budget, and retrofitting preferences).

If additional bird mortalities are recorded, retrofit information should be applied in a holistic, proactive approach. Similar pole configurations in similar habitats associated with future bird mortalities pose a similar risk. It may, therefore, be prudent to retrofit several structures, if a bird fatality occurs. Furthermore, as stated in Section 6.3 *Corrective Measures*, WSMR intends to prioritize the remediation of hazardous poles in areas of good eagle habitat or in areas where eagles are known to occur.

15.0 RESULTS FOR WSMR ELECTROCUTION ANALYSIS

The results from the avian field Risk Assessment conducted at WSMR November 2012 are presented and discussed relative to both the positive practices observed at WSMR and the patterns that should be addressed to reduce avian electrocution risk on WSMR's electrical infrastructure. The intent of the "pattern analysis" is to identify approaches that should be modified relative to both new pole/line construction and retrofitting existing structures.

Since the most cost-effective way to reduce avian mortality is to focus remedial efforts on areas posing the greatest risks to birds (APLIC and USFWS 2005), the WSMR APP methods involved identifying areas where poles and line spans posed a relatively high risk to birds. Because it was not feasible to inspect every electric pole or line span within WSMR, EDM delineated target areas to examine in the field based on an initial GIS-based compilation and review. The field surveys subsequently integrated detailed knowledge of at-risk structures and line locations (relative to bird use areas) with information on the habitats and behaviors of at-risk bird species. Risk priorities were then assigned to specific pole configurations and line spans to develop electrocution retrofitting recommendations. Detailed methodology is located in Chapter 14.0 *Risk Assessment Protocol*.

Although the 2012 field surveys reflect a static point in time, the field sampling results provide information on both the operational patterns observed and the site-specific locations that warrant retrofitting, allowing WSMR to use the APP as both a dynamic short- and long-term planning tool and model. This model can be applied to other areas within WSMR, as missions change, bird use expands or contracts, new lines are built or rebuilt, and WSMR construction standards evolve.

15.1 Approach

As stated, Chapter 14.0 *Risk Assessment Protocol* details the field survey methodologies used for the avian electrocution and collision Risk Assessment evaluations. Because no power lines were identified within WSMR that present an important collision risk to birds, the following assessments focus on the electrocution Risk Assessment. EDM recorded general practices or patterns that increase avian electrocution risks within WSMR and mapped site-specific at-risk structure and area locations. In the following report sections, positive practices observed are emphasized with white arrows and negative practices are emphasized with red arrows.

To facilitate consistent communication, pole configuration codes are based on the national Rural Electric Association (REA) Bulletin 50-3 Construction Drawings. However, because there are unique configurations specific to WSMR, additional configuration codes were developed during the November 2012 field review, accordingly. Appendix H contains a photo reference guide for these unusual or complex structure types.

The same configuration codes are used in the data matrix for the electrocution review located in Appendix J, which provides detailed summaries of each survey site or area. EDM also provided WSMR the associated geodatabase that contains feature classes for: (1) electrocution structures (i.e., individual structures) and (2) electrocution

areas (groups of structures with like characteristics), delineating where pole- or area-specific retrofits are recommended. Together, Appendix H Appendix J, and the geodatabase provide a template on how retrofitting measures can be implemented within WSMR.

*Caution: Raptor protection measures using the term "insulation" are **not** designed to protect linemen. Many products are not rated for the full line voltage and are designed to protect birds from incidental contact only. The engineering standards department must review and approve all raptor protection products and deployment applications prior to personnel in the field using raptor protection equipment.*

15.2 Survey Results

EDM collected field data on 1,047 poles and areas at WSMR (652 poles and 395 areas) (see Appendix J). The most common configurations encountered requiring remediation were C9-1 OHN, C7 OHN, C8 OHN, and C9 OHN (Appendix H).

15.3 Positive Practices

WSMR has de-energized some lines that are not currently being used for missions. This approach has reduced bird electrocution risk across the facility, system wide. However, because missions change, the intent of the WSMR APP is to proactively retrofit at-risk structures and implement new construction practices to incrementally make structures safer for perching birds.

WSMR has initiated the use of avian-friendly construction practices for new pole construction. Figure 15-1 provides an example of a deadend equipment pole constructed to avian-friendly standards with good coverage of the potential contact points. The only remaining exposed areas are the cutout locking horns that can result in phase-to-phase contact when a bird attempts to land on the lower kicker arm between the cutouts. This issue and possible resolutions are discussed below in greater detail.

However, new construction at WSMR is not consistent, which is discussed in greater detail in Section 15.4 *Distribution Voltage Electrocution Risk*.

Figure 15-1. Equipment pole with good coverup and extension link in center phase. Cutout locking horns still exposed (see Figure 8-58).

Other examples of positive practices on different pole configurations include Figure 15-2, which shows complete coverage of the jumper wires and pin insulation with no gaps in material, the use of fiberglass strain rods for the grounded guy wires in proximity to energized conductors and the installation of the extension link in the center phase. A more detailed photo of adequately covered pin insulators with covered wrap ties are shown in Figure 15-3.

Figure 15-2. Double deadend with covered jumpers, covered pin insulators, and extension links on center phases.

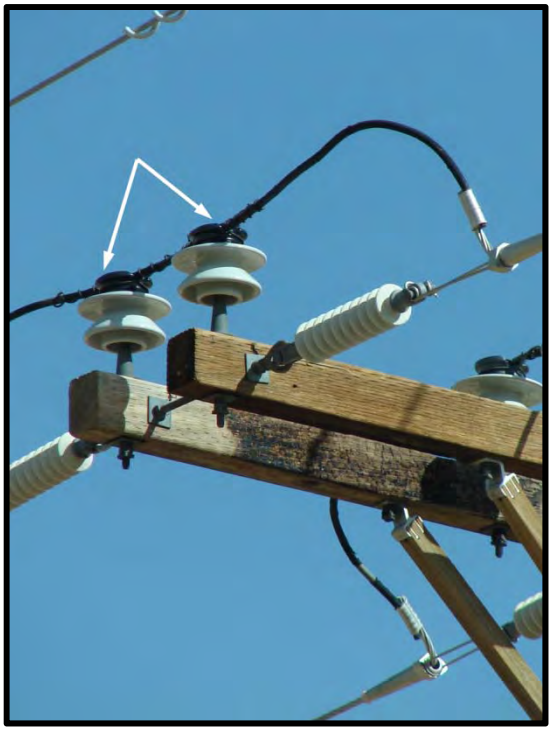


Figure 15-3. Covered pin insulators in conjunction with covered jumper wires.

Figure 15-4 depicts adequate spacing between the groundwire and the bracket hardware. Historically, WSMR has used wood molding over pole groundwires that provide some insulating properties, particularly on structures with minimal distance to energized conductors. However, new construction practices are not consistent, as discussed in the subsequent sections. Figure 15-5 provides an example of groundwire molding made of polymer materials that are more durable than wood when exposed to wind and UV light.

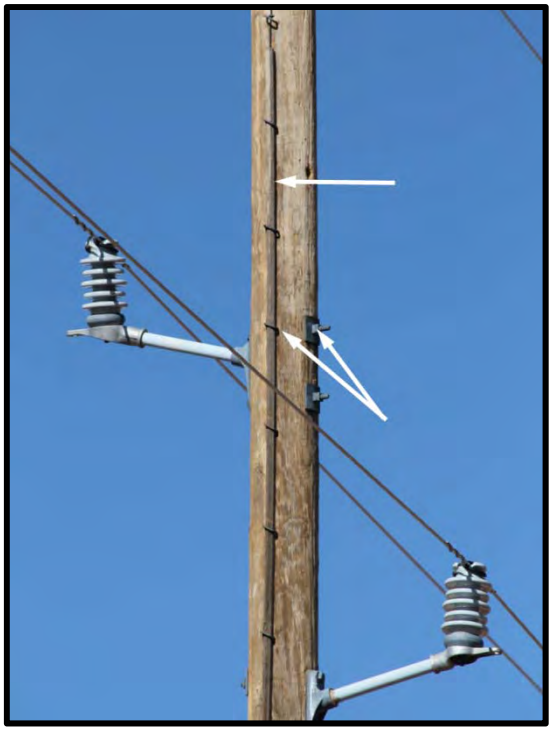


Figure 15-4. Bracket hardware not bonded and wood groundwire molding is present on some structures but can deteriorate quickly.

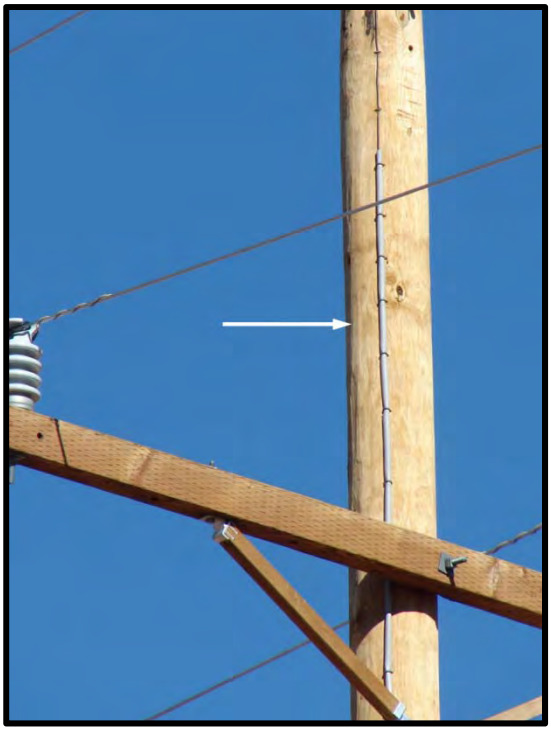


Figure 15-5. Groundwire molding made of a polymer is more durable.

WSMR has a number of single- and three-phase steel structures scattered across the facility. Figure 15-6 shows a correct approach to install a conductor cover on the energized conductor on a single-phase pole. However, the three-phase steel structures are discussed below, given they typically lacked sufficient cover up. Additionally, it was noted during the field Risk Assessment that a number of conductor covers had broken or dislodged on several structures. Potential options for resolving this issue are discussed below, as well.

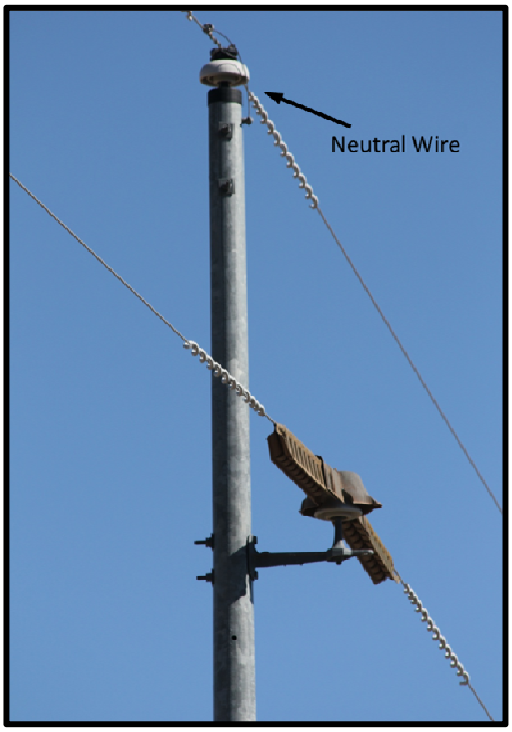


Figure 15-6. Good coverup of energized conductor on single-phase steel pole.

Switches are particularly problematic, given the limited clearances and retrofit approaches can interfere with switch operation (see Section 8.13 *Three-phase Switchgear*). Therefore, switch installation is key. WSMR has incorporated the use of underarm switches on some poles (Figure 15-7), which minimizes the electrocution risk to perching birds.

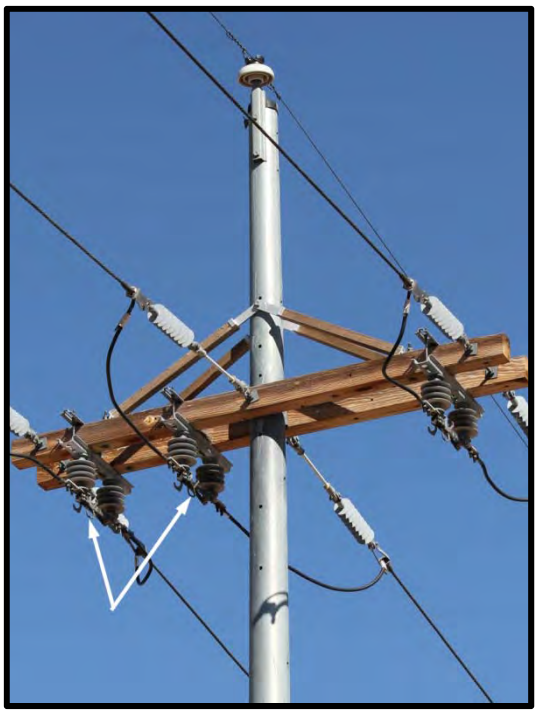


Figure 15-7. Use of underarm switches minimizes electrocution risk to perching birds. Good example of insulated jumper wires.

Other equipment, such as capacitors, reclosers, and regulators, also can be a high risk to perching birds. Many of these devices can be ordered with coverup already provided, as shown in Figure 15-8. Some of this coverup at WSMR is starting to degrade and should be replaced. When seen, it was recorded, accordingly.

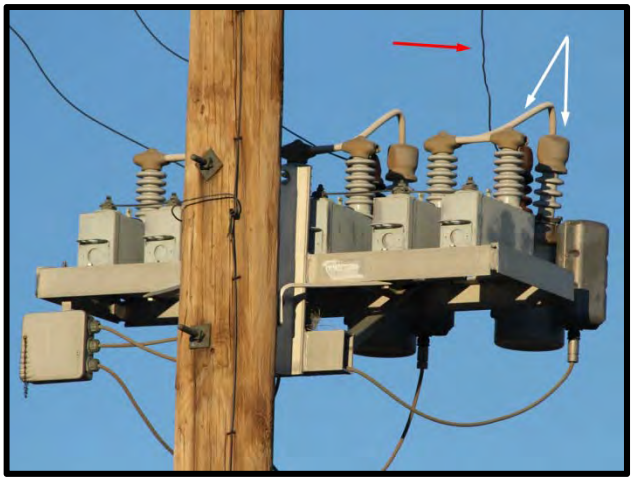


Figure 15-8. Equipment can be ordered with applicable covers. Capacitor bank with bushing covers and insulated wires; jumper wires to conductors are still exposed.

15.4 Distribution Voltage Electrocution Risk

15.4.1 Overview

As discussed in Section 3.1 *Line Electrocutions* the general guidelines to minimize electrocution risk to perching birds include a minimum of 60 inches of horizontal separation and 40 inches of vertical separation between phase-to-phase or phase-to-ground contact points (APLIC 2006). The most common distribution structures in the WSMR service territory are tangent structures. Typically, the main electrocution risk associated with tangent structures is the spacing of the energized conductors. However, for some configurations, electrocution risk also increases when minimal spacing occurs between energized conductors and a groundwire or grounded guy wire. Other configurations, such as deadend (and tap) structures and equipment poles, also present a moderate to high risk to birds.

A detailed field Risk Assessment was completed for the WSMR facility. The following information summarizes the patterns observed on the overall system. Approaches to address or resolve these patterns are discussed in Chapter 8.0 *Distribution Electrocutions*. As WSMR personnel implement the APP, these "pattern resolutions" should be followed for both new construction standards and retrofitting programs for existing structures.

15.4.2 Incomplete Retrofitting

Incomplete retrofitting is one of the primary causes of avian electrocution and electric shock injuries on retrofitted poles. Incomplete retrofitting examples specific to WSMR are provided in the following figures, delineating specific issues.

New construction standards at WSMR vary, based on contractors used and areas serviced by the local electric cooperatives. Figure 15-9 is an example of new pole construction on the Main Post cantonment area that is not covered adequately. The conductor cover on the center phase is lacking the cover wings to extend 36 inches on either side of the pole; groundwire molding should be installed over the groundwire; all surge arresters, cutouts, and potheads should be covered; and the jumper wire cover-up is incomplete. The outer phase conductor covers are not needed and are not installed properly, as discussed for the center phase cover.

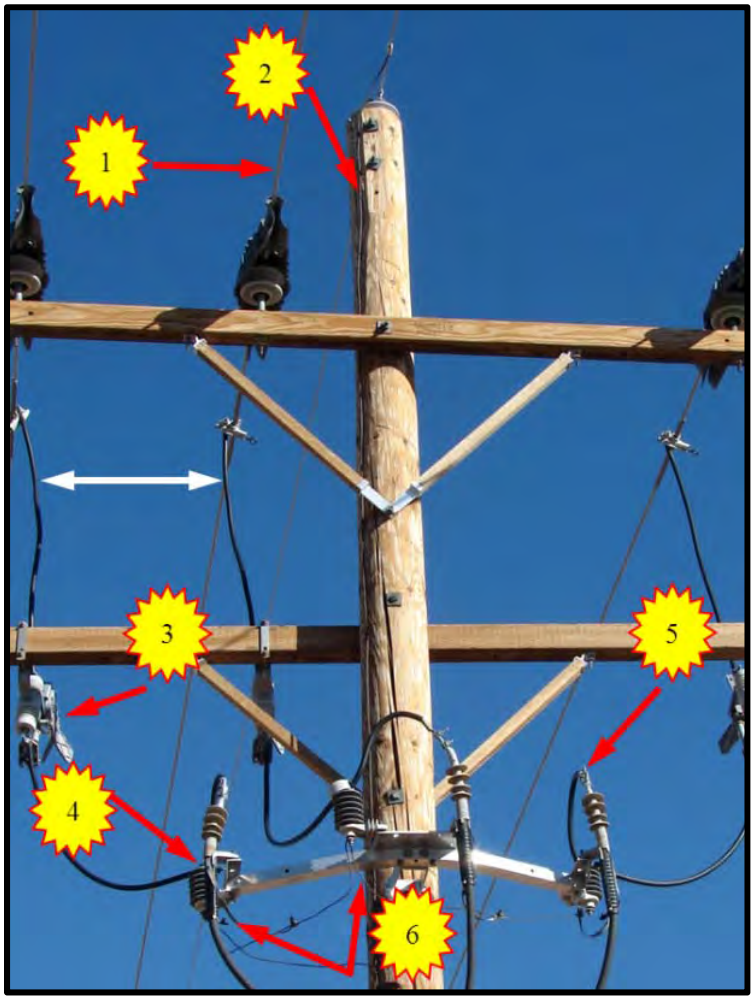


Figure 15-9. Newly constructed riser pole requires additional coverings: (1) install conductor cover wings, (2) cover groundwire, (3) install cutout covers, (4) install arrester caps, (5) install pothead covers, and (6) ensure all jumper wires are covered.

Figure 15-10 reflects an existing structure where a number of retrofitting approaches have been used with a bird nest located on the grounded metal bracket. The white arrows indicate positive approaches, including arrester caps, insulated jumpers, and use of conductor covers. However, a number of incomplete or incorrect

retrofit practices are shown on this structure, including improper covers for the transformer bushings, an exposed groundwire, gaps in the jumper insulation, exposed cutout locking horns, and a missing arrester cap. Additionally, the use of line markers (designed to minimize bird collision with overhead lines) is not effective in "hazing" birds or keeping them off structures. The data matrix provided in Appendix J summarizes missing retrofits on poles observed in the field; however, an integrative program to ensure complete coverage would be based on Chapter 8.0 *Distribution Electrocutions*.

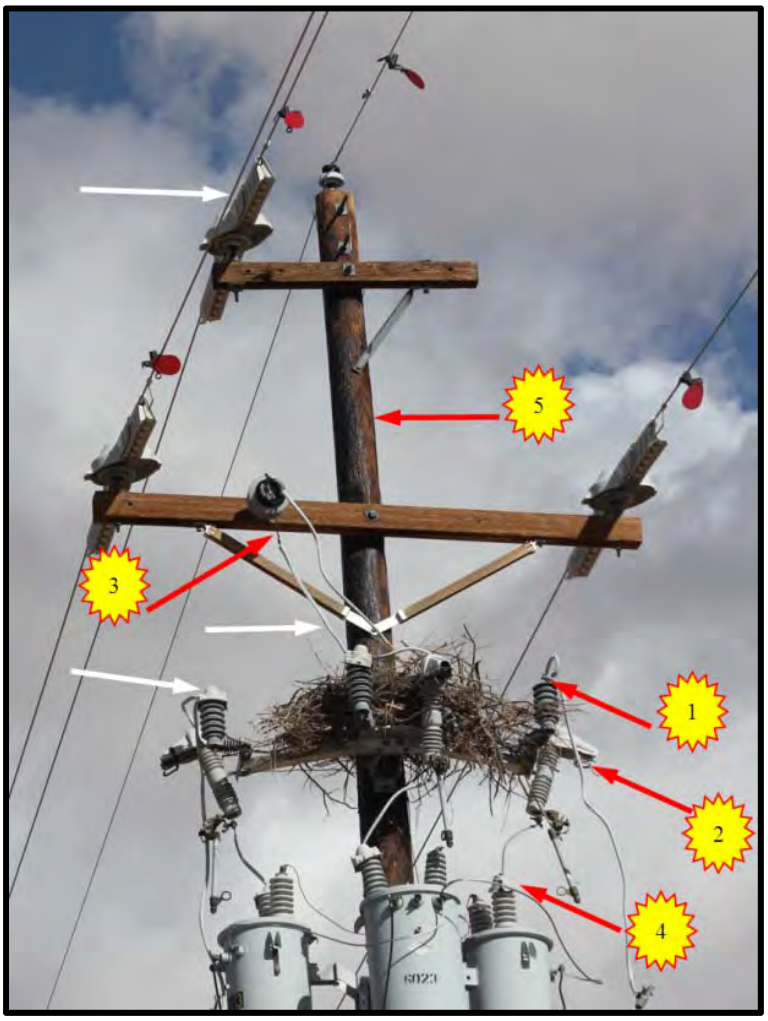


Figure 15-10. Incomplete retrofits on equipment pole with nest: (1) install missing arrester cap, (2) ensure cutout locking horns are covered, (3) fix gaps in jumper insulation, (4) replace incorrect devices used for bushing covers, (5) cover groundwire (6) replace incorrectly sized conductor covers. redundant devices include line markers and conductor covers.

Other examples of incomplete retrofitting are provided, including Figure 15-11, which shows two similar issues, encompassing the exposed cutout locking horns extending beyond the cutout covers and the gaps in the coverup on the surge arrester

jumper wires. Although these gaps are small, they can pose a high risk to birds attempting to perch on a structure. The entire length of the jumper should be covered or gaps in coverup can result in electrocutions on otherwise retrofitted structures. Similarly, if the jumpers are covered, but energized portions of the equipment remain uncovered, the avian electrocution and electric shock injury risks persist

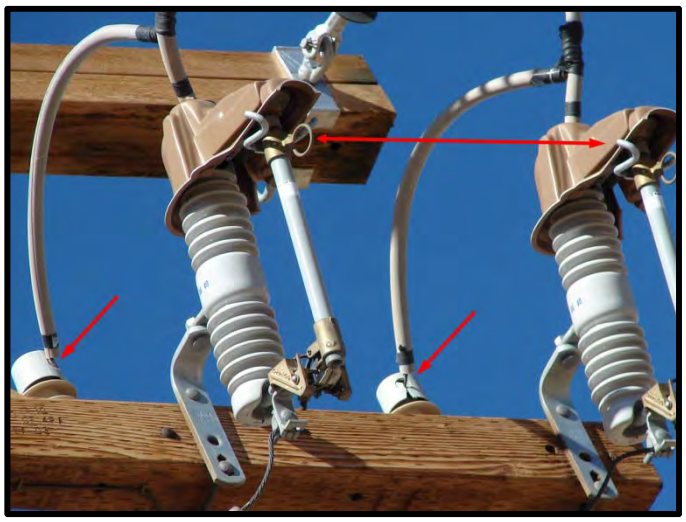


Figure 15-11. Incomplete retrofitting examples include exposed cutout locking horns extending beyond the cutout cover and gaps in cover-up materials.

Figure 15-12 shows where the jumper wire between the bushing and arrester has been covered and an arrester cap has been installed, but it is lacking cover-up on the jumper wire a minimum of 40 inches above the transformer and it is lacking a bushing cover.

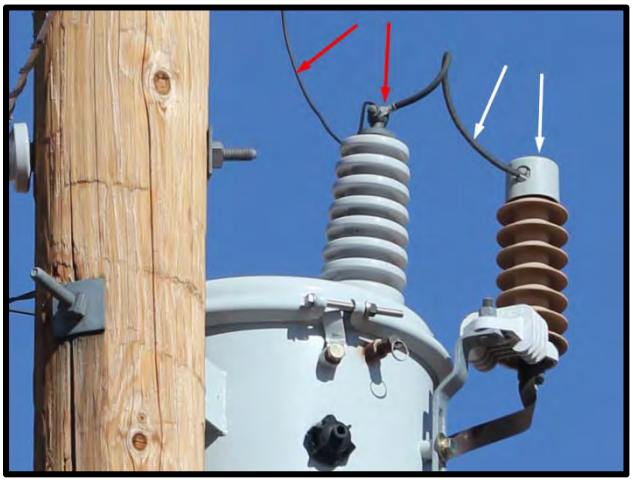


Figure 15-12. Add bushing cover and jumper insulation.

In summary, ensuring comprehensive installation of cover-up materials and devices is integral to minimizing avian electrocution risk. If correcting incomplete retrofitting approaches is required, this typically results in increased labor expenses for personnel in the field. Therefore, appropriate personnel training, internal communications, and quality checking retrofit approaches or installations are all critical to a successful APP program.

15.4.3 Tangent Structures

Configurations with two energized conductors on one side of a crossarm and the third energized conductor on the opposite side of the crossarm (Figure 15-13) do not provide sufficient separation for either hawks or eagles. Figure 15-13 reflects the most common structure occurring at WSMR (i.e., C9-1 OHN). This tangent structure can be problematic in three primary areas: (1) insufficient clearances between center phase and outer phase conductor, (2) exposed groundwire less than 60 inches from conductors or jumper wires (if present), and (3) grounded guy wires less than 60 inches from energized wires (e.g., conductors). Figure 15-14 is similar with the (1) insufficient clearances between the center phase and outer phase and (2) exposed groundwire on the pole, but this structure also exhibits (3) an offset groundwire that reduces the clearance between the groundwire and the outer conductor. In this scenario, the entire groundwire should be covered and a conductor cover installed on the center phase.

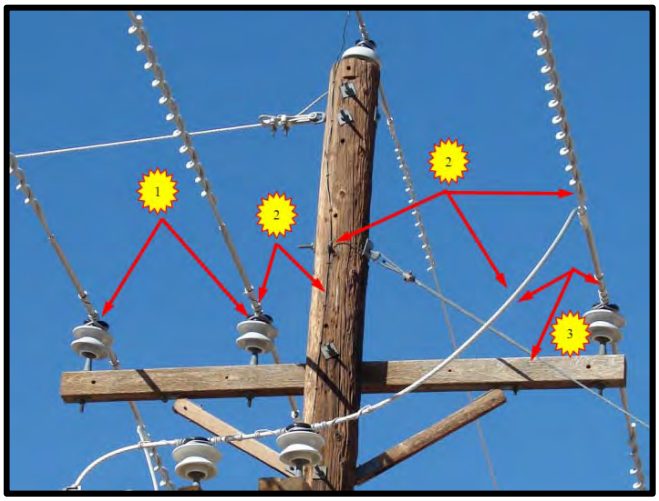


Figure 15-13. Typical tangent structure: add conductor cover to center phase, cover groundwire, and add insulating link to grounded guy wire.

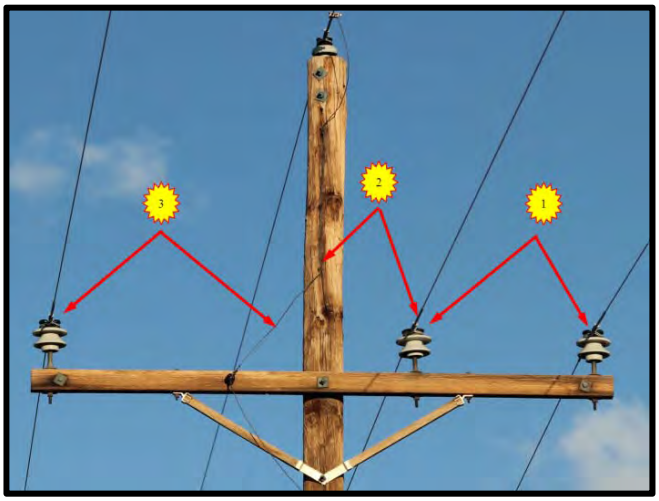


Figure 15-14. C9-1 OHN: add conductor cover to center phase, cover pole groundwire, and cover offset groundwire.

Older common tangent configurations at WSMR include two classified as C1-1 OHN and C1-2 OHN, referencing tangent structures with two sets of single and double crossarms (6-, 8-, or 10-foot) (Figure 15-15 and Figure 15-16). Groundwire molding should be applied to the groundwire when less than 60 inches from the energized conductors. Figure 15-17 depicts one variation of this configuration where the clearance

between the groundwire coming off the OHN and the upper conductor is not sufficient; therefore, the groundwire cover-up would need to extend up to the OHN.

Figure 15-15. Older tangent configuration C1-1 OHN with two sets of single crossarms - cover groundwire.

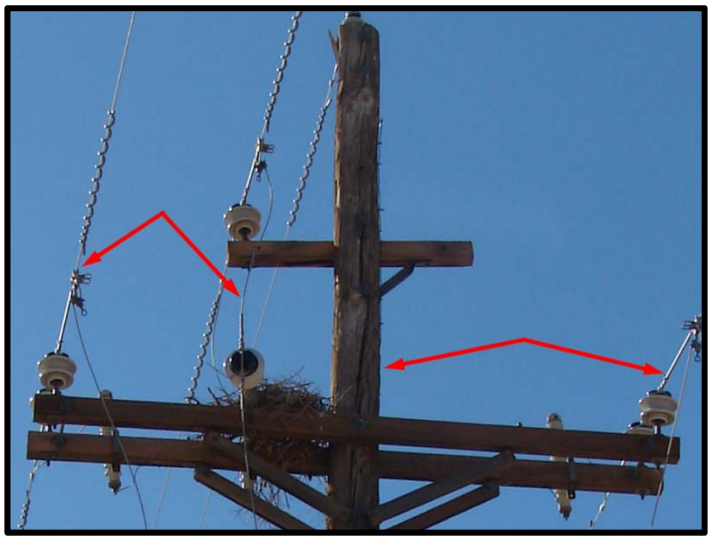


Figure 15-16. Older tangent configuration C1-2 OHN with one single and one double crossarm – cover groundwire and center phase jumper wire.

Figure 15-17. Groundwire should be covered at the top of pole.

Another three-phase tangent configuration that occurs at WSMR is shown in Figure 15-18. Similar to the other tangent structures with overhead neutral wires, the exposed groundwire can occur less than 60 inches from energized conductors. Under these scenarios, the groundwire should be covered to minimize a potential phase-to-ground contact. Figure 15-19 provides a close-up view of this configuration.

