SUSTAINABLE FORT LEWIS

2007 Annual Progress Report

Celebrating SIX YEARS of sustainability!

FORT LEWIS SUSTAINABILITY VISION STATEMENT

Fort Lewis is committed to supporting a strong national defense, securing the integrity of our natural and cultural heritage, and conserving our natural resources for tomorrow's generations, while seeking choices that enhance our neighboring communities' abilities to have a productive future.

Leading the Way

Dear Friends:

We are honored to share with you our accomplishments over the past six years. Your support and partnership gave us the foundation and momentum to bring our vision of a sustainable community to what we can proudly display today. The pages that follow celebrate milestones that we scarcely envisioned some six years ago at the inaugural Fort Lewis Sustainability Workshop. We also discuss our challenges as they too are an important part of this journey.

Mostly we want to reaffirm our commitment to you that Fort Lewis will continue to forge ahead, leading by example. It is with this commitment we present to you this six-year summary edition of the ISP Annual Report. With your continued support, we look ahead to a productive future.

Sincerely,

Fort Lewis Installation Sustainability Team

FORT LEWIS 25-YEAR SUSTAINABILITY GOALS

AIR QUALITY

1. Reduce installation stationary source and non-tactical motor vehicle air emissions 85% by 2025

ENERGY

2. Reduce total energy consumption by 30% by 2015
3. Sustain all activities on post using renewable energy sources by 2025

SUSTAINABLE COMMUNITY

4. Create sustainable neighborhoods for a livable Fort Lewis community that enhances the Puget Sound Region

PRODUCT AND MATERIALS MANAGEMENT

5. Cycle all material use to achieve ZERO net waste by 2025

SUSTAINABLE TRAINING LANDS

6. Maintain the ability of Fort Lewis to meet current and future military missions without compromising the integrity of natural and cultural resources, both on the installation and regionally
7. Recover all listed and candidate federal species in South Puget Sound Region

WATER RESOURCES

8. Treat all wastewaters to Class A reclaim standards by 2025 to conserve water resources and improve Puget Sound water quality

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In 2007, the Energy/Infrastructure Team was divided into two separate teams and the Infrastructure Team was refocused and renamed "Sustainable Community Team." Though several of their projects are still in the infancy stages, the activities of both the Sustainable Community and Energy teams are worthy of noting on pages 9-11. We look forward to reporting their success stories in our next annual report.

Fort Lewis Sustainability

Examining the first six years, with an eye towards the future

Fort Lewis' Installation Sustainability Program was established following a workshop in 2002, in which installation personnel, community members and interested stakeholders examined the installation's environmental footprint and established twelve 25-year goals for a sustainable future.

The goals were organized under five teams: Air Quality, Energy/Infrastructure, Products and Materials Management, Sustainable Training Lands and Water Resources. Each team, comprised of both installation personnel and local stakeholders, was responsible for setting and accomplishing the objectives for achieving each of the 12 goals.

In 2007, the ISP teams revised and condensed the original 12 strategic goals to eight and expanded the five original teams to six. The revisions ensure the ISP goals: 1) continue to lead down a meaningful path to a sustainable installation; 2) offer a realistic possibility of attainment within the prescribed timeframe of 2025; and 3) are supported with quantifiable metrics.

The following pages will highlight each team's accomplishments, unveil our recent changes and outline the path forward.

Installation leaders drive innovation and continual improvement

Military and civilian leadership play a significant role in the work of the Installation Sustainability teams, especially in ensuring that the innovation, initiatives and projects designed to achieve sustainability goals continue along the path of irreversible momentum.

The Installation Sustainability Board, chaired by either the Commanding or Deputy Commanding General, provides the venue for active planning and decision making at the highest levels. In addition, the Fort Lewis Garrison Commander emphasizes continual improvement of the Fort Lewis Environmental Management System, advocating aggressive community outreach and education.

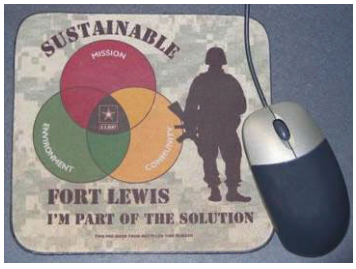
Together these leaders challenge the ISP to raise the level of awareness among Army and civilian personnel on Fort Lewis and to create opportunities for greater community involvement.

In 2007, for the first time, comprehensive Sustainability briefings were conducted as part of the Garrison Professional Development and Major Subordinate Commander's briefings. The presentations included a broad-based overview of sustainability; sustainability as a military force multiplier (presented by Mr. Kurt Kinnevan, US Army Engineer School, Fort Leonard Wood, Mo.); an overview of the Fort Lewis sustainability program; and individual team goals and accomplishments.

The briefings not only informed military and civilian leaders on the history of the ISP, but provided resources that could be disseminated throughout their organizations to their civilian staff and Soldiers. Beyond that, the attendees were challenged to re-examine their daily operations and identify environmental impacts that they can address both in the short and long-term.

Fort Lewis leaders were so impressed that they asked the ISP team to repackage the briefing series and make it available to the post-wide community and beyond.

That same year, the ISP unveiled its new campaign consisting of a new Fort Lewis Sustainability video, website, and logo, and introduced a new theme—"Sustainable Fort Lewis: Part of the Solution." The 12-minute video begins with a global perspective of what sustainability means to today's military installations, highlights existing initiatives at Fort Lewis, and ends by challenging the viewer to choose one or more simple actions that will improve the environment. Viewers are directed to the new website at https://sustainablefortlewis.army.mil where they can take a ***pledge*** to "be part of the solution," or get more information about Fort Lewis and Army Sustainability.



Other components of this outreach campaign include promotional items imprinted with the new logo and new signage identifying activities on post that contribute to a Sustainable Fort Lewis.

Environmental Management System

Tracking progress with the installation Environmental Management System

The installation Environmental Management System (EMS) is on track to meet the Army goal of having a fully functional, fence-line to fence-line EMS in place by September 2009. The EMS coordinator has worked to integrate EMS with ISP goals where possible in support of the installation's vision of a Sustainable Fort Lewis.

Fifteen Fort Lewis garrison directorates and resident organizations, as well as Yakima Training Center, implemented their EMS by 2007. Still, the requirement to have a functioning EMS in every activity operating on the installation called for an additional strategy to bridge the gap between large and small agency unique requirements as well as the military units. The Environmental Operating Permit (EOP), a program unique to Fort Lewis, was established to simplify the process. The primary objective is to incorporate EMS into everyday operations. Currently, the EOP is focused on I Corps maneuver units.

EOP advisors assist units with establishing their environmental programs and advise Soldiers on all aspects of their operations including proper collection, storage, and disposal of hazardous waste.

The EOP is a type of "CliffsNotes®" document which consolidates a unit's environmental requirements into an easy to read "how to" tool for commanders and Soldiers to use to perform their duties in an environmentally responsible way. The EOP links military operations with EMS requirements.

An organization receives an Interim or *fast-track* EOP which provides them with a step-by-step guide to set up an environmental program for the performance of daily operations. A permanent EOP, addressing unit specific requirements, is issued with the assistance of the Center for Health Promotion and Preventive Medicine – West (CHPPM-West). The first EOP was issued to the 80th Ordnance Battalion in August 2007.

As part of the EOP each organization has a designated environmental point of contact, an Environmental Advisor who will assist them in implementing their EOP and acts as a liaison helping them find solutions to their environmental issues. Environmental Advisors improve the unit's ability to maintain environmental compliance.

For example, Environmental Advisors have identified areas of potential waste resulting from the ordering of excess supplies and coordinated their return to the supply system.

The installation EMS includes a comprehensive system for monitoring its own effectiveness, checking that environmental programs are on track towards meeting their objectives, verifying that activities comply with laws and regulations and providing the Soldiers and civilians living and working at Fort Lewis with a means to identify their environmental concerns.

Annual EMS audits are conducted internally at the garrison and directorate levels and as part of the Army's Environmental Assessment Program. The Environmental Compliance Inspection Team also conducts scheduled, annual, unannounced, and follow-up compliance inspections, site visits and site assessments to monitor a unit's effectiveness in meeting compliance requirements.

Audits and inspections alone cannot identify potential environmental impacts for activities that span the entire installation. The Preventive Corrective Action Request (PCAR) provides an additional resource to monitor and improve the installation EMS. PCARs are accessible through the installation's intranet. This system allows an individual to submit environmental questions, concerns or suggestions to leaders and program managers. Each PCAR is analyzed to determine the need for action, forwarded to the appropriate action officer and tracked to ensure that an appropriate response is provided or corrective action is taken.

