Fort Wainwright 2018 Natural Resources Management Report to the Bureau of Land Management


Photograph by Garrett Savory

Prepared by:
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Introduction:

Effective communication and coordination between the Bureau of Land Management (BLM) and the Army has been identified as a need in the recent document entitled "Memorandum of Understanding between the U.S. Department of the Interior, Bureau of Land Management Alaska, and the U.S. Army Garrison Fort Wainwright concerning the management of lands in Alaska withdrawn by Public Law 106-65 for military use". This document, with brief project descriptions from FWA and DTA Environmental and ITAM staff and cooperators, serves as an annual report to the BLM as stipulated by that memorandum.

The FWA environmental office is guided by the Fort Wainwright Integrated Natural Resources Management Plan (INRMP), which establishes policies, programs, prescriptions, projects, and procedures that U.S. Army Garrison Fort Wainwright (USAG FWA) uses to manage natural resources on Army training lands in Alaska. The INRMP contains goals and specific objectives necessary to (1) sustain "no net loss" in the capability of military lands to support mission requirements, (2) support stewardship of natural resources, (3) ensure compliance with applicable environmental laws, and (4) maximize public access within the constraints of the military mission while protecting public safety and conserving the environment. The Fort Wainwright INRMP reflects mutual agreement of USAG FWA, U.S. Fish and Wildlife Service (USFWS) and the Alaska Department of Fish and Game (ADFG) concerning the conservation of the natural resources under their respective legal authorities. The INRMP consolidates other related Army natural resource planning documents in one place, including the Ecosystem Management Plan, Integrated Wildland Fire Management Plan, Endangered Species Management Plan, Forestry Management Plan, Watershed Management Plan, and Outdoor Recreation Management Plan. The INRMP also incorporates the applicable BLM Resource Management Plans for Yukon and Donnelly Training Areas. The INRMP for Fort Wainwright was last updated in 2013 (https://usartrak.isportsman.net/regulations.aspx), and is scheduled for update in 2018.

The FWA and DTA ITAM programs are housed within the USARAK Sustainable Range Program, and are guided by the FWA ITAM work plan, which is updated annually. The ITAM program is also integrated into the FWA INRMP. ITAM provides sustainable range management directly to the Army mission of USARAK, while coordinating with the FWA environmental staff. The goals of the ITAM program are to support the installation's training mission by providing maneuver land and decision support capability based on the integration of training requirements, land conditions, maneuver ranges, and land management requirements. For overall questions concerning environmental goals and polices, please contact Dan Rees:

Dan Rees
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(907) 361-9318

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Forestry

Forest Inventory
Maintaining healthy forest conditions is the primary objective of the FWA forestry program. Forest inventory and analysis and forest health monitoring permanent plots are an effective method for detecting changes in vegetation health, composition, structure, wildfire fuel loading and determining growth and mortality which can be applied in growth projection models. Inventory and monitoring of Fort Wainwright's forest resources also provides an indicator of ecosystem integrity, biodiversity of species and habitats, and sustained production of commercially valuable forest products. In addition, inventory and monitoring help to determine areas where improvements or rehabilitation are needed to maintain ecosystem integrity and to support military training activities. Vegetation cover type mapping is used to delineate and attribute forest species, size, type and distribution. Continuous forest inventory plots are used to detect changes in insect and disease abundance in representative forest stands across the landscape.

Vegetation cover type maps are updated annually using fire history perimeters, military construction overlays and overlays of other clearing projects. Vegetation types are mapped to level 4 standards using techniques identified in the US Forest Service publication, The Alaska Vegetation Classification (Viereck et al. 1973). In addition, size class and density are added to forest stands using techniques developed by the State of Alaska Division of Forestry. Vegetation cover types are delineated and attributed on a GIS using a combination of air photo interpretation, heads up digitizing, and ground truth plot information. Vegetation types are mapped to a five acre minimum mapping unit on all Fort Wainwright lands.
Vegetation cover type maps are used for forest utilization planning, identifying specific military training area requirements, military training range location, and natural resource management concerns. In fiscal year 2017 Fort Wainwright updated 5,000 acres of vegetation cover maps.