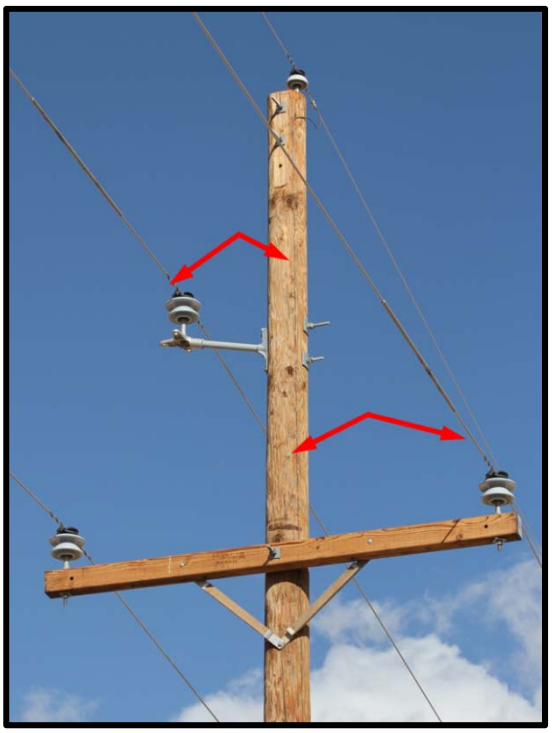


Figure 15-18. Tangent structure - cover groundwire.

Figure 15-19. Close-up of exposed groundwire in proximity to conductor increasing electrocution risk for even smaller birds.

A more common structure design used across WSMR is the three-phase vertical pole using horizontal post insulators (Figure 15-20). The vertical configuration aids in minimizing phase-to-phase contacts; however, the orientation of the groundwire can be problematic. Figure 15-21 shows the restricted clearance between the conductor and the groundwire, posing a risk for even smaller birds. Additionally, the location of the groundwire relative to the through bolts securing the metal brackets was a concern for some structures. During the field Risk Assessment surveys, a great horned owl was observed perching on one of these metal brackets.

Figure 15-20. Common three-phase vertical configuration at WSMR.

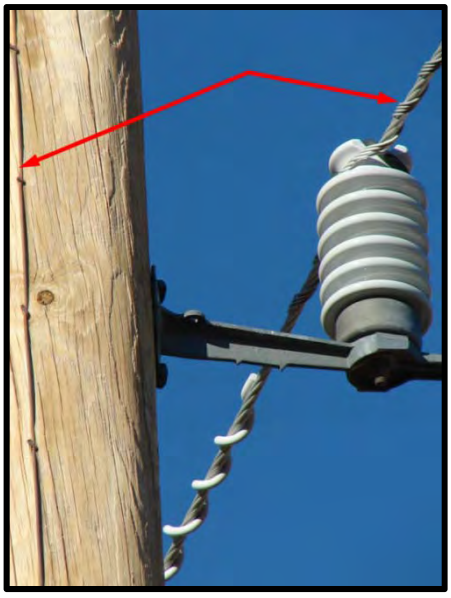


Figure 15-21. Restricted clearance between conductor and groundwire – cover groundwire.

As discussed above, wood molding materials have been used historically at WSMR to cover exposed groundwires. However, these have deteriorated on WSMR poles (Figure 15-22). Molding from polymer materials would be more durable in the harsh climates common to WSMR. Figure 15-23 shows where a polymer has been used to cover a portion of the groundwire. However, this would need to be extended to cover the groundwire 40 inches above and 10 inches below the metal conductor bracket.

Figure 15-22. Deteriorating wooden molding for exposed groundwire.

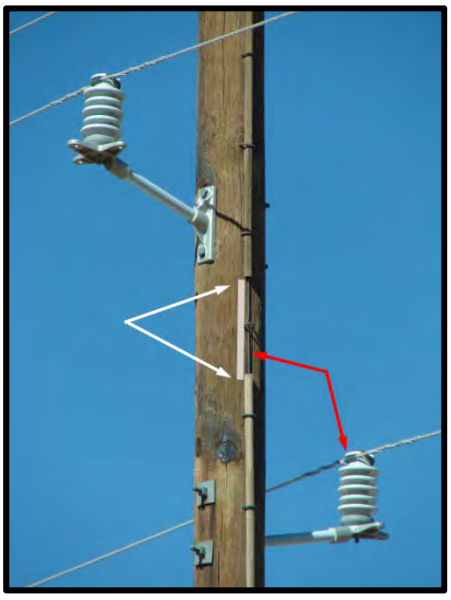


Figure 15-23. Groundwire molding should extend 40 inches above and 10 inches below a potential perch site.

15.4.4 Deadend Structures and Corner Poles

Three-phase, single deadend equipment poles, corner poles, and double deadend poles all incorporate jumper wires to connect phases or phases to equipment. The proximity of jumpers increases avian electrocution risk significantly. At WSMR, some of the more at-risk structures include those shown in the following figures. Specifically, Figure 15-24 shows the orientation of cutouts on the back of the deadend structure. It is important to install a cutout cover and to use a unit that covers the locking horns, particularly given the proximity to the other cutouts, but also the grounded guy wire (see Figure 15-11 and Section 8.6 *Cutouts*).

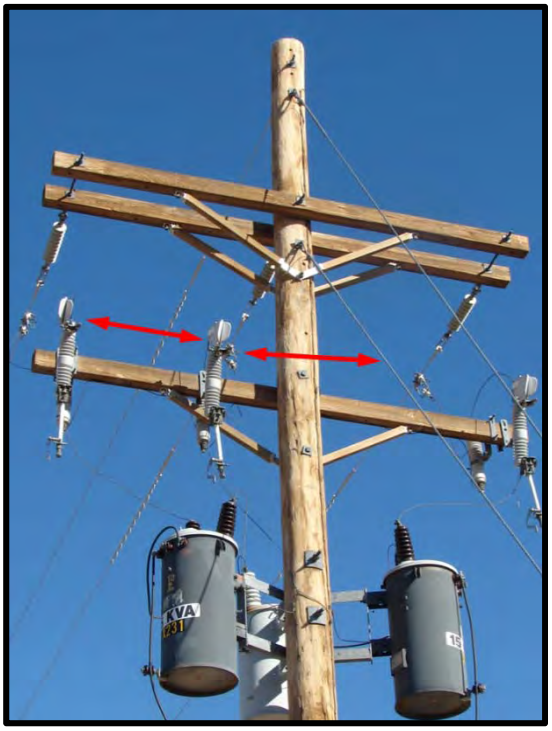


Figure 15-24. Cutouts should be covered – also lacking center phase extension and cover-up on all equipment and jumper wires.

Figure 15-25 shows a three-phase, single deadend corner structure that is a high electrocution risk to perching hawks, owls, and eagles. All jumper wires should be covered and extension links installed in center phases. Figure 15-26 depicts an alternative orientation of the center phase seen on some of the older WSMR poles. No center phase extension would be warranted.

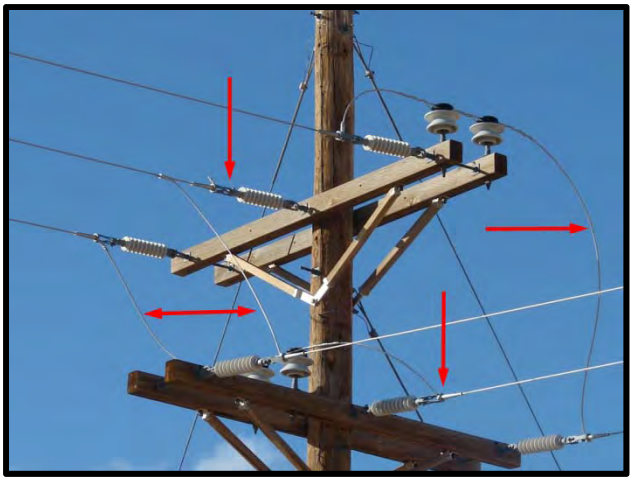


Figure 15-25. Single deadend corner structures – cover all jumper wires and install extension links in center phases.

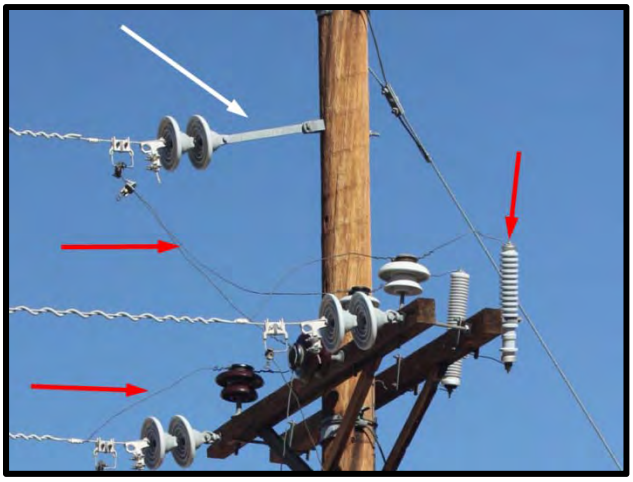


Figure 15-26. Raised center phase increases distance between conductors – this structure lacking covered jumper wires, arrester caps, and other equipment.

The majority of the deadend structures at WSMR incorporate overhead neutral wires. For those configurations, center phase extension links are required on the center phase. However, on Figure 15-27 and Figure 15-28 the neutral wire is attached to the crossarm. For these structures, two extension links (or deadend covers) would be required for both the center phase and the neutral wire. Jumper wires on deadend structures also should be covered, accordingly, or rerouted under crossarms, when feasible for human safety.

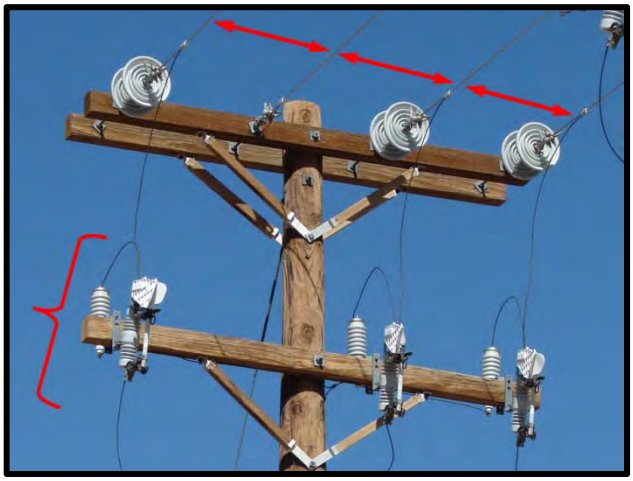


Figure 15-27. Single deadend with neutral wire up – requires two extension links on center phase and neutral wire and cover-up materials on all equipment and jumper wires.

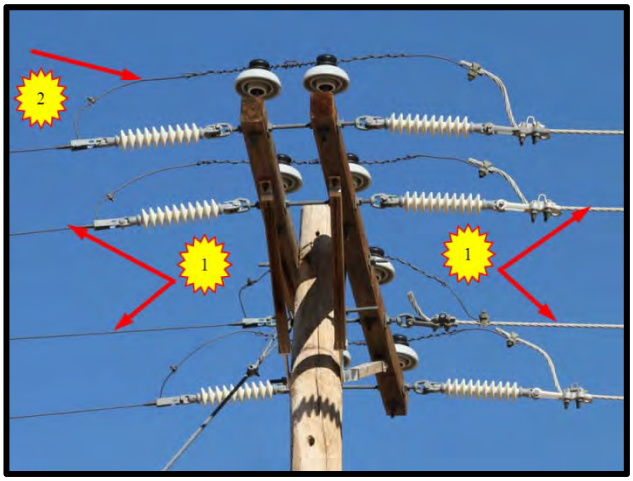


Figure 15-28. Double deadend with neutral wire up – requires (1) four extension links on center phase and neutral wire and (2) insulation on all jumper wires.

Other corner poles, such as vertical three-phase corner structures typically maintain sufficient clearances. However, at WSMR, some of the older configurations incorporate grounded guy wires, bonded hardware, and associated steel bands that do not have sufficient clearances between the grounds and the energized conductors or conductor jumper wires. Figure 15-29 and Figure 15-30 provide two examples of these structures. It is recommended that if feasible for operations the grounding and bonding be removed and insulating links be installed in the guy wires. Some structures also would require covering jumper wires. If bonding is required, retrofit options would include covering all jumper wires and possibly installing extension links or deadend covers on the conductors, if less than 60 inches between energized conductors and grounded hardware or guy wires. A third option would be to reconfigure these vertical corner structures.

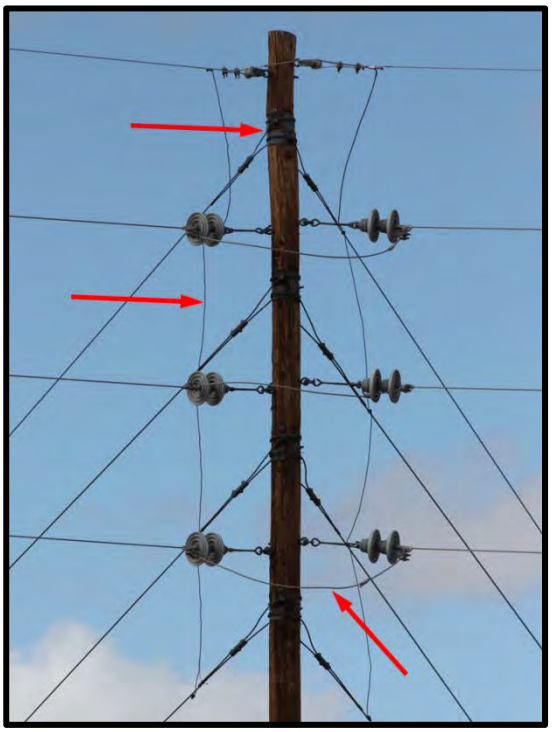


Figure 15-29. Grounded guy wires, hardware bonding, and exposed jumper wires are all problematic.

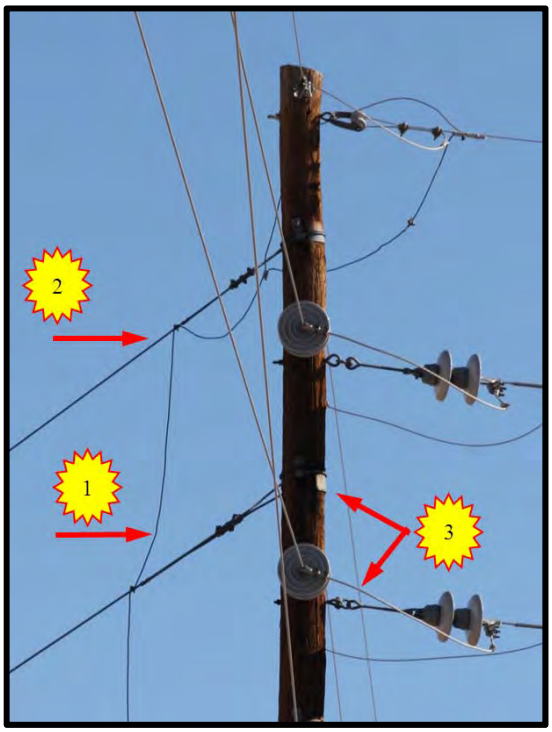


Figure 15-30. Suggested retrofits include: (1) remove bonding on guys and pole hardware (if feasible), (2) install insulating links in guy wires, (3) cover jumper wires.

Another deadend structure is shown in Figure 15-31 with a three-phase tangent and three-phase tap. In addition to addressing 60 inches of horizontal clearances, this is a good example where vertical clearances are important, as well. This structure shows: (1) less than 40 inches of vertical clearance exists between two conductor phases and (2) less than 60 inches of horizontal clearance exists between the upper conductor and both the groundwire and grounded guy wire.

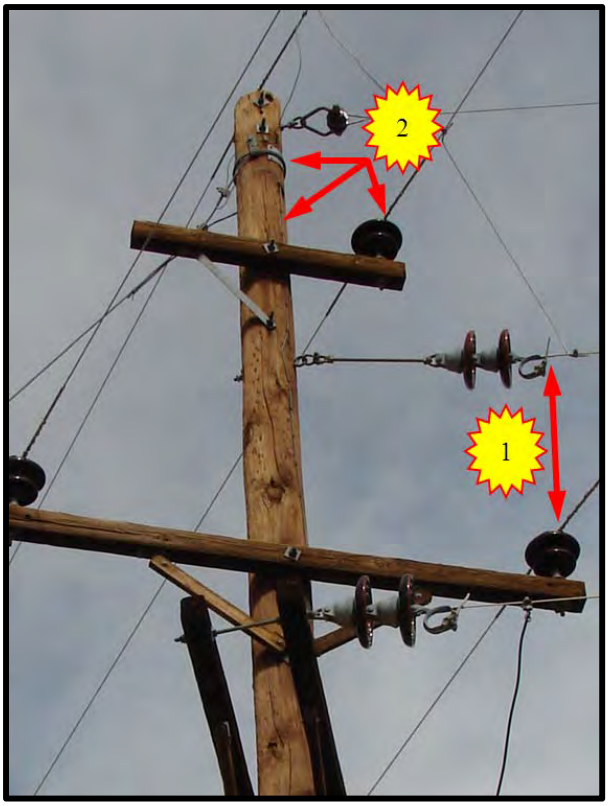


Figure 15-31. Lacking both 40 inches vertical clearance and 60 inches horizontal clearance. Requires: conductor covers on both upper and lower tangent phases.

15.4.5 Steel Structures

Figure 15-6 discussed in Section 15.3, *Positive Practices*, is an example of a good approach to retrofitting a single-phase steel structure with an overhead neutral wire. Relative to other steel structures at WSMR, three primary issues were recorded during the field Risk Assessment surveys. Three-phase steel structures often lacked sufficient cover-up materials, some conductor covers lacked the lateral wings needed to achieve 36 inches of cover from potential perch sites, and the conductor cover used at WSMR appeared to have a high failure rate.

Figure 15-32 shows a typical approach currently used at WSMR. Two additional conductor covers are required for steel structures. Figure 15-33 is an example of where conductor covers were lacking the extension wings on both sides. This wood pole also would not require three conductor covers, but only one if groundwire molding were applied.

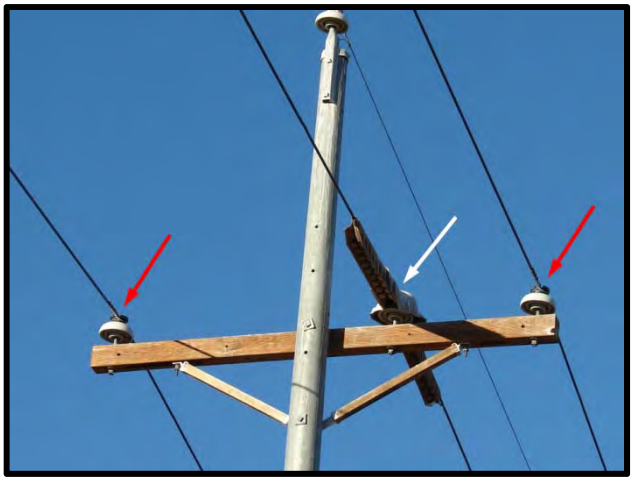


Figure 15-32. Steel structures require three conductor covers.

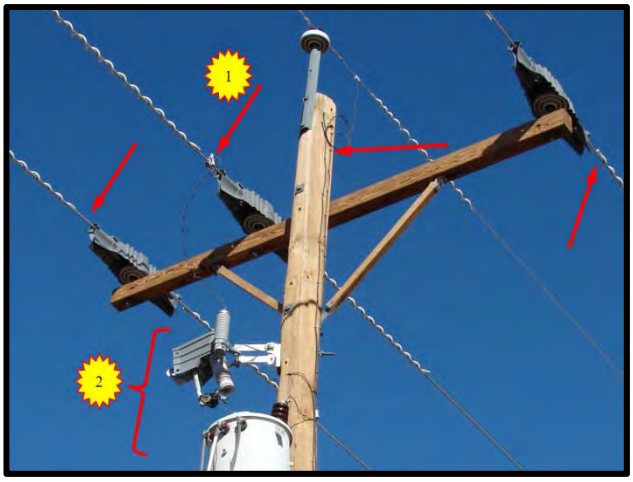


Figure 15-33. (1) Use of conductor covers requires wings extending 36 inches on either side; only one cover needed if groundwire covered. (2) equipment lacking sufficient cover-up materials and devices, cutout cover not fitted correctly.

Figure 15-34 and Figure 15-35 are representative of observations of conductor cover damage across WSMR on both steel and wood structures. Covers were found on the ground or parts missing altogether.

Figure 15-34. Conductor cover damage was recorded across WSMR.

Figure 15-35. Close-up of conductor cover damage.

15.4.6 Ground Banks

The highest-risk structure currently used at WSMR is the older three-phase transformer Ground Banks scattered throughout the facility. Figure 15-36 and Figure 15-37 provide representative examples of these older facilities that are still being used. The risks to perching birds encompass a number of issues including limited clearances between phase-to-phase and phase-to-ground, steel framing increases the grounding potential, the use of older equipment and configurations, and the fact birds are likely attracted to these fenced enclosures to feed on prey items such as rodents.

Figure 15-36. Ground Bank with older equipment, but still energized. Very high-risk structure.

Figure 15-37. Ground Bank with newer equipment and very high-risk structure.

Currently, WSMR is retrofitting these Ground Banks throughout the facility. This prioritization aligns with the Risk Assessment results and the summaries presented in the data matrix in Appendix J.

15.4.7 Equipment Retrofitting Issues

Section 15.4.2 *Incomplete Retrofitting* discusses a few issues observed in the field relative to cover-up materials and devices for certain equipment, such as cutouts. Currently, WSMR is primarily using older design Kaddas cutout covers where the locking horns are still exposed (see Figure 15-11). Given the incidence of bird use at WSMR and the prevalence of equipment poles, it is recommended a variation of cutout cover be installed. Figure 15-38 provides one example of a modified Kaddas design. Other manufacturers that produce devices to cover the locking horns include TE Connectivity, EcoElectrical, and Cantega (see Section 8.6 *Cutouts*). Additionally, cutout covers for loadbreak cutouts should be applied accordingly (Figure 15-39).

Figure 15-38. Example of cutout cover to enclose cutout locking horns.

Figure 15-39. Misapplication of cutout cover over loadbreak cutout – appropriately designed cutout covers for loadbreak cutouts should be used.

Another practice observed at WSMR was the installation of bushing covers too low on the insulator sheds (Figure 15-40 and Figure 15-41). Section 8.4 *Transformers* summarizes the correct approach for bushing cover installation.

Figure 15-40. Single-phase with bushing cover installed too low on bushing sheds.

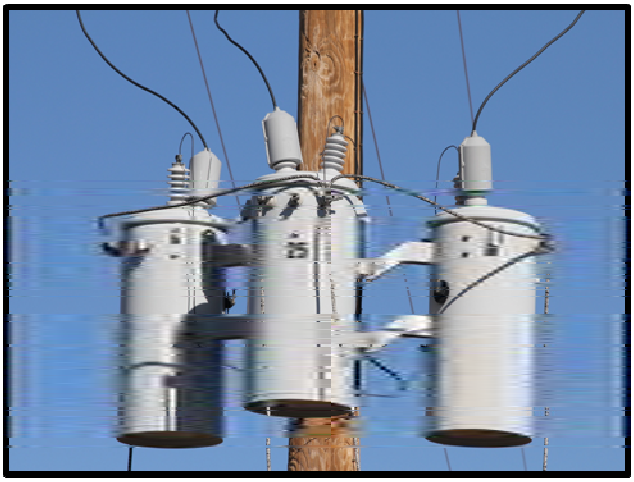


Figure 15-41. Three-phase with bushing covers installed too low on bushing sheds.

Figure 15-42 also displays the use of bushing covers to cover surge arresters. The appropriate device and cover-up materials should be used on the applicable equipment and wires. Chapter 8.0 *Distribution Electrocutions* and specifically Section 8.7 *Surge Arresters* provide more detail on cover-up options.

Figure 15-42. Incorrect use of bushing covers on surge arresters.

Horizontally mounted surge arresters places the ground above the crossarm, increasing the exposure risk to perching birds (Figure 15-43). On new construction it reduces the exposure risk to mount vertically when possible. Older gapped and horned arresters still exist at WSMR and are particularly problematic to wildlife due to the limited spacing between differently energized components (Figure 15-44). Gapped and horned arresters should be systematically retired and replaced whenever they are encountered during routine maintenance.

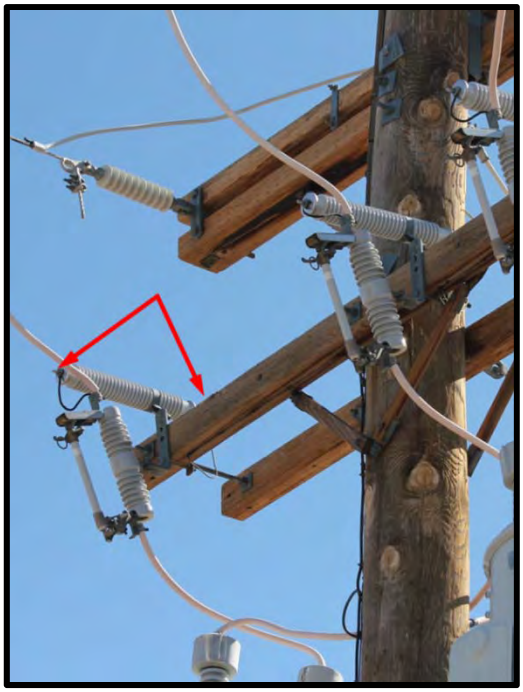


Figure 15-43. Horizontally mounted arresters place the ground above the crossarm increasing the exposure risk.

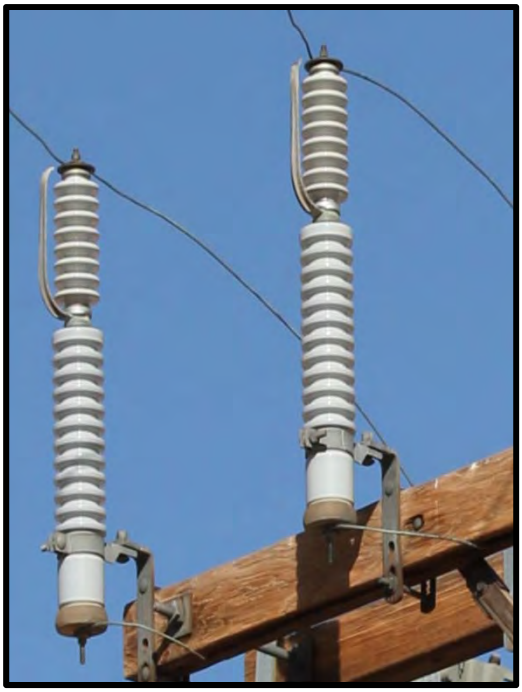


Figure 15-44. Horned (shown) and gapped surge arresters should be replaced and upgraded during line maintenance.

15.4.8 Pole-top Groundwires

Groundwire exposure to energized portions of distribution structures at WSMR is relatively common, given the majority of the lines utilize overhead neutral wires. However, this configuration is different than a "pole-top ground." Figure 15-45 shows an example of a pole-top ground on a single-phase structure on Main Post cantonment area. This practice is not currently used for new construction at WSMR, but pole-top grounds present a high risk to perching birds. These should be removed or gapped, according to Section 8.9 *Pole-top Grounds*, when found.

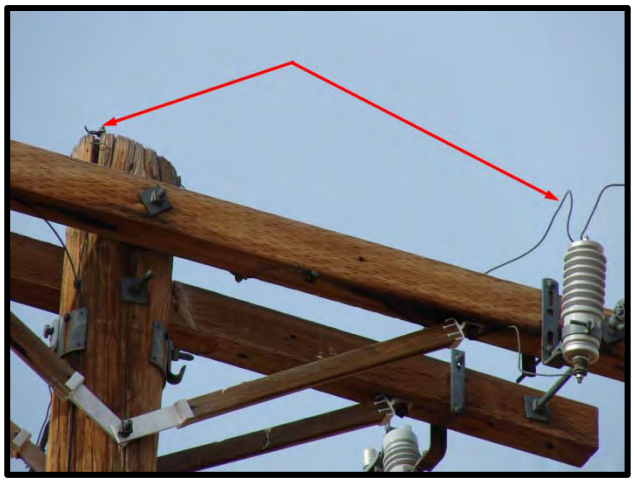


Figure 15-45. Pole-top grounds are uncommon at WSMR but should be removed or gapped when found.

15.4.9 Grounded Guy Wires

Grounded guy wires occur throughout WSMR. Section 15.4.3 *Tangent Structures* and Section 15.4.4 *Deadend Structures and Corner Poles* discuss scenarios where it is appropriate to retrofit grounded guy wires (see Figure 15-13). In some situations, however, guy wires are intentionally grounded. If insulating links cannot be installed in grounded guy wires, all energized equipment less than 60 inches from the guy wires should be covered for avian protection (see Section 8.11 *Guying*).

15.4.10 Bracket Grounding

Brackets are used to support pole-mounted equipment including surge arresters, fused cutouts, and potheads. WSMR uses a variety of metal and fiberglass brackets. Grounded metal brackets pose a particularly high electrocution risk to even smaller birds perched on or adjacent to the bracket in proximity to energized equipment or jumper wires. Figure 15-46 shows the arrester groundwire tied to the bracket hardware. It is important to be aware that metal brackets can be grounded via mounting bolts contacting groundwires on the opposite side of the pole from the equipment (Figure 15-47).

Figure 15-46. Grounded metal brackets supporting energized equipment present a high risk to even smaller birds.

Figure 15-47. Groundwire bonding metal mounting bolt and grounding associated bracket.

Fiberglass brackets are non-conductive, thus reducing the risk of electrocution from phase-to-ground contact. However, when groundwires are located immediately beneath fiberglass brackets, a bird's talon may still contact the groundwire, increasing the bird electrocution risk. This scenario would warrant covering the groundwire, accordingly.

To minimize electrocution risk, the energized equipment should be covered or the groundwires covered or moved from the fiberglass or metal brackets. Retrofit options will vary, based on the pole and equipment configuration (see Section 8.10 *Brackets*).

15.4.11 Nesting Issues

Nests of large birds increase risks of system outages and risks to nesting birds and their young. Section 3.4 *Nesting*, Chapter 5.0 *Permit Compliance*, and Section 6.6 *Nest Management* discuss in detail various approaches to resolve nesting issues in compliance with the applicable federal and state regulatory requirements.

WSMR has a number of stick nests (primarily raven and hawk species) on poles throughout WSMR. Most of these nests are located on de-energized structures. However, since any structures could be re-energized with little advanced warning, these nests can pose substantial risks of electrocution and pole fires, particularly when in direct contact with energized equipment (Figure 15-48). Therefore, nest poles should

receive a high priority ranking to minimize both operational issues and risks to nesting adult birds, their eggs, and young. A number of nests and nesting materials removed from poles were observed during the field review. These materials should be removed and dispersed away from the nesting pole to discourage future re-nesting attempts.

Figure 15-48. Nest poles should receive high priority for retrofits given risk to birds and risk of outages.

It is important to understand the varying regulatory requirements for nest management (e.g., nest removal and destruction vs. nest relocation). It also is important to discern what species is nesting, since eagle nests require a higher level of protection than hawks, owls, and other raptor species.

Finally, the use of perch discouragers can increase the potential for nesting (Figure 15-49) and are not in accordance with the primary state-of-the-art approaches to minimize avian electrocution risks on distribution structures (APLIC 2006). Specifically, the bird spikes shown in Figure 15-49 are not appropriate for use on power poles. Appropriately designed perch discouragers only should be used for perch management in areas that warrant redundant measures (see Section 8.14 *Perch Management*), and cover-up should be used as the primary approach.

Figure 15-49. Perch discourager used is not appropriate and provides good nest substrate.

15.4.12 Summary Comments

WSMR is a unique environment, based on a number of factors. The facility encompasses a wide range of habitat types associated with the northern Chihuahuan Desert, Tularosa Basin, the Jornada del Muerto, several mountain ranges, and human-influenced areas. Given the restriction to public access and areas that are not consistently used, bird use can be heavy and diverse, and typically the lack of natural perch sites across the landscape attracts a large number of bird species to the existing electrical infrastructure.

It has been advantageous that WSMR has the flexibility in de-energizing lines and taps when not needed for mission support. This approach has reduced the risk and likely reduced the avian electrocution mortality rate across WSMR. It is recommended the Environmental Division develop signage to install on the switch pole used to disconnect lines and taps. This sign would instruct the line crews to contact the Environmental Division in the event the line is scheduled for re-energizing. This approach would ensure the retrofit priorities would be assessed for that line to minimize electrocution risks to birds.