Environmental Management Review is key to making progress

A major benefit of the semiannual Environmental Management Review is the exchange of ideas. Each garrison directorate and resident organization lists its agency's EMS goals and achievements offering creative, realistic and measurable options that, in some cases, can be duplicated by other agencies across the installation. Exploring creative solutions from reducing paper consumption and energy conservation to reducing vehicle emissions make implementing the Installation EMS easier and more efficient. Fort Lewis garrison organizations that have established an EMS:

—Resource Management Office
—Directorate of Logistics
—Installation Safety Office
—Defense Reutilization and Marketing Office
—Fort Lewis Commissary
—Directorate of Information Management
—Directorate of Emergency Services
—Directorate of Family, Morale, Welfare and Recreation
—Madigan Army Medical Center
—Fort Lewis Dental Activity (DENTAC)
—Directorate of Public Works
—Center for Health Promotion and Preventive Medicine-West
—Directorate of Plans, Training, Mobilization and Security
—Joint Personal Property and Shipping Office
—Yakima Training Center

Team Reports: Air Quality

The challenge to improve air quality on a booming installation

Since 2001, Fort Lewis has kept pace with the Army Transformation, fielding four of seven Stryker Brigade Combat Teams, welcoming additional battalion and brigade-sized units to the installation to include the 160th SOAR and 17th Fires Brigade, all while mobilizing and deploying more than 64,000 Soldiers in support of the Global War on Terror.

Military operations including mobilizations and demobilizations, ongoing military training as well as growth in the family member and civilian populations all impact air emissions and air quality on the installation through energy use, transportation and hazardous material use.

To mitigate the environmental impacts of a transitioning military installation, the Air Quality Team pursued multiple avenues to reduce overall air emissions and reached some major milestones along the way. In the spirit of this effort, the Air Quality Team revised its 25-year goals set in 2002, ensuring the team's objectives remain focused, relevant, and realistic as we look ahead to 2025. The new goal is now: **"Reduce installation stationary source and non-tactical motor vehicle air emissions 85% by 2025."**

Installation Alternative Fuel Usage

Fort Lewis began installing temporary alternative fueling stations in 2003 and by 2005 Ethanol (E-85), Biodiesel (B-20), and Compressed Natural Gas (CNG) were available to GSA fleet vehicles. An awareness campaign that included maps, directions to the facilities and cross-coordination with transportation motor pool staff achieved a 38 percent increase in alternate fuel usage in GSA fleet vehicles. Proximity of the fueling stations to major transportation hubs has been a major challenge to draw more flex-fuel vehicles to these fueling stations. Drivers must plan ahead to travel across post to the alternate fuel sites rather than choose the convenience of a quick refill at the closest gas station. Fort Lewis is working with GSA to increase the installation fleet size of alternate fuel vehicles (AFV). Many Garrison Directorates are replacing their standard fleet vehicles for AFVs as they become available.

Community Access to Alternative Fuel

Looking ahead to the next phase, Fort Lewis was recently awarded $2.7 million for FY 2008 to design and build a permanent alternative fueling station. This station will provide community access near the Interstate-5 corridor.

The project calls for the construction of an alternative fuel station to include dispensing and storage for CNG, B-20 and E85 fuel systems and a supercharging system for electric vehicles. The infrastructure will be designed to incorporate hydrogen and propane fuel systems, a water system, covered dispensing islands and a retail building with restroom facilities. Support facilities will include utilities, paving, storm drainage, alarm systems, telecommunications, fencing and site improvements. Heating will be provided by a self-contained natural gas fired system with dual fuel capability.

While the facility will be built on federal land, this fueling station will be made available to the general public as well as military ID cardholders. The construction date is pending as planners work to identify a suitable location for the new fueling station.

Ride Share Program

An Installation Sustainability Program initiative to "reduce installation traffic congestion and air and traffic emissions" was implemented in 2002 to reduce vehicle emissions generated by commuters to and from the installation. Fort Lewis program managers introduced more commute options to installation personnel through existing statewide transportation programs.

Washington State's Commute Trip Reduction Program has been an important part of this effort. The Commute Trip Reduction program requires counties with more than 150,000 residents, and within those counties employers with more than 100 employees, to implement programs that reduce the number of commuting trips.

At Fort Lewis, Employee Transportation Coordinators assist post personnel in participating in vanpools, carpools and other commuting alternatives.

Interest in vanpools continues to grow. Between 2003 and 2007 the number of vanpool riders increased from 16 to 198. During this same period, a total of 26 vanpools have been added to the program.

Using commute trip alternatives reduces single occupancy vehicle (SOV) commutes and vehicle miles traveled, which contributes to reduced vehicle tailpipe emissions, road congestion, vehicle maintenance, and fuel consumption.

Participants in the program eliminate an average of 27 miles in daily SOV round trip commutes, saving hundreds of dollars per month in gasoline consumption and vehicle maintenance costs, and in some cases, reduced insurance premiums. According to a Washington Department of Transportation survey, Fort Lewis vanpoolers avoided approximately 2.2 million round-trip vehicle miles traveled in 2007.

Government employees use vouchers that pay up to $110 per month for an eligible commute. Commuters who

commute by bus or train; bike, walk, carpool or vanpool to work; telecommute or work a compressed work week benefit by saving money, trimming time off their commute and reducing vehicle tailpipe emissions.

One of the greatest barriers to vanpooling was eliminated when Pierce County provided the installation with a grant of $1,000 per year for the Guaranteed Emergency Ride Home program. Employees in the alternative commute program who have an emergency may take a taxi home and submit a receipt for reimbursement the next day. Although this service has been utilized fewer than five times in the last five years, its availability gives commuters a necessary contingency plan that makes vanpool membership an easy and stress-free commute alternative.

The Air Quality Team continues to promote commute trip reduction with Washington State's Ride Share Wheel Options Campaign and Pierce County's Relax Rewards program, which provide incentives for using alternate forms of transportation such as carpooling and compressed work weeks. Prizes to Fort Lewis personnel have ranged from a Seattle's Best Coffee gift card to a free ferry ride to Victoria, British Columbia.

Biking Versus Driving

Photo by Jason Kaye

Personnel who bike to work are in a category all their own. Considering the Pacific Northwest weather and the percentage of mild/dry days, it takes great fortitude to commit to this form of transportation. But one team in particular led by Mr. Jim Ahrens, Safety and Environmental Compliance Officer at the Directorate of Logistics, is leading the way. Team Ouzo, a group of 10 personnel, bike to work five to fifteen miles daily.

During the Bike to Work week 2007, the team members, ranging in age from 26 to 56, completed 73.5 round trips covering 1598.9 miles. This dedicated group not only is contributing to a healthy environment, but their overall health and well-being. Several of the bikers credit this form or transportation for improved health and vitality referring to increased energy, decreased blood pressure, and losing weight.

New bikers are cautioned. Biking to work requires special planning. Check routes to ensure they are accessible to bike traffic, pack a change of clothes, and ensure your supervisor understands and supports your commute choice.

The Air Team is exploring a new bike project that will encourage biking at Fort Lewis for short commutes between work locations. Elements for consideration include: maintenance, durability, storage, and the mix of personal and government bikes. Biking terrain, road bike courses, bike lanes, and bike stands will be enhanced to encourage this form of transportation.

Solar Wall project

Workers have commented that the Solar Wall has helped provide fresh air and purge emissions from vehicles repaired in the five acre building where it was constructed.

The solar heating panel on building 9580 at the Logistics Center is designed to save energy costs and help freshen the air. **By Don Kramer**

The Solar Wall is a passive heating system used to preheat air entering into the building's ventilation system. The wall's structure is made of sun-absorbing, all-metal cladding that is perforated with small slits. The slits are large enough to allow air to be drawn through the cladding but small enough that most of the rain does not enter. As air is drawn through the perforated siding, it is warmed by the sun then routed through the building's heating and ventilation system. In addition to supplementing the building's heating system with energy from the sun, the metal cladding prevents loss of heat through the walls in the winter, saving energy. It is maintenance free and uses no liquids.

The Solar Wall was constructed in 2006 as part of a larger project to improve the indoor air quality of a Directorate of Logistics maintenance facility. Workers have commented that the Solar Wall has helped provide fresh air and purge emissions from vehicles repaired in the building. Program managers are measuring the effectiveness of the system for return on investment to see if it would be applicable for other buildings on Fort Lewis.

Reduction in VOC air emissions

As early as 2003, Fort Lewis began switching to the use of Chemical Agent Resistant Coatings (CARC) that contained low levels of Volatile Organic Compound (VOC). This produced a significant decrease in VOC emissions installation wide. Today, the use of low VOC CARC paint at the Vehicle Maintenance and Repair Facility is the standard.

Fort Lewis operates 25 Neighborhood Electric Vehicles (NEVs) and 3 hybrid gas/electric vehicles used by Fort Lewis commanders for daily operations.

Energy/Infrastructure

Integrating sustainable features into Whole Barracks Renewal Projects

Fort Lewis has been a champion of sustainable building design for more than six years. The installation and its partner, the Seattle District—US Army Corps of Engineers (USACE), have been agents of change in administering the Fort Lewis military construction program—challenging designers to "think sustainability" and find sustainable technologies that could integrate into building designs. Beginning with the FY 2003 Whole Barracks Renewal Project, Fort Lewis adopted performance standards that would reduce environmental impact, promote greater worker productivity, extend long-term use of its facilities and reduce costs over time.