Fort Wainwright maintains a system of continuous forest inventory plots using standardized techniques developed by the US Forest Service, Forest Inventory and Analysis Program. Two hundred and fifty continuous forest inventory plots are monitored throughout the forested vegetation types of Fort Wainwright. Continuous forest inventory plot locations and intensity are systematically stratified by forest type across the landscape. These plots are re-measured every ten years. 10% of the forest inventory plots are forest health monitoring plots and are re-measured every five years. Plot data collected includes: tree species composition, size class distribution, understory and forest floor species composition, canopy cover, tree species crown size and position, stem density, basal area, mean annual growth, regeneration composition and density, wildfire fuel loading, disease and insect observations and merchantable volumes by species. In fiscal year 2017 Fort Wainwright re-measured 6 forest inventory plots.

For information contact: **Adam Davis**, Forester, CSU/CEMML, adam.l.davis.ctr@mail.mil, (907) 361-1168

Hunts Creek Timber Sale Reforestation
This project saw 19.8 acres of previously harvested areas in the YTA replanted to a mix of spruce and larch at 100-foot spacing. Project completed 30 September 2018.

For information contact: **Colin Barnard**, Programs Administrator, SDSWCD
Colin.barnard@salchadeltaswcd.org, (907) 867 – 6099

Vegetation Management
Fort Wainwright conducts active vegetation management to increase military training opportunities, enhance wildlife habitat and reduce wildland fire fuels. Ninety Five forested acres were hand thinned on Fort Wainwright lands to facilitate military maneuver training and wildfire hazard fuel reduction. Trees were generally thinned from original forest densities to a 15 foot average tree or tree clump spacing; understory shrubs and ladder fuels were also removed from the treatment sites. Residual slash was disposed of by pile burning or chipping on site.

In 2017 100 acres were cleared for wildfire hazard fuel reduction in the winter utilizing heavy equipment and track walking. Spring prescribed fires burned approximately 35,000 acres of mostly grass and grass/shrub vegetation types on live fire ranges within Fort Wainwright. BLM, Alaska Fire Service is the lead on all of Fort Wainwright's prescribed burns.

For more information contact: **Dan Rees**, Natural Resource Manager, USAG FWA, daniel.c.rees.civ@mail.mil, (907) 361-9318

DTA Fuel Break Debris Piling
This project piled shearblade debris into round piles for burning along 10.2 miles of newly created firebreak in the West DTA along the LaGrande firebreak. Project completed March, 2018.

For information contact: **Colin Barnard**, Programs Administrator, SDSWCD Colin.barnard@salchadeltaswcd.org, (907) 867 – 6099

Four Square Lakes Wildfire Fuel Reduction
Reduced fuel to 20 feet wide using a hydroax along 20.6 miles of trail from Delta Creek to the Little Delta River in the West DTA. Project completed March, 2018.

For information contact: **Colin Barnard**, Programs Administrator, SDSWCD Colin.barnard@salchadeltaswcd.org, (907) 867 – 6099

Hayes Wildfire Hazard Fuel Reduction
Created 251.6 acres of firebreaks along the north edge of the West DTA impact area. Project completed March, 2018.

For information contact: **Colin Barnard**, Programs Administrator, SDSWCD Colin.barnard@salchadeltaswcd.org, (907) 867 - 6099

Soil Surveys
Tanana Flats, Donnelly Training Area West, Gerstle River Training Area, and Black Rapids Training area Soils Planning Level Study will inventory and map approximately 1,000,000 acres of Army Training Land. Data to be collected includes soil classification, location, engineering limits and distribution. This study will update and ground truth existing soils maps and classify and map previously unmapped military lands. The study will adhere to guidelines on soil survey and mapping procedures as defined by the USDA Natural Resource Conservation Service for level four surveys. Soils will be classified according to morphology, physical and chemical properties; the spatial positioning of soils in the landscape and plotting on maps; the boundaries between kinds of soil; the interpretations of soils according to their capability to support various crops, grasses, and trees; a description of soil behavior under use or treatment for plant production or for other purposes; and a description of soil productivity under different

management systems. The Natural Resources Conservation Service's Soil Survey procedures and documentation standards are required. GIS based data of the soil study area and individual soil types will be mapped to a minimum map unit of 2.5 acres. The Tanana Flats Training Area (approximately 25,000 acres) survey is scheduled for completion the first week of July 2018. The Survey for DTA West (approximately 500,000 acres) will be complete sometime in January 2018. To date 25,000 acres have been surveyed and analyzed for the Gerstle River Training Area and Black Rapids Training Area. Report due on 30 June 2018.