Figure 15-50. Juvenile Red-tailed Hawk mantling over prey item, with an adult Red-tailed Hawk perched on adjacent power pole (not shown).

Despite the level of human use and presence on Main Post cantonment area, this area attracts a large number of raptors, including great horned owls, red-tailed hawks, and even ferruginous hawks. This attraction is likely tied to the prey base on Main Post, primarily consisting of gopher and squirrel species (Figure 15-50).

As discussed in Chapter 14.0 *Risk Assessment Protocol*, several patterns emerged that were observed during the field Risk Assessment surveys. One pattern was the amount of eagle sign in certain low shrub, grassland, and playa habitats in the Tularosa Basin of WSMR. In contrast, some of the high shrub and wooded habitats along the foothills (e.g., creosote, pine/juniper) had very little bird sign, even below structures located on higher topography overlooking the surrounding basin. The priority rankings reflect these field observations. As WSMR staff continues to implement the WSMR APP, these differences should be taken into account when planning retrofit approaches, schedules, and budgets.

Similarly, certain habitats appeared to support a greater number of coyotes (*Canis latrans*). Patterns were seen where coyote scat was common below individual electrical structures along specific areas of WSMR, particularly in areas exhibiting high bird sign. It could be theorized that consistent coyote presence along specific electrical lines infers possible attraction to prey items at the base of the poles (i.e., bird fatalities) and the individual animals are frequenting these lines on a periodic basis. However, this cannot be proven without additional data and a systematic review, and we do not know the scavenging rate in these areas.

The results from the 2012-2013 winter study of golden eagles at WSMR should be incorporated into the APP database and this APP. As eagle use is better defined, the electric retrofit prioritization can be fine-tuned.

15.5 Materials List

The field Risk Assessment for the WSMR service territory delineated suggested retrofits for structures, areas, and line spans to minimize avian electrocution risk, as summarized in the Appendix J data matrix. Table 15-1 totals the estimated materials and devices recommended for electrocution retrofits identified during the field Risk Assessment. Note that this Risk Assessment field review provides a static point in time on the WSMR system, and it is estimated to have covered approximately 80% of the distribution lines at WSMR. The following materials list will aid WSMR in estimating costs for structure retrofits and strategic retrofit planning in the near term. The data matrix provided in Appendix J also will aid WSMR in short- and long-term project tracking and retrofit status, identifying new areas that warrant retrofitting, and annual reporting.

Table 15-1. Minimum materials list for electrocution mitigation based on the WSMR avian risk assessment.

Estimated Minimum Amount of Retrofit Materials Recommended*									
	Number of Entries	Conductor Covers	Insulating Link (36" Extension)	Entries Requiring Insulated Jumpers	Cutout Covers	Arrester Caps	Bushing Covers	Pothead Covers	Install Groundwire Molding
Priority 1	438	1112	391	312	881	700	610	125	214
Priority 2	312	1068	343	216	685	421	344	74	196
Priority 3	127	997	65	47	26	42	11	0	90
Priority 4	151	469	35	28	0	27	8	3	109
Total	**1028**	**3646**	**834**	**603**	**1592**	**1190**	**973**	**202**	**609**

*** Estimates will be conservative, since "?" entries and "Y" entries for multiple devices do not list specific numbers, and for some entries applying to multiple poles (i.e., "areas" identified during the surveys) the numbers of retrofit devices or materials were estimated. However, materials numbers should aid in annual budget planning.**

15.6 Implementation Schedule

Retrofits to poles and areas are planned according to the following implementation schedule:

- Within 5 years: Retrofit all Priority 1 poles and areas.
- Within 10 years: Retrofit all Priority 2 poles and areas.
- Within 15 years: Retrofit all Priority 3 and 4 poles and areas.

It should be noted that additional areas not covered in this APP's Risk Assessment will continue to be identified for retrofitting priorities and new construction standards will be applied to new distribution line projects.

WSMR Environmental will review and update this APP annually, and meet annually with the USFWS Office of Law Enforcement to monitor implementation progress.

16.0 AVIAN PROTECTION TRAINING AND PUBLIC AWARENESS

Education is an integral part of an APP and essential to its success. Education can consist of both training opportunities for WSMR personnel and contractors and external communications with the general public.

Internally, avian protection training should be provided to applicable personnel, including managers, line supervisors, engineering, design, field staff, and contractors. Avian training should be ongoing. These training sessions can be opportunities to alert personnel and contractors to any changes in the regulatory framework, permits acquired by WSMR, reporting procedures, new construction design standards, and new retrofit approaches.

Building public awareness of avian issues also is an important component of an APP. Educating the public about WSMR's avian protection efforts helps to build strong community relationships and support for WSMR's environmental programs. Increased public awareness also leads to additional opportunities to collaborate with local and regional organizations on avian enhancement projects.

16.1 WSMR Personnel Training

Avian protection training can be formal, informal, ongoing, or periodic, depending on the goals of the WSMR Environmental Division. The USFWS Office of Law Enforcement is planning to provide a day of training in 2014 to WSMR DPW employees involved in avian protection. Topics could include, but are not limited to:

- Regulatory framework and compliance
- Bird identification
- New construction design standards and retrofitting approaches
- Nest management
- Avian incident reporting
- New materials, devices, properties

Currently, an example distribution utility pole top is assembled outside the CSTEDTC-WS-ES building (Bldg. 163). The purpose of this interpretive unit is to demonstrate an avian-friendly structure and what is required for either pole design or pole retrofits. However, the approaches used on this pole are outdated, and it is recommended the information provided in Chapter 8.0 *Distribution Electrocutions* and the data matrix in Appendix J be used to update this interpretive unit, accordingly.

The Environmental Division also is currently developing a Standard Operating Practices (SOP) for use by the WSMR line crews. This manual would facilitate the communication and reporting processes relative to avian electrocution risks.

Appendix K provides an example training syllabus and DVD that can be used for internal personnel orientation and training. Additional published resources also are available.

16.2 Published Training Resources

Resources listed below are some of the most valuable and can provide guidance for addressing unusual issues that may arise:

Avian Power Line Interaction Committee (APLIC). 2012. Reducing Bird Collisions with Power Lines: The State of the Art in 2012.

This document contains biological and ecological information on birds and bird behavior relevant to collisions; information on habitat, land use, and power line modifications; and an extensive bibliography.

APLIC. 2006. Suggested Practices for Avian Protection on Power Lines: The State of the Art in 2006.

This document contains biological and ecological information on birds and bird behavior relevant to electrocution; information on habitat, land use and power line modifications; and an extensive bibliography.

Electric Power Research Institute (EPRI). 2011. Field guide: visual inspection of avian issues on transmission and distribution structures. EPRI, Palo Alto, CA: 2011. 1022168.

This document contains photos illustrating avian issues pertaining to nesting, structural issues and damage, health issues, and mortality (electrocution and collision).

The Institute of Electrical and Electronics Engineers (IEEE). 1993. Guide for Animal Deterrents for Electric Power Supply Substations. IEEE Standard 1264-1993.

This document provides information regarding animals and the problems they cause at electric power supply substations. The guide presents methods and designs used to mitigate interruptions and equipment damage resulting from animal access into substations.

National Rural Electric Cooperative Association (NRECA). 1996. Animal-caused Outages. Rural Electrical Research (RER) 94-5.

This book focuses on understanding and preventing animal-caused outages. It describes common problems for transmission, distribution, and substation systems; the animals involved; and available products and techniques for mitigating outages. This book includes information on mammals as well as birds.

National Wildlife Health Center. 2007. Avian Influenza (HPAI) H5N1.

The global spread of H5N1 increases the likelihood that it will eventually be detected in North America. There are a number of pathways through which the virus could be brought to this continent including introduction by wild migratory birds. Updated information is available at www.nwhc.usgs.gov/.

New Mexico Avian Protection (NMAP) Working Group. 2006. Lineman's Guide to Avian Diseases.

This report provides an overview of diseases and bird-handling procedures. A copy of this report is presented in Appendix F of this APP, and an electronic version of the document may be downloaded at:

www.nmavianprotection.org/downloads/Guide_to_Avian_Disease.pdf.

16.3 Public Awareness

WSMR is committed to educating the public regarding threats to birds, regulatory protection afforded to birds, the availability of professional care for injured birds, and WSMR's efforts to protect and enhance avian populations. The goal of WSMR outreach efforts is to convey to the public they are responsible stewards of the environment working cooperatively with wildlife agencies towards reducing avian mortalities while maintaining military readiness and Mission support.

While implementing the WSMR APP, WSMR will take advantage of opportunities to increase public awareness of avian issues and WSMR's efforts to protect birds. Outreach associated with these occasions may consist of a press release, a public event, or the distribution of a brochure describing WSMR's APP and avian protection accomplishments. WSMR also may elect to sponsor programs or events planned by state agencies or non-governmental organizations that further WSMR's public outreach and educational goals.

17.0 ENVIRONMENTAL ENHANCEMENT

As described in Section 1.2 *Department of Defense Environmental and Avian Protection Policies,* WSMR strives to continually improve environmental performance through proactive and innovative habitat and species protection. Chapter 6.0 *Management Procedures and WSMR Reporting Systems* details WSMR's proactive management strategies.

Environmental enhancement programs initiated by the Environmental Division include:

- Northern Aplomado Falcon monitoring and recovery
- Surveys for wintering and breeding Golden Eagles
- Prescribed fires in grassland ecosystems
- Erosion control, monitoring, and research
- Protection of Burrowing Owl burrows in maneuver areas
- Wildlife water development maintenance
- Invasive plant species control

18.0 TERMS AND DEFINITIONS

Depredation Permit (MBTA) – a permit issued by the USFWS that allows the permittee to take, transport, and temporarily possess migratory birds and active nests under approved situations.

Eagle Nest Take Permit (BGEPA) – a permit issued by the USFWS that allows the permittee to relocate or remove a Golden Eagle or Bald Eagle nest. The removal or relocation of a Golden Eagle or Bald Eagle nest is addressed on a case-by-case basis and requires close coordination with both the federal USFWS and appropriate state agency.

Endangered Species – the classification provided to an animal or plant in danger of extinction within the foreseeable future throughout all or a significant portion of its range.

Human Health and Safety Emergency – a situation where human health or safety is at risk and immediate corrective action is necessary. Some outages may fall into this category.

Listed Species – a species, subspecies, or distinct vertebrate population segment that has been added to the federal lists of Endangered and Threatened Wildlife and Plants as they appear in sections 17.11 and 17.12 of Title 50 of the Code of Federal Regulations (50 CFR 17.11 and 17.12).

Migratory Bird – any bird, whatever its origin and whether or not raised in captivity, which belongs to a species listed in 50 CFR § 10.13, or which is a mutation or a hybrid of any such bird, or any product, whether or not manufactured, which consists, or is composed in whole or part, of any such bird or any part, nest, or egg thereof. The majority of bird species in the U.S. are considered to be migratory and protected under the MBTA, except for introduced species (e.g., House Sparrow, European Starling, Rock Pigeon, Monk Parakeet, Eurasian Collared-dove) and some game birds (e.g., wild turkey, quail). Refer to Federal Register 12710 Volume 70, No. 49 for a list of all species not covered by the MBTA.

Nest – any readily identifiable structure built, maintained, or occupied for incubating and rearing of protected species offspring. Nests can be found on the ground, in trees, or on structures.

MBTA:

- Active Nest – nest containing either eggs or young.
- Inactive Nest – nest that does not contain eggs or young.

Possession – detention and control of a protected species. This includes picking up or handling of any migratory bird, as defined above. Possession also may include moving or transporting.

Protected Species – any bird either federally or state protected by regulatory statute. Federally protected species include any federally threatened or endangered species found in 50 CFR § 17.11 and § 17.12, Bald or Golden Eagle found in 16 U.S.C. 668 668d 54 Stat. 250 and Amendments, or migratory bird found in 50 CFR 10.13.

Raptor – any bird that kills with its feet (e.g., hawks, eagles, falcons, Osprey, owls). Also known as "bird of prey."

Recovery Permit (ESA) – a permit issued by the USFWS that authorizes the permittee to relocate the nest of a federally listed species.

Special Purpose Relocate Permit (MBTA) – a permit issued by the USFWS that authorizes the permittee to relocate an active or inactive nest of a migratory species (depending on the Region.) The applicable Regional USFWS Migratory Bird Permit Office should be contacted for the most recent information pertaining to the relocation of inactive migratory bird nests.

Special Purpose Salvage Permit (MBTA) – a permit issued by the USFWS that authorizes the permittee to pick up dead birds, abandoned nests, nonviable eggs, and their parts from the wild. All salvaged birds must be tagged and transferred to a designated holding facility.

Take (Eagles) – to pursue, hunt, shoot, shoot at, wound, kill, trap, capture, collect, or molest or disturb (alive or dead), or to attempt to engage in such conduct. The USFWS published a final rule in the Federal Register defining the term “disturb” (FR 31132 Volume 72, No. 107 June 5, 2007). Under the BGEPA the term disturb means “to agitate or bother a Bald or Golden Eagle to a degree that causes, or is likely to cause, based on the best scientific information available, (1) injury to an eagle, (2) a decrease in its productivity, by substantially interfering with normal breeding, feeding, or sheltering behavior, or (3) nest abandonment, by substantially interfering with normal breeding, feeding, or sheltering behavior.”

Take (Federally Endangered or Threatened Birds) – to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect (alive or dead), or to attempt to engage in such conduct. Take includes habitat degradation.

Take (Incidental) – to harm or harass as a result of an otherwise lawful activity where the harm or harassment is not the purpose of the activity.

Take (Migratory Birds) – to pursue, hunt, shoot, wound, kill, trap, capture (alive or dead), or to attempt to engage in such conduct.

Threatened Species – the classification provided to an animal or plant likely to become endangered within the foreseeable future throughout all or a significant portion of its range.

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APPENDIX A
WSMR 2002 COMMANDERS GUIDANCE

U.S. Army White Sands Missile Range

Commander's Guidance

CG-02-02

JAN 24 2002

THE MIGRATORY BIRD TREATY ACT AND THE BALD AND GOLDEN EAGLE PROTECTION ACT - CONSERVATION

1. Environmental stewardship is vitally important to the accomplishment of the White Sands Missile Range (WSMR) test and evaluation mission. "America's Range" fully supports and implements the Migratory Bird Treaty Act (MBTA) and the Bald and Golden Eagle Protection Act (BGEPA). Many actions taking place on WSMR have the potential to "take" migratory birds, including raptors (birds of prey, such as hawks, eagles, and owls). All directors, tenants, Range customers, civilian employees, military personnel, and contractors must ensure that actions which may result in the "taking" of a migratory bird are properly identified and addressed in the environmental coordination document associated with project planning, execution, and follow up. Addressing bird protection measures in this manner is not only consistent with the Commander's Guidance on National Environmental Policy Act (NEPA) Compliance, but will ensure they become part of the administrative record for all proposed actions, are properly coordinated with the U.S. Fish and Wildlife Service, and appropriate permits are obtained.

2. All but three species of wild birds are protected in the United States under federal and/or state laws. Pursuant to the MBTA it is illegal to "take" any migratory bird without a federal permit, excluding only three non-native species: the rock dove (pigeon), English (house) sparrow, and starling. The BGEPA extends additional protections to bald and golden eagles.

3. Under both the MBTA and BGEPA, "take" includes "pursue, shoot, shoot at, wound, kill, capture, collect, molest, or disturb...," or to attempt any of these actions. Additionally, these acts make it illegal to "take," transport, or possess any part of a protected bird without a permit, including the feathers, feet, beak, nest, eggs, etc. Any action at WSMR that may "take" birds must be coordinated with the U.S. Fish and Wildlife Service prior to implementation. The White Sands Environment and Safety Directorate is responsible for assisting activities in accomplishing this coordination.

4. Among the most preventable potential sources of "take" are improperly designed power lines and poles that electrocute large birds and the intentional, unpermitted nest destruction to remedy nuisance bird concerns. To alleviate these problems, it is White Sands policy to:

- Design all new power lines, poles, and other power distribution facilities in accordance with the guidance provided in the publication entitled, Suggested Practices for Raptor Protection on Power Lines: The State of the Art in 1996 (Avian Power Line Committee (APLIC), Edison Electric Institute/Raptor Research Foundation, Washington, D.C.). Any

exception to this guidance must be coordinated through the Environment and Safety Directorate with the U.S. Fish and Wildlife Service which may delay project execution.

- Promptly report and remediate any power lines and poles found to electrocute birds in accordance with the above standards. Plans for these actions will be coordinated with the Environment and Safety Directorate prior to implementation.

- Incorporate the above standards in all proposed actions involving power lines, including line and pole modifications, maintenance and repair activities, and pole removal. Plans for these actions will be coordinated with the Environment and Safety Directorate prior to implementation.

- Identify power lines and poles that have or are suspected to have electrocuted birds to the Environment and Safety Directorate for record-keeping and reporting purposes in accordance with Army policy. Also, report the location of carcasses of birds suspected of having been electrocuted to the Environment and Safety Directorate for action.

- Refrain from any action involving the removal or disturbance of bird nests until the Environment and Safety Directorate has been consulted to determine if a federal permit is required.

5. The Environment and Safety Directorate has copies of the cited publication for reference and can provide the source information for those who wish to obtain individual copies. Where permits are required, the proponent of the action applying for the permit will provide the necessary information to the Environment and Safety Directorate. The proponent is responsible for ensuring compliance with all permit conditions.

6. For additional information regarding this guidance or for further assistance in integrating environmental stewardship in your activities, contact the Directorate of Environment and Safety, at 678-2224/8731.

WILLIAM F. ENGEL
Brigadier General, USA
Commanding

DISTRIBUTION:
D, E, F, G, L

APPENDIX B
WSMR MAY 2011 COMMITMENTS TO USFWS

DEPARTMENT OF THE ARMY
U.S. ARMY GARRISON WHITE SANDS
100 Headquarters Avenue
WHITE SANDS MISSILE RANGE, NEW MEXICO 88002-5000

REPLY TO
ATTENTION OF

Directorate of Public Works

MAY 26 2011

Mr. Delivan J. Roper
Office of Law Enforcement
U.S. Fish and Wildlife Service
5686 Santa Gertrudis Drive
Las Cruces, NM 88012

Dear Mr. Roper:

I have enclosed the summary report, "Migratory Bird Injuries and Mortalities in 2010 at White Sands Missile Range, New Mexico". This is a summary of mortalities already reported to you by my staff via email or telephone as they occurred throughout the year. We have also summarized remediation efforts that were undertaken in response to these mortalities.

White Sands is taking the following steps regarding the range wide bird electrocutions at power poles and ground banks:

1. The Range will continue to retrofit all poles that shock or kill a bird.

2. A work request has been submitted to upgrade all 27 ground banks to ensure they are bird-safe. WSMR is currently estimating the cost of this work.

3. We are currently scoping and estimating costs for a range wide power pole and bird carcass survey to be completed in 2011.

4. We have requested funding for an Avian Protection Plan to be written after the power pole and carcass survey is complete. The plan will identify and prioritize lines and banks that need to be remediated and will outline plans for upgrading all hazardous lines within 10 years. The highest priorities for remediation will be those which pass through golden eagle habitat.

5. Large scale work to remediate power lines will be initiated after completion of the Avian Protection Plan.

I am forwarding a copy of this letter to Mr. Bill Howe, US Fish and Wildlife Service, Albuquerque, New Mexico.

White Sands Missile Range will continue to collect data on injured and dead birds, and to report them to your office as they occur. If you have any questions or need additional information please contact Ms. Trish Cutler, Environmental Stewardship Branch, at (575) 678-2225.

Sincerely,

Thomas A. Ladd

Thomas A. Ladd
Director, Public Works

Enclosure

APPENDIX C
FEDERAL AND STATE PERMIT APPLICATIONS

WHAT YOU SHOULD KNOW ABOUT A FEDERAL MIGRATORY BIRD SPECIAL PURPOSE SALVAGE PERMIT

A Federal Migratory Bird Special Purpose Salvage permit will authorize you to collect dead migratory birds, nests, eggs and parts from the wild that you had no part in the killing or death thereof, for wildlife conservation education purposes. You should review Title 50 Parts 10, 13 and 21.27 of the Code of Federal Regulations (CFR). **You are responsible for reviewing and understanding these regulations before you request and accept a permit.** These regulations can be found on our website at: http://www.fws.gov/permits/ltr/ltr.html.

1. Can I salvage migratory birds for personal use?

No. This permit does not allow anyone to salvage or possess migratory birds for personal use. All migratory birds salvaged must be transferred to a public scientific or educational institution, zoological park, museum or scientific society as defined in 50 CFR 10 or a Migratory Bird Special Purpose Possession permit issued under 50 CFR 21.27.

2. Do I need to tag the migratory birds I salvage?

Yes. Each migratory bird salvaged must be tagged. Each tag should include the following information:
(a) Date and location specimen of salvaged, and
(b) Name of person who salvaged the specimen
The permit number under which the specimen was salvaged must be recorded in the permanent accession record.

3. How long may I retain birds in my possession before transferring them to a designated repository?

All migratory birds salvaged must be deposited with a repository designated on your permit within 6 months of acquisition and/or by December 31 of that calendar year.

4. Do I need additional authorization to salvage migratory birds on Federal or State lands or private property?

Yes. This permit does not authorize you to salvage specimens on Federal or State lands or other public or private property without additional prior written authorization, permission, or permits from the appropriate Federal or State agency, landowner, or custodian.

5. Do I need a State permit to salvage migratory birds?

Your Federal salvage permit is not valid unless you are also in compliance with State requirements. This means that if your State requires you to have a permit to salvage birds, you must hold a valid State permit in order for your Federal permit to be valid. It is your responsibility to make sure you comply with State permit requirements.

6. What is required to transfer my permit to a new location?

Any address change or other circumstances that affect your permit must be reported to your Regional Migratory Bird Permit Office in writing within 10 days so your permit can be amended. (See 50 CFR 13.23)

7. Will I be required to keep records of my activities?

Yes. You must maintain accurate records of operations on a calendar-year basis. Your records should include the species that is salvaged, date salvaged, the city or county and State where the bird was salvaged and the final disposition of the specimen.

8. Will anyone inspect my records or salvage activities?

By accepting a Federal Special Purpose Salvage permit, you authorize an agent of the Service to enter your premises at any reasonable hour to inspect the wildlife you hold, your books and records. (See 50 CFR 13.47)

9. Will I be required to submit an annual report of activities?

Yes. You will receive an annual report form from your Regional Migratory Bird Permit Office. The report form can also be found on our website at: http://www.fws.gov/forms/3-202-3.pdf. -This report must be completed

and submitted to your issuing office by January 31 of each year.

10. How do I renew my permit?

A renewal letter or form and annual report form will be sent to you at least 60 days prior to the expiration of your permit. If you wish to renew your permit, you must return the completed renewal to your Regional Migratory Bird Permit Office at least 30 days prior to the expiration of your permit and include a copy of your current State permit, if one is required. If we receive your renewal request at least 30 days prior to the expiration of your permit, your permit will remain valid beyond the expiration date for the activity authorized on your permit until a decision on your renewal is made. If we receive your renewal request fewer than 30 days prior to expiration of your permit and we are unable to process your request before the expiration date, your permit will expire and you will no longer be covered for your activity. If you allow your permit to expire before requesting renewal, you may be required to submit a new application. (See 50 CFR 13.22 and 13.11(c))

(3-200-10a) 9/30/2010

Department of the Interior
U.S. Fish and Wildlife Service

Expires 02/28/2014
OMB No. 1018-0022

Federal Fish and Wildlife Permit Application Form

Click here for addresses.

Return to: U.S. Fish and Wildlife Service (USFWS)

Type of Activity: Special Purpose – Salvage

_____ New Application
_____ Requesting Renewal/Amendment of Permit # _____

Complete Sections A or B, and C, D, and E of this application. U.S. address may be required in Section C, see instructions for details.
See attached instruction pages for information on how to make your application complete and help avoid unnecessary delays.

A. Complete if applying as an individual			
1.a. Last name	1.b. First name	1.c. Middle name or initial	1.d. Suffix
2. Date of birth (mm/dd/yyyy)	3. Social Security No.	4. Occupation	5. Affiliation/ Doing business as (see instructions)
6.a. Telephone number	6.b. Alternate telephone number	6.c. Fax number	6.d. E-mail address

B. Complete if applying on behalf of a business, corporation, public agency, tribe, or institution			
1.a. Name of business, agency, tribe, or institution	1.b. Doing business as (dba)		
2. Tax identification no.	3. Description of business, agency, or institution		
4.a. Principal officer Last name	4.b. Principal officer First name	4.c. Principal officer Middle name/ initial	4.d. Suffix
5. Principal officer title	6. Primary contact		
7.a. Business telephone number	7.b. Alternate telephone number	7.c. Business fax number	7.d. Business e-mail address

C. All applicants complete address information				
1.a. Physical address (Street address; Apartment #, Suite #, or Room #; no P.O. Boxes)				
1.b. City	1.c. State	1.d. Zip code/Postal code:	1.e. County/Province	1.f. Country
2.a. Mailing Address (include if different than physical address; include name of contact person if applicable)				
2.b. City	2.c. State	2.d. Zip code/Postal code:	2.e. County/Province	2.f. Country

D. All applicants MUST complete

1. Attach check or money order payable to the U.S. FISH AND WILDLIFE SERVICE **in the amount** **$75.00**. Federal, tribal, State, and local government agencies, and those acting on behalf of such agencies, are exempt from the processing fee – ***attach documentation of fee exempt status as outlined in instructions.*** (50 CFR 13.11(d))

2. Do you currently have or have you ever had any Federal Fish and Wildlife permits?
Yes ☐ If yes, list the number of the most current permit you have held or that you are applying to renew/re-issue: _____ No ☐

3. Certification: I hereby certify that I have read and am familiar with the regulations contained in ***Title 50, Part 13 of the Code of Federal Regulations*** and the other ***applicable parts in subchapter B of Chapter I of Title 50***, and I certify that the information submitted in this application for a permit is complete and accurate to the best of my knowledge and belief. I understand that any false statement herein may subject me to the criminal penalties of 18 U.S.C. 1001.

_____
Signature (**in blue ink**) of applicant/person responsible for permit (No photocopied or stamped signatures) Date of signature (mm/dd/yyyy)

Please continue to next page

E. SPECIAL PURPOSE – SALVAGE
(Migratory Bird Treaty Act, 50 CFR 21.27)

Note: ***A Federal Special Purpose Salvage Permit is required to salvage migratory birds that you find dead and had no part in killing. The permit authorizes temporary possession of the dead specimens for transport to a designated public, scientific, or educational institution. Possession for personal use is prohibited. You must be at least 18 years old to apply. Please read "What You Should Know About A Migratory Bird Special Purpose Salvage Permit" and the pertinent regulations before you sign and submit your application.***

Please provide the following information in the space provided or numbered according to the questions below on a separate sheet of paper. Be as specific as possible in your responses. If you are requesting renewal, you only need to provide information that has changed since your prior application.

1. Describe the project or activity for which you require this permit, including the location or area where you propose to salvage.

2. Identify the public, scientific, or educational institution where the migratory birds salvaged under this permit will be deposited. If the specimens will be deposited with an institution other than your own, attach a letter, on the institution's letterhead, from the Director or Principal Officer of the institution where the salvaged materials will be deposited. The letter must confirm the institution's need for the specimens, that they want you to salvage for them, and describe how they will be used.

_____

_____

_____

3. Anyone who will be assisting you with the permitted activities or acting as your agent must either have their own Federal migratory bird permit for the activity or be identified by you, in writing, as a subpermittee under your permit. They may also require a State permit. Subpermittees must be at least 18 years old. As the primary permittee, you will be responsible for ensuring that your subpermittees are properly trained and adhere to the terms of your permit. Provide the name of anyone besides yourself who will be conducting activities under your permit.

_____

_____

_____

4. You must retain records relating to the activities conducted under your permit for at least 5 years after the date of expiration of your permit. Is the physical address you provided in Section C on page 1 of this application the address where your records will be kept? _____ Yes _____ No If "no", provide the physical address.

_____

5. **Any permit issued as a result of this application is not valid unless you also have any required State or tribal permits or approvals associated with the activity.** Have you obtained all required State or tribal permits or approvals to conduct this activity?

_____Yes If "yes", attach a copy of the approval(s). _____ Have applied **(Send copy when issued)** _____ None required

PERMIT APPLICATION FORM INSTRUCTIONS

The following instructions pertain to an application for a U.S. Fish and Wildlife Service or CITES permit. The General Permit Procedures in 50 CFR 13 address the permitting process. For simplicity, all licenses, permits, registrations, and certificates are referred to as a permit.

GENERAL INSTRUCTIONS:

- Complete all blocks/lines/questions in Sections A or B, and C, D, and E.
- **An incomplete application may cause delays in processing or may be returned to the applicant. Be sure you are filling in the appropriate application form for the proposed activity.**
- Print clearly or type in the information. Illegible applications may cause delays.
- Sign the application in blue ink. Faxes or copies of the original signature will not be accepted.
- Mail the original application to the address at the top of page one of the application or if applicable on the attached address list.
- **Keep a copy of your completed application.**
- **Please plan ahead. Allow at least 60 days for your application to be processed. Some applications may take longer than 90 days to process. (50 CFR 13.11)**
- Applications are processed in the order they are received.
- Additional forms and instructions are available from http://permits.fws.gov.

COMPLETE EITHER SECTION A OR SECTION B:

Section A. **Complete if applying as an individual:**

- Enter the complete name of the responsible individual who will be the permittee if a permit is issued. Enter personal information that identifies the applicant. ***Fax and e-mail are not required if not available.***
- If you are applying on behalf of a client, the personal information must pertain to the client, and a document evidencing power of attorney must be included with the application.
- **Affiliation/ Doing business as (dba)**: business, agency, organizational, or institutional affiliation *directly* related to the activity requested in the application (e.g., a taxidermist is an individual whose business can *directly* relate to the requested activity). The Division of Management Authority (DMA) will **not** accept *doing business as* affiliations for individuals.

Section B. **Complete if applying as a business, corporation, public agency, tribe, or institution:**

- Enter the complete name of the business, agency, tribe, or institution that will be the permittee if a permit is issued. Give a brief description of the type of business the applicant is engaged in. Provide contact phone number(s) of the business.
- **Principal Officer** is the person in charge of the listed business, corporation, public agency, tribe, or institution. The principal officer is the person responsible for the application and any permitted activities. Often the principal officer is a Director or President. **Primary Contact** is the person at the business, corporation, public agency, tribe, or institution who will be available to answer questions about the application or permitted activities. Often this is the preparer of the application.

ALL APPLICANTS COMPLETE SECTION C:

- For all applications submitted to the Division of Management Authority (DMA) a physical U.S. address is **required**. Province and Country blocks are provided for those USFWS programs which use foreign addresses and are not required by DMA.
- **Mailing address** is address where communications from USFWS should be mailed if different than applicant's physical address.

ALL APPLICANTS COMPLETE SECTION D:

Section D.1 **Application processing fee:**

- An application processing fee is required at the time of application; unless exempted under 50 CFR13.11(d)(3). The application processing fee is assessed to partially cover the cost of processing a request. **The fee does not guarantee the issuance of a permit. Fees will not be refunded for applications that are approved, abandoned, or denied**. We may return fees for withdrawn applications prior to any significant processing occurring.
- **Documentation of fee exempt status is not required for Federal, tribal, State, or local government agencies; but must be supplied by those applicants acting on behalf of such agencies**. Those applicants acting on behalf of such agencies must submit a letter on agency letterhead and signed by the head of the unit of government for which the applicant is acting on behalf, confirming that the applicant will be carrying out the permitted activity for the agency.