Initially, Fort Lewis adopted the Army's Sustainable Project Rating Tool (SPiRiT), which addressed military specific design standards, similar to those set by the US Green Building Council's Leadership in Energy and Environmental Design (LEED™) rating system. By the following year, the USGBC updated and improved its LEED standards and Fort Lewis adopted LEED as its official standard for new construction.

FY 2003 Barracks were designed using the Army's SPiRit rating system. The sustainable features in these barracks represent first attempts at implementing green building and design techniques. Inside, alternative flooring such as stained and polished concrete increase durability while decreasing maintenance. A heat recovery system pulls heat from dryer vents and circulates it to heat the building. All appliances are Energy Star certified. Waterless urinals decrease overall water usage and energy efficient hot water heaters are programmed to support peak demand periods and "rest" during lulls. The FY 2003 Barracks set the first benchmarks for sustainable construction on Fort Lewis, including the use of rainwater harvesting cisterns for toilet flushing and irrigation.

This FY 2003 Barracks courtyard features native landscaping and pavers set in pea gravel to allow storm water run-off. Photos By Jeanette Fiess, USACE

The FY 2004 Whole Barracks Renewal project (completed 2006) was the first to be registered for LEED Silver rating. Certification is expected by fall 2008. This project achieved a 30 percent reduction in potable water usage by installing a 350,000 gallon rainwater cistern used for irrigation, installing waterless urinals, and low-flow plumbing fixtures. The building's ductwork was sealed during construction to prevent contaminants from entering the ventilation system. Landscaping includes native and drought resistant plants rather than large areas of turf. Low-emitting paints, adhesives, sealants and carpets improve indoor air quality. Contractors recycled more than 90 percent of construction waste.

Cabinetry in the FY 2005 Barracks is made from Agrifiber, rapidly renewable wheat strawboard.

FY 2005 WBR project will be completed in spring 2008. Rainwater harvesting cisterns used to flush toilets are expected to achieve more than 40 percent savings of potable water usage. And for the first time, energy conservation in new construction significantly exceeded the American Society of Heating, Refrigerating, and Air-Conditioning Engineers (ASHRAE) 90.1 standards. ASHRAE is the baseline for obtaining LEED credit. The FY 2005 WBR Company Operations buildings will save 36 percent more energy than required by the ASHRAE standard, which amounts to a $30,000 per year energy savings for the 4-building compound. Daylighting is a major contributor to overall energy savings as 80 percent of building has access to natural light. Also a first, 50 percent of the wood used for formwork, cabinetry and doors is Forest Stewardship Council (FSC) certified.

Fort Lewis and Seattle District took a different approach to designing the FY 2006 Barracks. First, architects and engineers conducted an eco-charrette, to identify sustainable features that were practical, economical and achievable. Significant attention was given to the building's siting for the best daylighting, and to preserve surrounding trees. Additional innovations were explored and integrated such as sensors that will turn out lights when the room is unoccupied. Exterior sunshades maximize the benefits of daylighting while keeping out the summer sun thus moderating the building's overall temperature. In all, a 32 percent energy savings is expected. Despite the collaborative efforts, overall budget constraints limited the team's ability to integrate previously used and some new sustainability features, including rainwater harvesting cisterns and solar hot water heating. However, the process for sustainable construction

Energy/Infrastructure

The FY 2006 Barracks complex was designed to preserve the surrounding trees, built with exterior sunshades and oriented to maximize daylighting.

is more streamlined than ever. And lessons learned will ensure future success.

Sustainability is now a key marketing strategy within the private industry and the pool of innovative and capable contractors has expanded. Fort Lewis and the Seattle District have an established business practice of building incentives into new contracts that will encourage a more aggressive approach applying LEED standards to new construction. That means integrating sustainable features into a project is no longer an additional consideration, but rather an expectation for all new construction. And, in accordance with the Army's new Sustainable Design and Development policy, starting in FY 2008 all new military construction on Fort Lewis (and Army-wide) will achieve a minimum of LEED Silver.

Lessons Learned

The challenges to sustainable construction include lack of awareness for sustainable design and concern over the higher costs associated with a sustainable building versus traditional building design and construction. Seattle District designers, some of whom also serve as Sustainability Coordinators at the project site, have the important role of addressing these concerns and managing other challenges as they arise. They champion the cause for incorporating sustainable features into the fundamental design from the outset to reduce the incremental costs associated with sustainability. They encourage the consideration of new products and technology to help further the cause. Below are some additional strategies they employ to enforce sustainability:

- Educate all parties involved in the project—the contractor, designers, project managers
- Ensure contractors know what is required or expected. Contractors are required to have a LEED Accredited Professional on staff
- Review LEED specifications in preparatory and safety meetings where the information reaches subcontractors and laborers
- Encourage contractors to approach sustainability requirements in the same manner as safety requirements. It's not optional
- Contractors provide quarterly reports of their documentation to ensure they are making appropriate progress as they track LEED credits
- Conduct site inspections to ensure that daily operations reflect sustainable requirements and documentation

Jeanette Fiess, P.E., Quality Assurance, USACE, contributed to this article.

Energy

Renewable Energy Certificates

In 2004, Fort Lewis purchased 12,000 mega-watt hours (MWH) of green power, approximately 5 percent of the installation's energy needs. Today the amount of green energy purchased annually has more than quadrupled. Fort Lewis purchased 21 percent of its electrical needs from green energy in 2007. Under a contract with the Western Area Power Administration, Fort Lewis will purchase the equivalent of 52,364 MWH of renewable energy certificates annually through 2010. Such purchase of Green Tags results in carbon emission avoidance and helps provide market incentives for renewable energy generation. Fort Lewis is currently ranked No. 6 on the Environmental Protection Agency's list of Top 10 Federal Government purchasers of green power.

UESC/ partnership with Bonneville

Fort Lewis partnered with Bonneville Power Administration (BPA) to execute a Utility Energy Savings Contract (UESC) for energy savings in structures on the installation. The Interagency Agreement was signed September 25, 2007. The agreement authorizes BPA and the Army to enter into contract to accomplish energy savings projects. A significant capability of the BPA is the authority to borrow monies at favorable interests rates to finance energy saving projects. Fort Lewis will repay BPA over time. The projects are designed to more than offset the financing costs by reducing utility costs. Financially viable projects are identified via building Energy Audits conducted by a BPA contractor. The first of several energy savings projects is underway and consists of upgrades to lighting, building insulation and HVAC control systems that will result in more than $5 million worth of energy savings within the first three years.

Energy Savings Audits

An Energy Engineering Analysis Program (EEAP) Audit was conducted at Fort Lewis, McChord AFB and YTC in August 2007. Personnel from Huntsville Corps of Engineers, Construction Engineering Lab and Pacific Northwest National Lab studied various structures for energy savings during the EEAP. Fort Lewis is still awaiting the results of the audit. When the final report arrives, it will be used to help identify viable projects that can be accomplished using the UESC mechanism.

Sustainable Community

Community partners help create a new Fort Lewis Master Plan

The first six years of the Installation Sustainability Program brought noteworthy, even award winning innovations to Fort Lewis in the areas of environmental restoration, waste diversion/pollution prevention, green procurement, training area management, cultural resource conservation, and sustainable construction. Still, ISP team members along with installation leadership sought greater community involvement and a more holistic vision for future installation development. This search brought to focus a new direction that will lead us in the path forward.

The Sustainable Community Team was formed in August 2007. It is a cross-disciplinary team comprised of representatives from multiple agencies across the installation that recommends master plan implementation strategies to make Fort Lewis more livable today and into the future.

Until now the integration of sustainability into installation planning was focused on the construction of individual new buildings and improvements to individual existing buildings under the previous ISP goal: "*All facilities adhere to the LEED™ Platinum Standard for sustainable features by 2025.*" While LEED is an excellent program, it was decided that a more comprehensive perspective was needed to effect true sustainability in the Fort Lewis built environment.

As an example, a recent barracks project at North Fort Lewis designed to LEED Silver standards will reduce CO^2 emissions by about 60,000 pounds per year. In contrast, focusing on large-scale planning principles to build 750 housing units near the center of downtown Fort Lewis with access to public transit and mixed-use facilities rather than on the edge of the developed area will reduce vehicle miles traveled, thereby eliminating 16 million pounds of carbon dioxide emissions per year.

Fort Lewis remains highly committed to using LEED and all new facilities will be constructed to LEED standards according to Army's Sustainable Design and Development policy. There is also a great opportunity to apply broader principles to Fort Lewis, such as those in the LEED rating system for neighborhood development, currently in the pilot phase.

Recognition of these principles led to the formation of the Sustainable Community Team that supports a new goal designed to expand the focus from individual buildings to overall neighborhood and community issues: *"Create sustainable neighborhoods for a livable Fort Lewis community that enhances the Puget Sound Region."*

The team will guide community development at Fort Lewis beginning with a regional perspective—how does Fort Lewis contribute to the South Puget Sound environmental quality? How do we support interconnection of economic, social, and environmental considerations within our neighboring communities? Are we making sustainable improvement to the installation infrastructure? Are we providing our Soldiers, family members, and civilian employees livable buildings that improve their quality of life?