For information contact: **Colin Barnard**, Program Manager, SDSWCD, Colin.barnard@salchadeltaswcd.org, (907) 867 – 6099

Public Access to Training Lands

Recreation Tracking and Access
Fort Wainwright maintains an automated online recreational access system called the U.S. Army Recreation Tracking System USARTRAK for military training lands that is specific to Fort Wainwright and Donnelly Training Area (DTA) lands. This system is designed to de-conflict recreational activities with military training. To access Fort Wainwright land for recreation; users must obtain a Recreation Access Permit (RAP) and check into the training area(s) they wish to recreate in. Users can obtain a RAP, check into training areas and view closed areas online at https://usartrak.isportsman.net or at one of Fort Wainwrights electronic kiosks located at Fort Wainwright and Fort Greely front gate visitor centers. Army Range Control also uses the system to open and close training areas to recreation. Environmental staff provides additional permitting for bear baiting, trapping, and firewood cutting.

The biggest change this year is to trapping. Trappers are no longer required to register their traplines in person for trapping on Fort Wainwright Land. Now users can register their lines through their isportsman account. Trapping permits are available to anyone anytime during the trapping season and all areas open to recreation are also open to trapping.

USARTRAK/iSportsman Visitor Check-in FY 2018	
Data Point	**Quantity**
People checked into USARTAK (individuals)	3,255
Check ins	8,453
User days (1 calendar day = 1 user day)	27,821
Average user days/person	3.2

For more information contact: **Shawn Osborn**, Natural Resource Specialist, USAG FWA, shawn.f.osborn2.civ@mail.mil, (907) 361-4539

Range and Training Land Assessment (RTLA) and Land Restoration and Maintenance (LRAM)

Range and Training Land Assessment (RTLA) and Land Restoration and Maintenance (LRAM)

Sustainable Range Study for DTA, GRTA and BRTA

FWA DTA, Gerstle River Training Area (GRTA) and Black Rapids Training Area (BRTA) Range and Training Land Assessment (RTLA) surveys are conducted annually. In 2018, field surveys were done from June through September. Two types of field surveys were completed, including: (1) Training Land Sustainability (TLS) Assessment, which measures overall condition of training lands by collecting data on vegetative species and cover and (2) Maneuverability Assessment, which measures how easily an area surveyed for TLS is to utilize for maneuver exercises. Both RTLA surveys were conducted by trained CSU staff. RTLA 2018 field data analysis is in progress and will be presented in the annual report by 31 Jan 2019. An in-office assessment of the Range Facility Management Support System (RFMSS) data is conducted on a calendar year basis. This analysis retrieves annual data from the RFMSS, which tracks military use of training areas. This information is then mapped to display the number of days utilized and personnel trained per training asset, which shows a distribution of use and associated impact across DTA, GRTA, and BRTA. RFMSS data reports are available annually by 31 Jan for the prior calendar year.

FWA DTA Land Rehabilitation and Maintenance (LRAM) crew worked April through November 2018 on vegetation maintenance projects within DTA. These projects consisted of brush clearing and tree removal for the purpose of improving training capabilities for military training. For these projects, salvageable trees were stacked for firewood gathering, and limbs, tops, and brush were stacked for pile burning by AFS. Hazard trees were removed from 57 acres, including around bivouac sites. Trees were cleared for line of sight around 1 acre of firing range targets, and a total of 5.6 acres of brush was removed at 2 additional line of sight locations. 5 acres of brush were cleared at landing zones. Thinning was completed within 48 acres of forested areas. Brush and overhanging trees were cleared back on 7.9 miles of trails in DTA East and West. Spruce beetle mitigation activities were also conducted on 5 acres. The LRAM crew consisted of five staff employed by both CSU and the Salcha-Delta Soil and Water Conservation District (SDSWCD). All staff was trained and followed appropriate safety procedures. Project areas for 2018 were determined by ITAM and RTLA/LRAM coordinators with input from Range Control. Projects are coordinated with Natural Resources and SDSWCD. The full report on 2018 LRAM crew projects will be produced by 31 Jan 2019 and presented in conjunction with the 2018 RTLA Final Report.