Section D.2 **Federal Fish and Wildlife permits:**

- List the number(s) of your most current FWS or CITES permit or the number of the most recent permit if none are currently valid. If applying for re-issuance of a CITES permit, the original permit must be returned with this application.

Section D.3 **CERTIFICATION:**

- **The individual identified in Section A, the principal officer named in Section B, or person with a valid power of attorney (documentation must be included in the application) must sign and date the application in blue ink.** This signature binds the applicant to the statement of certification. This means that you certify that you have read and understand the regulations that apply to the permit. You also certify that everything included in the application is true to the best of your knowledge. Be sure to read the statement and re-read the application and your answers before signing.

ALL APPLICANTS MUST COMPLETE SECTION E.

Please continue to next page

APPLICATION FOR A FEDERAL FISH AND WILDLIFE PERMIT
Paperwork Reduction Act, Privacy Act, and Freedom of Information Act – Notices

In accordance with the Paperwork Reduction Act of 1995 (44 U.S.C. 3501, *et seq.*) and the Privacy Act of 1974 (5 U.S.C. 552a), please be advised:

1. The gathering of information on fish and wildlife is authorized by:
(Authorizing statutes can be found at: http://www.gpoaccess.gov/cfr/index.html and http://www.fws.gov/permits/ltr/ltr.html.)

   a. Bald and Golden Eagle Protection Act (16 U.S.C. 668), 50 CFR 22;
   b. Endangered Species Act of 1973 (16 U.S.C. 1531-1544), 50CFR 17;
   c. Migratory Bird Treaty Act (16 U.S.C. 703-712), 50 CFR 21;
   d. Marine Mammal Protection Act of 1972 (16 U.S.C. 1361, *et. seq*.), 50 CFR 18;
   e. Wild Bird Conservation Act (16 U.S.C. 4901-4916), 50 CFR 15;
   f. Lacey Act: Injurious Wildlife (18 U.S.C. 42), 50 CFR 16;
   g. Convention on International Trade in Endangered Species of Wild Fauna and Flora (TIAS 8249), http://www.cites.org , 50 CFR 23;
   h. General Provisions, 50 CFR 10;
   i. General Permit Procedures, 50 CFR 13; and
   j. Wildlife Provisions (Import/export/transport), 50 CFR 14.

2. Information requested in this form is purely voluntary. However, submission of requested information is required in order to process applications for permits authorized under the above laws. Failure to provide all requested information may be sufficient cause for the U.S. Fish and Wildlife Service to deny the request. We may not conduct or sponsor and you are not required to respond to a collection of information unless it displays a currently valid OMB control number.

3. Certain applications for permits authorized under the Endangered Species Act of 1973 (16 U.S.C. 1539) and the Marine Mammal Protection Act of 1972 (16 U.S.C. 1374) will be published in the **Federal Register** as required by the two laws.

4. Disclosures outside the Department of the Interior may be made without the consent of an individual under the routine uses listed below, if the disclosure is compatible with the purposes for which the record was collected. (Ref. 68 FR 52611, September 4, 2003)

   a. Routine disclosure to subject matter experts, and Federal, tribal, State, local, and foreign agencies, for the purpose of obtaining advice relevant to making a decision on an application for a permit or when necessary to accomplish a FWS function related to this system of records.
   b. Routine disclosure to the public as a result of publishing **Federal Register** notices announcing the receipt of permit applications for public comment or notice of the decision on a permit application.
   c. Routine disclosure to Federal, tribal, State, local, or foreign wildlife and plant agencies for the exchange of information on permits granted or denied to assure compliance with all applicable permitting requirements.
   d. Routine disclosure to Captive-bred Wildlife registrants under the Endangered Species Act for the exchange of authorized species, and to share information on the captive breeding of these species.
   e. Routine disclosure to Federal, tribal, State, and local authorities who need to know who is permitted to receive and rehabilitate sick, orphaned, and injured birds under the Migratory Bird Treaty Act and the Bald and Golden Eagle Protection Act; federally permitted rehabilitators; individuals seeking a permitted rehabilitator with whom to place a bird in need of care; and licensed veterinarians who receive, treat, or diagnose sick, orphaned, and injured birds.
   f. Routine disclosure to the Department of Justice, or a court, adjudicative, or other administrative body or to a party in litigation before a court or adjudicative or administrative body, under certain circumstances.
   g. Routine disclosure to the appropriate Federal, tribal, State, local, or foreign governmental agency responsible for investigating, prosecuting, enforcing, or implementing statutes, rules, or licenses, when we become aware of a violation or potential violation of such statutes, rules, or licenses, or when we need to monitor activities associated with a permit or regulated use.
   h. Routine disclosure to a congressional office in response to an inquiry to the office by the individual to whom the record pertains.
   i. Routine disclosure to the General Accounting Office or Congress when the information is required for the evaluation of the permit programs.
   j. Routine disclosure to provide addresses obtained from the Internal Revenue Service to debt collection agencies for purposes of locating a debtor to collect or compromise a Federal claim against the debtor or to consumer reporting agencies to prepare a commercial credit report for use by the FWS.

5. For individuals, personal information such as home address and telephone number, financial data, and personal identifiers (social security number, birth date, etc.) will be removed prior to any release of the application.

6. The public reporting burden on the applicant for information collection varies depending on the activity for which a permit is requested. The relevant burden for a Special Purpose – Salvage permit application is 1 hour and 30 minutes for recordkeeping. This burden estimate includes time for reviewing instructions, gathering and maintaining data and completing and reviewing the form. You may direct comments regarding the burden estimate or any other aspect of the form to the Service Information Clearance Officer, U.S. Fish and Wildlife Service, Mail Stop 222, Arlington Square, U.S. Department of the Interior, 1849 C Street, NW, Washington D.C. 20240.

Freedom of Information Act – Notice

For organizations, businesses, or individuals operating as a business (i.e., permittees not covered by the Privacy Act), we request that you identify any information that should be considered privileged and confidential business information to allow the Service to meet its responsibilities under FOIA. Confidential business information must be clearly marked "Business Confidential" at the top of the letter or page and each succeeding page and must be accompanied by a non-confidential summary of the confidential information. The non-confidential summary and remaining documents may be made available to the public under FOIA [43 CFR 2.13(c)(4), 43 CFR 2.15(d)(1)(i)].

U.S. Fish & Wildlife Service

Migratory Bird Regional Permit Offices

FWS REGION	AREA OF RESPONSIBILITY	MAILING ADDRESS	CONTACT INFORMATION
Region 1	**Hawaii, Idaho, Oregon, Washington**	911 N.E. 11th Avenue Portland, OR 97232-4181	Tel. (503) 872-2715 Fax (503) 231-2019 Email *permitsR1MB@fws.gov*
Region 2	**Arizona, New Mexico, Oklahoma, Texas**	P.O. Box 709 Albuquerque, NM 87103	Tel. (505) 248-7882 Fax (505) 248-7885 Email *permitsR2MB@fws.gov*
Region 3	**Iowa, Illinois, Indiana, Minnesota, Missouri, Michigan, Ohio, Wisconsin**	5600 America Blvd. West Suite 990 Bloomington, MN 55437-1458 (Effective 5/31/2011)	Tel. (612) 713-5436 Fax (612) 713-5393 Email *permitsR3MB@fws.gov*
Region 4	**Alabama, Arkansas, Florida, Georgia, Kentucky, Louisiana, Mississippi, North Carolina, South Carolina, Tennessee, Virgin Islands, Puerto Rico**	P.O. Box 49208 Atlanta, GA 30359	Tel. (404) 679-7070 Fax (404) 679-4180 Email *permitsR4MB@fws.gov*
Region 5	**Connecticut, District of Columbia, Delaware, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, Virginia, Vermont, West Virginia**	P.O. Box 779 Hadley, MA 01035-0779	Tel. (413) 253-8643 Fax (413) 253-8424 Email *permitsR5MB@fws.gov*
Region 6	**Colorado, Kansas, Montana, North Dakota, Nebraska, South Dakota, Utah, Wyoming**	P.O. Box 25486 DFC(60154) Denver, CO 80225-0486	Tel. (303) 236-8171 Fax (303) 236-8017 Email *permitsR6MB@fws.gov*
Region 7	**Alaska**	1011 E. Tudor Road (MS-201) Anchorage, AK 99503	Tel. (907) 786-3693 Fax (907) 786-3641 Email *permitsR7MB@fws.gov*
Region 8	**California, Nevada**	2800 Cottage Way Sacramento, CA 95825	Tel. (916) 978-6183 Fax (916) 414-6486 Email*permitsR8MB@fws.gov*

Department of the Interior
U.S. Fish and Wildlife Service

OMB Control No. 1018 - 0022
Expires 02/28/2014

Federal Fish and Wildlife Permit Application Form

Click here for addresses.

Return to: U.S. Fish and Wildlife Service (USFWS)

Type of Activity: Special Purpose – Miscellaneous

____ New Application

____ Requesting Renewal or Amendment of Permit # _____

Complete Sections A or B, and C, D, and E of this application. U.S. address may be required in Section C, see instructions for details.
See attached instruction pages for information on how to make your application complete and help avoid unnecessary delays.

A. Complete if applying as an individual

1.a. Last name	1.b. First name	1.c. Middle name or initial	1.d. Suffix

2. Date of birth (mm/dd/yyyy)	3. Social Security No.	4. Occupation	5. Affiliation/ Doing business as (see instructions)

6.a. Telephone number	6.b. Alternate telephone number	6.c. Fax number	6.d. E-mail address

B. Complete if applying on behalf of a business, corporation, public agency, tribe, or institution

1.a. Name of business, agency, tribe, or institution	1.b. Doing business as (dba)

2. Tax identification no.	3. Description of business, agency, or institution

4.a. Principal officer Last name	4.b. Principal officer First name	4.c. Principal officer Middle name/ initial	4.d. Suffix

5. Principal officer title	6. Primary contact

7.a. Business telephone number	7.b. Alternate telephone number	7.c. Business fax number	7.d. Business e-mail address

C. All applicants complete address information

1.a. Physical address (Street address; Apartment #, Suite #, or Room #; no P.O. Boxes)				
1.b. City	**1.c. State**	**1.d. Zip code/Postal code:**	**1.e. County/Province**	**1.f. Country**

2.a. Mailing Address (include if different than physical address; include name of contact person if applicable)				
2.b. City	**2.c. State**	**2.d. Zip code/Postal code:**	**2.e. County/Province**	**2.f. Country**

D. All applicants MUST complete

1. Attach check or money order payable to the U.S. FISH AND WILDLIFE SERVICE **in the amount** **$100.00** . Federal, tribal, State, and local government agencies, and those acting on behalf of such agencies, are exempt from the processing fee – ***attach documentation of fee exempt status as outlined in instructions.*** (50 CFR 13.11(d))

2. Do you currently have or have you ever had any Federal Fish and Wildlife permits?
Yes ☐ If yes, list the number of the most current permit you have held or that you are applying to renew/re-issue: _____ No ☐

3. Certification: I hereby certify that I have read and am familiar with the regulations contained in ***Title 50, Part 13 of the Code of Federal Regulations*** and the other ***applicable parts in subchapter B of Chapter I of Title 50***, and I certify that the information submitted in this application for a permit is complete and accurate to the best of my knowledge and belief. I understand that any false statement herein may subject me to the criminal penalties of 18 U.S.C. 1001.

_____
Signature (**in blue ink**) of applicant/person responsible for permit (No photocopied or stamped signatures) Date of signature (mm/dd/yyyy)

Please continue to next page

E. SPECIAL PURPOSE - MISCELLANEOUS
(Migratory Bird Treaty Act, 50 CFR 21.27)

***Note**: A Federal Special Purpose - Miscellaneous permit is required to address migratory bird activities that are not covered by other existing permit types. Activities must benefit the migratory bird resource, address important research, address human concerns for individual birds, or show other compelling justification. You must be at least 18 years of age to apply for a permit. Special Purpose Permits may be valid up to 3 years.*

Please provide the following information numbered according to the questions below on a separate sheet of paper. Be specific as specific as possible in your responses. If you are requesting renewal, you only need to provide information that has changed since your last permit.

1. The species (scientific and common name) and quantity of migratory birds, parts, nests, and eggs to be covered by the permit.

2. A detailed description of the project or activity, including the purpose. Include copies of supporting documentation, research proposals, and any other information that may be useful for evaluating your request.

3. The exact location (physical – address and/or GPS coordinates in decimal degree; or geographic, as appropriate) where the activity would be conducted.

4. A full description of your background and expertise in conducting the proposed activities.

5. If live birds will be maintained in captivity, describe the facilities. Attach photographs and diagrams of your enclosures. Diagrams must include dimensions (length, width, and height) and a description of interior and exterior construction materials, such as flooring and netting materials.

6. Indicate the intended disposition of the specimens, including, if applicable, the name and address of the public, scientific, or educational institution to which all specimens ultimately will be donated upon completion of activity.

7. Anyone who will be assisting you with the permitted activities or acting as your agent must either have their own Federal migratory bird permit for the activity or be identified by you, in writing, as a subpermittee under your permit. They may also require a State permit. Subpermittees must be at least 18 years old. As the primary permittee, you will be responsible for ensuring that your subpermittees are properly trained and adhere to the terms of your permit. Provide the name of anyone besides yourself who will be conducting activities under your permit. For anyone handling or caring for live birds, briefly describe what they will be doing and their qualifications.

8. You must retain records relating to the activities conducted under your permit for at least 5 years from the date of expiration of your permit. Is the physical address you provided in Section C on page 1 of this application the address where your records will be kept? ____ Yes ____ No If no, provide the physical address.

_____

9. **Any permit issued as a result of this application is not valid unless you also have any required State or tribal permits or approvals associated with the activity.** Have you obtained all required State or tribal permits or approvals to conduct this activity?

____ Yes If "yes", attach a copy of the approval(s). ____ Have applied **(Send copy when issued)** ____None required

PERMIT APPLICATION FORM INSTRUCTIONS

The following instructions pertain to an application for a U.S. Fish and Wildlife Service or CITES permit. The General Permit Procedures in 50 CFR 13 address the permitting process. For simplicity, all licenses, permits, registrations, and certificates are referred to as a permit.

GENERAL INSTRUCTIONS:

- Complete all blocks/lines/questions in Sections A or B, and in C, D, and E.
- **An incomplete application may cause delays in processing or may be returned to the applicant. Be sure you are filling in the appropriate application form for the proposed activity.**
- Print clearly or type in the information. Illegible applications may cause delays.
- Sign the application in blue ink. Faxes or copies of the original signature will not be accepted.
- Mail the original application to the address at the top of page one of the application or if applicable on the attached address list.
- **Keep a copy of your completed application.**
- **Please plan ahead. Allow at least 60 days for your application to be processed. Some applications may take longer than 90 days to process. (50 CFR 13.11)**
- Applications are processed in the order they are received.
- Additional forms and instructions are available from http://permits.fws.gov.

COMPLETE EITHER SECTION A OR SECTION B:

Section A. **Complete if applying as an individual:**

- Enter the complete name of the responsible individual who will be the permittee if a permit is issued. Enter personal information that identifies the applicant. ***Fax and e-mail are not required if not available.***
- If you are applying on behalf of a client, the personal information must pertain to the client, and a document evidencing power of attorney must be included with the application.
- **Affiliation/ Doing business as (dba)**: business, agency, organizational, or institutional affiliation *directly* related to the activity requested in the application (e.g., a taxidermist is an individual whose business can *directly* relate to the requested activity). The Division of Management Authority (DMA) will **not** accept *doing business as* affiliations for individuals.

Section B. **Complete if applying as a business, corporation, public agency, tribe, or institution:**

- Enter the complete name of the business, agency, tribe, or institution that will be the permittee if a permit is issued. Give a brief description of the type of business the applicant is engaged in. Provide contact phone number(s) of the business.
- **Principal Officer** is the person in charge of the listed business, corporation, public agency, tribe, or institution. The principal officer is the person responsible for the application and any permitted activities. Often the principal officer is a Director or President. **Primary Contact** is the person at the business, corporation, public agency, tribe, or institution who will be available to answer questions about the application or permitted activities. Often this is the preparer of the application.

ALL APPLICANTS COMPLETE SECTION C:

- For all applications submitted to the Division of Management Authority (DMA) a physical U.S. address is **required**. Province and Country blocks are provided for those USFWS programs which use foreign addresses and are not required by DMA.
- **Mailing address** is address where communications from USFWS should be mailed if different than applicant's physical address.

ALL APPLICANTS COMPLETE SECTION D:

Section D.1 **Application processing fee:**

- An application processing fee is required at the time of application; unless exempted under 50 CFR13.11(d)(3). The application processing fee is assessed to partially cover the cost of processing a request. **The fee does not guarantee the issuance of a permit. Fees will not be refunded for applications that are approved, abandoned, or denied**. We may return fees for withdrawn applications prior to any significant processing occurring.
- **Documentation of fee exempt status is not required for Federal, tribal, State, or local government agencies; but must be supplied by those applicants acting on behalf of such agencies**. Those applicants acting on behalf of such agencies must submit a letter on agency letterhead and signed by the head of the unit of government for which the applicant is acting on behalf, confirming that the applicant will be carrying out the permitted activity for the agency.

Section D.2 **Federal Fish and Wildlife permits:**

- List the number(s) of your most current FWS or CITES permit or the number of the most recent permit if none are currently valid. If applying for re-issuance of a CITES permit, the original permit must be returned with this application.

Section D.3 **CERTIFICATION:**

- **The individual identified in Section A, the principal officer named in Section B, or person with a valid power of attorney (documentation must be included in the application) must sign and date the application in blue ink.** This signature binds the applicant to the statement of certification. This means that you certify that you have read and understand the regulations that apply to the permit. You also certify that everything included in the application is true to the best of your knowledge. Be sure to read the statement and re-read the application and your answers before signing.

ALL APPLICANTS COMPLETE SECTION E.

Please continue to next page

APPLICATION FOR A FEDERAL FISH AND WILDLIFE PERMIT
Paperwork Reduction Act, Privacy Act, and Freedom of Information Act – Notices

In accordance with the Paperwork Reduction Act of 1995 (44 U.S.C. 3501, *et seq.*) and the Privacy Act of 1974 (5 U.S.C. 552a), please be advised:

1. The gathering of information on fish and wildlife is authorized by:
(Authorizing statutes can be found at: http://www.gpoaccess.gov/cfr/index.html and http://www.fws.gov/permits/ltr/ltr.html.)

   a. Bald and Golden Eagle Protection Act (16 U.S.C. 668), 50 CFR 22;
   b. Endangered Species Act of 1973 (16 U.S.C. 1531-1544), 50CFR 17;
   c. Migratory Bird Treaty Act (16 U.S.C. 703-712), 50 CFR 21;
   d. Marine Mammal Protection Act of 1972 (16 U.S.C. 1361, *et. seq*.), 50 CFR 18;
   e. Wild Bird Conservation Act (16 U.S.C. 4901-4916), 50 CFR 15;
   f. Lacey Act: Injurious Wildlife (18 U.S.C. 42), 50 CFR 16;
   g. Convention on International Trade in Endangered Species of Wild Fauna and Flora (TIAS 8249), http://www.cites.org , 50 CFR 23;
   h. General Provisions, 50 CFR 10;
   i. General Permit Procedures, 50 CFR 13; and
   j. Wildlife Provisions (Import/export/transport), 50 CFR 14.

2. Information requested in this form is purely voluntary. However, submission of requested information is required in order to process applications for permits authorized under the above laws. Failure to provide all requested information may be sufficient cause for the U.S. Fish and Wildlife Service to deny the request. We may not conduct or sponsor and you are not required to respond to a collection of information unless it displays a currently valid OMB control number.

3. Certain applications for permits authorized under the Endangered Species Act of 1973 (16 U.S.C. 1539) and the Marine Mammal Protection Act of 1972 (16 U.S.C. 1374) will be published in the **Federal Register** as required by the two laws.

4. Disclosures outside the Department of the Interior may be made without the consent of an individual under the routine uses listed below, if the disclosure is compatible with the purposes for which the record was collected. (Ref. 68 FR 52611, September 4, 2003)

   a. Routine disclosure to subject matter experts, and Federal, tribal, State, local, and foreign agencies, for the purpose of obtaining advice relevant to making a decision on an application for a permit or when necessary to accomplish a FWS function related to this system of records.
   b. Routine disclosure to the public as a result of publishing **Federal Register** notices announcing the receipt of permit applications for public comment or notice of the decision on a permit application.
   c. Routine disclosure to Federal, tribal, State, local, or foreign wildlife and plant agencies for the exchange of information on permits granted or denied to assure compliance with all applicable permitting requirements.
   d. Routine disclosure to Captive-bred Wildlife registrants under the Endangered Species Act for the exchange of authorized species, and to share information on the captive breeding of these species.
   e. Routine disclosure to Federal, tribal, State, and local authorities who need to know who is permitted to receive and rehabilitate sick, orphaned, and injured birds under the Migratory Bird Treaty Act and the Bald and Golden Eagle Protection Act; federally permitted rehabilitators; individuals seeking a permitted rehabilitator with whom to place a bird in need of care; and licensed veterinarians who receive, treat, or diagnose sick, orphaned, and injured birds.
   f. Routine disclosure to the Department of Justice, or a court, adjudicative, or other administrative body or to a party in litigation before a court or adjudicative or administrative body, under certain circumstances.
   g. Routine disclosure to the appropriate Federal, tribal, State, local, or foreign governmental agency responsible for investigating, prosecuting, enforcing, or implementing statutes, rules, or licenses, when we become aware of a violation or potential violation of such statutes, rules, or licenses, or when we need to monitor activities associated with a permit or regulated use.
   h. Routine disclosure to a congressional office in response to an inquiry to the office by the individual to whom the record pertains.
   i. Routine disclosure to the General Accounting Office or Congress when the information is required for the evaluation of the permit programs.
   j. Routine disclosure to provide addresses obtained from the Internal Revenue Service to debt collection agencies for purposes of locating a debtor to collect or compromise a Federal claim against the debtor or to consumer reporting agencies to prepare a commercial credit report for use by the FWS.

5. For individuals, personal information such as home address and telephone number, financial data, and personal identifiers (social security number, birth date, etc.) will be removed prior to any release of the application.

6. The public reporting burden on the applicant for information collection varies depending on the activity for which a permit is requested. The relevant burden for a Special Purpose – Miscellaneous permit application is 2 hours and 30 minutes for recordkeeping. This burden estimate includes time for reviewing instructions, gathering and maintaining data and completing and reviewing the form. You may direct comments regarding the burden estimate or any other aspect of the form to the Service Information Clearance Officer, U.S. Fish and Wildlife Service, Mail Stop 222, Arlington Square, U.S. Department of the Interior, 1849 C Street, NW, Washington D.C. 20240.

Freedom of Information Act – Notice

For organizations, businesses, or individuals operating as a business (i.e., permittees not covered by the Privacy Act), we request that you identify any information that should be considered privileged and confidential business information to allow the Service to meet its responsibilities under FOIA. Confidential business information must be clearly marked "Business Confidential" at the top of the letter or page and each succeeding page and must be accompanied by a non-confidential summary of the confidential information. The non-confidential summary and remaining documents may be made available to the public under FOIA [43 CFR 2.13(c)(4), 43 CFR 2.15(d)(1)(i)].

U.S. Fish & Wildlife Service

Migratory Bird Regional Permit Offices

FWS REGION	AREA OF RESPONSIBILITY	MAILING ADDRESS	CONTACT INFORMATION
Region 1	**Hawaii, Idaho, Oregon, Washington**	911 N.E. 11th Avenue Portland, OR 97232-4181	Tel. (503) 872-2715 Fax (503) 231-2019 Email *permitsR1MB@fws.gov*
Region 2	**Arizona, New Mexico, Oklahoma, Texas**	P.O. Box 709 Albuquerque, NM 87103	Tel. (505) 248-7882 Fax (505) 248-7885 Email *permitsR2MB@fws.gov*
Region 3	**Iowa, Illinois, Indiana, Minnesota, Missouri, Michigan, Ohio, Wisconsin**	5600 America Blvd. West Suite 990 Bloomington, MN 55437-1458 (Effective 5/31/2011)	Tel. (612) 713-5436 Fax (612) 713-5393 Email *permitsR3MB@fws.gov*
Region 4	**Alabama, Arkansas, Florida, Georgia, Kentucky, Louisiana, Mississippi, North Carolina, South Carolina, Tennessee, Virgin Islands, Puerto Rico**	P.O. Box 49208 Atlanta, GA 30359	Tel. (404) 679-7070 Fax (404) 679-4180 Email *permitsR4MB@fws.gov*
Region 5	**Connecticut, District of Columbia, Delaware, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, Virginia, Vermont, West Virginia**	P.O. Box 779 Hadley, MA 01035-0779	Tel. (413) 253-8643 Fax (413) 253-8424 Email *permitsR5MB@fws.gov*
Region 6	**Colorado, Kansas, Montana, North Dakota, Nebraska, South Dakota, Utah, Wyoming**	P.O. Box 25486 DFC(60154) Denver, CO 80225-0486	Tel. (303) 236-8171 Fax (303) 236-8017 Email *permitsR6MB@fws.gov*
Region 7	**Alaska**	1011 E. Tudor Road (MS-201) Anchorage, AK 99503	Tel. (907) 786-3693 Fax (907) 786-3641 Email *permitsR7MB@fws.gov*
Region 8	**California, Nevada**	2800 Cottage Way Sacramento, CA 95825	Tel. (916) 978-6183 Fax (916) 414-6486 Email*permitsR8MB@fws.gov*

Department of the Interior
U.S. Fish and Wildlife Service

OMB Control No. 1018 - 0022
Expires 02/28/2014

Federal Fish and Wildlife Permit Application Form

Click here for addresses.

Return to: U.S. Fish and Wildlife Service (USFWS)

Type of Activity: **Migratory Bird Depredation Permit**

_____ New Application
_____ Requesting Renewal or Amendment of Permit #_____

Complete Sections A or B, and C, D, and E of this application. U.S. address may be required in Section C, see instructions for details.
See attached instruction pages for information on how to make your application complete and help avoid unnecessary delays.

A. Complete if applying as an individual

1.a. Last name	1.b. First name	1.c. Middle name or initial	1.d. Suffix

2. Date of birth (mm/dd/yyyy)	3. Social Security No.	4. Occupation	5. Affiliation/ Doing business as (see instructions)

6.a. Telephone number	6.b. Alternate telephone number	6.c. Fax number	6.d. E-mail address

B. Complete if applying on behalf of a business, corporation, public agency, tribe, or institution

1.a. Name of business, agency, tribe, or institution	1.b. Doing business as (dba)

2. Tax identification no.	3. Description of business, agency, or institution

4.a. Principal officer Last name	4.b. Principal officer First name	4.c. Principal officer Middle name/ initial	4.d. Suffix

5. Principal officer title	6. Primary contact

7.a. Business telephone number	7.b. Alternate telephone number	7.c. Business fax number	7.d. Business e-mail address

C. All applicants complete address information

1.a. Physical address (Street address; Apartment #, Suite #, or Room #; no P.O. Boxes)				
1.b. City	**1.c. State**	**1.d. Zip code/Postal code:**	**1.e. County/Province**	**1.f. Country**

2.a. Mailing Address (include if different than physical address; include name of contact person if applicable)				
2.b. City	**2.c. State**	**2.d. Zip code/Postal code:**	**2.e. County/Province**	**2.f. Country**

D. All applicants MUST complete

1. Attach check or money order payable to the U.S. FISH AND WILDLIFE SERVICE **in the amount of $100.00 if you are applying for a new permit or $50.00 if you are requesting a substantaive amendment to your existing permit. If you are a homeowner requesting a permit for damage to your personal residence or property, attach $50.00**. Federal, tribal, State, and local government agencies, and those acting on behalf of such agencies, are exempt from the processing fee – ***attach documentation of fee exempt status as outlined in instructions.*** (50 CFR 13.11(d))

2. Do you currently have or have you ever had any Federal Fish and Wildlife permits?
Yes ☐ If yes, list the number of the most current permit you have held or that you are applying to renew/re-issue: _____ No ☐

3. Certification: I hereby certify that I have read and am familiar with the regulations contained in ***Title 50, Part 13 of the Code of Federal Regulations*** and the other ***applicable parts in subchapter B of Chapter I of Title 50***, and I certify that the information submitted in this application for a permit is complete and accurate to the best of my knowledge and belief. I understand that any false statement herein may subject me to the criminal penalties of 18 U.S.C. 1001.

_____
Signature (**in blue ink**) of applicant/person responsible for permit (No photocopied or stamped signatures) Date of signature (mm/dd/yyyy)

Please continue to next page

E. MIGRATORY BIRD DEPREDATION PERMIT
(Migratory Bird Treaty Act, 50 CFR 21.41)

A Federal Migratory Bird Depredation Permit is required to capture or kill migratory birds for depredation control purposes. The permit authorizes certain management and control activities necessary to provide for human health and safety, protect personal property, or allow resolution of other injury to people or property. No permit is required merely to scare or herd depredating migratory birds other than endangered or threatened species and bald or golden eagles. You should apply for a depredation permit only after non-lethal management proves unsuccessful. If a permit is issued, you will be expected to continue to integrate non-lethal techniques when implementing any lethal measures. You must be at least 18 years of age to apply.

Protected Species: The species listed in the Code of Federal Regulations at 50 CFR 10.13 are protected under the Migratory Bird Treaty Act. A list of species in the U.S. and their status under the MBTA is available at the following website: http://www.fws.gov/migratorybirds/issues/nonnative/MBTA-protected&NonprotectedSpecies.htm.

Resident Canada goose nests & eggs: If you are only destroying or addling resident Canada goose eggs and your state is one that accepts Federal registration, you may register for free on-line at https://epermits.fws.gov/eRCGR in lieu of obtaining a depredation permit.

Note: Your application for a depredation permit must include a recommendation from the U.S. Department of Agriculture, Animal and Plant Health Inspection Service, Wildlife Services, for addressing your depredation problem. You may contact Wildlife Services at (866) 487-3297. If Wildlife Services recommends that a permit be issued to capture or kill birds, they will complete a Wildlife Services Permit Review Form (Form 37). This form and a copy of any required State permits must accompany your application. (This form is not required for resident Canada goose egg addling/destruction/OvoControl™G.)

Please provide the following information numbered according to the questions below on a separate sheet of paper. You should be as specific as possible in your responses. You should submit your application at least 60 days prior to the date that you need your permit (50 CFR 13.11(c)).

1. List the species of migratory birds causing the depredation problem and estimate the number of each involved.

2. Provide the exact location of the property or properties where the control activity would be conducted (State, county, and physical address of the specific site).

3. Description of damage.
(a) Describe the specific migratory bird damage or injury you are experiencing.
(b) How long has it been occurring (e.g., the number of years)?
(c) What times or seasons of the year does it occur?
(d) Describe any human health and safety hazards involved.
(e) Provide details such as types of crops destroyed, human injuries sustained, property damage incurred, and health and safety hazards created.

4. Describe the extent of the damage and estimate the economic loss suffered as a result, such as percentage of acres of crop and dollar loss, cost to replace damaged property, or cost of injuries.

5. Describe the nonlethal measures you have taken to control or eliminate the problem, including how long (e.g., a week, month, year(s)) and how often they have been conducted. List the techniques you have tried, such as harassment (e.g., horns, pyrotechnics, propane cannons), habitat management (e.g., vegetative barriers, longer grass management, fencing), cultural practices (e.g., crop selection and placement, management of pets and feeding schedules), or no feeding policies.

6. Proposed actions.
(a) What actions are you proposing to take to alleviate the problem (e.g., kill, eliminate nesting, trap and relocate)?
(b) Describe the method you propose (e.g., shoot; addle, oil, destroy eggs; trap and relocate; trap and donate birds to a food processing center).
(c) If you propose to trap birds, describe the method that will be used and your (or your agent's) experience with the method.

7. What long-term measures do you plan to take to eliminate the problem?

8. If you are applying on behalf of an airport for a permit to control birds in flight zones, indicate whether you are operating under an approved Wildlife Hazard Management Plan.