In August 2007, the Urban Collabortive, LLC, a planning firm led by Dr. Mark Gillem was invited to Fort Lewis to lead the installation in the work of developing a renewed vision, goals and objectives for master planning according to sustainable and livable community principles.

Nearly 70 representatives from all Fort Lewis garrison directorates, military units, family members and teens participated in the initial three-day planning session to identify key issues affecting Fort Lewis.

Soldiers and Civilian personnel contributed ideas to form goals and objectives for Fort Lewis' new Master Plan.

Dr. Gillem and his team, conducted additional planning sessions, site surveys and field analysis resulting in a vision statement: *"In support of the mission, our Soldiers and families, we will create a sustainable community of walkable neighborhoods with identifiable town centers connected by great streets."*

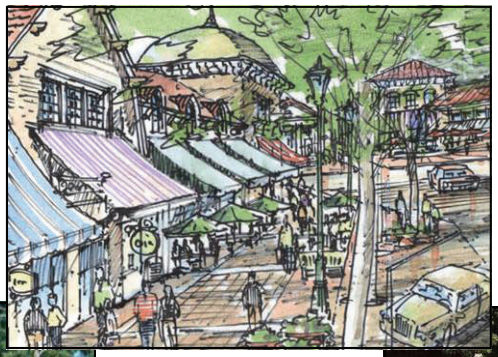
The new master plan consists of 12 Area Development Plans (ADPs) one for each district or neighborhood of Fort Lewis that will guide the installation's development in the short and long-term. The master plan is scheduled for completion by October 2008.

As a result of these efforts, a new downtown development is planned for Fort Lewis that will feature expanded retail services, housing and office space along a walkable main street. Partners in this project include: the Fort Lewis Garrison, Army Air Force Exchange Service, Defense Commissary Agency, Armed Forces Bank, America's Credit Union and Torti Gallas Development. The new Downtown Lifestyle Center is expected to be complete by 2011.

The Sustainable Community Team will be an integral contributor to this process. The team's primary objectives are working to build the master plan on solid principles and creating true sustainable neighborhoods as the master plan is implemented.

Sustainable Community

Fort Lewis Downtown Lifestyle Center Concept



Where we are today...

Where we want to be...

Working with Equity Residential, Fort Lewis' housing partner, and the Army Air Force Exchange Service (AAFES), the new vision will create pedestrian routes between shopping, business, and housing areas. Current transportation options will be enhanced using efficient commute options, with transportation hubs across the installation bringing passengers right into the center of town.

Existing Garrison Area

Future Garrison Area

An example of the type of principles that will guide Fort Lewis development comes from the American Institute of Architects (AIA) 10 principles for sustainable communities:

- Design on a human scale—pedestrian-friendly communities allow residents to wall to destinations, can reduce traffic congestion, and benefit people's health
- Provide choices—variety in housing, shopping, recreation, transportation, and employment creates lively neighborhoods
- Encourage mixed-use development—integrate different land uses and vary building types to create diverse communities
- Preserve urban centers—restore, revitalize and infill urban centers
- Vary transportation options—provide the option of walking, biking and using public transit
- Build vibrant public spaces—well-defined public places stimulate face-to-face interaction, civic participation and collective gathering
- Create a neighborhood identity—unique character enhances the walking environment and creates community pride
- Protect environmental resources—balance nature and development to protect natural systems, reduce pollution and protect property values
- Conserve landscape—protect open-space, farms and wild life habitat
- Design excellence matters—foundation of successful, healthy communities

Products and Materials Management

Shrinking waste from mountain-size to mole hill and headed toward ZERO

The Products and Materials Team formed in 2002, with only one strategic goal, "Cycle all material use to achieve ZERO net waste by 2025." The team's focus and primary concern at that time was to reduce or eliminate all sources of materials that would eventually become waste. Today that goal remains intact but the scope has broadened to support the vision of an aggressive and forward thinking team.

Through creativity, innovation and sheer will, the team reduced a $2.6M per year disposal expense in 2002 to less than $350,000 per year in 2007. Numerous pilot projects and partnerships helped to accelerate the team's efforts. These programs, which are now established business practices, guarantee that progress will continue and the goal to achieve ZERO net waste by 2025 is well within reach.

Compost

Composting of organic waste—bio-solids, yard debris, wood waste—began in 2005. This project diverted potential waste streams to reuse opportunities on the installation. In 2006, Products and Materials team members partnered with Washington State University Cooperative Extension in Puyallup to analyze compost and soil from Fort Lewis and devise a formula for compost amended topsoil. The partnership with Washington State University provided valuable information about the proper mix of soil and compost product derived from composted organic wastes and excavated soils generated at Fort Lewis for use in grounds maintenance and landscaping projects. To date, more than 1,470 yards of the nutrient rich topsoil have been used for beautification projects and landscaping in unit and garrison area construction projects.

The team spent one year planning a system for composting food waste in partnership with LeMay Inc., the recycling contractor. A study conducted in September 2007 indicated that 28 percent or 3,744 tons of all refuse generated annually at Fort Lewis is pre- and post-consumer food waste. In a pilot project to test this new system, pre-consumer food waste was collected from the Fort Lewis Commissary and Madigan Army Medical Center dining facilities and delivered to the Earthworks for composting. Within two weeks of operation, LeMay collected nearly four tons of compostable waste.

In October, collections expanded to a unit dining facility. Arrowhead Inn, 3rd Brigade, 2nd Infantry Division's dining facility, is one of the largest on post, serving 1,500 Soldiers per day. Following successful food composting at the Arrowhead Inn, the team is working to bring the 10 remaining dining facilities into the program. Approximately 65 tons of food waste have been collected since the program began in July. Considering that Fort Lewis pays $130 per ton to dispose of waste, this new business practice delivers significant cost savings to the installation.

Recycling of Construction and Demolition Debris

In just two years, Fort Lewis diverted for reuse over 20,000 tons of waste concrete, asphalt and masonry generated at construction and demolition projects. In FY 2007, 28,253 tons of concrete and 8,417 tons of asphalt were converted into an aggregate product for reuse in Fort Lewis construction, road maintenance and repair, saving the installation $220,020 in disposal costs and an estimated $366,700 cost avoidance for purchasing new materials. Crushed concrete is used for road and parking lot applications as well as filler for sidewalk improvements. Recycled asphalt is mainly used for tactical-vehicle trail surfacing as a road binder and dust palliative. This program is now an established business practice with $60,000 per year allocated for the crushing of waste concrete and asphalt.

Deconstruction

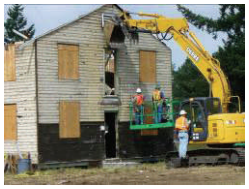
In 2006, Fort Lewis and the US Army Corps of Engineers (USACE)—Seattle District replaced the traditional approach to facility removal (by crush and haul techniques) with a more resource responsible approach that uses a combination of deconstruction and material diversion. In the installation's first application of this new technique, 12 WWII era wood buildings were removed rather than demolished achieving 100% diversion of non-hazardous solid waste through reuse and recycling. The buildings covered a combined total of 48,000 square feet. Innovative deconstruction techniques, the availability of material reuse and recycling outlets, and contractual incentives helped maximize the diversion rate.

Subcontractors recovered 215 tons of structural and non-structural materials for resale in local markets. Material such as lumber, flooring, trusses, porcelain bathroom fixtures, aluminum, steel, brick and siding were segregated on-

Composting food waste: key steps and lessons learned

1. Survey your municipal solid waste stream to identify candidate compostable and organic wastes.
2. Design and develop a composting program that includes all organic wastes as well as pre- and post-consumer food wastes.
3. Contact local, state and federal agencies to develop your program in partnership with them.
4. Contact and gain Commissary and Installation Dining Facility management support.
5. Partner with the regional refuse and recycling contractor to supply containers and transportation from the generating activity to the composting operation.
6. Learn more about composting by consulting with experts and participating in local, state and national organic recycling associations and organizations.
7. Research and develop end-use markets on the installation for compost product produced (topsoil, erosion control, landscaping).

Products and Materials Management



(Above) Contractors remove old growth Douglas fir flooring, historical material in the Pacific Northwest. (Left) Contractors prepare building for panelization; bringing the building down in partitions helped maximize recovery.

C& D Waste Management Summary				
MATERIALS	**WEIGHT (lbs)**	**WEIGHT (tons)**	**PERCENT (%)**	**DISPOSITION**
roofing, plastic, carpet, window glass	1,210,880	605	16.8	materials recycled or remanufactured
concrete, asphalt, soil, clean wood waste	5,505,079	2753	76.8	delivered to the Earthworks for reuse on installation grounds and construction projects
structural/nonstructural	328,000	164	4.6	resold or currently on the market
metal, fencing, steel	101,538	51	1.5	available for resale
misc. structural/ nonstructural	20,752	10	0.3	donated for private projects
TOTAL	7,166,249	3583	100	

site before transport to reuse markets. Total estimated value of these products is $207,000. By using local recycling and salvage contractors (20 mile radius), Fort Lewis preserved much of the embodied energy (the energy it took to grow, harvest, process and transport the original materials) and saved the energy spent on transporting the materials to new markets. The use of local subcontractors created additional jobs resulting in more than $80,000 of economic impact. Additionally, some of the products were reused for repair and improvements to training facilities as well as for beautification projects around the post. This project earned the 2006 Washington State Recycling Association Recycler of the Year Award and the 2006 Secretary of the Army Environmental Award for Pollution Prevention.