For more information contact: **Deborah White**, DTA RTLA/LRAM Coordinator, CSU/CEMML**,** deborah.s.white19.ctr@mail.mil, (907) 873-1617

Sustainable Range Study YTA and TFTA

FWA RTLA surveys were conducted in June through August of 2017 in the Local Training Areas, Tanana Flats Training Area (TFTA), and Yukon Training Area (YTA). Three types of field surveys were completed summer of 2017, which include; (1) 868 acres of Training land Sustainability (TLS) Assessment which measures overall condition of training lands by collecting data on vegetative species and cover; (2) 25 acres of Vegetation Recovery Assessment which measures the percentage of cover along areas that were once cleared for construction projects; and (3) A little over 1 mile of Trail Inventory and Condition Assessment which tracks types of trails available for use along with the condition of each one surveyed. All RTLA surveys were conducted by trained CSU staff. An in-office assessment of the Range Facility Management Support System (RFMSS) 2017 data will be conducted after 31 December 2016. This analysis retrieves annual data from RFMSS, which tracks use of training areas. This information is then mapped to display the number of days utilized and personnel trained per training asset. RTLA 2017 field data analysis is in progress and will be presented in the annual report by 31 January 2018.

FWA LRAM crew worked April through October 2017 on vegetation maintenance projects within the local training areas, YTA and TFTA. These projects consisted of brush clearing and tree removal for the purpose of improving training capabilities for military training. For these projects, salvageable trees were stacked for firewood gathering, and limbs, tops, and brush were stacked for pile burning by the Alaska Fire Service (AFS) or chipped on site for ground cover improvements. Hazard trees were removed from 34 acres, including thinning around bivouac sites and ranges. A little over 14 acres were clear cut of trees and shrubs, to remove line of sight and training obstructions. The LRAM crew also mowed approximately 28 acres in effort to maintain existing design parameters. A little over one acre of land was also treated for erosion control through seeding and the spreading of organic ground cover. Lastly the crew cut in approximately 2 miles of restored trails and maintained vegetation along 19 miles of trails and access routes. The LRAM crew consisted of four staff employed by CSU. All staff was trained and followed appropriate safety procedures. Project areas for 2016 were determined by ITAM and RTLA/LRAM coordinator with input from Range Control and FWA Natural Resources. The full report on 2017 LRAM crew projects will be produced by 31 January 2018 and presented in conjunction with the RTLA Final Report.

For more information contact: **Brenda Fiddick**, FWA RTLA/LRAM Coordinator, brenda.l.fiddick.ctr@mail.mil, (907) 353-6702

Range Maintenance

DTA Arctic Anvil 16 TARP
This project saw 24.8 acres of firebreak being created around target berms in the BAX using a tractor and disk. In addition, 41.5 acres of maneuver damage was repaired and replanted to native vegetation on Buffalo Drop Zone. Project completed August 30, 2018.

TA 503 Maneuver Trail Maintenance
This project saw 1 mile of 33 Mile Loop improved for drainage and hardened for vehicular traffic during training exercises. Project completed August 30, 2018.

TA 505 TARP
This project saw TA 505 improved to reduce the impact of training activities on the ecosystem. 1.3 acres of damaged area was hardened to provide pads for Stryker vehicles to move off the road. 14.3 acres of access trail was improved. Project completed July 30, 2018.

DTA TA 511 Maneuver Trail Repairs
This project improved 5.6 miles of access trail on the southern portion off Donnelly Drop Zone in TA 511. Project completed September 30, 2018.

Combat Trail Repair South Cam Road
This project saw 2.9 miles of South Cam Road widened, hardened and drainage improved. Project competed October 22, 2018.

FP Hippie Reconfiguration
This project saw the leveling, hardening, and improvement of drainage for this firing point. Project completed July 25, 2018.
FP Bravo Reconfiguration
This project saw the leveling, hardening, and improvement of drainage for this firing point. Project completed July 25, 2018.

FP Charlie Reconfiguration
This project saw the leveling, hardening, and improvement of drainage for this firing point. Project completed July 25, 2018.

For information contact: **Colin Barnard**, Programs Administrator, SDSWCD
Colin.barnard@salchadeltaswcd.org, (907) 867 - 6099

Wetlands

Wetlands Surveys
Wetland determinations were conducted June – October 2018 by CSU staff on FWA, TFTA, YTA and DTA using the US Army Corp of Engineers three-parameter approach (positive identification of hydrophytic vegetation, hydric soil, and wetland hydrology). Data were collected, organized and stored using an Access Database. Wetland determinations were used to delineate wetlands and waterbodies using GIS. Wetlands and waterbodies were then classified using the Cowardin wetlands and Viereck vegetation classification systems. Approximately 200,000 acres of training lands were surveyed in 2018. Reports, including maps describing the above information, will be submitted to the funding agent and Army Corps of Engineers (Corps) Regulatory branch.