9. Anyone who will be acting as your agent or assisting you with the activities authorized by your permit must be authorized as a subpermittee under your permit. As the primary permittee, you will be legally responsible for ensuring that your subpermittees comply with the terms of your permit. List the name of anyone who will be directly involved in doing the work to resolve your problems. Include any commercial company that may be contracted to conduct the work.

10. You must retain records relating to the activities conducted under your permit for at least 5 years from the date of expiration of your permit. Is the physical address you provided in Section C on page 1 of this application the address where your records will be kept?

____ Yes ____ No If "no", provide the physical address:

_____

11. Any permit issued as a result of this application is not valid unless you also have any required State or tribal permits or approvals associated with the activity. Have you obtained all required State or tribal permits or approvals to conduct this activity?

____Yes If "yes", attach a copy of the approval(s). ____ Have applied **(Send copy when issued)** ____ None required

12. Attach a copy of the completed Wildlife Services Permit Review Form (Form 37) prepared by USDA, APHIS, Wildlife Services providing their recommendation regarding your depredation problem.

PERMIT APPLICATION FORM INSTRUCTIONS

The following instructions pertain to an application for a U.S. Fish and Wildlife Service or CITES permit. The General Permit Procedures in 50 CFR 13 address the permitting process. For simplicity, all licenses, permits, registrations, and certificates are referred to as a permit.

GENERAL INSTRUCTIONS:

- Complete all blocks/lines/questions in Sections A or B, and in C, D, and E.
- **An incomplete application may cause delays in processing or may be returned to the applicant. Be sure you are filling in the appropriate application form for the proposed activity.**
- Print clearly or type in the information. Illegible applications may cause delays.
- Sign the application in blue ink. Faxes or copies of the original signature will not be accepted.
- Mail the original application to the address at the top of page one of the application or if applicable on the attached address list.
- **Keep a copy of your completed application.**
- **Please plan ahead. Allow at least 60 days for your application to be processed. Some applications may take longer than 90 days to process. (50 CFR 13.11)**
- Applications are processed in the order they are received.
- Additional forms and instructions are available from http://permits.fws.gov.

COMPLETE EITHER SECTION A OR SECTION B:

Section A. **Complete if applying as an individual:**

- Enter the complete name of the responsible individual who will be the permittee if a permit is issued. Enter personal information that identifies the applicant. ***Fax and e-mail are not required if not available.***
- If you are applying on behalf of a client, the personal information must pertain to the client, and a document evidencing power of attorney must be included with the application.
- **Affiliation/ Doing business as (dba)**: business, agency, organizational, or institutional affiliation *directly* related to the activity requested in the application (e.g., a taxidermist is an individual whose business can *directly* relate to the requested activity). The Division of Management Authority (DMA) will **not** accept *doing business as* affiliations for individuals.

Section B. **Complete if applying as a business, corporation, public agency, tribe, or institution:**

- Enter the complete name of the business, agency, tribe, or institution that will be the permittee if a permit is issued. Give a brief description of the type of business the applicant is engaged in. Provide contact phone number(s) of the business.
- **Principal Officer** is the person in charge of the listed business, corporation, public agency, tribe, or institution. The principal officer is the person responsible for the application and any permitted activities. Often the principal officer is a Director or President. **Primary Contact** is the person at the business, corporation, public agency, tribe, or institution who will be available to answer questions about the application or permitted activities. Often this is the preparer of the application.

ALL APPLICANTS COMPLETE SECTION C:

- For all applications submitted to the Division of Management Authority (DMA) a physical U.S. address is **required**. Province and Country blocks are provided for those USFWS programs which use foreign addresses and are not required by DMA.
- **Mailing address** is address where communications from USFWS should be mailed if different than applicant's physical address.

ALL APPLICANTS COMPLETE SECTION D:

Section D.1 **Application processing fee:**

- An application processing fee is required at the time of application; unless exempted under 50 CFR13.11(d)(3). The application processing fee is assessed to partially cover the cost of processing a request. **The fee does not guarantee the issuance of a permit. Fees will not be refunded for applications that are approved, abandoned, or denied**. We may return fees for withdrawn applications prior to any significant processing occurring.
- **Documentation of fee exempt status is not required for Federal, tribal, State, or local government agencies; but must be supplied by those applicants acting on behalf of such agencies**. Those applicants acting on behalf of such agencies must submit a letter on agency letterhead and signed by the head of the unit of government for which the applicant is acting on behalf, confirming that the applicant will be carrying out the permitted activity for the agency.

Section D.2 **Federal Fish and Wildlife permits:**

- List the number(s) of your most current FWS or CITES permit or the number of the most recent permit if none are currently valid. If applying for re-issuance of a CITES permit, the original permit must be returned with this application.

Section D.3 **CERTIFICATION:**

- **The individual identified in Section A, the principal officer named in Section B, or person with a valid power of attorney (documentation must be included in the application) must sign and date the application in blue ink.** This signature binds the applicant to the statement of certification. This means that you certify that you have read and understand the regulations that apply to the permit. You also certify that everything included in the application is true to the best of your knowledge. Be sure to read the statement and re-read the application and your answers before signing.

ALL APPLICANTS COMPLETE SECTION E.

Please continue to next page

APPLICATION FOR A FEDERAL FISH AND WILDLIFE PERMIT
Paperwork Reduction Act, Privacy Act, and Freedom of Information Act – Notices

In accordance with the Paperwork Reduction Act of 1995 (44 U.S.C. 3501, *et seq.*) and the Privacy Act of 1974 (5 U.S.C. 552a), please be advised:

1. The gathering of information on fish and wildlife is authorized by:
(Authorizing statutes can be found at: http://www.gpoaccess.gov/cfr/index.html and http://www.fws.gov/permits/ltr/ltr.html.)

   a. Bald and Golden Eagle Protection Act (16 U.S.C. 668), 50 CFR 22;
   b. Endangered Species Act of 1973 (16 U.S.C. 1531-1544), 50CFR 17;
   c. Migratory Bird Treaty Act (16 U.S.C. 703-712), 50 CFR 21;
   d. Marine Mammal Protection Act of 1972 (16 U.S.C. 1361, *et. seq*.), 50 CFR 18;
   e. Wild Bird Conservation Act (16 U.S.C. 4901-4916), 50 CFR 15;
   f. Lacey Act: Injurious Wildlife (18 U.S.C. 42), 50 CFR 16;
   g. Convention on International Trade in Endangered Species of Wild Fauna and Flora (TIAS 8249), http://www.cites.org , 50 CFR 23;
   h. General Provisions, 50 CFR 10;
   i. General Permit Procedures, 50 CFR 13; and
   j. Wildlife Provisions (Import/export/transport), 50 CFR 14.

2. Information requested in this form is purely voluntary. However, submission of requested information is required in order to process applications for permits authorized under the above laws. Failure to provide all requested information may be sufficient cause for the U.S. Fish and Wildlife Service to deny the request. We may not conduct or sponsor and you are not required to respond to a collection of information unless it displays a currently valid OMB control number.

3. Certain applications for permits authorized under the Endangered Species Act of 1973 (16 U.S.C. 1539) and the Marine Mammal Protection Act of 1972 (16 U.S.C. 1374) will be published in the **Federal Register** as required by the two laws.

4. Disclosures outside the Department of the Interior may be made without the consent of an individual under the routine uses listed below, if the disclosure is compatible with the purposes for which the record was collected. (Ref. 68 FR 52611, September 4, 2003)

   a. Routine disclosure to subject matter experts, and Federal, tribal, State, local, and foreign agencies, for the purpose of obtaining advice relevant to making a decision on an application for a permit or when necessary to accomplish a FWS function related to this system of records.
   b. Routine disclosure to the public as a result of publishing **Federal Register** notices announcing the receipt of permit applications for public comment or notice of the decision on a permit application.
   c. Routine disclosure to Federal, tribal, State, local, or foreign wildlife and plant agencies for the exchange of information on permits granted or denied to assure compliance with all applicable permitting requirements.
   d. Routine disclosure to Captive-bred Wildlife registrants under the Endangered Species Act for the exchange of authorized species, and to share information on the captive breeding of these species.
   e. Routine disclosure to Federal, tribal, State, and local authorities who need to know who is permitted to receive and rehabilitate sick, orphaned, and injured birds under the Migratory Bird Treaty Act and the Bald and Golden Eagle Protection Act; federally permitted rehabilitators; individuals seeking a permitted rehabilitator with whom to place a bird in need of care; and licensed veterinarians who receive, treat, or diagnose sick, orphaned, and injured birds.
   f. Routine disclosure to the Department of Justice, or a court, adjudicative, or other administrative body or to a party in litigation before a court or adjudicative or administrative body, under certain circumstances.
   g. Routine disclosure to the appropriate Federal, tribal, State, local, or foreign governmental agency responsible for investigating, prosecuting, enforcing, or implementing statutes, rules, or licenses, when we become aware of a violation or potential violation of such statutes, rules, or licenses, or when we need to monitor activities associated with a permit or regulated use.
   h. Routine disclosure to a congressional office in response to an inquiry to the office by the individual to whom the record pertains.
   i. Routine disclosure to the General Accounting Office or Congress when the information is required for the evaluation of the permit programs.
   j. Routine disclosure to provide addresses obtained from the Internal Revenue Service to debt collection agencies for purposes of locating a debtor to collect or compromise a Federal claim against the debtor or to consumer reporting agencies to prepare a commercial credit report for use by the FWS.

5. For individuals, personal information such as home address and telephone number, financial data, and personal identifiers (social security number, birth date, etc.) will be removed prior to any release of the application.

6. The public reporting burden on the applicant for information collection varies depending on the activity for which a permit is requested. The relevant burden for a Migratory Bird Depredation permit application varies from 1.5 hours for individuals to 3 hours for businesses. The burden for recordkeeping varies from 15 minutes for individuals to 30 minutes for businesses. This burden estimate includes time for reviewing instructions, gathering and maintaining data and completing and reviewing the form. You may direct comments regarding the burden estimate or any other aspect of the form to the Service Information Clearance Officer, U.S. Fish and Wildlife Service, Mail Stop 222, Arlington Square, U.S. Department of the Interior, 1849 C Street, NW, Washington D.C. 20240.

Freedom of Information Act – Notice

For organizations, businesses, or individuals operating as a business (i.e., permittees not covered by the Privacy Act), we request that you identify any information that should be considered privileged and confidential business information to allow the Service to meet its responsibilities under FOIA. Confidential business information must be clearly marked "Business Confidential" at the top of the letter or page and each succeeding page and must be accompanied by a non-confidential summary of the confidential information. The non-confidential summary and remaining documents may be made available to the public under FOIA [43 CFR 2.13(c)(4), 43 CFR 2.15(d)(1)(i)].

U.S. Fish & Wildlife Service

Migratory Bird Regional Permit Offices

FWS REGION	AREA OF RESPONSIBILITY	MAILING ADDRESS	CONTACT INFORMATION
Region 1	**Hawaii, Idaho, Oregon, Washington**	911 N.E. 11th Avenue Portland, OR 97232-4181	Tel. (503) 872-2715 Fax (503) 231-2019 Email *permitsR1MB@fws.gov*
Region 2	**Arizona, New Mexico, Oklahoma, Texas**	P.O. Box 709 Albuquerque, NM 87103	Tel. (505) 248-7882 Fax (505) 248-7885 Email *permitsR2MB@fws.gov*
Region 3	**Iowa, Illinois, Indiana, Minnesota, Missouri, Michigan, Ohio, Wisconsin**	5600 America Blvd. West Suite 990 Bloomington, MN 55437-1458 (Effective 5/31/2011)	Tel. (612) 713-5436 Fax (612) 713-5393 Email *permitsR3MB@fws.gov*
Region 4	**Alabama, Arkansas, Florida, Georgia, Kentucky, Louisiana, Mississippi, North Carolina, South Carolina, Tennessee, Virgin Islands, Puerto Rico**	P.O. Box 49208 Atlanta, GA 30359	Tel. (404) 679-7070 Fax (404) 679-4180 Email *permitsR4MB@fws.gov*
Region 5	**Connecticut, District of Columbia, Delaware, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, Virginia, Vermont, West Virginia**	P.O. Box 779 Hadley, MA 01035-0779	Tel. (413) 253-8643 Fax (413) 253-8424 Email *permitsR5MB@fws.gov*
Region 6	**Colorado, Kansas, Montana, North Dakota, Nebraska, South Dakota, Utah, Wyoming**	P.O. Box 25486 DFC(60154) Denver, CO 80225-0486	Tel. (303) 236-8171 Fax (303) 236-8017 Email *permitsR6MB@fws.gov*
Region 7	**Alaska**	1011 E. Tudor Road (MS-201) Anchorage, AK 99503	Tel. (907) 786-3693 Fax (907) 786-3641 Email *permitsR7MB@fws.gov*
Region 8	**California, Nevada**	2800 Cottage Way Sacramento, CA 95825	Tel. (916) 978-6183 Fax (916) 414-6486 Email*permitsR8MB@fws.gov*

Department of the Interior
U.S. Fish and Wildlife Service

OMB Control No. 1018-0094
Expires 12/31/2013

Federal Fish and Wildlife Permit Application Form

click here for return addresses

Return to: U.S. Fish and Wildlife Service (USFWS)

Type of Activity: Native Endangered and Threatened Species – Scientific Purposes, Enhancement of Propagation or Survival Permits (i.e., Recovery Permits) & Interstate Commerce Permits

Complete Sections A or B, and C, D, and E of this application. U.S. address may be required in Section C, see instructions for details.
See attached instruction pages for information on how to make your application complete and help avoid unnecessary delays.

A. Complete if applying as an individual			
1.a. Last name	1.b. First name	1.c. Middle name or initial	1.d. Suffix
2. Date of birth (mm/dd/yyyy)	3. Social Security No.	4. Occupation	5. Affiliation/ Doing business as (see instructions)
6.a. Telephone number	6.b. Alternate telephone number	6.c. Fax number	6.d. E-mail address

B. Complete if applying on behalf of a business, corporation, public agency, tribe, or institution			
1.a. Name of business, agency, tribe, or institution	1.b. Doing business as (dba)		
2. Tax identification no.	3. Description of business, agency, tribe, or institution		
4.a. Principal officer Last name	4.b. Principal officer First name	4.c. Principal officer Middle name/ initial	4.d. Suffix
5. Principal officer title	6. Primary contact		
7.a. Business telephone number	7.b. Alternate telephone number	7.c. Business fax number	7.d. Business e-mail address

C. All applicants complete address information				
1.a. Physical address (Street address; Apartment #, Suite #, or Room #; no P.O. Boxes)				
1.b. City	1.c. State	1.d. Zip code/Postal code:	1.e. County/Province	1.f. Country
2.a. Mailing Address (include if different than physical address; include name of contact person if applicable)				
2.b. City	2.c. State	2.d. Zip code/Postal code:	2.e. County/Province	2.f. Country

D. All applicants MUST complete

1. Attach check or money order payable to the U.S. FISH AND WILDLIFE SERVICE **in the amount indicated on pages 2-3**. Federal, tribal, State, and local government agencies, and those acting on behalf of such agencies, are exempt from the processing fee – ***attach documentation of fee exempt status as outlined in instructions.*** (50 CFR 13.11(d))

2. Do you currently have or have you ever had any Federal Fish and Wildlife permits?
Yes ☐ If yes, list the number of the most current permit you have held or that you are applying to renew/re-issue: _____ No ☐

3. Certification: I hereby certify that I have read and am familiar with the regulations contained in ***Title 50, Part 13 of the Code of Federal Regulations*** and the other ***applicable parts in subchapter B of Chapter I of Title 50***, and I certify that the information submitted in this application for a permit is complete and accurate to the best of my knowledge and belief. I understand that any false statement herein may subject me to the criminal penalties of 18 U.S.C. 1001.

_____
Signature (**in blue ink**) of applicant/person responsible for permit (No photocopied or stamped signatures) Date of signature (mm/dd/yyyy)

Please continue to next page

**** See page 15 for additional instructions on completing the above form. See page 16 for information on the Paperwork Reduction Act, Privacy Act, and Freedom of Information Act aspects of this application form.**

Section E. **ALL APPLICANTS COMPLETE SECTION E.** Provide the information outlined in Section E. on the following pages. Be as complete and descriptive as possible. Please do not send pages that are over 8.5" x 11", videotapes, or DVDs.

SCIENTIFIC PURPOSES, ENHANCEMENT OF PROPAGATION OR SURVIVAL PERMITS (i.e., RECOVERY PERMITS) & INTERSTATE COMMERCE PERMITS

What type of permit are you requesting?

- ○ Recovery (see instructions and requirements on pp. 2-10 and 15-16 of this application form)

OR

- ○ Interstate Commerce (see instructions and requirements on pp. 2-4, 11-12 and 15-16 of this application form)

Have you obtained all required Federal, tribal, State, county, municipal or foreign government approval to conduct the activity you propose? Please be aware that there may be other requirements necessary to conduct this activity such as an import permit, collection permit, permission to work on Federal or tribal lands, Federal bird banding permit, Corps of Engineers permits, Environmental Protection Agency NPDES permits, tribal, State, county or municipal permits, etc.

☐ Yes. Provide a copy of the approval(s). List the Federal agency, tribe, State, county, municipality or foreign countries involved and type of document required. Include a copy of these documents with the application.

☐ I have applied. List the Federal agency, tribe, State, county, municipality or foreign countries involved and type of documents required. Provide the reasons why the permits have not been issued.

_____

☐ Not required. The proposed activity is not regulated.

Application Processing Fees

You may update your name, address, telephone number, fax number, or e-mail address in your current application package on file at any time. These changes are considered an administrative change, and no application processing fee is required. If you wish to make an administrative change, please fill out page 1 and indicate the information that you are updating. Then check the box below, provide your permit number, and send the completed pages 1-2 to the appropriate Regional Office (see attached list).

☐ Administrative change for permit number: _____.

If you wish to make changes other than an administrative change, then an application processing fee is required as described below.

The application processing fee for a new Recovery or Interstate Commerce permit, or to renew/substantively amend an existing valid permit *(with major changes*) is $100. If permit amendment *(with minor changes)* is required at a time other than renewal, the processing fee is $50. For additional information on the application processing fee and the requirements to qualify for a fee exemption, please see the instructions for section D. on page 15.

If the information in your current application package on file has changed in a manner that triggers a substantive amendment or a change not otherwise specified in the permit, then you must apply for substantive amendment to your valid permit. For example, such major changes may include changes in study plan or research proposal, location, activity, amount or type of take, or species to be covered by the permit. Please contact the Regional Endangered Species Program located within the U.S. Fish and Wildlife Service (Service) Region of your proposed activity for technical assistance in making this determination (see attached list).

Check the appropriate box below and enclose check or money order payable to the *U.S. Fish and Wildlife Service* in the amount of

○ $100 [or ○ fee exempt (attach justification if required)] for a **new** permit. Use Option III. below to provide the required information.

OR

○ $100 [or ○ fee exempt (attach justification if required)] to **renew or substantively amend** my existing valid permit (*with major changes*) using my current application package on file. Use Options II. and III. below to provide the required information. Please indicate the information that you are changing.

OR

○ $100 [or ○ fee exempt (attach justification if required)] to **renew/re-issue** my existing valid permit (*without changes*) using my current application package on file. Use Option I. below to provide the requested information.

OR

○ $50 [or ○ fee exempt (attach justification if required)] to **amend** my existing valid permit *(with minor changes)* at a time other than permit renewal. Use Options II. and III. below to provide the required information. Please indicate the information that you are changing.

Please check the **type of amendment** you are requesting --

☐ add species (specify) _____

☐ add new activity with previously permitted species (specify) _____

☐ add a geographic area ☐ change in personnel

☐ other (specify) _____

Referral of a Recovery permitte's contact information (optional)

The U.S. Fish and Wildlife Service often receives requests for lists of Recovery permittees who could conduct contract work for endangered and threatened species (e.g., presence/absence surveys). In accordance with our Privacy Act System of Records Notice (Permits System, Interior – FWS-21), we may release the name and work address or work telephone number of those who wish to be contacted by third parties to do commercial survey activities. Such information is not normally released under the Freedom of Information Act - unless a compelling need on the part of the general public can be cited.

Please be aware that this list does not represent an endorsement by us of any particular permittee. This referral is provided at the discretion of each U.S. Fish and Wildlife Service Regional Office as time and workload allow.

Please indicate below your preference for the release of your information to third parties.

○ Yes, I authorize the U.S. Fish and Wildlife Service to release my name, work address and/or work telephone number to third parties as a referral for contract work for endangered and threatened species.

○ No, I do not authorize the U.S. Fish and Wildlife Service to release my name and work address and/or work telephone number to third parties.

Application Processing

To expedite a final decision on your application, you are urged to coordinate with us as soon as possible for guidance in assembling a complete application package, and to send us your complete permit application package <u>at least three months</u> prior to the start of your proposed activities. If you are renewing or amending a valid permit, your complete application package must be received at least 30 days prior to the expiration of the valid permit. These time periods begin with our acceptance of a complete permit application package and do not include any time required for requesting clarification or additional information about your application, or the length of time between our request and your response.

The information provided in your permit application will be used to evaluate your application for compliance with the Endangered Species Act, its implementing regulations (which may require a 30 day public comment period), and with U.S. Fish and Wildlife Service policy. Receipt and possession of a permit under the Endangered Species Act should be regarded as a privilege, as we must balance permit issuance with our duties to protect and recover listed species.

Up-to-date annual reports and any other required reports under your valid permit(s) must be on file before a permit will be considered for renewal, re-issuance or amendment.

If your activities may affect species under the authority of the National Marine Fisheries Service (NMFS/NOAA Fisheries), then you may need to obtain a separate permit from that agency. In addition we share jurisdiction with NMFS/NOAA Fisheries for sea turtles (e.g., we evaluate applications for permits to conduct activities impacting sea turtles on land, and NMFS/NOAA Fisheries evaluates applications for permits to conduct activities impacting sea turtles in the marine environment). To apply for a permit to conduct activities with sea turtles in the marine environment or other species under NMFS/NOAA Fisheries jurisdiction, please contact them via their permit web page at http://www.nmfs.noaa.gov/pr/permits/

****

If you are not applying as an individual but as a business, corporation, tribe, institution, or non-Federal public agency (block B. on page 1 of the application), the person to whom the permit will be issued (e.g., the landowner, president, director, executive director, or executive officer) is legally responsible for implementing the permit. Although other people under the direct control of the permittee (e.g., employees, contractors, consultants) receive third party take authorization in their capacity as designees of the permittee, the individual named as the permittee ultimately is legally responsible for the permit and any activities carried out under the permit except as otherwise limited in the case of permits issued to State or local government entities under 50 CFR 13.25(e).

****

RECOVERY PERMIT APPLICATION INSTRUCTIONS

(see pp. 11-12 for Interstate Commerce permit application instructions)

You have 3 options for providing the required information for a Recovery permit application.

Recovery Permit Application: Option I. Renew/Re-issue of an Existing Valid Recovery Permit (*Without Changes*) Using My Current Application Package On File.

Up-to-date annual reports and any other required reports under your valid permit(s) must be on file before a permit will be considered for renewal or re-issue.

Sign the following statement if you are applying to renew or re-issue an existing valid Recovery permit without changes. If you are proposing changes to your Recovery permit, you must use Options II. and III. below.

The individual signing box D. on page 1 of the application must also sign (in blue ink) the following statement. This certification language is required under 50 CFR 13.22(a).

> I certify that the statements and information submitted in support of my original application for a U.S. Fish and Wildlife Service Recovery permit # _____ are still current and correct and hereby request (please check either ○ renewal or ○ re-issuance) of that permit without changes.
>
> _____ _____
> signature (in blue ink) date
>
> _____
> please print name legibly
>
> * Please note: If you have signed the above statement, then your renewal/re-issue request is complete. Please submit completed pages 1- 5 of this application to our Regional Office (see attached list) covering the location of your proposed activity. Requests for renewals/re-issuance must complete and accepted by the Service no later than 30 days prior to permit expiration to ensure that your current permit remains in effect while we process your request.

<u>Recovery Permit Application: Option II.</u> Renewal or Amendment of an Existing Valid Recovery Permit (*With Changes*)

Up-to-date annual reports and any other required reports under your valid permit(s) must be on file before a permit will be considered for renewal or amendment.

Sign the following statement if you are proposing to renew or amend an existing valid Recovery permit, including making major changes. Such major changes may include changes in study plan or research proposal, location, activity, amount or type of take, or species to be covered by the permit.

The individual signing box D. on page 1 of the application must also sign (in blue ink) the following statement. This certification language is required under 50 CFR 13.22(a).

> I certify that the statements and information submitted in support of my original application for a U.S. Fish and Wildlife Service Recovery permit # _____ are still current and correct, except for the changes listed in Option III. below, and hereby request (please check either ○ renewal or ○ amendment) of that permit.
>
> _____ _____
> signature (in blue ink) date
>
> _____
> please print name legibly

Provide a brief description of the changes to your valid permit (answer the appropriate questions for these changes requested under Recovery Permit Application Option III. below). Please submit this page and completed pages 1-3 of this application form (along with the changed information relative to Option III. below) to our Regional Office (see attached list) covering the location of your proposed activity.

<u>Recovery Permit Application: Option III</u>. New Recovery Permit & Supplementary Information for Renewal or Amendment of an Existing Valid Permit (*With Changes*)

General permit regulations for the U.S. Fish and Wildlife Service can be found at 50 CFR 13. Regulations for Recovery and Interstate Commerce permits under the Endangered Species Act can be found at 50 CFR 17.22(a)(1) for endangered wildlife species, 50 CFR 17.32(a)(1) for threatened wildlife species, 50 CFR 17.62 for endangered plant species, and 50 CFR 17.72 for threatened plant species.

Applications for a Recovery permit must provide the following specific information (relevant to the activity) in addition to the general information on pages 1-4 of this application. Please attach separate pages. In order to assist us in processing your request, please provide the item number (A.1.a., etc.) of the required information before each of your responses. Thank you.

A. Identify species and activity:

1. For a new Recovery permit:

    a. Provide the common and scientific names of the species being requested for coverage in the permit and their status (endangered (E) or threatened (T)).

    b. Provide the number, age, and sex of such species to the extent known.

    c. Identify the activity sought to be authorized (i.e., presence/absence survey, nest monitoring, bird banding, etc.) for each species.

2. For an amended Recovery permit:

    a. Identify the activities and/or species to be added to your valid permit (provide both the scientific, to the most specific taxonomic level, and common names) as well as the species' status (see 1.a. above).

    b. Provide the number, age, and sex of such species to the extent known.

    c. If any activities requested in this application differ from those authorized in your valid permit, then for each species state the currently authorized activity, the requested new activity, and how the new activity will impact each species.

    d. Identify the activity sought to be authorized (i.e., presence/absence survey, nest monitoring, banding, etc.) for each species.

    e. Quantify any anticipated effects to the habitat of each added species.

    f. Identify activities and/or species to be deleted from your valid permit and the reason(s) for the deletion.

3. If you are applying for a permit for the collection of plants from the wild:

    a. Describe what plant part(s), and the number(s) or other type(s) of indication of material you plan to collect (i.e., whole plant, leaves, pollen, seeds, etc.).

    b. If the proposed activity involves the collection of seeds taken from the wild, provide information that evaluates the effects of the seed collection on the reproductive potential of the species at the collection location.

B. Identify location of the proposed activity:

1. Provide the name of the State, county, tribal land, and the specific location of the proposed activity site(s). Include a formal legal description, section/township/range information, county tax parcel number, local address, or any other identifying property designation that will precisely place the location of the proposed activity site(s).

2. If the specific study area is known at the time of application, attach a U.S. Geological Survey map of the study area in 7.5 minute quadrangle (1:24,000) scale, or other appropriately scaled map. If you plan to conduct surveys on a

contract basis in the future, these maps can be provided once the specific area is known (the counties in which you will work must be provided at this time).

3. If your request is for aquatic species, identify the aquatic system (river/lake/stream name, river mile information, and drainage basin).

C. Describe the proposed activity:

1. Provide a statement justifying the permit request, including the following: *[A copy of a research or study proposal that provides this information can be attached in lieu of the information requested below.]* Use additional sheets as necessary.

   a. Describe in detail the purpose(s) and objective(s) of the project.

      i. Include study design, sampling methodologies and equipment to be used.

      ii. Identify any null hypothesis or other anticipated results from the project that will support the reasoning why the project is justified for enhancement of propagation or survival of the affected species.

      iii. Include planned disposition of specimens upon completion of project.

   b. Describe how the proposal will help recover each species.

      i. If there is an approved recovery plan, identify the recovery tasks by number and name, if applicable. Include any additional recovery tasks identified in a Spotlight Species Action Plan, or in a 5-year status review of the species.

      ii. Identify, or provide copies of any previous or similar research conducted on this species.

      iii. If this information exists, explain how the project will answer questions not answered by earlier research.

      iv. Explain how you will coordinate your efforts with past and ongoing research studies.

   c. Can this project result in the injury, death, or removal from the wild of any individuals of the species?

      i. If yes, describe all that apply (i.e., injury, death, removal from the wild).

      ii. For each species, please state the maximum number of individuals that would be injured, killed, or removed from the wild: [*If applicable, please identify, based on a reasonable expectation, the number of individuals likely to be injured or killed per activity.]*

      iii. Please state what will be done to minimize the possibility of injury to or death of individuals.

      iv. If the proposed activity would cause the death of individuals from the wild or remove individuals from the wild, describe your attempts to obtain the wildlife or plant specimens currently held in captivity/nurseries/museums, or produced in captivity. You must demonstrate conclusively that existing specimens are unavailable or your study objectives require new/additional specimens. *[Provide the identity and phone number of each contact made in this regard.]*

   d. Identify contracts and agreements held for the proposed activities (attach copy or give title, funding organization name and address, date of signature, duration of contract).

      i. State whether full funding will be available for the completion of the proposed activity. *[If you do not hold a contract at this time, but foresee receiving one, you may apply for a permit contingent upon receiving the contract(s).]*

   e. If live wildlife or plants to be covered by the permit are to be held in captivity:

[Note: Under our regulations at 50 CFR 17.22(a)(3) and 17.32(a)(3), escape of wildlife held in captivity must be reported immediately to our appropriate Regional Office (see attached list)].

i. Give a complete description, attaching photographs and/or diagrams, of the area and facilities where wildlife or plant(s) will be held and/or maintained in captivity and describe arrangements for care during transportation and maintenance. Include the name and address of the area and facilities. *[A separate discussion specific for each species must be provided, if applicable.]*

ii. Provide the full names of person(s) who will care for live specimens, including a resume of their experience in raising, caring for, and propagating similar wildlife or plants.

iii. Provide any contract or agreement you have secured for care of any live specimens collected under this permit request if the identified facility is not affiliated with you. Attach a copy or give title, funding organization name and address, date of signature, and duration of contract. *[A joint application may be appropriate in situations where one entity will collect the specimens and another entity will conduct the propagation/maintenance activities.]*

iv. List mortalities resulting from your activities with these or similar species in the last 2 years.

v. Provide an explanation of each mortality event and the procedures employed or modified to eliminate any future mortality events.

vi. Indicate your willingness to participate in a cooperative breeding or propagation program or to contribute data to a database or studbook. Holding wildlife and plants in captivity must comply with our Policy Regarding Controlled Propagation of Species Listed Under the Endangered Species Act. This policy can be found on the U.S. Fish and Wildlife Service's Endangered Species web page at http://www.fws.gov/endangered/laws-policies/policy-controlled-propagation.html. Briefly describe how the proposed activity will comply with this policy.

vii. State the planned disposition of the collected and/or propagated species after termination of the project/activity.