Chapel Move

Public Works (PW) staff recycled an entire building in 2007. A former WWII chapel was physically moved from its original site in the North Fort Lewis cantonment area to its new home at the Sequalitchew Training Area - Center for Environmental Education and Earthworks (STACEEE). Representatives from Fort Lewis Public Works, USACE-Seattle District, Construction Engineering and Research Laboratory (CERL) and multiple contractors conducted months of planning to synchronize the move of the 37-foot-wide by 82-foot-long building through installation roadways, across a two-lane highway and into it's new home. The actual move took two hours and more than 20 staff and volunteers made the transition appear practically seamless. This project, primarily funded by CERL under the Army Corrosion Prevention and Control Program, will demonstrate both sustainable building practices and high performance materials. At completion, the facility will showcase sustainable construction, equipment, furnishing and flooring, and will be designed to achieve LEED™ Silver certification. The 65-year-old historical structure, renamed the Environmental Education and Conference Center (E2C2) will serve as the centerpiece of the STACEEE—a 240-acre former landfill that is being converted into an environmental preserve.

Illegal Dumping Investigator

For nearly three years our illegal dumping investigator has tracked and pursued corrective actions for illegal dumping in training and garrison areas. Between FY 2006 and FY2007, more than 950 sites were investigated and 90 percent cleaned by the perpetrator, saving the installation $127,700 in waste disposal costs. Major benefits to this program are reductions in the number of dumpsites Soldiers must clean during the semiannual Pride Week as well as the additional waste disposal cost to the installation during this period. Waste disposal costs dropped from $140,000 for Fall 2006 (downrange and garrison area clean-up) to $70, 000 in spring 2007.

In fall 2007, the scope of work expanded to address abandoned vehicles found on the installation. The Illegal Dumping Investigator is now able to expedite removal of abandoned vehicles that pose a negative impact to the environment or training area use. This coordinated effort between the Military Police and PW significantly improves the turn around time from identification to removal of abandoned vehicles. By winter 2007, the illegal dumping investigator was authorized to clean dumpsites as they are found and initiate claims for reimbursement of the waste disposal cost. This new business practice decreases the number of dumpsites found in training areas year-round and diverts recyclable items from the waste stream.

Products and Materials Management

New Permanent Recycling Center

A new permanent recycling center opened in April 2007. With a larger facility, the recycling contractor expanded the list of materials accepted for recycling. In addition to routine recyclables, the new facility accepts items such as used cooking oil, pots and pans, tires, large and small plastic toys, computer parts and various electric items. Since the opening, recycling has increased 20 percent. The facility also includes space for onsite training and education. In addition to daily monitoring and addressing corrective actions at unit and garrison areas, the recycling contractor's outreach coordinator has seen a 20 percent increase in attendance at recycling awareness classes at the facility. Since the Recycle Center opened, it has had a recorded use of up to 140 customers per day. The new facility is designed with six bays used to off-load heavy items such as recyclable wood, commercial refuse and yard waste.

Darnell Peterson, Alliance Property Services, delivers material collected from the Beachwood housing area residents. At the recycle center, he sorts paper, yard debris, cardboard, metal and appliances into designated containers.

Qualified Recycling Program

Fort Lewis is in the process of developing a plan to implement a Qualified Recycling Program (QRP) to further improve recycling activities installation-wide. Department of Defense Instruction 4715.4 outlines the requirements for the new QRP at Fort Lewis that will eventually end up serving both the environment and the financial bottom line. The Fort Lewis QRP is expected to be in place by FY 2008. Public Works Environmental Division staff are currently developing a business plan for the new program.

Sustainable Interiors Showroom

Created in 2005, the Army's first Sustainable Interiors Showroom (SIS) continues to promote procurement of recycled, recyclable or renewable office products. The SIS is now integrated within the new Furnishings Management Office (FMO) and offers a working model of sustainable furniture and flooring materials that purchasers can see, feel and test during the procurement process. The FMO ensures that new customers visit the SIS prior to making purchases, educates buyers on sustainable options to meet green procurement requirements, and streamlines the requisition process.

Between 2005 and 2006 and pre-FMO, Fort Lewis procured more than $2,625,200 worth of sustainable administrative and barracks furniture for new and renovated facilities. Furniture in the Soldiers Readiness Processing site (which supports 500-600 soldiers per day); the Fort Lewis Emergency Communications Center; FY 2005 and FY 2006 barracks; and new battalion and company headquarters buildings all have sustainable features including recycled content, extended warranties and some items are GREENGUARD certified.

Hazardous Materials Control Center (HMCC)

The HMCC accepts excess hazardous materials and re-issues to other units and organizations reducing both disposal and procurement costs.

The HMCC serves a portion of every directorate and major subordinate command at 220 sites, providing centralized management and visibility of all hazardous materials stored and used on the installation. Delivery service started in 2003 and focuses on reducing costly disposal of hazardous waste and unused hazardous materials. The HMCC material disposition program picks up excess and unneeded serviceable material for redistribution to other organizations. For example, the availability of products entered through the re-issue program resulted in a procurement cost avoidance of $602,649 and waste disposal cost avoidance of $73,702 in 2007.

Delivery service has been the key to the success of the program that now serves 85 percent of Fort Lewis customers and 50 percent of McChord Air Force Base customers. The HMCC will expand the delivery program with two additional drivers and trucks to provide delivery service to all of Fort Lewis, McChord, Madigan Army Medical Center and Camp Murray.

Summary

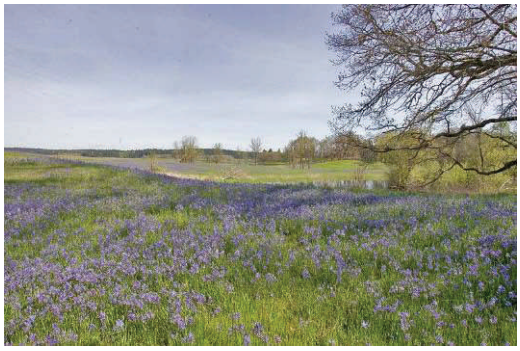
The Products and Materials Team has established and proven several new business practices that together help reduce the environmental liabilities and costs associated with waste disposal, promote sustainable manufacture, and stimulate both local and national markets for environmentally preferable products.

The SIS has been a centerpiece of the installation's transition from throwaway furniture to more recyclable and reusable administrative furnishings.

Sustainable Training Lands

Preserving Fort Lewis training land is key to sustaining the mission

Fort Lewis has demonstrated a strong commitment to protecting the natural and cultural resources of the South Puget Sound region. In accordance with our goal to maintain mission capability without compromising the integrity of these resources, Fort Lewis has partnered with the Nisqually Tribe, federal and state agencies, The Nature Conservancy (TNC), and other interested stakeholders to preserve local habitat and history.



Conservation, Species recovery, Habitat restoration

A key focus has been the preservation of Puget Lowland prairies on the installation and throughout the South Sound region. Impacted by decades of development, this endangered ecosystem now covers less than one tenth its original area. Existing remnants are home to some of the state's rarest species and hold considerable cultural and historical significance. As these prairies have declined, Fort Lewis' training lands have become a refuge for imperiled prairie species. In an effort to avoid training impacts and protect the resources entrusted to it, Fort Lewis has adopted a proactive strategy that combines integrated land management, site protection, habitat acquisition, and regional partnerships with species recovery and reintroduction.

One recent example of these efforts involved the reintroduction of the Taylor's checkerspot butterfly. Like other local prairie species, the checkerspot is both a state endangered species and a candidate for federal listing under the Endangered Species Act. In recent years Fort Lewis has worked with the Washington State Department of Fish and Wildlife (WDFW), TNC, and the Oregon Zoo to collect eggs from the installation, nurture them through their long hibernation process, and reintroduce them to local prairies. In March 2007, nearly 200 Taylor's checkerspot caterpillars were released, with similar releases planned for state and Fort Lewis lands in the coming years.

In 2007 Fort Lewis also began relocating three pairs of western bluebirds to oak prairie habitat on San Juan Island, where the species had become extinct. A successful 25-year nest box project has increased the number of known bluebird pairs on Fort Lewis from just four in 1981 to 86 in 2006, thereby enabling the installation to donate some birds to the recovery effort. In addition to the nest box program, Fort Lewis Fish and Wildlife provides additional bird habitat by girdling trees and creating nest cavities. Annual events, such as National Public Lands Day, offer local citizens the opportunity to help contribute to habitat restoration. In September 2007, Fort Lewis Fish and Wildlife staff and volunteers built and placed bird boxes for wood ducks, purple martins, Western Bluebirds, American kestrels, and Northern Pigmy owls. Seven Western gray squirrels, captured in Lake Chelan, Wash., were released on Fort Lewis this fall, in an effort to increase the dwindling population of this imperiled species. Fort Lewis Fish and Wildlife, WDFW and TNC staff are closely monitoring their progress in hopes that the genetic diversity will produce a healthy population.