For more information contact: **Kate Beattie**, Katherine.l.beattie.ctr@mail.mil, (907) 361-3551

Wetlands Functional Assessments
Functional assessment data were collected in conjunction with wetland determinations on FWA, TFTA, YTA and DTA from June – October 2018 by CSU staff. Boundaries of Wetland Assessment Areas were delineated using GIS where a significant change in hydrology or an upland boundary was detected. The functions and services of wetlands and waterbodies were quantified using the Alaska Wetland Assessment Method (AKWAM). Assessment Areas are ranked based on values assigned to various functions and services, including habitat for threatened and endangered species, wildlife support, fish support, water storage, sediment, nutrient and toxicant removal, sediment and shoreline stabilization, production and export of nutrients for food chain support, ground water discharge and recharge, uniqueness, and use or potential use for recreation and education. Reports including maps describing the above information will be submitted to Corps Regulatory branch.

For more information contact: **Kate Beattie**, Katherine.l.beattie.ctr@mail.mil, (907) 361-3551

Monitoring of Invasive Plant Species
Invasive plant species surveys were conducted June – October 2017 by CSU staff on Fort Wainwright lands using the Alaska Exotic Plants Information Clearinghouse (AKEPIC) standard protocol. Potential survey sites were prioritized based on methods developed by the AKEPIC and/or the US Forest Service (Field Guide Invasive Plant Field Guide, Monitoring and Mapping Protocol Inventory, 2002) and other reliable methods. Field surveys targeted areas with likely infestations by focusing on areas with a human disturbance vector, areas disturbed by natural processes and intersections of pathways, such as a bridge across a river. Location, area of infestation and percent cover were recorded for 20 high priority invasive plant species. Absence data were also collected to document areas surveyed where no invasive plant species were found. Survey locations were used to make GIS based plant map that details location, type and size of infestation. Data will be curated by the Alaska Exotic Plants Information Clearinghouse (AKEPIC) and available via their database and mapping application

which is designed to document infestations of non-native plants across Alaska. A total of 6,778 acres were surveyed; 306 acres were infested with invasive plants. Of the 5,945 points sampled 2,600 of those contained invasive plants. The Fort Wainwright invasive plant report for 2017 will be submitted in January 2018.

For information contact: **Adam Davis**, Forester, CSU/CEMML, adam.l.davis.ctr@mail.mil, (907) 361-1168

Surface Water Planning Study TFTA and DTA
TFTA and DTA Surface Water will be inventoried and mapped for approximately 10,000 acres of Army Training Land in regards to surface water classification, location and distribution. This survey will update and ground truth existing surface water maps, providing a surface water flow map with minimum mapping unit of one hectare, water quality attributes of each water body and associated report will be delivered to the FWA Environmental Office. The survey will focus on the impact of developed winter and all season trails to fisheries resources. To date field work has been done to install and maintain measurement stations at 3 sites in West DTA and 4 sites in TFTA. GIS stream digitizing has been done for 50% of the contracted area. A final report will be provided that describes surface water distribution, and data will be entered into relational and GIS databases for use by natural resources personnel. Completed 30 September 2018.

For information contact: **Colin Barnard**, Programs Administrator, SDSWCD Colin.barnard@salchadeltaswcd.org, (907) 867 - 6099

Wildlife

Fauna Level Planning Surveys for Songbirds
Bird surveys were conducted in May, June, and early July of 2017, and consisted of three monitoring standard methods, the Breeding Bird Survey (BBS), the Alaska Landbird Monitoring System, and remote bird surveys (RBS) in both DTA and FWA. Only RBS in DTA West were conducted during the 2018 field season. We were directed to not collect other survey data by our federal POC during the 2018 field season. All bird surveys were conducted by trained CSU wildlife staff. BBS and ALMS data were reported to the U.S. Geological Survey (USGS) in September 2017. RBS were used to improve annual bird count data and supported Neotropical Bird Habitat Assessment Studies conducted by CSU staff. Progress was reported at the Fall Inter-annual Progress Report (IPR) meeting. The final report for SOW 15-41 was submitted in June 2018; the final report for SOW 16-56 will be submitted by December 2019.