D. Identify the persons who will conduct the proposed activity:

1. Provide the full name of all individuals, *including first name, middle initial, and last name,* who you propose will work under this permit.

   a. If more than one activity is included in the permit application, indicate which activity(ies) will be completed by each individual.

   b. For each listed individual, please also provide a copy of each person's resume and/or curriculum vitae, plus specific information on previous professional training and experience working with the species affected by the permit request. Information must include: the approximate number of hours of focused activity with each species in occupied habitat; approximate number of each species the applicant has worked with at each site (e.g., how many pair of birds at a specific site); names, dates, and location of areas surveyed; and experience with similar species. Please provide the names and phone numbers of at least two references who can verify experience with the species (reference letters are always appreciated).

E. Identify the location of the affected species, to the extent known:

1. For each species indicate whether, at the time of the application, the organism was:

   a. Still in the wild;

   b. Had been removed from the wild (provide State, county, and specific location of removal); and

   c. Was born in captivity or artificially propagated (provide State, county, specific location, and name of the institution where born or propagated).

2. If you are applying for a permit for the collection of plants from the wild, list the lands from which you plan to collect the plants.

   a. If these lands are under Federal jurisdiction, identify the Federal land management agency(ies) that have jurisdiction for the lands. Include the name, title (District Ranger, Field Supervisor, etc.), address, and telephone number of the person in charge of the Federal lands.

INTERSTATE COMMERCE PERMIT APPLICATION INSTRUCTIONS

General permit regulations for the U.S. Fish and Wildlife Service can be found at 50 CFR 13. Regulations for Recovery and Interstate Commerce permits under the Endangered Species Act can be found at 50 CFR 17.22(a)(1) for endangered wildlife species, 50 CFR 17.32(a)(1) for threatened wildlife species, 50 CFR 17.62 for endangered plant species, and 50 CFR 17.72 for threatened plant species.

Interstate Commerce permits authorize the sale of native endangered and threatened species across State lines, but only for activities that will contribute to the species' recovery by enhancing their propagation or survival.

PLEASE NOTE:

- Interstate commerce activities for *wildlife* require the ***buyer*** to obtain a permit prior to the sale (50 CFR 17.21(f) and 17.31(a)).

- In addition, our regulations at 50 CFR 17.62(a) for endangered plant species and 17.72(a) for threatened plant species require that –

  - Interstate commerce activities for *plants taken from the wild* require the ***buyer*** to obtain a permit prior to the sale.

  - Interstate commerce activities for *plants taken from cultivated stock* require the ***seller*** to obtain a permit prior to the sale.

Unlike other permits for native endangered and threatened species (which are issued by the U.S. Fish & Wildlife Service Regions according to where the proposed activity will take place), Interstate Commerce permits are issued by the Region having the lead responsibility for the affected species. To determine the lead Region for a species, follow the instructions at the top of our Endangered Species permit web page at http://www.fws.gov/endangered/permits/how-to-apply.html.

Applications for an Interstate Commerce permit must provide the following specific information (relevant to the activity) in addition to the general information on pages 1-3 of this application. Please attach separate pages. In order to assist us in processing your request, please provide the item number (A.1., etc.) of the required information before each of your responses. Thank you.

A. For Wildlife:

1. Provide the common and scientific names of the species being requested for coverage in the permit and their status (endangered (E) or threatened (T)).

2. Identify the activity sought to be authorized for each species.

3. Provide the sex, birth date, birth place, age, number of specimens, and identifying features (e.g., band number, collar number, scars, tattoo number, etc.).

4. Provide the name, address and telephone number of the seller.

5. State whether the wildlife has been captively bred or removed from the wild.

6. Provide the expected time needed to complete transaction(s).

7. Provide a complete description with photographs and/or diagrams of the area and facilities where wildlife will be held in captivity, and description of arrangements for care during transportation and maintenance. [Note: Under our regulations at 50 CFR 17.22(a)(3) and 17.32(a)(3), escape of wildlife held in captivity must be reported immediately to our Regional Office (see attached list)].

8. Describe experience with breeding this or similar species in the past.

9. Provide the full names of person(s) who will care for live specimens, including any experience in raising, caring for, and propagating similar wildlife.

10. List mortalities resulting from your activities with these or similar species in the last 2 years. Provide an explanation of each mortality event and the procedures employed or modified to eliminate any future mortality events.

11. Indicate your willingness to participate in a cooperative breeding or propagation program or to contribute data to a database or studbook. Holding wildlife in captivity must comply with our Policy Regarding Controlled Propagation of Species Listed Under the Endangered Species Act. This policy can be found on the U.S. Fish and Wildlife Service's Endangered Species web page at http://www.fws.gov/endangered/laws-policies/policy-controlled-propagation.html. Briefly describe how the proposed activity will comply with this policy.

12. Provide a statement from the wildlife breeder that the wildlife was bred at their home/facility. This statement must include the name and address of the breeder, date of birth or hatch, band number or any other identifying marks or characteristics.

13. Please provide detailed information on how you propose to manage your breeding stock to uniquely identify all progeny, and to ensure that the genetic diversity and integrity of your breeding stock are maintained to the maximum extent possible.

B. For Plants:

1. Provide the common and scientific names of the species being requested for coverage in the permit and their status (endangered (E) or threatened (T)).

2. Identify the activity sought to be authorized for each species.

3. Provide the location where plants will be cultivated for sale.

4. Provide the full names of person(s) who will care for live specimens, including any experience in raising, caring for, and propagating similar plants.

5. State whether the breeding stock is of cultivated or wild origin.

6. If you are applying a permit to buy plants taken from the wild, provide the name, address and telephone number of the seller. If you are applying for a permit to sell plants taken from cultivated stock, provide the name, address, and telephone number of the buyer.

7. Indicate your willingness to participate in a cooperative breeding or propagation program or to contribute data to a database. Holding plants in captivity must comply with our Policy Regarding Controlled Propagation of Species Listed Under the Endangered Species Act. This policy can be found on the U.S. Fish and Wildlife Service's Endangered Species web page at http://www.fws.gov/endangered/laws-policies/policy-controlled-propagation.html. Briefly describe how the proposed activity will comply with this policy.

USFWS Regional Contacts for Native Endangered & Threatened Species Permits

Pacific Region (Region 1): HI, ID, OR, WA, American Samoa, Commonwealth of the Northern Mariana Islands, Guam, and the Pacific Trust Territories

U.S. Fish and Wildlife Service
Endangered Species Permit Office
911 NE 11th Avenue
Portland, Oregon 97232-4181

Web: http://www.fws.gov/pacific/ecoservices/endangered/index.html
Phone: (503) 231-2071
email: permitsR1ES@fws.gov
Fax: (503) 231-6243

Southwest Region (Region 2): AZ, NM, OK, and TX

U.S. Fish and Wildlife Service
Endangered Species Permit Office
500 Gold Avenue S.W. (street address)
P.O. Box 1306 (mailing address)
Albuquerque, New Mexico 87103-1306

Web: http://www.fws.gov/southwest/es/EndangeredSpecies/
Phone: (505) 248-6649
email: permitsR2ES@fws.gov
Fax: (505) 248-6788

Midwest Region (Region 3): IA, IL, IN, MI, MN, MO, OH, and WI

U.S. Fish and Wildlife Service
Endangered Species Permit Office
B.H. Whipple Federal Building
One Federal Drive
Fort Snelling, Minnesota 55111-4056

Web: http://www.fws.gov/midwest/Endangered/
Phone: (612) 713-5343
email: permitsR3ES@fws.gov
Fax: (612) 713-5292

Southeast Region (Region 4): AL, AR, FL, GA, KY, LA, MS, NC, PR, SC, TN, and U.S. Virgin Islands

U.S. Fish and Wildlife Service
Endangered Species Permit Office
1875 Century Blvd., Suite 200
Atlanta, Georgia 30345

Web: http://www.fws.gov/southeast/es/#
Phone: (904) 731-3191 (10(a)(1)(A) permit coordinator) or (404) 679-7140 (R4 Endangered Species main office)
email: permitsR4ES@fws.gov
Fax: (904) 731-3045 or (404) 679-7081

Northeast Region (Region 5): CT, DC, DE, MA, MD, ME, NH, NJ, NY, PA, RI, VA, VT, and WV

U.S. Fish and Wildlife Service
Endangered Species Permit Office
300 Westgate Center Drive
Hadley, MA 01035-9589

Web: http://www.fws.gov/northeast/endangered/
Phone: (413) 253-8628
email: permitsR5ES@fws.gov
Fax: (413) 253-8482

Mountain-Prairie Region (Region 6): CO, KS, MT, NE, ND, SD, UT, and WY

U.S. Fish and Wildlife Service
Endangered Species Permit Office
Denver Federal Center
P.O. Box 25486
Denver, Colorado 80225-0489

Web: http://www.fws.gov/mountain%2Dprairie/endspp/
Phone: (303) 236-4256
email: permitsR6ES@fws.gov
Fax: (303) 236-0027

Alaska Region (Region 7): AK

U.S. Fish and Wildlife Service
Endangered Species Permit Office
1011 E. Tudor Road
Anchorage, Alaska 99503-6199

Web: http://alaska.fws.gov/fisheries/endangered/index.htm
Phone: (907) 786-3323
email: permitsR7ES@fws.gov
Fax: (907) 786-3350

Pacific Southwest Region (Region 8): CA and NV

U.S. Fish and Wildlife Service
Endangered Species Permit Office
2800 Cottage Way, Suite W-2606
Sacramento, California 95825

Web: http://www.fws.gov/cno/es/
Phone: (916) 414-6464
email: permitsCNES@fws.gov
Fax: (916) 414-6486

PERMIT APPLICATION FORM INSTRUCTIONS

The following instructions pertain to an application for a U.S. Fish and Wildlife Service or CITES permit. The General Permit Procedures in 50 CFR 13 address the permitting process. For simplicity, all licenses, permits, registrations, and certificates are referred to as a permit.

GENERAL INSTRUCTIONS:

- Complete all blocks/lines/questions in Sections A or B, and in C, D, and E.
- **An incomplete application may cause delays in processing or may be returned to the applicant. Be sure you are filling in the appropriate application form for the proposed activity.**
- Print clearly or type in the information. Illegible applications may cause delays.
- Sign the application in blue ink. Faxes or copies of the original signature will not be accepted.
- Mail the original application to the address at the top of page one of the application or if applicable on the attached address list.
- **Keep a copy of your completed application.**
- **Please plan ahead. Allow at least 60 days for your application to be processed. Some applications may take longer than 90 days to process. (50 CFR 13.11)**
- Applications are processed in the order they are received.
- Additional forms and instructions are available from http://www.fws.gov/permits/.

COMPLETE EITHER SECTION A OR SECTION B:

Section A. **Complete if applying as an individual:**

- Enter the complete name of the responsible individual who will be the permittee if a permit is issued. Enter personal information that identifies the applicant. ***Fax and e-mail are not required if not available.***
- If you are applying on behalf of a client, the personal information must pertain to the client, and a document evidencing power of attorney must be included with the application.
- **Affiliation/Doing business as (dba)**: business, agency, organizational, or institutional affiliation *directly* related to the activity requested in the application (e.g., a taxidermist is an individual whose business can *directly* relate to the requested activity). The Division of Management Authority (DMA) will **not** accept *doing business as* affiliations for individuals.

Section B. **Complete if applying as a business, corporation, public agency, tribe, or institution:**

- Enter the complete name of the business, agency, tribe, or institution that will be the permittee if a permit is issued. Give a brief description of the type of business the applicant is engaged in. Provide contact phone number(s) of the business.
- **Principal Officer** is the person in charge of the listed business, corporation, public agency, tribe, or institution. The principal officer is the person responsible for the application and any permitted activities. Often the principal officer is a Director or President. **Primary Contact** is the person at the business, corporation, public agency, tribe, or institution who will be available to answer questions about the application or permitted activities. Often this is the preparer of the application.

ALL APPLICANTS COMPLETE SECTION C:

- For all applications submitted to the Division of Management Authority (DMA) a physical U.S. address is **required**. Province and Country blocks are provided for those USFWS programs which use foreign addresses and are not required by DMA.
- **Mailing address** is address where communications from USFWS should be mailed if different than applicant's physical address.

ALL APPLICANTS COMPLETE SECTION D:

Section D.1 **Application processing fee:**

- An application processing fee is required at the time of application; unless exempted under 50 CFR13.11(d)(3). The application processing fee is assessed to partially cover the cost of processing a request. **The fee does not guarantee the issuance of a permit. Fees will not be refunded for applications that are approved, abandoned, or denied**. We may return fees for withdrawn applications prior to any significant processing occurring.
- **Documentation of fee exempt status is not required for Federal, tribal, State, or local government agencies; but must be supplied by those applicants acting on behalf of such agencies**. Those applicants acting on behalf of such agencies must submit a letter on agency letterhead and signed by the head of the unit of government for which the applicant is acting on behalf, confirming that the applicant will be carrying out the permitted activity for the agency.

Section D.2 **Federal Fish and Wildlife permits:**

- List the number(s) of your most current FWS or CITES permit or the number of the most recent permit if none are currently valid. If applying for re-issuance of a CITES permit, the original permit must be returned with this application.

Section D.3 **CERTIFICATION:**

- **The individual identified in Section A, the principal officer named in Section B, or person with a valid power of attorney (documentation must be included in the application) must sign and date the application in blue ink.** This signature binds the applicant to the statement of certification. This means that you certify that you have read and understand the regulations that apply to the permit. You also certify that everything included in the application is true to the best of your knowledge. Be sure to read the statement and re-read the application and your answers before signing.

ALL APPLICANTS COMPLETE SECTION E.

Please continue to next page

APPLICATION FOR A FEDERAL FISH AND WILDLIFE PERMIT
Paperwork Reduction Act, Privacy Act, and Freedom of Information Act – Notices

In accordance with the Paperwork Reduction Act of 1995 (44 U.S.C. 3501, *et seq.*) and the Privacy Act of 1974 (5 U.S.C. 552a), please be advised:

1. The gathering of information on fish and wildlife is authorized by:
(Authorizing statutes can be found at: http://www.gpoaccess.gov/cfr/index.html and http://www.fws.gov/permits/ltr/ltr.html.)

   a. Bald and Golden Eagle Protection Act (16 U.S.C. 668), 50 CFR 22;
   b. Endangered Species Act of 1973 (16 U.S.C. 1531-1544), 50CFR 17;
   c. Migratory Bird Treaty Act (16 U.S.C. 703-712), 50 CFR 21;
   d. Marine Mammal Protection Act of 1972 (16 U.S.C. 1361, *et. seq*.), 50 CFR 18;
   e. Wild Bird Conservation Act (16 U.S.C. 4901-4916), 50 CFR 15;
   f. Lacey Act: Injurious Wildlife (18 U.S.C. 42), 50 CFR 16;
   g. Convention on International Trade in Endangered Species of Wild Fauna and Flora (TIAS 8249), http://www.cites.org/, 50 CFR 23;
   h. General Provisions, 50 CFR 10;
   i. General Permit Procedures, 50 CFR 13; and
   j. Wildlife Provisions (Import/export/transport), 50 CFR 14.

2. Information requested in this form is purely voluntary. However, submission of requested information is required in order to process applications for permits authorized under the above laws. Failure to provide all requested information may be sufficient cause for the U.S. Fish and Wildlife Service to deny the request. We may not conduct or sponsor and you are not required to respond to a collection of information unless it displays a currently valid OMB control number.

3. Certain applications for permits authorized under the Endangered Species Act of 1973 (16 U.S.C. 1539) and the Marine Mammal Protection Act of 1972 (16 U.S.C. 1374) will be published in the **Federal Register** as required by the two laws.

4. Disclosures outside the Department of the Interior may be made without the consent of an individual under the routine uses listed below, if the disclosure is compatible with the purposes for which the record was collected. (Ref. 68 FR 52611, September 4, 2003)

   a. Routine disclosure to subject matter experts, and Federal, tribal, State, local, and foreign agencies, for the purpose of obtaining advice relevant to making a decision on an application for a permit or when necessary to accomplish a FWS function related to this system of records.
   b. Routine disclosure to the public as a result of publishing **Federal Register** notices announcing the receipt of permit applications for public comment or notice of the decision on a permit application.
   c. Routine disclosure to Federal, tribal, State, local, or foreign wildlife and plant agencies for the exchange of information on permits granted or denied to assure compliance with all applicable permitting requirements.
   d. Routine disclosure to Captive-bred Wildlife registrants under the Endangered Species Act for the exchange of authorized species, and to share information on the captive breeding of these species.
   e. Routine disclosure to Federal, tribal, State, and local authorities who need to know who is permitted to receive and rehabilitate sick, orphaned, and injured birds under the Migratory Bird Treaty Act and the Bald and Golden Eagle Protection Act; federally permitted rehabilitators; individuals seeking a permitted rehabilitator with whom to place a bird in need of care; and licensed veterinarians who receive, treat, or diagnose sick, orphaned, and injured birds.
   f. Routine disclosure to the Department of Justice, or a court, adjudicative, or other administrative body or to a party in litigation before a court or adjudicative or administrative body, under certain circumstances.
   g. Routine disclosure to the appropriate Federal, tribal, State, local, or foreign governmental agency responsible for investigating, prosecuting, enforcing, or implementing statutes, rules, or licenses, when we become aware of a violation or potential violation of such statutes, rules, or licenses, or when we need to monitor activities associated with a permit or regulated use.
   h. Routine disclosure to a congressional office in response to an inquiry to the office by the individual to whom the record pertains.
   i. Routine disclosure to the General Accounting Office or Congress when the information is required for the evaluation of the permit programs.
   j. Routine disclosure to provide addresses obtained from the Internal Revenue Service to debt collection agencies for purposes of locating a debtor to collect or compromise a Federal claim against the debtor or to consumer reporting agencies to prepare a commercial credit report for use by the FWS.

5. For individuals, personal information such as home address and telephone number, financial data, and personal identifiers (social security number, birth date, etc.) will be removed prior to any release of the application.

6. The public reporting burden on the applicant for information collection varies depending on the activity for which a permit is requested. The relevant burden for a **Recovery and Interstate Commerce** permit application is **4 hours**. This burden estimate includes time for reviewing instructions, gathering and maintaining data and completing and reviewing the form. You may direct comments regarding the burden estimate or any other aspect of the form to the Service Information Clearance Officer, U.S. Fish and Wildlife Service, Mail Stop 222, Arlington Square, U.S. Department of the Interior, 1849 C Street, NW, Washington D.C. 20240.

Freedom of Information Act – Notice

For organizations, businesses, or individuals operating as a business (i.e., permittees not covered by the Privacy Act), we request that you identify any information that should be considered privileged and confidential business information to allow the Service to meet its responsibilities under FOIA. Confidential business information must be clearly marked "Business Confidential" at the top of the letter or page and each succeeding page and must be accompanied by a non-confidential summary of the confidential information. The non-confidential summary and remaining documents may be made available to the public under FOIA [43 CFR 2.13(c)(4), 43 CFR 2.15(d)(1)(i)].

WHAT YOU SHOULD KNOW ABOUT A FEDERAL PERMIT FOR EAGLE NEST REMOVAL

A Federal permit for take of an eagle nest authorizes take (removal and/or relocation) of a bald or golden eagle nest to protect human safety or eagles, and under other limited circumstances. You should review Title 50 Parts 10, 13, and 22.27 of the Code of Federal Regulations (CFR). **You are responsible for reviewing and understanding these regulations before you request and accept a permit.** These regulations can be found on our website at http://www.fws.gov/permits/ltr/ltr.html. Below are questions and answers regarding eagle nest take permits.

1. Under what circumstances may an eagle nest be removed?

This permit may be used to authorize the removal of a bald or golden eagle nest where the removal is: (a) necessary to alleviate a safety emergency to people or eagles; (b) necessary to ensure public health and safety; (c) the nest prevents the use of a pre-existing human-engineered structure; or (d) the activity or mitigation for the activity will provide a net benefit to eagles. Only inactive nests may be taken, except in the case of safety emergencies. Inactive nests are defined by the continuous absence of any adult, egg, or dependent young at the nest for at least 10 consecutive days leading up to the time of take.

2. If one of the four situations described above applies, will the Service automatically issue a nest removal permit?

No. Other criteria also must be met, including the following: the removal must be compatible with the preservation of bald and golden eagles; there is no practicable alternative to removing the nest; and for take that is not necessary to alleviate an immediate threat to human safety or eagles, we additionally must find that suitable nesting and foraging habitat is available to the area nesting population of eagles to accommodate any eagles displaced by the nest removal.

3. Does the permit allow people to take nests that have eggs or nestlings in them?

The only situation in which the permit may authorize removal of an active nest is in the case of a safety emergency, meaning a situation that necessitates immediate action to alleviate a threat of bodily harm to humans or eagles. Otherwise, only inactive nests may be removed with this permit. For purposes of this permit, an inactive nest is "a bald eagle or golden eagle nest that is not currently being used by eagles as determined by the continuing absence of any adult, egg, or dependent young at the nest for at least 10 consecutive days immediately prior to, and including, at present."

4. If an emergency necessitates the removal of a nest with eggs or dependent young, what should the permittee do about the eggs or young eagles?

Emergency nest-take permits may authorize the take of eggs or young if they are present. Any take of nestlings or eggs must be conducted by a Service-approved, qualified, and permitted agent, and all nestlings and viable eggs must be immediately transported to foster/recipient nests or a rehabilitation facility permitted to care for eagles, as directed by the Service.

5. Can a permittee keep an eagle nest taken under this permit?

No. A separate permit is required to possess an eagle nest and it can be issued only to specific types of organizations. The Bald and Golden Eagle Protection Act (16 U.S.C 668—668d) allows only public museums, public scientific societies, and public zoological parks to obtain permits to possess eagle nests for scientific or educational purposes.

6. Are post-activity monitoring and reporting required?
Permittees may be required to monitor the area and report whether eagles attempt to build or occupy another nest at another site in the vicinity for the duration specified in the permit. Permittees must submit a report to the Regional Migratory Bird Permit Office within 30 days after the permitted nest removal (except for programmatic permittees who must report each nest removal within 10 days after the take and submit an annual report by January 31 of the calendar year). The report must include all the information required by Service Form 3-202-16.

7. What is a programmatic permit and when is it required?
Programmatic take is generally defined as take that is recurring and not in a specific, identifiable time frame and/or location. The specific regulatory definition is "take that (a) is recurring, but not caused solely by indirect effects, and (b) occurs over the long term and/or in a location or locations that cannot be specifically identified."

Programmatic take permits may be issued to entities, such as electric utilities or airports that cannot entirely avoid the need to remove eagle nests during the course of their routine operations. In order to qualify for programmatic permits, applicants must work with the Service to develop and implement additional, exceptionally comprehensive measures ("advanced conservation practices" or "ACPs") to reduce take to the level where any remaining take is essentially unavoidable.

8. Will mitigation measures be required?
All permittees will be required to avoid and minimize the potential for take to the degree practicable, and for programmatic permits, to the point where take is unavoidable. Where feasible, if suitable conditions are present, the permittee may be required to relocate the nest, construct an alternate nest, or improve conditions at alternate nest sites in the territory. Compensatory mitigation may be appropriate depending on the biological value of the nest and the type of circumstances necessitating its removal. In general, little or no compensatory mitigation will be required for emergency nest-take if the permittee could not foresee or prevent the eagles from nesting.

9. How long does it take to get a permit to remove an eagle nest?
The time needed by the Service to process a permit application depends on the complexity and scope of the activity and associated take, whether tribal consultation is warranted, what additional environmental analyses may be required, and other factors. In general, applicants may expect the following approximate permit processing times from the time we receive a complete application:

Emergency nest-take permit	2 to 5 days
Standard permit	90 days
Standard or programmatic permit requiring an environmental assessment	4 to 6 months
Standard or programmatic permit with EIS	18 to 24 months

10. Do I need additional authorization to take eagles from my State or tribal government?
State, tribal and local governments may have their own regulations protecting eagles and eagle nests. Your federal permit is not valid unless you obtain and comply with all permits, licenses, or other authorizations required by these jurisdictions that apply your activity with respect to eagles.

11. How do I renew my permit?
Except for programmatic permits, this type of permit should not typically be subject to renewal considerations, because, in general, standard permits issued under these regulations authorize take of a specific nest in an identifiable time-frame. However, a renewal letter or form and annual report form will be sent to you at least 60 days prior to the expiration of your permit (partially as a reminder that your

permit is due to expire). If you wish to renew your permit, you must return the completed renewal to your Regional Migratory Bird Permit Office at least 30 days prior to the expiration of your permit and include copies of any other permits required by your State, tribe, or other jurisdiction. If we receive your renewal request at least 30 days prior to the expiration of your permit, your permit will remain valid beyond the expiration date for the activity authorized on your permit until a decision on your renewal is made. If we receive your renewal request fewer than 30 days prior to expiration of your permit and we are unable to process your request before the expiration date, your permit will expire and you will no longer be covered for your activity. If you allow your permit to expire before requesting renewal, you may be required to submit a new application. (See 50 CFR 13.22 and 13.11(c)).

Department of the Interior
U.S. Fish and Wildlife Service

Federal Fish and Wildlife Permit Application Form

OMB Control No. 1018 - 0022
Expires 02/28/2014

Click here for addresses.

Return to: U.S. Fish and Wildlife Service (USFWS)

Type of Activity: Eagle Nest Take

_____ New Application

_____ Requesting Renewal or Amendment of Permit # _____

Complete Sections A or B, and C, D, and E of this application. U.S. address may be required in Section C, see instructions for details.
See attached instruction pages for information on how to make your application complete and help avoid unnecessary delays.

A. Complete if applying as an individual			
1.a. Last name	1.b. First name	1.c. Middle name or initial	1.d. Suffix
2. Date of birth (mm/dd/yyyy)	3. Social Security No.	4. Occupation	5. Affiliation/ Doing business as (see instructions)
6.a. Telephone number	6.b. Alternate telephone number	6.c. Fax number	6.d. E-mail address

B. Complete if applying on behalf of a business, corporation, public agency, tribe, or institution			
1.a. Name of business, agency, tribe, or institution	1.b. Doing business as (dba)		
2. Tax identification no.	3. Description of business, agency, or institution		
4.a. Principal officer Last name	4.b. Principal officer First name	4.c. Principal officer Middle name/ initial	4.d. Suffix
5. Principal officer title	6. Primary contact		
7.a. Business telephone number	7.b. Alternate telephone number	7.c. Business fax number	7.d. Business e-mail address

C. All applicants complete address information				
1.a. Physical address (Street address; Apartment #, Suite #, or Room #; no P.O. Boxes)				
1.b. City	1.c. State	1.d. Zip code/Postal code:	1.e. County/Province	1.f. Country
2.a. Mailing Address (include if different than physical address; include name of contact person if applicable)				
2.b. City	2.c. State	2.d. Zip code/Postal code:	2.e. County/Province	2.f. Country

D. All applicants MUST complete

1. Attach check or money order payable to the U.S. FISH AND WILDLIFE SERVICE **in the amount** $500.00 (standard) or $1,000 (programmatic) if you are applying for a new permit or $150.00 (standard) or $500 (programmatic) if you are requesting a substantive amendment of your existing valid permit. Federal, tribal, State, and local government agencies, and those acting on behalf of such agencies, are exempt from the processing fee – ***attach documentation of fee exempt status as outlined in instructions.*** (50 CFR 13.11(d))

2. Do you currently have or have you ever had any Federal Fish and Wildlife permits?
   Yes ☐ If yes, list the number of the most current permit you have held or that you are applying to renew/re-issue: _____ No ☐

3. Certification: I hereby certify that I have read and am familiar with the regulations contained in ***Title 50, Part 13 of the Code of Federal Regulations*** and the other ***applicable parts in subchapter B of Chapter I of Title 50***, and I certify that the information submitted in this application for a permit is complete and accurate to the best of my knowledge and belief. I understand that any false statement herein may subject me to the criminal penalties of 18 U.S.C. 1001.

_____
Signature (**in blue ink**) of applicant/person responsible for permit (No photocopied or stamped signatures) Date of signature (mm/dd/yyyy)

Please continue to next page

E. Eagle Nest Take
(Bald and Golden Eagle Protection Act, 50 CFR 22.27)

Note: ***A Federal eagle nest take permit authorizes the removal of bald eagle or golden eagle nests for human safety, the safety of eagles, or the public's welfare. Permits are available to individuals, agencies, businesses, and other organizations. This permit does not authorize possession of any eagle or eagle parts including nests or the lethal take of any eagle eggs. Please read "What You Should Know About a Federal Permit for Eagle Nest Removal" and the regulations at 50 CFR 21.27 before you sign and submit your application.***

Please provide the following information numbered accordingly to the questions below on a separate sheet of paper. You should be as specific as possible in your responses. Please do not send pages that are over 8.5" x 11", videotapes, or DVDs. Although you may send supplemental documents that contain some of this information, you must include a separate attachment that responds to each specific application requirement and only the specific application requirements included on this form.

We strongly recommend that you submit your application at least 60 days prior to the date you need your permit, as required by 50 CFR 13.11(c).

1. A description of the situation that necessitates removal of the eagle nest(s), including:

(a) (1) The number of nests proposed to be taken;

(2) Whether the nest is a bald eagle or golden eagle nest; and

(3) Whether the nest is active or inactive. (An active nest may only be taken to alleviate an immediate safety emergency. A "safety emergency" means "a situation that necessitates immediate action to alleviate a threat of bodily harm to humans or eagles." An inactive nest is one that is not currently used by eagles as determined by the absence of any adult, egg, or dependent young at the nest during the 10 days before the nest is taken.)

(b) Is the nest take necessary to alleviate a safety emergency? ☐ Yes ☐ No

(1) If Yes, describe the safety emergency and why removal of the nest is necessary to alleviate it.

(2) If No, Provide the following:

A. An explanation for why removal of the nest(s) is necessary)

B. A calculation of the bald eagle or golden eagle area nesting population, including an appropriately scaled map or plat showing the location of each eagle nest used to calculate the area nesting population unless the Service has sufficient data to independently calculate the area nesting population.

C. A description of the avoidance, minimization, and mitigation measures you have used to reduce the need to take the nest, to offset the take, or in some situations (see 50 CFR 22.27(b)(7)) to provide a net benefit to eagles.

(c) Is the nest built on a human-engineered structure, creating a functional hazard that renders the structure inoperable for its intended use? ☐ Yes ☐ No

If yes, provide maps, digital photographs and a detailed description of the situation and functional hazard.

(d) A description of the property, including maps and digital photographs that show the location of the nest in relation to buildings, infrastructure, and human activities;

(e) The location of the property, including city, country and latitude and longitude geographic coordinates;

(f) The length of time for which the permit is requested, including beginning and ending dates; and

(g) When an active nest must be removed under this permit, any take of nestlings or eggs must be conducted by a Service-approved, qualified, and permitted agent, and all nestlings and viable eggs must be immediately transported to foster/recipient nests or a rehabilitation facility permitted to care for eagles, as directed by the Service. Provide a statement outlining how the eagle's nest will be removed, indicating the intended disposition of the nest, and if active, a description of how the nestlings or eggs will be removed, including the recipient nest(s) or federally permitted rehabilitation facility that is authorized for the possession of live eagle(s) or eggs, and/or eagle nest(s).

2. If the nest will be removed or relocated (rather than destroyed in the course of an activity), provide the name, address, phone number, and e-mail address of the qualified party conducting the removal and/or relocation.

3. You must retain records relating to the activities conducted under your permit for at least 5 years from the date of expiration of the permit. Please provide the address where these records will be kept.

4. **Any permit issued as a result of this application is not valid unless you also have any required State or tribal permits or approvals associated with the activity.** Have you obtained all required State or tribal permits or approvals to conduct this activity?

☐ Yes If "yes", attach a copy of the approval(s). ☐ Have applied **(Send copy when issued)** ☐ None required

PERMIT APPLICATION FORM INSTRUCTIONS

The following instructions pertain to an application for a U.S. Fish and Wildlife Service or CITES permit. The General Permit Procedures in 50 CFR 13 address the permitting process. For simplicity, all licenses, permits, registrations, and certificates are referred to as a permit.