Army Compatible Use Buffer

Fort Lewis further aids species recovery by helping its partners manage additional habitat through the Army Compatible Use Buffer (ACUB) program. Since the start of the ACUB program in September 2006, partners have acquired 1,025 acres of prairie habitat and $1 million in Department of Defense (DoD) funds have been spent on habitat restoration, reintroduction and monitoring of these prairies. ACUB funds facilitate the management of the 809-acre West Rocky Prairie near Maytown, 27 miles southwest of Fort Lewis. Habitat restoration at this site will return the land to high-quality native prairie, allowing new populations of federal candidate species to be established there. Similarly, Fort Lewis is proceeding with plans to re-establish native prairie, wetland and woodland habitats at its Sequalitchew Training Area. Initial preparation of the prairie is ongoing and funding for the wetland project is being secured.

Training Area Management

Management of these ecosystems requires the coordinated efforts of the Forestry, Fish and Wildlife, and Integrated Training Area Management (ITAM) programs. Each is vital to maintaining training lands in order to ensure quality training.

In the spring of 2007, for example, the ITAM program propagated 25,000 native plant plugs used to repair maneuver damage and monitor the success of individual species. The ITAM plant propagation facility, or greenhouse, was built on Fort Lewis in 2005. Land Rehabilitation and Maintenance (LRAM) staff operate the facility, collecting native seeds, germinating them into plugs that are used to repair land damage. More than 120,000 native prairie plants have been planted and propagated in the last three years.

Sustainable Training Lands

The Nisqually tribal crew conducted tree planting in Spring 2004 as part of a 4-year restoration project.

2007 also marked the completion of a four-year project to remove invasive reed canary grass from Muck Creek and replant the area with native vegetation. The 15,000 native shrubs and trees planted along Muck Creek will provide shade and prevent canary grass from choking the channel. This cooperative venture between Fort Lewis Fish and Wildlife and the Nisqually Tribe repaired important spawning habitat for local salmon, steelhead, and cutthroat.

Forestry

Over the same period, 54,000 acres of Fort Lewis forest land were recertified as meeting the Forest Stewardship Council's standards and best practices. When originally certified in 2002, Fort Lewis was the first military installation and the first federal agency to receive this coveted recognition. Fort Lewis forestry operations emphasize timber harvests that enhance biodiversity and ecological restoration, while producing economic benefits for the local community. Record timber sales generated more than $6 million in revenue. Nearly $1.7 million of that was allocated to Pierce, Thurston and Clark counties for public schools and road maintenance.

Reforestation is an important part of forestry operations. For the first time, Fort Lewis collected Douglas fir and western red cedar seed from its native stands in 2007, and recollected seed from ponderosa pine in 2006 for future plantings. The Douglas fir cone collection project produced three pounds at 38,000 seeds per pound; western red cedar collection produced three pounds at 321,000 seeds per pound; and the Ponderosa Pine collection produced 12 pounds at 11,700 seeds per pound for reforestation over the next decade. These new collections provide sound footing for future reforestation at Fort Lewis by utilizing seed from local seed zones to optimize tree survival and growth. In 2007, over 55,000 trees were outplanted in timber harvested areas.

Forestry staff, Polo Cantu, perched 50-feet above ground, helped collect enough red cedar cone to yield nearly one million seeds.

Cultural resources

The effort to preserve natural resources often coincides with Fort Lewis' equally strong commitment to preserve cultural resources and history. This is most evident in the preservation of local prairies, which remain central to Native American cultural identities and values in the South Sound region. Fort Lewis continues to work closely with the Nisqually Tribe to ensure these areas are protected and available for traditional practices.

Similarly, archeological surveys and excavations conducted by the Cultural Resources program have uncovered artifacts important to the native peoples and the history of our region. Between fiscal years 2003 and 2006, the program investigated 26 sites, 12 of which were eligible for listing on the National Register of Historic Places. Highlights include the discovery of a nearly 100-year-old logging camp staffed by Japanese workers, a Nisqually Indian winter village and summer fishing camp, and a Nisqually Indian Reservation homestead. Fourteen sites were ineligible for listing and reopened to training on or near the sites.

The Cultural Resources program also documents the more recent history of the installation. In May 2007, the program received the Historic Preservation Officer's Award for outstanding achievement in historic education. The award, presented by the Washington State Department of Archaeology and Historic Preservation, recognized the program's CD-ROM "Fort Lewis Division Area Barracks: Meeting the Challenges of the Cold War Era." This multimedia presentation combines music, film, photographs, articles and interviews to chronicle life on Fort Lewis during the 1950s and the historic barracks in the post's division area. Documenting the barracks of this period is of great significance as buildings are being removed or altered to meet current and future mission requirements and quality of life standards.

These and other actions over the past six years have helped ensure the sustainability of our local ecosystems and heritage. Working together, the installation's Training Lands Team and its partners have laid the groundwork for an ongoing cooperative venture to secure the health and well-being of the South Sound region. Fort Lewis looks forward to building on this foundation in the coming years and working with more organizations committed to a sustainable future.

Sustainable Training Lands

Squirrel release to stabilize post population

Seven new residents made Fort Lewis' Holden Woods their home Oct. 9 in Training Area 10.

A group of Western gray squirrels, caught by Washington State Fish and Wildlife employees near Lake Chelan, were introduced to Fort Lewis to supplement the post's waning population. Three females and four males were fitted with radio collars and inoculated against mange, then spent the previous nights in cages on Fort Lewis soil to get used to the scent.

Gene Orth, biologist for Fish and Wildlife, and his team carried four cages covered with towels to a clearing in the woods. The squirrels were released one at a time while the crowd of onlookers watched their progress into the trees. Three squirrels had been released earlier that morning in another location.

Western gray squirrels, a threatened species, are the largest squirrels in America. Because of habitat degradation, there are only three major populations left in Washington: in Klickitat County, in Okanogan County and at Fort Lewis. The Fort Lewis population is estimated to be fewer than 50 animals.

Over the last year, Orth has worked with Fort Lewis Fish and Wildlife staff to track and monitor Western grays on the fort, to find out how many there are and how they are using the habitat. In cooperation with The Nature Conservancy, the post has worked for the last five years to improve habitat for the animals, in the hope that the population will grow. All that work was leading up to the day when a new, genetically different, set of squirrels could be brought to post — the new genes will help create a healthy, increased population.

"The whole idea is to stabilize, if not ramp up the population in the state," Orth said. "This population was headed for extinction in short order."

A Western gray squirrel peers out of a trap on Fort Lewis. Photo by Jason Kaye

If the populations breed together, it won't take long for the genetic diversity to build up, he said. For now, the plan is to watch the Western gray squirrels on Fort Lewis and see how they do. The population will continue to be monitored to prepare for the next round of squirrels.

"They are going to monitor the success, see if there were any deficiencies, change where needed, and then try it again next year," said Dave Clouse, Fort Lewis fish and wildlife manager. Also, more habitat restoration, like scotch broom removal and planting trees that supply food, like Oregon grape and oak trees, will continue.

More Western grays will be introduced to the post over the next four years in groups of 12 to 24 animals.

By Rachel Young, Northwest Guardian, published October 2007

Fort Lewis youth help plant trees at Red Salmon Creek, part of the Nisqually Land Trust property.

Volunteers plant trees at Red Salmon Creek

Planting 2,000 native trees and shrubs might appear to be an endless job, but that depends on how many people help do the job.

Twenty-one students from the North Fort Youth Center's School Age Services, 15 Soldiers from the 402nd Brigade Support Battalion, three classes from Komachin Middle School, the Conservation Corps (a veterans organization dedicated to inproving the environment) and other volunteers planted trees and shrubs March 9 and 10 at Red Salmon Creek, part of the Nisqually Land Trust property.

"We are adding these trees and shrubs to improve the wildlife habitat here," said Don Perry, Nisqually Natural Resources outreach coordinator and volunteer for the Nisqually Indian tribe.

The U.S. Fish and Wildlife Service paid for the trees and shrubs, which were purchased from three locations — the Pierce County Conservation District, the Washington Conservation District Nursery and the Four Corners Nursery.

"Some of the shrubs we are planting will provide food for wildlife within three years, and you are going to see a really nice forest out here within about 20 years," said Linda Kunze, stewardship coordinator, Nisqually Land Trust.

Fort Lewis has a long history of supporting habitat restoration in the Nisqually drainage. Sgt. Jeremiah Snedigar, 402nd BSB, was happy to take a place in that effort.