For information contact: **Justin Smith**, Wildlife Biologist, CSU/CEMML, justin.a.smith230.ctr@mail.mil, (907) 361-3001

Neotropical Bird Habitat Assessment
Two projects were ongoing, both designed to assess migratory neotropical songbird use of the TFTA, YTA, and DTA. We evaluate which and when certain habitat characteristics are necessary to neoptropical songbird presence in an occupancy approach. Trained CSU staff conducted point count songbird surveys on 264 stratified random sites in the TFTA, YTA, and DTA in May though early July of 2018, completing data collection for both projects. Data were entered and checked by November, and data analysis is currently underway. A final report including predictive habitat maps for SOW 15-49 was submitted in September 2018; a final

report for SOW 16-57 will be produced by September 2019.

For information on this project in YTA and TFTA contact: **Justin Smith**, Wildlife Biologist, CSU/CEMML, justin.a.smith230.ctr@mail.mil, (907) 361-3001

For information on this project in DTA contact: **Dr. Kim Jochum**, Wildlife Biologist, CSU/CEMML, kim.a.jochum2.ctr@mail.mil (907) 873-1616

Shorebird Studies Interior
Shorebird plot surveys of 400 x 400 meters were conducted in TFTA and DTA during May, June and early July in 2016 and 2017 based on a stratified random sample across upland and lowland habitats to determine habitat use and breeding ecology of shorebirds on military lands in TFTA and DTA. Overall 140 plots were sampled twice. We found that Donnelly Training Areas East and West on interior Alaska military lands host 12 species of shorebirds. Specifically, DTA hosts 7 shorebird species of moderate to high conservation concern as listed by the Alaska Shorebird Conservation Plan (American Golden Plover (*Pluvialis dominica*), Black-bellied Plover (*Pluvialis squatarola)*, Solitary Sandpiper (*Tringa solitaria*), Lesser Yellowlegs (*Tringa flavipes*), Upland Sandpiper (*Bartramia longicauda*), Whimbrel (*Numenius phaeopus*), and Wilson's Snipe (*Gallinago delicate*) and 4 species of conservation concern as listed by the U.S. Fish and Wildlife Service (Solitary Sandpiper, Lesser Yellowlegs, Upland Sandpiper, and Whimbrel). We conclude military lands in Interior Alaska provide important breeding habitat for these species. Habitat use models suggest that habitat characteristics such as elevation and percent scrub canopy cover on plot are the most important factors in determining shorebird use. As climate change impacts habitat suitability for shorebirds, these results suggest that current suitable habitat for shorebirds is most likely to shift with the changing climate. Our results provide the Department of Defense with habitat relationships that can be used to refine shorebird occupancy maps and inform military use of habitat. A final report including predictive habitat maps for SOW 15-35 was submitted in September 2018.

For information on this project contact: **Dr. Kim Jochum**, Wildlife Biologist, CSU/CEMML, kim.a.jochum2.ctr@mail.mil (907) 873-1616

Sandhill Crane Monitoring
Sandhill Cranes are identified as a priority management species in the Fort Wainwright INRMP. Parts of the Delta River and Delta Creek, both mainly within Fort Wainwright boundaries, are recognized as important roosting habitat for Sandhill cranes and are classified as 'sensitive habitat area' during spring and fall migrations, from the 25th of April to the 15th of May and from the 1st through the 30th of September. This study investigated Sandhill crane roosting behavior on the Delta River and Delta Creek within Fort Wainwright boundaries during sensitive habitat time frames. CSU biologists conducted in-person surveys of riverbeds via spotting scopes before and during sunrise from specific observation points between 2016 and 2018, and included previously collected data between 2011 and 2015 along the Delta River in part of the analysis. We found that Sandhill cranes are not using the Delta River any longer as roosting site during spring migration. We did observe cranes using the Delta River and the Delta Creek as roosting sites during the whole sensitive habitat time frame of fall migration, annually. Daily temporal use patterns range from around sunset until shortly before or shortly after sunrise (about 1 hour respectively). Sandhill cranes roost mostly on the northern part of the Delta River within Fort Wainwright boundaries, including the Mississippi and Small Arms Range Impact Areas. Overall numbers of cranes roosting on the riverbed have slowly but steadily decreased since 2012; reasons are unknown. We did not find a correlation between absence of cranes roosting on the Delta River and concurrent training events in associated impact areas; however

data to conduct these analysis were sparse and temporally vague. We make specific recommendations for changes to be adapted in the next Integrated Natural Resources Management Plan revision to both, eliminate unnecessary limitations to training opportunities for the military, and limit possible impacts to roosting Sandhill cranes. A final report for SOW 15-44 was submitted in September 2018.