GENERAL INSTRUCTIONS:

- Complete all blocks/lines/questions in Sections A or B, and C, D, and E.
- **An incomplete application may cause delays in processing or may be returned to the applicant. Be sure you are filling in the appropriate application form for the proposed activity.**
- Print clearly or type in the information. Illegible applications may cause delays.
- Sign the application in blue ink. Faxes or copies of the original signature will not be accepted.
- Mail the original application to the address at the top of page one of the application or if applicable on the attached address list.
- **Keep a copy of your completed application.**
- **Please plan ahead. Allow at least 60 days for your application to be processed. Some applications may take longer than 90 days to process. (50 CFR 13.11)**
- Applications are processed in the order they are received.
- Additional forms and instructions are available from http://permits.fws.gov.

COMPLETE EITHER SECTION A OR SECTION B:

Section A. **Complete if applying as an individual:**

- Enter the complete name of the responsible individual who will be the permittee if a permit is issued. Enter personal information that identifies the applicant. ***Fax and e-mail are not required if not available.***
- If you are applying on behalf of a client, the personal information must pertain to the client, and a document evidencing power of attorney must be included with the application.
- **Affiliation/ Doing business as (dba)**: business, agency, organizational, or institutional affiliation *directly* related to the activity requested in the application (e.g., a taxidermist is an individual whose business can *directly* relate to the requested activity). The Division of Management Authority (DMA) will **not** accept *doing business as* affiliations for individuals.

Section B. **Complete if applying as a business, corporation, public agency, tribe, or institution:**

- Enter the complete name of the business, agency, tribe, or institution that will be the permittee if a permit is issued. Give a brief description of the type of business the applicant is engaged in. Provide contact phone number(s) of the business.
- **Principal Officer** is the person in charge of the listed business, corporation, public agency, tribe, or institution. The principal officer is the person responsible for the application and any permitted activities. Often the principal officer is a Director or President. **Primary Contact** is the person at the business, corporation, public agency, tribe, or institution who will be available to answer questions about the application or permitted activities. Often this is the preparer of the application.

ALL APPLICANTS COMPLETE SECTION C:

- For all applications submitted to the Division of Management Authority (DMA) a physical U.S. address is **required**. Province and Country blocks are provided for those USFWS programs which use foreign addresses and are not required by DMA.
- **Mailing address** is address where communications from USFWS should be mailed if different than applicant's physical address.

ALL APPLICANTS COMPLETE SECTION D:

Section D.1 **Application processing fee:**

- An application processing fee is required at the time of application; unless exempted under 50 CFR13.11(d)(3). The application processing fee is assessed to partially cover the cost of processing a request. **The fee does not guarantee the issuance of a permit. Fees will not be refunded for applications that are approved, abandoned, or denied**. We may return fees for withdrawn applications prior to any significant processing occurring.
- **Documentation of fee exempt status is not required for Federal, tribal, State, or local government agencies; but must be supplied by those applicants acting on behalf of such agencies**. Those applicants acting on behalf of such agencies must submit a letter on agency letterhead and signed by the head of the unit of government for which the applicant is acting on behalf, confirming that the applicant will be carrying out the permitted activity for the agency.

Section D.2 **Federal Fish and Wildlife permits:**

- List the number(s) of your most current FWS or CITES permit or the number of the most recent permit if none are currently valid. If applying for re-issuance of a CITES permit, the original permit must be returned with this application.

Section D.3 **CERTIFICATION:**

- **The individual identified in Section A, the principal officer named in Section B, or person with a valid power of attorney (documentation must be included in the application) must sign and date the application in blue ink.** This signature binds the applicant to the statement of certification. This means that you certify that you have read and understand the regulations that apply to the permit. You also certify that everything included in the application is true to the best of your knowledge. Be sure to read the statement and re-read the application and your answers before signing.

ALL APPLICANTS COMPLETE SECTION E.

Please continue to next page

APPLICATION FOR A FEDERAL FISH AND WILDLIFE PERMIT
Paperwork Reduction Act, Privacy Act, and Freedom of Information Act – Notices

In accordance with the Paperwork Reduction Act of 1995 (44 U.S.C. 3501, *et seq.*) and the Privacy Act of 1974 (5 U.S.C. 552a), please be advised:

1. The gathering of information on fish and wildlife is authorized by:
(Authorizing statutes can be found at: http://www.gpoaccess.gov/cfr/index.html and http://www.fws.gov/permits/ltr/ltr.html.)

   a. Bald and Golden Eagle Protection Act (16 U.S.C. 668), 50 CFR 22;
   b. Endangered Species Act of 1973 (16 U.S.C. 1531-1544), 50CFR 17;
   c. Migratory Bird Treaty Act (16 U.S.C. 703-712), 50 CFR 21;
   d. Marine Mammal Protection Act of 1972 (16 U.S.C. 1361, *et. seq*.), 50 CFR 18;
   e. Wild Bird Conservation Act (16 U.S.C. 4901-4916), 50 CFR 15;
   f. Lacey Act: Injurious Wildlife (18 U.S.C. 42), 50 CFR 16;
   g. Convention on International Trade in Endangered Species of Wild Fauna and Flora (TIAS 8249), http://www.cites.org/ , 50 CFR 23;
   h. General Provisions, 50 CFR 10;
   i. General Permit Procedures, 50 CFR 13; and
   j. Wildlife Provisions (Import/export/transport), 50 CFR 14.

2. Information requested in this form is purely voluntary. However, submission of requested information is required in order to process applications for permits authorized under the above laws. Failure to provide all requested information may be sufficient cause for the U.S. Fish and Wildlife Service to deny the request. We may not conduct or sponsor and you are not required to respond to a collection of information unless it displays a currently valid OMB control number.

3. Certain applications for permits authorized under the Endangered Species Act of 1973 (16 U.S.C. 1539) and the Marine Mammal Protection Act of 1972 (16 U.S.C. 1374) will be published in the **Federal Register** as required by the two laws.

4. Disclosures outside the Department of the Interior may be made without the consent of an individual under the routine uses listed below, if the disclosure is compatible with the purposes for which the record was collected. (Ref. 68 FR 52611, September 4, 2003)

   a. Routine disclosure to subject matter experts, and Federal, tribal, State, local, and foreign agencies, for the purpose of obtaining advice relevant to making a decision on an application for a permit or when necessary to accomplish a FWS function related to this system of records.
   b. Routine disclosure to the public as a result of publishing **Federal Register** notices announcing the receipt of permit applications for public comment or notice of the decision on a permit application.
   c. Routine disclosure to Federal, tribal, State, local, or foreign wildlife and plant agencies for the exchange of information on permits granted or denied to assure compliance with all applicable permitting requirements.
   d. Routine disclosure to Captive-bred Wildlife registrants under the Endangered Species Act for the exchange of authorized species, and to share information on the captive breeding of these species.
   e. Routine disclosure to Federal, tribal, State, and local authorities who need to know who is permitted to receive and rehabilitate sick, orphaned, and injured birds under the Migratory Bird Treaty Act and the Bald and Golden Eagle Protection Act; federally permitted rehabilitators; individuals seeking a permitted rehabilitator with whom to place a bird in need of care; and licensed veterinarians who receive, treat, or diagnose sick, orphaned, and injured birds.
   f. Routine disclosure to the Department of Justice, or a court, adjudicative, or other administrative body or to a party in litigation before a court or adjudicative or administrative body, under certain circumstances.
   g. Routine disclosure to the appropriate Federal, tribal, State, local, or foreign governmental agency responsible for investigating, prosecuting, enforcing, or implementing statutes, rules, or licenses, when we become aware of a violation or potential violation of such statutes, rules, or licenses, or when we need to monitor activities associated with a permit or regulated use.
   h. Routine disclosure to a congressional office in response to an inquiry to the office by the individual to whom the record pertains.
   i. Routine disclosure to the General Accounting Office or Congress when the information is required for the evaluation of the permit programs.
   j. Routine disclosure to provide addresses obtained from the Internal Revenue Service to debt collection agencies for purposes of locating a debtor to collect or compromise a Federal claim against the debtor or to consumer reporting agencies to prepare a commercial credit report for use by the FWS.

5. For individuals, personal information such as home address and telephone number, financial data, and personal identifiers (social security number, birth date, etc.) will be removed prior to any release of the application.

6. The public reporting burden on the applicant for information collection varies depending on the activity for which a permit is requested. The relevant burden for an Eagle Nest Take permit application is 16 hours, 40 hours for a programmatic permit application, 6 hours for a permit amendment, and 20 hours for a programmatic permit amendment. This burden estimate includes time for reviewing instructions, gathering and maintaining data and completing and reviewing the form. You may direct comments regarding the burden estimate or any other aspect of the form to the Service Information Clearance Officer, U.S. Fish and Wildlife Service, Mail Stop 222, Arlington Square, U.S. Department of the Interior, 1849 C Street, NW, Washington D.C. 20240.

Freedom of Information Act – Notice

For organizations, businesses, or individuals operating as a business (i.e., permittees not covered by the Privacy Act), we request that you identify any information that should be considered privileged and confidential business information to allow the Service to meet its responsibilities under FOIA. Confidential business information must be clearly marked "Business Confidential" at the top of the letter or page and each succeeding page and must be accompanied by a non-confidential summary of the confidential information. The non-confidential summary and remaining documents may be made available to the public under FOIA [43 CFR 2.13(c)(4), 43 CFR 2.15(d)(1)(i)].

U.S. Fish & Wildlife Service

Migratory Bird Regional Permit Offices

FWS REGION	AREA OF RESPONSIBILITY	MAILING ADDRESS	CONTACT INFORMATION
Region 1	**Hawaii, Idaho, Oregon, Washington**	911 N.E. 11th Avenue Portland, OR 97232-4181	Tel. (503) 872-2715 Fax (503) 231-2019 Email *permitsR1MB@fws.gov*
Region 2	**Arizona, New Mexico, Oklahoma, Texas**	P.O. Box 709 Albuquerque, NM 87103	Tel. (505) 248-7882 Fax (505) 248-7885 Email *permitsR2MB@fws.gov*
Region 3	**Iowa, Illinois, Indiana, Minnesota, Missouri, Michigan, Ohio, Wisconsin**	5600 America Blvd. West Suite 990 Bloomington, MN 55437-1458 (Effective 5/31/2011)	Tel. (612) 713-5436 Fax (612) 713-5393 Email *permitsR3MB@fws.gov*
Region 4	**Alabama, Arkansas, Florida, Georgia, Kentucky, Louisiana, Mississippi, North Carolina, South Carolina, Tennessee, Virgin Islands, Puerto Rico**	P.O. Box 49208 Atlanta, GA 30359	Tel. (404) 679-7070 Fax (404) 679-4180 Email *permitsR4MB@fws.gov*
Region 5	**Connecticut, District of Columbia, Delaware, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, Virginia, Vermont, West Virginia**	P.O. Box 779 Hadley, MA 01035-0779	Tel. (413) 253-8643 Fax (413) 253-8424 Email *permitsR5MB@fws.gov*
Region 6	**Colorado, Kansas, Montana, North Dakota, Nebraska, South Dakota, Utah, Wyoming**	P.O. Box 25486 DFC(60154) Denver, CO 80225-0486	Tel. (303) 236-8171 Fax (303) 236-8017 Email *permitsR6MB@fws.gov*
Region 7	**Alaska**	1011 E. Tudor Road (MS-201) Anchorage, AK 99503	Tel. (907) 786-3693 Fax (907) 786-3641 Email *permitsR7MB@fws.gov*
Region 8	**California, Nevada**	2800 Cottage Way Sacramento, CA 95825	Tel. (916) 978-6183 Fax (916) 414-6486 Email*permitsR8MB@fws.gov*

NEW MEXICO DEPARTMENT OF GAME AND FISH (NMDGF) PERMIT APPLICATION FOR THE TAKING AND POSESSION OF WILDLIFE FOR SCIENTIFIC AND EDUCATIONAL PURPOSES

INSTRUCTIONS/DEFINITIONS:

New Mexico law and regulations provide for the taking of protected wildlife for scientific and educational purposes under NMSA 17-3-29, 19 NMAC 36.2 and 19 NMAC 35.6. In 19 NMAC 36.2 such purposes are defined as "research, management and/or related purposes (e.g. captive, experimental and mark-and-release studies)" as well as activities that expand scientific knowledge, educate, or similarly promote the conservation of New Mexico's wildlife. These activities must meet stringent standards to be authorized and permitted by NMDGF.

1. Protected wildlife defined
   - A. Non-residents: all wild species of mammals, birds, reptiles, amphibians and fishes and endangered mollusks and crustaceans (19 NMAC.36.2.G.1).
   - B. Residents: pikas, marmots and game, furbearing and endangered/threatened mammals; all birds (except rock doves, European starlings, and house sparrows); horned lizards (if sacrificed, retained and /or transported out-of-state) and endangered/threatened reptiles; and endangered/threatened amphibians; game and endangered/threatened fishes; and endangered/threatened mollusks and crustaceans (19 NMAC.36.2.G.2).
   - C. Take: possession (temporary or permanent), sacrifice, capture, salvage
2. Permits holder(s) defined
   - A. Permits are issued to individuals, as opposed to agencies or other inclusive bodies and are non-transferable (19 NMAC 36.2.8.E and J).
   - B. Subpermittees (19 NMAC 36.2.8.E)
     a. To be designated as subpermittees, qualifications of such person(s) must be included in application as well as signature of subpermittee.
     b. Subpermittees should be listed if "they take or possess protected wildlife when outside the immediate oversight and supervision of the permittee".
3. Permit process
   - A. Submit a complete application: contact information, exact species, number of take for each species, locations of take for each species, methods, disposition, purpose/ rationale/justification for activities, qualification of permittee and subpermittees, signatures of permittee and subpermittees.
   - B. Enclose annual fee: $15.00 except as exempted (see 19 NMAC 36.2.9).
   - C. Allow a processing time up to six weeks.
   - D. Issuance: Permits will be issued only to qualified applicants, for purposes demonstrated and supported by the permit application and determined by NMDGF staff as legitimate scientific and educational activities carried out in a humane, judicious, sensitive and otherwise appropriate manner (19 NMAC.36.2.8.H).
4. Permit authorization period
   - A. Permits are authorized on a calendar year and may be authorized up to 3 years.
   - B. Multi-year permits will only be approved if request is substantiated in permit application and applicant is in good standing (year-end reports submitted and no current infractions are in place).

5. Amendments (19 NMAC 36.2.8.G)
    A. Authorizations can only be amended when requested in writing by permittee.
    B. Any addition of newly-added subpermittees requires their signature and a description of qualifications (signature form can be provided upon request or last page of following application form may be used to submit signature).
6. Salvage
    A. Any form of salvage (temporary or permanent) of protected wildlife requires a permit from NMDGF. Species protected by federal law may also require an appropriate federal salvage permit.
    B. Any person who salvages or aids in salvaging dead, injured or otherwise incapacitated wildlife for the department of game and fish or others authorized for such possession are exempt from a permit only when it can be demonstrated in writing that such persons are conducting the salvage for those authorized for such possession.
7. Year-end reports (19 NMAC 36.2.11)
    A. All permittees are required to file a year-end report.
    B. Regardless of the duration of a permit, an annual report of activities (or lack of activities) conducted is due no later than January 31 following the end of each year for which a permit was issued.
8. Permit must be in possession of permittee/subpermittees when conducting activities.
9. Revocation or suspension of permit
    A. Permits are subject to suspension or revocation at the discretion of the Director of the NMDGF, if permittees or subpermittees violate the conditions of a permit, and prosecution (plus confiscation of specimens or data) may also result. In addition, if little or no activity occurs under a permit for three consecutive years, the authorization may be subject to non-renewal.
    B. A system has been adopted by NMDGF for suspending or revoking privileges by the Game Commission of permittees who commit specific violations (see 19 NMAC 26.2.12.A).

The conditions and provisions outlined above and within the following application represent NMDGF regulations and policies with regard to the taking and possession of wildlife for scientific and educational purposes in New Mexico. By signing applications, year-end reports, and other documents, permittees and their subpermittees affirm their understanding of and intent to abide by New Mexico statutes, regulations and NMDGF policies. As a consequence, these documents can be used in dealing with infractions committed by a permittee or any subpermittees (19 NMAC 34.2.9.L). **A permit may be denied if the application does not provide substantial written explanation of or justification for the requested activities.**

The State Game Commission reserves the right to modify the regulations concerning permits at anytime. Such changes will be communicated to permittees and shall be incorporated as terms and conditions of any outstanding permits

Revised 8 November 2001; 2 November 2010; January 2012

This space for official use only		Receipt (Date and Initial)

New Mexico Department of Game and Fish (NMDGF) Permit Application to Take Protected Wildlife For Scientific and/or Educational Purposes

This form must be filled out completely, in detail and signed by the applicant and all subpermittees, if any. It is not sufficient to say "same as last year" or "see file" in any section of the application, except for qualifications of permit holder or subpermittees approved in a previous permit application or amendment.

Allow up to 6 weeks for processing of permit application from date of submission. If approved, you will be issued a permit that stipulates the specific activities you will be authorized to conduct.

All applicants should send their signed/dated application and fee (if required) to the New Mexico Department of Game and Fish, Field Operations Division, P.O. Box 25112, Santa Fe, NM 87504-5112. This form may also be submitted electronically, if the final page (#14) is scanned with the original signatures, to kristin.madden@state.nm.us. Call 505.476. 8066 if you have any questions.

1) CONTACT INFORMATION

Name of Prospective Permittee: _____

Mailing address: _____

_____

Daytime Phone(s): _____ **Other:** _____

Email Address: _____

2) PREVIOUS PERMITS

Have you previously been authorized a NMDGF Scientific or Educational Permit?

If so, please indicate your most recent Permit number _____ **and last year of issue** _____ **. (Leave blank if unknown)**

3) REQUESTED TIME PERIOD

Permits are authorized on a calendar year basis. Indicate the year(s) for which you request authorization. No more than 3 years will be approved for a given permit period. A multi-year permit will only be authorized for ongoing projects which demonstrate the need. If you do not know what your permit requirements will be from year-to-year do not apply for a multi-year permit. Multi-year permits will not be authorized to first time permit holders.

Years of authorization requested: From _____ **(Year) to** _____ **(Year)**

4) FEE EXEMPTIONS

Applicants are exempt from the $15.00 annual fee when activities are part of your official duties as a federal or New Mexico state employee or local agency employee, or a contractor of or as a designated cooperator with the NMDGF (if in doubt contact the Permit Section to ascertain your status, 505.476.8066). If exempt provide a brief statement of explanation below:

5) WILDLIFE REQUEST

Provide a detailed listing of protected wildlife for which you are requesting take (See Page 1 for definitions of "take" and "protected"). Attach additional pages if necessary. Banders may indicate taxonomic group but listing of specific species preferred. Education permit applicants use "Species Scientific Name" and "Maximum Number To Be Retained":

Species scientific name	Capture & release?	Subset captured to be marked or sampled before release (tail clips, collared, banded, etc.) (estimate if needed)	Maximum # to be retained (killed, for laboratory use, behavioral study etc.)
	☐ Yes		
	☐ Yes		
	☐ Yes		
	☐ Yes		
	☐ Yes		
	☐ Yes		
	☐ Yes		
	☐ Yes		
	☐ Yes		

6) SALVAGE

Indicate salvage authorization requested by checking all appropriate boxes. Provide justification as required and indicated by asterisk (*) :

New Mexico Residents

☐ Game * ☐ Furbearer* ☐ Birds ☐ Threatened/Endangered Reptiles ☐ Threatened/Endangered Amphibians

☐ Threatened/Endangered Mammals

Non-Residents

☐ Game * ☐ Furbearer* ☐ Reptiles ☐ Birds ☐ Non-game mammals ☐ Amphbians

* If you require authorization for more than 2 specimens of game or furbearer indicate why this is needed	

7) FEDERAL PERMITING

If requesting activities involving federally protected species, have you received a federal scientific collection permit, education permit or banding permit?

○ **Yes** ○ **No** ○ **Pending** **If yes, federal permit number:**

8) LOCATION

List counties and describe the specific location(s) by county in which the surveys, trapping, banding, capture/retention of wildlife will occur. If you are applying for an Education permit, use this space to describe the facilities in which the animals will be held. Attach additional documentation if necessary:

9) METHODS

Specific means of taking of wildlife (e.g. mist nets, seines, pit traps, leg-hold, hand, etc.):

10) DISPOSITION OF RETAINED WILDLIFE

Include voucher specimens and any unintentional casualties. In what institution and in what form (e.g. dead specimens or live animals for behavioral study) will wildlife be retained? If no specific preference is listed, disposition will be to the Museum of Southwestern Biology, University of New Mexico, Albuquerque, NM:

11) RATIONALE/JUSTIFICATIONS

Provide the following in a separate document	Included?
Purposes: explain the purpose of the project. If this request is a renewal from a previous year indicate why project is continuating.	☐ YES
Justification for any requested collection and retention of wildlife: demonstrate need for the take and necessity of requested numbers. Poor justification may result in the denial of a permit application.	☐ YES
Benefits of project: this should also include how the State of New Mexico may benefit from the research, education activity, project, etc.	☐ YES
Time frame of work: in what months or season will work occur? Also use this space to describe why a multi-year permit should be approved if requested.	☐ YES
Resource needs and availability: indicate if this project is under contract or supported by grants and provide information demonstrating that this project will realistically occur	☐ YES

12) QUALIFICATIONS

Attach resume/CV or narrative description of permit applicant and any subpermittees' qualifications to conduct requested activities. If qualifications approved in a previous permit application or amendment note this in number 14.

13) REFERENCES

Include names and phone number of two people who can attest to your statements:

Name **Phone**

Name **Phone**

14) LEGAL CONFIRMATION

The information contained in this application and any attachments is true and complete to the best of my knowledge. I agree to abide by NMDGF laws and regulations relating to scientific and education permits. Once authorized, I agree to abide by the "Conditions of Authorization" contained in the permit approved for taking protected wildlife for scientific or educational purposes in New Mexico as requested in this application. I understand that my being authorized to conduct such activities can be revoked, suspended or amended by the Department to protect wildlife or as the result of violations that I may commit as a permittee or subpermittee.

Sign and date below, including all subpermittees

Applicant _____ **Date** _____
(Original Signature Required)

Qualifications previously approved?
◯ Yes ◯ No

Subpermittees Signatures:

Printed Name	Original Signature	Date	Qualifications Previously Approved?
			◯ Yes ◯ No
			◯ Yes ◯ No
			◯ Yes ◯ No
			◯ Yes ◯ No
			◯ Yes ◯ No
			◯ Yes ◯ No
			◯ Yes ◯ No
			◯ Yes ◯ No
			◯ Yes ◯ No
			◯ Yes ◯ No
			◯ Yes ◯ No
			◯ Yes ◯ No

APPENDIX D
USFWS NEST DESTRUCTION MEMORANDUM AND REGION 2 INTERIM EMPTY NEST POLICY

United States Department of the Interior
FISH AND WILDLIFE SERVICE
Washington, D C 20240
MBPM-2
Date: APR 15, 2003

MIGRATORY BIRD PERMIT MEMORANDUM

SUBJECT: Nest Destruction

PURPOSE: The purpose of the memorandum is to clarify the application of the Migratory Bird Treaty Act (MB TA) to migratory bird nest destruction, and to provide guidance for advising the public regarding this issue.

POLICY: The MB TA does not contain any prohibition that applies to the destruction of a migratory bird nest alone (without birds or eggs), provided that no possession occurs during the destruction. To minimize MB TA violations, Service employees should make every effort to inform the public of how to minimize the risk of taking migratory bird species whose nesting behaviors make it difficult to determine occupancy status or continuing nest dependency.

The MB TA specifically protects migratory bird nests from *possession, sale, purchase, barter, transport, import,* and *export,* and *take.* The other prohibitions of the MB TA - *capture, pursue, hunt,* and *kill* - are inapplicable to nests. The regulatory definition of *take,* as defined by 50 CFR 10.12, *means to pursue, hunt, shoot, wound, kill, trap, capture, or collect, or attempt hunt, shoot, wound, kill, trap, capture, or collect.* Only *collect* applies to nests.

While it is illegal to collect, possess, and by any means transfer possession of any migratory bird nest, the MB TA does not contain any prohibition that applies to the destruction of a bird nest alone (without birds or eggs), provided that no possession occurs during the destruction. The MB TA does not authorize the Service to issue permits in situations in which the prohibitions of the Act do not apply, such as the destruction of unoccupied nests. (Some unoccupied nests are legally protected by statutes other than the MB TA, including nests of threatened and endangered migratory bird species and bald and golden eagles, within certain parameters.)

However, the public should be made aware that, while destruction of a nest by itself is not prohibited under the MB TA, nest destruction that results in the unpermitted take of migratory birds or their eggs, is illegal and fully prosecutable under the MB TA.

Due to the biological and behavioral characteristics of some migratory bird species, destruction of their nests entails an elevated degree of risk of violating the MB TA. For example, colonial nesting birds are highly vulnerable to disturbance, the destruction of unoccupied nests during or near the nesting season could result in a significant level of take. Another example involves ground nesting species such as burrowing owls and bank swallows, which nest in cavities in the ground, making it difficult to detect whether or not their nests are occupied by eggs or nestlings or are otherwise still essential to the survival of the juvenile birds. The Service should make every effort to raise public awareness regarding the possible presence of birds and the risk of violating the MB TA, the Endangered Species Act (ESA), and the Bald and Golden Eagle Protection Act (BGEPA), and should inform the public of factors that will help minimize the likelihood that take would occur should nests be destroyed (i.e., when active nesting season normally occurs).

The Service should also take care to discern that persons who request MB TA permits for nest destruction are not targeting nests of endangered or threatened species or bald or golden eagles, so that the public can be made aware of the prohibitions of the ESA and the BGEPA against nest destruction.

In situations where it is necessary (i.e., for public safety) to remove (destroy) a nest that is occupied by eggs or nestlings or is otherwise still essential to the survival of a juvenile bird, and a permit is available pursuant to 50 CFR parts 13 and 21, the Service may issue a permit to take individual birds.

Interim Empty Nest Policy of the U. S. Fish and Wildlife Service, Region 2

Effective May 2000. Revised November 15, 2000

The following is the Interim policy of the Region 2 Migratory Bird Office regarding the need for permits to remove/destroy nuisance empty bird nests. Under this interpretation, empty nests are those nests that contain no live eggs or nestlings. Empty nests include nests under construction by adult birds. This interim policy is in effect pending review by the D.O.I. Solicitors Office of the scope of applicability of the Migratory Bird Treaty Act (MBTA) to empty nests. Possession of nests in the absence of a valid permit continues to fall under the prohibitions of the MBTA.

1. **Solitary-Nesting Birds** (species that do not cluster nests in colonies - all species except the groups listed under Colonial-Nesting Birds below).

   A permit is not needed for any individual to remove or destroy nuisance empty nests of non-colonial species of birds. If live eggs or nestlings are present in the nest, or if recently fledged birds are returning to roost in the nest at night until they achieve complete independence from the adult birds, then those nests may not be destroyed.

2. **Colonial-Nesting Birds** (species placing nests in dense multiple nest colonies - eared, western, and Clark's grebes; pelicans; cormorants; herons; egrets; ibis; spoonbills; storks; gulls; terns; skimmers; swifts; cave, cliff, and bank swallows).

   A) **Inactive or Abandoned Colonies**. In cases where a colony is no longer active (i.e.no evidence of the colonial species using the colony site for nesting purposes in the current year), then those old nests may be destroyed at any time without the need for a permit.

   In cases where a colony that was active during the current year abandons the site for some reason (e.g. weather; harassment), the colony should be considered ACTIVE; those nests may not be removed without permit until after the nesting season would normally be over (i.e. October through February). Reasons: (a) Birds may resume nesting after responsible weather factor abates; (b) in cases where abandonment is due to deliberate harassment to reduce depredation damages, the colony is often only partially abandoned and is therefore still (partially) active. Take of nests in partially or fully active colonies must be done by trained Wildlife Services personnel (see below). If all birds abandon the colony (which may be difficult to determine), the depredation problem is resolved and there should be no need to rush to remove the nests. Removal can commence after nesting would normally be over for the year.

   B) **Active or Partially Active Colonies**. Empty nests may be destroyed without permit at the beginning of the nesting season, up until such time as the first egg is laid by any bird in that colony. Once egg laying has commenced by any of those birds, all nest destruction must cease. Destruction of empty nests in an active or

partially active colony will likely threaten surrounding nests that contain eggs or nestlings; therefore it will not be allowed except on a case-by-case basis as determined by the Migratory Bird Permits Office. Nest destruction may resume at2 the end of the nesting season without a permit only after all nesting activities by all birds in the colony have ceased, which should be by October 1 (i.e. after all nestlings have fledged and left the site and no eggs are being incubated by late nesters). At such time nests containing infertile/abandoned/dead eggs or long-dead nestlings may also be destroyed without permit.

Permitting and Related Nest Issues.

Permits will not be issued for activities constituting unintentional (incidental) take (i.e. when take of the nest contents is not the ultimate purpose of the activity, but is an incidental result of an otherwise legal activity, such as construction of buildings or roads). Unintentional take of nests with live eggs or nestlings remains a violation of the MBTA.

Permits to take active nests (containing eggs or nestlings) of colonial species for Depredation Control purposes will not be issued by the Migratory Bird Permits Office. Destruction of such active nests must be done by trained personnel of the U.S.D.A. - Wildlife Services.

Please direct questions to the Region 2 Migratory Bird Permits Office (505-248-7882).

APPENDIX E
WSMR BIRD INCIDENT TRACKING FORM

Inspection Report for Avian Fatality

☐ **Avian Fatality** ☐ **New Record** ☐ **Historic Record**
☐ **Retrofitting** ☐ **New Record** ☐ **Historic Record**

Division: _____ Date: _____ Submitted by: _____

Pole ID: _____ Lat/Long: _____ Photos: _____

Primary Voltage ☐ 7.2/12.47 ☐ 14.4/24.9 ☐ Other _____ Secondary Voltage _____

Report History (*attach prior reports if possible*)

Death and Corrective Measure Report(s) (date/#) _____ Salvage Report(s) (date/#) _____

Wet conditions at time of fatalities? ☐ Yes ☐ No ☐ Don't Know

Bird Fatalities

Species: _____ Carcass(es) present? ☐ Yes ☐ No Location relative to pole: _____

Necropsy requested? ☐ Yes ☐ No ☐ Don't Know Cause of death, if known _____

Mark and describe locations of any burned feathers, burned flesh, signs of entanglement, etc.

Detailed Inspection

- Look for any separation less than 60" horizontal, 40" vertical
- Note condition of retrofit materials, look for flash marks on possible contact points
- Consider "non-typical" perch points, e.g. conductors, neutral, clevises, etc.

Crossarms

Unit	Avian Protection	Types / Manufacturers
Primary Top Unit: _____	☐ Wood ☐ Fiberglass	
☐ 60"h/40"v Const	☐ Covers ☐ Perch Discouragers ☐ Insulating Links	_____
Primary Low Unit: _____	☐ None ☐ Wood ☐ Fiberglass	
☐ 60"h/40"v Const	☐ Covers ☐ Perch Discouragers ☐ Insulating Links	_____
Kicker Arm:	☐ None ☐ Wood ☐ Fiberglass ☐ Perch Discouragers	_____

Devices/Equipment

Device	Quantity	Avian Protection	Types / Manufacturers
Arresters	_____	☐ Covers ☐ Perch Discouragers	_____
Cutouts	_____	☐ Covers ☐ Perch Discouragers	_____
Transformers	_____	☐ Covers ☐ Perch Discouragers	_____
Potheads	_____	☐ Covers ☐ Perch Discouragers	_____
_____	_____	☐ Covers ☐ Perch Discouragers	_____
_____	_____	☐ Covers ☐ Perch Discouragers	_____

Other (Item)	Avian Protection	Types / Manufacturers
☐ Primary Jumpers	☐ Covers ☐ Perch Discouragers	_____
☐ Stinger Wires	☐ Covers ☐ Perch Discouragers	_____
☐ Grounded Brackets	☐ Covers ☐ Perch Discouragers	_____
☐ Pole Ground Wire	☐ Covers ☐ Perch Discouragers	_____
☐ Grounded Guy	☐ Covers ☐ Perch Discouragers	_____
☐ Secondary Bushings	☐ Covers ☐ Perch Discouragers	_____

Inspection Report for Avian Fatality

☐ **Avian Fatality** ☐ **New Record** ☐ **Historic Record**
☐ **Retrofitting** ☐ **New Record** ☐ **Historic Record**

Division: _____

Pole ID: _____

Evaluation

Describe possible situations for electrocution or entanglement. Include any suspected gaps in the retrofitting, and consider non-typical perch locations. Refer to photos or make drawings.