"It's always good to help out with the Native Americans here," he said. "It's also good for the Soldiers because it lets them know where they are in the community."

Spc. Nicholas Schrader, from the same unit, recognizes the importance of community spirit, too.

"I volunteered because I want to give back to the community," he said. "The community is helping me out, so I'm helping the community out."

Liz Ortiz, school age program lead, Fort Lewis Youth Center, said many children volunteer to help with restoration and conservation of native plants every summer, from July to September.

"I am here because I want to help plant new trees to help the salmon," said Deja Trezevantte, 10.

Red Salmon Creek is a salmon spawning creek, Perry said.

"I want to make this place more beautiful and healthier for our kids," said Staff Sgt. Linda Lightner, 4th Bde., 2nd Inf. Div. "I watched my grandparents planting things in Eufaula (Ala.), and they taught me how important it is to replenish the earth."

By Barbara Sellers, Northwest Guardian, published March 2007

Water Resources

Water quality and conservation as a top priority

Water is one of our most precious and vital natural resources. And as the Fort Lewis population continues to grow, the installation is paying more attention to water quality and water conservation. Clean, safe, drinking water is critical to the Fort Lewis mission. Clean water is necessary for the health, safety and welfare of Soldiers, families and civilians at Fort Lewis. Water quality applies not only to the water people drink, but the water flowing into bodies of water, rivers and streams of the region.

In the past six years, the Water Team has increased its effort to address water quality, water consumption, and wastewater discharge.

The Water Team revised its original four sustainability goals in 2007. The goal "Develop an Effective Regional Aquifer and Watershed Management Program by 2012" was completed in 2004. The three remaining goals were consolidated into one new goal. In 2007, the Installation Sustainability Board approved the changes and the new water goal: "Treat All Wastewaters to Class A Reclaim Standards by 2025 to Conserve Water Resources and Improve Puget Sound Water Quality."

Three new objectives were outlined to guide the team in accomplishing the new goal:

1. Improve existing processes and infrastructure by 2018
2. Treat all WWTP effluent to Class A standards by 2018
3. Maximize water reuse by 2025

Puget Sound view from the Fort Lewis Wastewater Treatment Plant at Solo Point.

Improve Existing Processes and Infrastructure by 2018—Wastewater Pretreatment

In 2006 the Water Team began to develop a pretreatment program for the Fort Lewis Wastewater Treatment Plant (WWTP) which discharges to Puget Sound. The pretreatment program identifies industrial users and monitors the wastewater that is discharged from those facilities. Fort Lewis is currently developing local limits and will establish local limits for the installation. The primary focus of this pretreatment program is to identify and pre-treat sources of pollutants that may interfere with WWTP operations or that may pass through the plant untreated. Ultimately, the purpose of the pretreatment program is to:

1. Prevent the introduction of pollutants into the WWTP, which will interfere with its operation;
2. Prevent the introduction of pollutants into the WWTP, which will pass through the WWTP—inadequately treated—into the Puget Sound, or otherwise be incompatible with the WWTP;
3. Protect both WWTP personnel who may be affected by wastewater, sludge, biosolids and other waste by-products in the course of their employment and the general public;
4. Promote reuse and recycling of wastewater; waste fats, oils and greases; and biosolids from the WWTP; and
5. Enable Fort Lewis to comply with its National Pollutant Discharge Elimination System (NPDES) permit conditions, the State's biosolids use and disposal requirements, and any other Federal or State laws to which the WWTP is subject.

A professional engineer was hired in January 2007 to lead the Pretreatment Program. In June 2007, a consulting firm was awarded a contract to assist with developing and implementing the pretreatment program.

The program includes an Industrial User (IU) survey, water quality monitoring at IUs, database development, training, procedure development and establishment of a pretreatment regulation for the installation.

Since there was no pretreatment program to permit and monitor nondomestic discharges to the WWTP, Washington State Department of Ecology (Ecology) had a concern that discharges to the WWTP may occur that are detrimental to the WWTP operation or that may pass through the WWTP with insufficient treatment. To address this concern, Fort Lewis and Ecology entered into a Memorandum of Understanding (MOU) in June 2007 to establish and implement a pretreatment program for the Fort Lewis WWTP. The MOU outlined the steps and timeline to establish a pretreatment program for industrial users who discharge to the WWTP, including entities on McChord Air Force Base, the Veterans Administration Hospital, and Camp Murray. The MOU formalized the agreement and the partnership between Ecology and the installation.

The Fort Lewis WWTP effluent is discharged under a National Pollutant Discharge Elimination System (NPDES) permit issued by Environmental Protection Agency (EPA). Pretreatment is not a condition of the current NPDES permit. A Notice of Intent was mailed to the Environmental Protection Agency (EPA) regarding the installation's intent to develop the pretreatment program.

During the summer of 2007, potential IUs were surveyed that discharge to the Fort Lewis WWTP. The next step in the pretreatment program is to analyze water quality at each of the industrial user facilities and to develop local pretreatment limits for the installation.

For the next year all potential industrial users will be monitored and local limits will be developed based on the data. The Department of Ecology has extended the deadline for local limit development under the MOU to January 2009.

This will allow for more data to be collected and better characterization of the waste streams.

The Water Team is currently working on a pretreatment regulation. All entities discharging to the Fort Lewis WWTP will be required to meet pretreatment requirements such as local limits. Furthermore, Environmental Management Systems (EMS) and Environmental Operating Permits (EOPs) are being developed for military unit and post agencies. The EOPs will be used as training tools for environmental requirements, including pretreatment.

Treat all WWTP Effluent to Class A Standards by 2018—Water Reclamation

Fort Lewis was selected by the Army Environmental Center (AEC) for a water reuse study that was contracted to Scientific Applications International Corporation (SAIC) and Malcolm Pirnie. In May 2007, Malcolm Pirnie began conducting a water quality assessment and feasibility study to evaluate options to treat wastewater effluent to Class A reclaimed standards and to identify potential beneficial use facilities. The Reuse Evaluation Report outlined the water quality and permit requirements to treat wastewater to Class A standards and a feasibility plan assessed the options for treating wastewater to Class A reclaimed standards. Class A standards entail more rigid water quality parameters than our current WWTP is able to treat; therefore, the study also addressed upgrades for capital improvements and best available technologies. The recommended option from the feasibility study indicated that upgrades to the WWTP should be implemented versus constructing new satellite treatment plants.

Fort Lewis can reduce its wastewater discharge to Puget Sound and potentially eliminate the discharge by treating wastewater to Class A reclaimed standards. Fort Lewis has the potential to produce three to five million gallons of reclaimed water per day that can be reused for activities that do not require potable water including irrigation and military vehicle wash racks. There is a potential to reuse 70 percent of the reclaimed water during the summer months, but only about three percent during the winter months. By reusing water, Fort Lewis could offset over 25 percent of the potable water production requirements per year.

Water Conservation

Executive Order 13423, Strengthening Federal Environmental, Energy and Transportation Management, directs a reduction of water consumption by 2 percent each year beginning in FY 2008 through FY 2015. In accordance with EO 13423, passed in January 2007, the post committed to reduce water consumption by two percent every year through 2015. Several measures are already in place and new measures are being explored to ensure that the goal is reached.

One of the ways to do this is through water conservation. In May 2006, the Fort Lewis Water Conservation Policy was elevated to a Fort Lewis Regulation, prescribing mandatory action by garrison and resident organizations to support conservation. The Water Team intensified its education and outreach during a four-month Water Conservation Awareness Campaign.

Trickling filters digest nutrients during the wastewater treatment process.

Visual cues describing water conservation levels and corresponding measures were placed in high traffic areas on post. Articles announcing the beginning of the campaign were posted in the installation newspaper followed by recurring announcements in the news briefs page. In 2007 the Water Conservation Campaign continued to promote water conservation and Fort Lewis Regulation 11-5. Information was distributed in daily bulletins, newsletters, the annual Consumer Confidence Report and on electronic reader boards.

In the spring of 2007, Fort Lewis conducted a leak detection survey of the potable water system. During the survey 96 leaks were detected that had potential water loss of approximately 395,550 gallons per day or 144.4 million gallons per year. Public Works has begun prioritizing the leak repairs beginning with the major leaks.

To further reduce water consumption, an inventory of irrigation systems on the installation was conducted in the winter of 2007. During the inventory numerous irrigation systems were found to be damaged. Repair of the damaged systems is in progress. Fort Lewis will also continue to install irrigation systems with timers around the parade fields and other 'pride' areas. By using automatic systems, overwatering is reduced.

The Fort Lewis Parade field, used year-round for major ceremonies, maintains its lush green appearance through an irrigation system that conserves water.

Yakima Training Center

Efforts to recover greater sage-grouse at Yakima Training Center

Every spring since 1989, biologists at the Yakima Training Center (YTC) have conducted annual monitoring of the Columbia Basin Distinct Population Segment (DPS) of greater sage-grouse (*Centrocercus urophasianus*) displaying at leks (i.e. areas used by male sage-grouse to display during the breeding season) as a means to estimate the numbers of birds and determine trends in the population residing on the installation. And for nearly twenty years, monitoring has indicated a slow declining trend in the number of birds and leks on the installation. It is the species status and its close association with sagebrush-steppe communities that makes it a priority for management at YTC.