For information on this project contact: **Dr. Kim Jochum**, Wildlife Biologist, CSU/CEMML, kim.a.jochum2.ctr@mail.mil (907) 873-1616

Evaluating Bat Habitat on DTA

To determine bat occupancy rates throughout DTA and GRTA, bat acoustic detectors were deployed in stratified random sample locations for roughly two weeks for each deployment period. A total of 684 calls in 31 locations were recorded, and five high use areas were detected. Presence of bats along the DTA West boundary was documented. We used site and survey-specific variables to estimated occupancy and detectability of bats across Donnelly TA East and Gerstle River TA, and determined bat activity patterns for specific sites across all surveyed TAs. We found that detectability changed throughout the season and is highest during the month of August. Bats were found to use a high proportion of forested habitats and were more active in closed mixed forest near water. In 2017 and 2018 we installed a total of five bat houses in areas where high bat activity was found; we have not detected use of these houses by bats at this time. A final report for SOW 15-52 was submitted in September 2018.

For information on this project in DTA contact: **Dr. Kim Jochum**, Wildlife Biologist, CSU/CEMML, kim.a.jochum2.ctr@mail.mil (907) 873-1616

Evaluating High Use Bat Habitat Using Mist Nets and Radio Telemetry on Fort Wainwright Training Lands, Alaska

The objectives of this study are 1) genetic testing of individuals for species distinction, 2) roost detection, and 3) identification of habitats that are used by bats. We netted bats from May through September 2018 on Main Cantonment and Yukon, Tanana, Donnelly, and Gerstle River Training Areas. We captured a total of 77 bats. We collected morphometric data on all captured bats and attached a wing band with a unique ID. On a subset of the bats we collected skin tissue for identification via DNA analysis. On 17 of the bats we attached radio transmitters in order to track the bats to roost sites. A confirmed natural maternity roost and additional suspected natural maternity roosts were identified in the northwest portion of the YTA. A final report for SOW 16-55 will be produced by September 2019.

For more information on this project in YTA and TFTA contact: **Garrett Savory**, Wildlife Biologist, CSU/CEMML, garrett.a.savory.ctr@mail.mil (907) 361-9689

For information on this project in DTA contact: **Dr. Kim Jochum**, Wildlife Biologist, CSU/CEMML, kim.a.jochum2.ctr@mail.mil (907) 873-1616

Mew Gull Study

In May-July 2016 and 2017, we surveyed the Main Cantonment for mew gull nests, surveyed nest habitat, and monitored nest fates. We used a double-sampling method to estimate the mew gull nesting population and used chi-square analysis to analyze preferred nesting habitat. To model the spatial distribution of nests, we used point process models to estimate conditional intensity. We used nest survival models to estimate daily survival probability. We identified a mean mew gull nest abundance of 80 (64-95 95% CI) nests for both years. We found most gulls

nested on flat structures ≥ 1 meter off the ground on a variety of substrates. Most gulls nested in clusters, near buildings, away from buildings with dogs, and near water bodies. Daily nest survival was highest when a nest was on a structure, near a neighboring nest, and away from a water body but decreased as the nest aged. The mew gull nesting population density is likely much higher on the Main Cantonment of Fort Wainwright than would be expected in undeveloped regions of interior Alaska, likely due to urbanization. To reduce negative interactions with the mew gull nesting population, we recommend an integrated approach. A final report for SOW 15-48 was submitted September 2018.