Conclusion

☐ Adequate retrofit/construction
☐ Inadequate retrofit/construction (describe)
☐ Adequate retrofit/construction but avian protection device(s) failed (describe)
☐ Retrofit/construction appears adequate – reason for fatality is not evident

Recommendation

☐ Please check, sign, and date after any additional measures are completed.

Signature _____ Date _____

APPENDIX F
LINEMAN'S GUIDE TO AVIAN DISEASES

NEW MEXICO AVIAN PROTECTION WORKING GROUP *"Working Cooperatively to Resolve Avian Issues"*

NMAP

www.nmavianprotection.org

Lineman's Guide to Avian Diseases

Table of Contents:

Photo Courtesy of Xcel Energy

As linemen, you may occasionally encounter birds (alive and dead), and may have to handle bird nests during the course of your work. Lately, the media has been full of stories of avian diseases, and their impact on humans. This guide has been put together to inform you of the current state of affairs of those diseases in New Mexico, and the proper procedures to protect yourselves.

Avian Flu – Overview

Although Avian Influenza (flu) viruses are relatively common in wild birds, most do not cause obvious symptoms. These viruses are primarily spread through saliva and feces. Most do not infect humans; however in 1997, a particular strain (called H5N1) was found that could spread directly from birds to humans. This is highly contagious and is deadly to poultry. Despite the ability to infect humans, only about 200 cases of H5N1 in humans have been reported worldwide. However, nearly half of those cases have been fatal. No human or avian cases of H5N1 have been reported in the U.S. at the time of writing.

"Will H5N1 come to the USA?"

There are reports of infected migratory birds in Asia; therefore, there is potential for the virus to be carried to North America. However, there is currently little evidence that migratory birds play a major role in the dispersal of H5N1.

"Will we know if it does arrive?"

Although there is currently little evidence that migrants disperse Avian Flu, this remains the most likely natural route. The virus could be transmitted via birds that come into contact with each other in the arctic, and then disperse south to Asia and North America. The accidental or intentional import of infected birds is a far more likely route to the U.S. Currently, there is a ban on the import of all birds and bird products from H5N1-infected countries. Additionally, the inter-agency National Influenza Pandemic Preparedness Task Force, organized by the U.S. Secretary of Health and Human Services, is monitoring migratory birds for Avian Flu, especially in areas where those birds interact with others from countries where H5N1 is already present.

A Lineman's Guide to Avian Diseases – Page 2

Common Avian Flu Misconceptions

"There is an Avian Flu pandemic right now" – **False**. The current form of H5N1 is not efficient at passing from birds to humans. Therefore, although H5N1 is highly contagious and dangerous to birds, and can be transmitted to humans, the passage is difficult. Because the virus does not appear to spread easily to humans, it cannot spread rapidly among humans, as would be necessary for a pandemic to occur.

"Avian Flu is present in the U.S." – **Partially True**. There are types of Avian Flu present in the U.S. but the H5N1 form has not been detected in either birds or humans.

"All types of Avian Flu are dangerous" – **False**. Very few forms of Avian Flu are dangerous to birds, and even less are dangerous to humans. The majority do not cause visible symptoms in birds and are not transmissible to humans.

"Any bird I come in contact with is likely to have Avian Flu" – **False**. The majority of outbreaks have been in domestic poultry farms. Although wild birds are known to be able to carry Avian Flu, they are less likely to be infected than poultry. In addition, birds in the U.S. do not have H5N1.

"There is no cause for concern about Avian Flu" – **False**. There is some cause for concern, and it is better to be prepared than to be caught unaware. Although H5N1 does not currently transmit easily between birds and humans, nor from human to human, viruses can mutate over time and it is possible that one or both of those factors could change. In the event that the virus changes in a way that increases transmission, H5N1 could spread quickly and become a pandemic.

Avian Flu Links

Center for Disease Control - www.cdc.gov/flu/avian/index.htm
National Wildlife Health Center - www.nwhc.usgs.gov/disease_information/avian_influenza/index.jsp
NWHC Safety Guidelines for Handling Wild Birds www.nwhc.usgs.gov/publications/wildlife_health_bulletins/WHB_05_03.jsp
OSHA - www.osha.gov/dts/shib/shib121304.pdf
World Health Organization - www.who.int/csr/disease/avian_influenza/en/
Federal Government - www.pandemicflu.gov
US Dept of Interior - www.doi.gov/issues/avianflu.html
US Dept of Homeland Security - www.whitehouse.gov/homeland/nspi.pdf
US Dept of Agriculture - www.usda.gov/birdflu

Photo Courtesy of US FWS

A Lineman's Guide to Avian Diseases – Page 3

West Nile Virus (WNV) Overview

WNV has been in the U.S. since 1999 and in New Mexico since 2002. Since then, there have been approximately 330 laboratory-confirmed human cases, and 4 deaths in New Mexico. It is safe to assume that WNV is present in some local birds; however, very few mosquitoes carry the virus. WNV is transmitted when a mosquito that has bitten an infected bird also bites a human. The majority of human cases occur in immune-compromised individuals and the elderly. Occasionally healthy adults will contract WNV.

Mosquito (*Culex tarsalis*) photo courtesy of the CDC

Frequently Asked Questions

"Can I get WNV from human contact, or by contact with dead birds?"

No. WNV is transmitted by mosquito bite. However, it is always a good idea to wear gloves when handling sick or dead animals.

"Do all mosquitoes carry WNV?"

No. Most mosquitoes do not carry WNV. In fact some species of mosquito can't transmit the virus even if they are carriers. Even if you are in a location where you are frequently bitten by mosquitoes, you are still unlikely to become infected with WNV.

"Do all birds carry WNV?"

No. Similarly to mosquitoes, most birds do not carry WNV. Some carriers never exhibit symptoms, others cannot pass it on. WNV only stays active in most birds systems for 3-7 days, making it very difficult to pass on to a mosquito.

"What are the symptoms?"

The majority of people infected with WNV exhibit no symptoms, and never realize they were infected. About 1/5th of those infected will have mild flu-like symptoms (fever, fatigue, headache, etc.). About 1 in 150 people infected progress to West Nile encephalitis which is much more serious. Its symptoms can include: high fever, disorientation, tremors, convulsions, paralysis, coma or even death. Symptoms of WNV usually last for only a few days, although severe symptoms may last for weeks. Some neurological effects may be permanent.

Links

New Mexico Health Department - http://www.health.state.nm.us/wnv.html
Centers for Disease Control - http://www.cdc.gov/ncidod/dvbid/westnile/index.htm
US Geological Survey - http://westnilemaps.usgs.gov/

A Lineman's Guide to Avian Diseases – Page 4

Avian Ectoparasites

"What is an ectoparasite?"

Ectoparasites are parasites that live on the outside of animals, as opposed to endoparasites which live inside animals. Examples include: fleas, ticks, mites, flies, lice etc.

"Where would I encounter them?"

Many ectoparasites live on the bodies of animals and birds, however some also live in the nest material and only feed when the host (the animal or bird) is around. Therefore, if you are handling a bird or nest material, you may be exposed to any number of parasites. Many of these will abandon a dead host, but dead birds may also be infested with flies or ants, eating or laying eggs in the body.

"Are they dangerous?"

The vast majority of avian ectoparasites are host-specific, meaning that they will only live on one particular species or group of birds. Some will travel from bird to bird, but almost none are likely to bother humans, other than the "Ick" factor! Some spiders, which may also inhabit nests, can give a nasty bite, as can ants which may be defending a food supply (e.g. a dead bird).

Bird handling

Although the H5N1 form of Avian Flu has not yet arrived in North America, it is a good idea to take precautions when handling dead or injured birds. **PNM currently recommends that a dust mask and gloves be worn when handling birds. Additionally, some form of eye protection, as well as a long sleeved shirt and pants to reduce skin exposure are all good ideas.**

Viruses are transmitted primarily though oral secretions and feces, so avoid contact with either. If this is not possible, avoid touching your eyes, ears, nose, and mouth after handling any bird or nest, and wash hands thoroughly with antibacterial soap as soon as possible.

Local Contact Numbers

Hawks Aloft Inc. – 505-828-9455

US FWS – 505-248-6911

NM Public Health – 505-827-2613

USDA Wildlife Services – 1-866-487-3297

NM Game & Fish – 505-222-4700

Sponsored in 2006 by:

Hawks Aloft, Inc.
Conservation, Avian Research & Education

U.S. Fish & Wildlife Service

PNM® A personal commitment to New Mexico

APPENDIX G
DEVICE AND MATERIALS MANUFACTURER CONTACT LIST

MANUFACTURER	MATERIAL	PHONE	WEBSITE
DISTRIBUTION ELECTROCUTIONS			
Conductor Cover Manufacturers			
DMX Industries	Polymer	1-314-385-9396	N/A
EcoElectrical	PVC w/ Silicone Coating	1-775-853-8623	www.ecoelectrical.com/
Exensor Technology	Plastisol	+44 (0)1420 488646	www.exensor.co.uk/
Kaddas	ABS Plastic	1-801-972-5400	www.kaddas.com
Midsun Group	Silicone	1-860-378-0100	www.midsungroup.com/
Power Line Sentry	Prototype	1-970-599-1050	www.powerlinesentry.com
Preformed Line Products	Linear Low Density Polyethylene	1-440-461-5200	www.preformed.com/
Salisbury	Polymer	1-877-406-4501	www.salisburybyhoneywell.com/
TE Connectivity	Polymer	1-336-689-7348	www.te.com
Groundwire Molding Manufacturers			
Joslyn	Plastic	1-773-625-1500	www.joslynmfg.com
Osmose	Polyethylene	1-800-877-7653	www.osmose.com
Virginia Plastics	PVC	1-888-224-1751	www.vaplastics.com
Manufacturers Of Isolating Disks			
Salisbury	Polyurethane	1-877-406-4501	www.salisburybyhoneywell.com
TE Connectivity	Polymer	1-336-689-7348	www.te.com
Deadend Cover Manufacturers			
EcoElectrical	PVC w/ Silicone Coating	1-775-853-8623	www.ecoelectrical.com
Kaddas	ABS Plastic	1-801-972-5400	www.kaddas.com
TE Connectivity	Polymer	1-336-689-7348	www.te.com

MANUFACTURER	MATERIAL	PHONE	WEBSITE
Wheel-type Transformer Protector Manufacturers			
Central Moloney, Inc.	Polypropylene	1-870-247-5320	www.centralmoloneyinc.com/
Cooper Power Systems	Polypropylene	1-877-277-4636	www.cooperpower.com/
Howard Industries, Inc.	Polymer	1-601-425-3151	www.howard-ind.com
Porcelain Products Co.	Porcelain	1-832-364-0113	www.porcelainproductsco.com
Snap-on Bushing Cover Manufacturers			
Central Moloney, Inc.	Polypropylene	1-870-247-5320	www.centralmoloneyinc.com
DMX Industries	Polymer	1-314-385-9396	N/A
H.J. Arnett Industries	Polypropylene	1-800-684-9844	www.arnettindustries.com
Hendrix Wire and Cable	Polypropylene	1-603-673-2040	www.hendrix-wc.com
Howard Industries, Inc.	Polymer	1-601-425-3151	www.howard-ind.com
Hubbell Power Systems	Polypropylene	1-573-682-5521	www.hubbellpowersystems.com
InsulBoot	Arbosol PVC	1-800-262-2111	www.insulboot.com
Kaddas	Polymer	1-801-972-5400	www.kaddas.com
Midsun Group	Silicone	1-860-378-0100	www.midsungroup.com
Phoenix	Plastisol	1-905-878-2818	www.phnxmfg.com
Preformed Line Products	Plastisol	1-440-461-5200	www.preformed.com
Rauckman Utility Products	Polymer	1-618-222-7100	www.rauckmanutility.com/
Salisbury	Polyurethane and SALCOR	1-877-406-4501	www.salisburybyhoneywell.com/
TE Connectivity	Polymer	1-336-689-7348	www.te.com
Universal Thermography, Inc.	HDPE	1-888-388-4348	www.thermaguard.com
Warco, Inc.	Ethylene Propylene	1-636-433-2212	www.warcoinc.com
Transformer Animal Contact Barriers			
MANUFACTURER	**ACTIVE OR PASSIVE**	**PHONE**	**WEBSITE**
3M	Active	1-888-364-3577	solutions.3m.com/wps/portal/3M
Rauckman Utility Products	Active and Passive	1-618-222-7100	www.rauckmanutility.com/

MANUFACTURER	MATERIAL	PHONE	WEBSITE
Cutout Cover Manufacturers			
EcoElectrical	PVC w/ Silicone Coating	1-775-853-8623	www.ecoelectrical.com
Kaddas	ABS Plastic	1-801-972-5400	www.kaddas.com
Midsun Group	Polymer	1-860-378-0100	www.midsungroup.com
Salisbury	Polyurethane	1-877-406-4501	www.salisburybyhoneywell.com
TE Connectivity	Polymer	1-336-689-7348	www.te.com
Split-seam Jumper Manufacturers			
3M	Silicone	1-775-853-8623	solutions.3m.com/
Midsun	Vulcanized silicone	1-801-972-5400	www.midsungroup.com/
Salisbury	SALCOR Elastomer	1-877-406-4501	www.salisburybyhoneywell.com/
TE Connectivity	Polymer	1-888-264-1722	www.te.com
Pin Insulating Manufacturers			
EcoElectrical	PVC w/ Silicone Coating	1-775-853-8623	www.ecoelectrical.com
Hendrix Wire and Cable	Nylon	1-603-673-2040	www.hendrix-wc.com
Kaddas	ABS Plastic	1-801-972-5400	www.kaddas.com
TE Connectivity	Polymer	1-336-689-7348	www.te.com
Switch Barrier Manufacturers			
Midsun Group	Silicone, Polycarbonate	1-860-378-0100	www.midsungroup.com/
Salisbury	Polyurethane	1-877-406-4501	www.salisburybyhoneywell.com
TE Connectivity	Polymer	1-336-689-7348	www.te.com
Isolating Plate Manufacturers			
Midsun Group	Silicone, Polycarbonate	1-860-378-0100	www.midsungroup.com/
Salisbury	Polyurethane	1-877-406-4501	www.salisburybyhoneywell.com
TE Connectivity	Polymer	1-336-689-7348	www.te.com

MANUFACTURER	PHONE	WEBSITE
Animal-friendly Switch Manufacturers		
Bridges Electric, Inc.	1-800-743-6367	www.energy.siemens.com
Chance	1-573-682-5521	www.hubbellcatalog.com/hps
S&C Electric Company	1-410-266-8484 (DC) 1-570-619-7944 (DE/MA) 1-609-490-1667 (NJ) 1-804-320-8005 (VA)	www.sandc.com/

MANUFACTURER	MATERIAL	PHONE	WEBSITE
Perch Manufacturers			
Aluma-Form	Wood	1-901-362-0100	www.alumaform.com/
Hughes Brothers	Fiberglass	1-402-643-2991	www.hughesbros.com/index.html
Perch Discourager Manufacturers			
EcoElectrical	PVC w/ Silicone Coating	1-775-853-8623	www.ecoelectrical.com
Hendrix Wire & Cable	Polypropylene	1-603-673-2040	www.hendrix-wc.com
Hughes Brothers	Fiberglass	1-402-643-2991	www.hughesbros.com
Kaddas	PVC	1-801-972-5400	www.kaddas.com
Mission Engineering	HDPE	+27 11 334-0882	www.mission-eng.co.za
Pacer Industries	PVC	1-208-733-8074	N/A
Power Line Sentry	Electrical PVC	1-970-599-1050	www.PowerLineSentry.com
Zena	Polyethylene	1-970-663-3980	www.zenadesign.com/

SUBSTATION ELECTROCUTIONS

MANUFACTURER	PHONE	WEBSITE
Substation Protection Vendors		
Kaddas	1-801-972-5400	www.kaddas.com/
Midsun Group	1-860-378-0100	www.midsungroup.com/
Salisbury	1-877-406-4501	www.salisburybyhoneywell.com

MANUFACTURER	PHONE	WEBSITE
TE Connectivity	1-336-689-7348	www.te.com

MANUFACTURER	MATERIAL	PHONE	WEBSITE
Switch Barrier Manufacturers			
Midsun Group	Silicone, Polycarbonate	1-860-378-0100	www.midsungroup.com/
Salisbury	Polyurethane	1-877-406-4501	www.salisburybyhoneywell.com
TE Connectivity	Polymer	1-336-689-7348	www.te.com
Isolating Plate Manufacturers			
Midsun Group	Silicone, Polycarbonate	1-860-378-0100	www.midsungroup.com/
Salisbury	Polyurethane	1-877-406-4501	www.salisburybyhoneywell.com
TE Connectivity	Polymer	1-336-689-7348	www.te.com

MANUFACTURER	PHONE	WEBSITE
Animal-friendly Switch Manufacturers		
Bridges Electric, Inc.	1-800-743-6367	www.energy.siemens.com
Chance	1-573-682-5521	www.hubbellcatalog.com/hps
S&C Electric Company	1-410-266-8484 (DC) 1-570-619-7944 (DE/MA) 1-609-490-1667 (NJ) 1-804-320-8005 (VA)	www.sandc.com/
Animal Fencing Manufacturers		
Kinectrics	1-416-207-6000 ext. 6001	www.kinectrics.com/Solutions/Pages/PowerKage-Non-Electric-Fence.aspx
Transgard Systems	1-717-227-2600	www.transgardfence.com/
Vanquish Fencing	1-215-295-2863	www.vanquishfencing.com/products/
Animal Getaway Barrier Manufacturers		
Critter Guard	1-573-256-2110	www.critterguard.org/

COLLISIONS

MANUFACTURER	DEVICE	DESCRIPTION	PHONE	WEBSITE
Bird Collision Devices and Manufacturers				
Kaddas	Flapper	Swinging Plate	1-801-972-5400	www.kaddas.com/

MANUFACTURER	DEVICE	DESCRIPTION	PHONE	WEBSITE
P&R	BirdMARK/ Firefly	Swinging Plate	1-503-292-8682	www.pr-tech.com/
P&R	Firefly HW	Plate	1-503-292-8682	www.pr-tech.com
Power Line Sentry	BFD	Swinging Plate	1-970-599-1050	www.powerlinesentry.com
Preformed Line Products	BFD	Coiled Solid PVC Wire Marker	1-440-461-5200	www.preformed.com/
Preformed Line Products	SFD	Coiled Solid PVC Wire Marker	1-440-461-5200	www.preformed.com/
Preformed Line Products	SVD	Vibration Dampers	1-440-461-5200	www.preformed.com/
TE Connectivity	AFD	Swinging Plate	1-336-689-7348	www.te.com

NEST MANAGEMENT

Nest Deflector Manufacturers

MANUFACTURER	PHONE	WEBSITE
Kaddas	1-801-972-5400	www.kaddas.com
Power Line Sentry	1-970-599-1050	www.PowerLineSentry.com

AVIAN STREAMERS

MANUFACTURER	MATERIAL	PHONE	WEBSITE
Perch Discourager and Cover-up Material Manufacturers			
Kaddas	PVC	1-801-972-5400	www.kaddas.com
Mission Engineering	HDPE	+27 11 334-0882	www.mission-eng.co.za
Power Line Sentry	Electrical PVC	1-970-599-1050	www.PowerLineSentry.com
TE Connectivity	Polymer	1-336-689-7348	www.te.com
Zena Design	Polyethylene	1-970-663-3980	www.zenadesign.com/

AVIAN POLLUTION

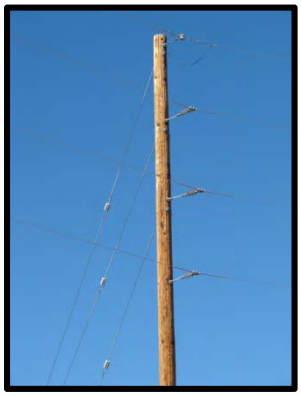
Shield and Barrier Manufacturers			
TE Connectivity	Polymer	1-336-689-7348	www.te.com
Zena Design	Polyethylene	1-970-663-3980	www.zenadesign.com/

APPENDIX H
WSMR CONFIGURATION GUIDE

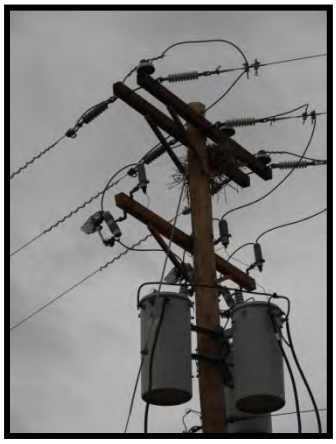
To facilitate the Risk Assessment field review and streamline data compilation, pole configuration codes were based on the Rural Electric Association (REA) Bulletin 50-3 *Construction Drawings*. However, there are unique or complicated configurations specific to WSMR. The following photos with the applicable cross references provide a Configuration Guide for these unusual or complex structures recorded during the November 2012 field review. The alpha-numerical abbreviations listed in the Field Data Matrix Designation column below coincide with the pole configurations recorded in the data matrix in Appendix J. Common configurations can be cross-referenced in the REA Bulletin 50-3 *Construction Drawings*.

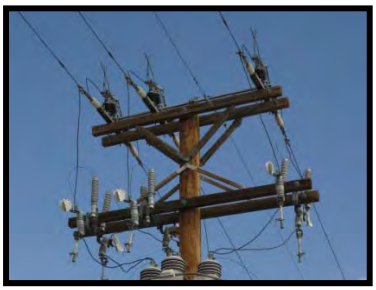
FIELD DATA MATRIX DESIGNATION	DESCRIPTION	PHOTO EXAMPLE
A5 OHN	Single-phase deadend with overhead neutral	
A7 OHN	Single-phase crossarm deadend with overhead neutral	
AP-1 OHN	Single-phase tangent with horizontal post bracket and overhead neutral	

FIELD DATA MATRIX DESIGNATION	DESCRIPTION	PHOTO EXAMPLE
C1	Three-phase tangent with single crossarm	
C1 OHN (offset phase)	Three-phase tangent with offset center phase on pole and overhead neutral	
C1-1 OHN	Three-phase tangent with two single crossarms and overhead neutral	
C1-2 OHN	Three-phase tangent with one single crossarm, one double crossarm, and overhead neutral	

FIELD DATA MATRIX DESIGNATION	DESCRIPTION	PHOTO EXAMPLE
C3 OHN	Three-phase tangent vertical construction with overhead neutral	
C4 OHN	Three-phase deadend vertical construction with overhead neutral	
C4 OHN/C5 OHN	Three-phase double deadend vertical pole with three-phase vertical tap and overhead neutral	

FIELD DATA MATRIX DESIGNATION	DESCRIPTION	PHOTO EXAMPLE
C7 NU - C7 NU	Three-phase deadend corner pole with neutral wires up	
C7 OHN	Three-phase deadend with overhead neutral	
C7 OHN (center phase up)	Three-phase deadend with elevated center phase and overhead neutral	

FIELD DATA MATRIX DESIGNATION	DESCRIPTION	PHOTO EXAMPLE
C8	Three-phase double deadend	
C8 OHN	Three-phase double deadend with overhead neutral	
C8 OHN steel	Three-phase double deadend with overhead neutral – steel pole	
C8 NU	Three-phase double deadend with neutral wire up	

FIELD DATA MATRIX DESIGNATION	DESCRIPTION	PHOTO EXAMPLE
C8-2 OHN	Three-phase double deadend with two double crossarms and overhead neutral	
C8 OHN GOABS	Three-phase double deadend with overhead neutral and Gang Operated Air Break Switch	
C8 NU GOABS and PT/CT	Three-phase double deadend with neutral wire up, Gang Operated Air Break Switch, and Potential Transformer/Current Transformer	
C9	Three-phase tangent with double crossarms and neutral wire on crossarm	

FIELD DATA MATRIX DESIGNATION	DESCRIPTION	PHOTO EXAMPLE
C9 OHN	Three-phase tangent with double crossarms and overhead neutral	
C9-1	Three-phase tangent with single crossarm and neutral wire on crossarm	
C9-1 OHN - C7 OHN steel	Three-phase tangent with three-phase deadend tap and overhead neutral – steel pole	
CP-1 OHN	Three-phase tangent with horizontal post brackets and overhead neutral	

FIELD DATA MATRIX DESIGNATION	DESCRIPTION	PHOTO EXAMPLE
Ground Bank	Three-phase deadend (typically steel frame) structure with 6 ground transformers and associated equipment	

APPENDIX I
ELECTROCUTION FIELD DATA FORM

Date: _______ Initials:________

ELECTROCUTION RISK DATA SHEET

MAP:________ Client: WSMR

Sheet _______ of _________

Rev. 02/02/12

Type	Primary	Phases (#)	Deadend (Y/N)	Jumpers (#)	COs (#)	SAs (#)	XFMRs (#)	Potheads (#)	Other (check)	Ground (# or check)	Topography	Habitat Codes	Sign (check)	Mortality?	Prey Base	Access (check)	Priority calculation components at bottom of page.	PRIORITY
ID / Photos — C S E A B N / WP	Top: / Low:	CC	DEC	IJ	COC	AC	BC	PHC	☐ CAP ☐ REG ☐ RECL ☐ SWCH ☐ Other	BKT: Ground: Metal # ____: #____ F-Glass # ____: #____ ☐ GUY ☐ OHN ☐ PTG ☐ GWM	H M L F	________ ________ ________	☐ WhW ☐ Cast ☐ Rem ☐ Nest Spp.	○ Spp.		☐ Visit ☐ Dist ☐ Air ☐ NS	Priority Calc: 3 + (____) + (____) = ____ Adj. Comment / Adj.	1 2 3 4
Pole #:		# Poles, if EA:							Comments: MATERIAL: ☐ Wood ☐ Steel ENERGIZED: ☐ Yes ☐ No ☐ Unknown									
ID / Photos — C S E A B N / WP	Top: / Low:	CC	DEC	IJ	COC	AC	BC	PHC	☐ CAP ☐ REG ☐ RECL ☐ SWCH ☐ Other	BKT: Ground: Metal # ____: #____ F-Glass # ____: #____ ☐ GUY ☐ OHN ☐ PTG ☐ GWM	H M L F	________ ________ ________	☐ WhW ☐ Cast ☐ Rem ☐ Nest Spp.	○ Spp.		☐ Visit ☐ Dist ☐ Air ☐ NS	Priority Calc: 3 + (____) + (____) = ____ Habitat Config. Adj. Comment / Adj.	1 2 3 4
Pole #:		# Poles, if EA:							Comments: MATERIAL: ☐ Wood ☐ Steel ENERGIZED: ☐ Yes ☐ No ☐ Unknown									
ID / Photos — C S E A B N / WP	Top: / Low:	CC	DEC	IJ	COC	AC	BC	PHC	☐ CAP ☐ REG ☐ RECL ☐ SWCH ☐ Other	BKT: Ground: Metal # ____: #____ F-Glass # ____: #____ ☐ GUY ☐ OHN ☐ PTG ☐ GWM	H M L F	________ ________ ________	☐ WhW ☐ Cast ☐ Rem ☐ Nest Spp.	○ Spp.		☐ Visit ☐ Dist ☐ Air ☐ NS	Priority Calc: 3 + (____) + (____) = ____ Adj. Comment / Adj.	1 2 3 4
Pole #:		# Poles, if EA:							Comments: MATERIAL: ☐ Wood ☐ Steel ENERGIZED: ☐ Yes ☐ No ☐ Unknown									
ID / Photos — C S E A B N / WP	Top: / Low:	CC	DEC	IJ	COC	AC	BC	PHC	☐ CAP ☐ REG ☐ RECL ☐ SWCH ☐ Other	BKT: Ground: Metal # ____: #____ F-Glass # ____: #____ ☐ GUY ☐ OHN ☐ PTG ☐ GWM	H M L F	________ ________ ________	☐ WhW ☐ Cast ☐ Rem ☐ Nest Spp.	○ Spp.		☐ Visit ☐ Dist ☐ Air ☐ NS	Priority Calc: 3 + (____) + (____) = ____ Adj. Comment / Adj.	1 2 3 4
Pole #:		# Poles, if EA:							Comments: MATERIAL: ☐ Wood ☐ Steel ENERGIZED: ☐ Yes ☐ No ☐ Unknown									
ID / Photos — C S E A B N / WP	Top: / Low:	CC	DEC	IJ	COC	AC	BC	PHC	☐ CAP ☐ REG ☐ RECL ☐ SWCH ☐ Other	BKT: Ground: Metal # ____: #____ F-Glass # ____: #____ ☐ GUY ☐ OHN ☐ PTG ☐ GWM	H M L F	________ ________ ________	☐ WhW ☐ Cast ☐ Rem ☐ Nest Spp.	○ Spp.		☐ Visit ☐ Dist ☐ Air ☐ NS	Priority Calc: 3 + (____) + (____) = ____ Adj. Comment / Adj.	1 2 3 4
Pole #:		# Poles, if EA:							Comments: MATERIAL: ☐ Wood ☐ Steel ENERGIZED: ☐ Yes ☐ No ☐ Unknown									
ID / Photos — C S E A B N / WP	Top: / Low:	CC	DEC	IJ	COC	AC	BC	PHC	☐ CAP ☐ REG ☐ RECL ☐ SWCH ☐ Other	BKT: Ground: Metal # ____: #____ F-Glass # ____: #____ ☐ GUY ☐ OHN ☐ PTG ☐ GWM	H M L F	________ ________ ________	☐ WhW ☐ Cast ☐ Rem ☐ Nest Spp.	○ Spp.		☐ Visit ☐ Dist ☐ Air ☐ NS	Priority Calc: 3 + (____) + (____) = ____ Adj. Comment / Adj.	1 2 3 4
Pole #:		# Poles, if EA:							Comments: MATERIAL: ☐ Wood ☐ Steel ENERGIZED: ☐ Yes ☐ No ☐ Unknown									

ELECTROCUTION RISK DATA SHEET

Habitat values: -1, 0, 1. Where low values are High Quality Habitat.

Configuration values: -1, 0, 1. Where low values are High Risk Configurations.

APPENDIX K
TRAINING SYLLABUS AND RAPTORS AT RISK DVD

AVIAN ELECTROCUTION SYLLABUS

Opening and Introduction
- Purpose
- Scope

Protected Bird Species
- Background
- Primary Federal Laws Protecting Birds - MBTA, ESA, BGEPA
- Examples of protected and excluded species

The State of the Art in Raptor Protection: A Historical Perspective
- Video: Raptors at Risk

Regulations and Enforcement
- Federal Requirements
- State Requirements
- Required Permits
- Reporting Requirements

Retrofitting and Construction Standards
- Mitigating Products – What's Available?
- Collision Problems and Solutions
- Raptors and Nesting Problems

Raptors and Other Birds
- Overview of common species
- Perching, roosting, and nesting behavior

APLIC Guidelines
- Suggested Practices 2006

Bird Incident Tracking Forms/Data Collection/Handling
- Nest Procedures
- Dead or Injured Bird Procedures
- Bird/Nest Report Form
- Monitoring
- Importance of keeping records

Questions and Open Discussion