For more information contact: **Garrett Savory**, Wildlife Biologist, CSU/CEMML, garrett.a.savory.ctr@mail.mil (907) 361-9689

Migratory Bird Nesting Habitat Study
For cliff swallows, three man-made structures were installed on the Main Cantonment area of Fort Wainwright to attract nesting away from buildings in 2015, but these structures were never used by cliff swallows to date. We suggest further improvements to the structures and subsequent monitoring before concluding that the man-made structures are ineffective. We also observed the effect of deterrents attached to buildings on cliff swallow nest density. Deterrents included aluminum or steel siding applied underneath overhangs, where cliff swallows prefer to construct nests. To determine deterrent effectiveness, we counted the number of cliff swallow nests along the perimeter of 21 buildings, and compared the number of nests on buildings with and without deterrents. We found significantly lower density of nests per building when deterrents were used. This is most likely because cliff swallows cannot physically attach their nests to the smooth materials. Therefore we recommend deterrents for building that lack them, and further monitoring of buildings to continue to observe deterrent' effectives. For tree swallows, we installed 261 nest boxes on Fort Wainwright lands to provide alternative nesting habitat. We monitored nest box use during nesting season, and cleaned out boxes to observe use and success rates. 87 boxes were used in either one or both years, and 50 of those were successful. Habitat was a significant feature on where swallows preferred to use boxes, favoring areas of high human activity and ignoring or avoiding forested areas. Nest boxes were only observed for two years, but past research has demonstrated tree swallows require up to four years to begin to use man-made nest boxes. We recommend a long-term monitoring study of tree swallow nest boxes to gain a better understanding if these boxes are providing additional nesting habitat. A final report for SOW 14-43 was submitted September 2018.

For more information contact: **Garrett Savory**, Wildlife Biologist, CSU/CEMML, garrett.a.savory.ctr@mail.mil (907) 361-9689

Mitigation of Migratory Bird Flight Risk Study
We surveyed Ladd Army Airfield from April through September of 2016 to determine which wildlife species were present, when they were present, and where they used the airfield. Surveys were conducted up to three days per week. We conducted both, point count surveys to determine abundance of wildlife using the airfield, and runway crossing surveys to determine abundance of birds flying in the airspace above the airfield. Point surveys were conducted on a 15 point grid where points were 500 m apart from each other. We surveyed each point for three minutes each day of the survey. Runway crossing surveys were conducted on three points for 20 minutes. We found that wildlife used Ladd Army Airfield during all survey days every month and every time of day during the study. A total of 38 bird species and 3 mammal species used the airfield. We found that modeled bird

abundance was highest during August and September mornings. The most abundant species and/or guilds were mew gulls, herring gulls, geese, and common ravens. Two features of the airfield attracted the most wildlife: areas with maintained grass with heights of < 20 cm, and the Chena River. Based on the results of this study, we suggest Ladd Army Airfield personnel use an integrated management approach to reduce wildlife-strike hazards. A final report for SOW 15-50 was submitted September 2018.

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TFTA King Salmon Habitat Survey
The objective of this project was to describe winter habitat and occurrence of juvenile Chinook salmon in the Blair Lakes region in the interior of Alaska to inform JPARC road construction plans for stream crossings. We found that traditional sampling methods (e.g. minnow traps) were not efficient tools to investigate winter habitat of Chinook salmon in interior Alaska. We detected Chinook salmon using environmental DNA (eDNA) at 10 of 39 sites tested, and therefore recommend using eDNA to identify areas likely to have overwintering juvenile Chinook salmon. Identifying these areas using eDNA will allow Fort Wainwright environmental staff to use traditional sampling more economically and effectively. We recommend additional sampling on TFTA streams based on where juvenile Chinook are most abundant; streams with little elevation change, temperatures between 0.1 – 5 ^{0}C, relatively deep, low flow, with woody debris or cut-banks streams, and available dissolved oxygen. If construction of the JPARC road commences without further exploration of overwintering streams, flowing water in the winter should not be impeded due to potential juvenile Chinook salmon use in the winter. A final report for SOW 15-46 was submitted September 2018.

For information on this project in FWA contact: **Justin Smith**, Wildlife Biologist, CSU/CEMML, justin.a.smith230.ctr@mail.mil, (907) 361-3001

Tanana Flats Training Area Small Mammal Surveys
Small mammal communities have not been studied in the Tanana Flats where there is significant interest for military development, such as the Tanana Flats Roadway Access. Species of particular concern are the Alaska tiny shrew (*Sorex yukonicus*) and water shrew (*Sorex palustris*). The goal of this study is to identify which species of small mammals occur on the Tanana Flats Training Area. We trapped for small mammals from July through August 2017 and June through August 2018 using a variety of methods including pitfall, snap, and Sherman traps. So far, we have identified four species of shrews (one of which was the water shrew) and four species of voles that occur on TFTA. A final report for SOW 16-45 will be available by September 2019.

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