The majority of the installation consists of shrub-steppe and grassland vegetation communities typical of the Columbia Basin and sage-grouse habitat. The installation itself is one of the largest contiguous areas of shrub-steppe still in existence in the Columbia Basin and is home to many shrub-steppe dependent species. Recovering state and federally listed species inhabiting the Columbia Basin is an installation sustainability goal.

Photo by Lisa Dunham

Historically, sage-grouse ranged throughout the Columbia Basin but currently only reside in two populations in Washington with the one on YTC the only one on federal land. The species is a Washington State threatened species, a federal Candidate species under the Endangered Species Act, and the Army's highest priority Species at Risk (SAR) due to continued population declines, habitat loss, fragmentation, low genetic diversity, and other threats such as fire and disease.

In an effort to prevent further listing and to contribute toward recovery of the Columbia Basin DPS of greater sage-grouse, YTC continues to employ a number of conservation efforts. YTC developed and implemented a sage-grouse management plan that includes population monitoring, habitat protection and restoration, emphasizes fire prevention and suppression, and encourages the participation in local conservation partnerships and working groups. More specifically, YTC's annual population monitoring effort is used to identify temporal distributions of leks to help define the protection period afforded the birds during lek attendance and the nesting season. It identifies spatial distributions to help define habitat protection measures and it estimates the annual population and establishes trends that are used to evaluate conservation measures at YTC and across Washington State.

YTC conducts annual restoration efforts of both its shrub-steppe uplands and riparian areas to address both past and present impacts of habitat loss and degradation from grazing, fire, noxious weeds, and military training. YTC continues to develop fire prevention and suppression capabilities to address the ever-present threat of fire. Development of downrange water sources, establishment and maintenance of firebreaks, stationing of aerial fire assets, addition of a seasonal fire crew, prescribed fire/fuel reduction efforts, a wildland fire management plan, and the development and use of a fire risk matrix that considers local fire related factors in making management decisions regarding training have all been instrumental in addressing the continued threat of fire to sage-grouse on YTC.

Sage-grouse release on YTC, 2006. Photo by Shane Early

In terms of cooperative partnerships, in 2001 YTC initiated and funded the Yakama Nation to assess habitat and the possibility of a reintroduction effort on the Yakama Reservation. As a result, in 2006 the Yakama Nation reintroduced sage-grouse on the Reservation increasing the distribution of sage-grouse in the Columbia Basin. In 2004, YTC and the Washington Department of Fish and Wildlife (WDFW) worked cooperatively to translocate sage-grouse to augment the population on YTC in an attempt to improve genetic diversity and possibly the numbers of sage-grouse on the installation. Translocated birds that have survived have successfully nested on and adjacent to YTC and have likely contributed new genetic material into the population.

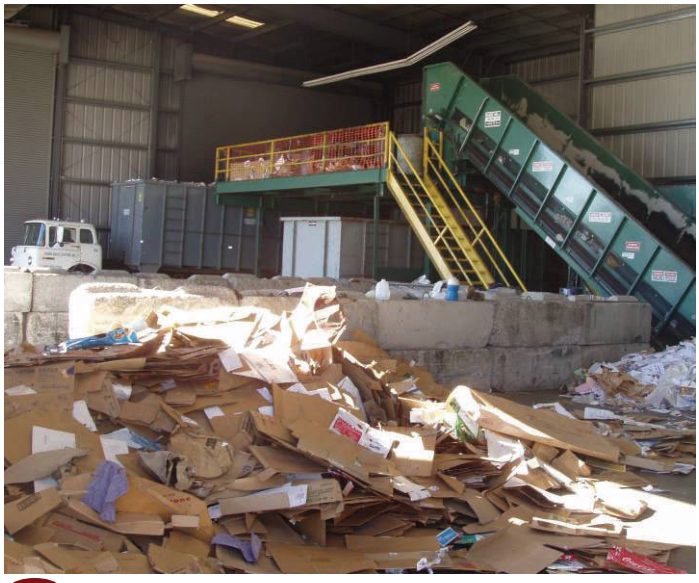
YTC works cooperatively with the Washington Department of Health, Madigan Army Medical Center, and U.S. Army Center for Health Promotion and Preventative Medicine – West (USACHPPM-West) in monitoring for West Nile virus on the installation, a disease that sage-grouse are extremely susceptible to and that is also a threat to Soldiers training at YTC. In 2006, YTC, WDFW, and the Natural Resources Conservation Service (NRCS) formed the Central Washington Shrub-Steppe Collaborative along with other state and federal agencies, non-governmental organizations, and private landowners to emphasize the conservation of sage-grouse and shrub-steppe habitat on private lands adjacent to the installation. It is hoped that by spreading the conservation responsibility for this species and the habitat it is dependent on outside the installation's boundary the declining trends in both numbers of birds and acres of habitat will start to reverse and move this species towards recovery.

It is through these combined conservation efforts that YTC hopes to meet its sustainability goals and to restore and recover greater sage-grouse to shrub-steppe areas of the Columbia Basin.

By Colin G. Leingang, YTC Wildlife Program Manager

Yakima Training Center

Recycling at Yakima Training Center



One of the ways to demonstrate good environmental stewardship is to minimize the impact our activities have on the environment. Diverting waste material from landfills to a beneficial use (recycling) reduces the need for raw materials, reduces energy requirements, and conserves landfill space. Recycling programs are driven primarily by financial considerations. A persons desire to benefit the environment is an incentive for recycling but if it costs more to recycle an item than to dispose of it, a recycling program will fail in the long term. Thus, for recycling to be affective the value of the recycled material needs to be equal to or greater than the costs of collecting the material and sending it to the recycling facility.

Recycling is generally more economical in large metropolitan areas. These areas generate larger quantities of recyclable material and there are usually more options on the use of materials. In Yakima the options for recycling are very limited. It is not cost effective to collect low value recyclable material and transport it to the Seattle area for shipment overseas and local recycling opportunities are very limited. Due to the costs involved in collection and the low disposal costs, Yakima does not have a mandated household recycling program. There is a program available at extra cost to the homeowner.

Recycling at YTC has been developing for a number of years. Prior to increased security measures, YTC had a recycling location that was available for the both YTC personnel and the public. Since the tightening of security, only a few members of the public bring their household items to YTC for recycling. The material that is collected can be separated into three categories:

1. The high value category consists of scrap metal and cardboard. These materials are collected separately and generate funds that go into a Soldier MWR account. The scrap metal containers are kept at the One-Stop yard and the cardboard containers are located near its major generators.
2. The dangerous waste category consists of used oil, used antifreeze and batteries. These materials are exempted from the dangerous waste regulations when they are sent to Ecology approved recyclers. No funds are received for these materials but disposal costs are avoided.
3. The low value category consists of mixed or commingled recyclables. This material is collected in specially marked bins all around the installation. Due to economic considerations, it is not feasible to provide bins for each separate type of recyclable material. Mixed recyclable material is collected and transported to Yakima Waste Systems, Inc. where it is hand sorted. Once sorted, cardboard, paper and plastics are sent to Michelsen Packaging Company where they are converted into fruit packaging. Michelsen makes paper trays that protect fruit such as apples and pears during shipment. Since food is involved, the recycled material has to be fairly clean and cannot have been mixed with food waste. YTC only benefits economically from this program by paying a smaller disposal fee based on the labor involved in hand sorting and the low value of the material.

By Chuck Mulkey, YTC EMS/Sustainability Coordinator

Western Sage Grouse at YTC

YTC Sustainability Goals

- Supply all activities on Yakima Training Center (YTC) with renewable energy sources and on-site generation for down range energy needs by 2030
- Maintain and improve YTC's capability of supporting current and future military training standards
- Achieve zero net waste by 2030
- Recover listed and candidate federal species in the Columbia Basin by 2030
- Protect the aesthetic and visual appearance of the natural and cultural landscape of YTC
- Reduce emissions by 75% and dust by 40-50% by 2030
- Reduce potable and irrigation water use by 50% by 2030
- Construction on all new permanent facilities will meet the LEED Gold standard by 2025 and 50% will meet the Platinum standard by 2035

Community Outreach

Fort Lewis shares both the Army and the Fort Lewis Sustainability story through an extensive communications program that includes media relations and community outreach. Special visits, briefings, and tours are conducted to inform federal, state, and other local representatives of our environmental performance and to enhance community partnerships. Fort Lewis leaders set the standard for reaching out to our neighbors and stakeholders, educating and empowering others to take their first steps toward a sustainable future, and motivating our teams to reach beyond existing boundaries to achieve our 25-year goals.

Fort Lewis Leaders

LTG Charles Jacoby, Jr, I Corps and Fort Lewis commanding general, greets members of Gold Star Wives of America following the Reflection Park and Memorial groundbreaking ceremony, July 2007. The 10-acre, tree-lined site dedicated to memorialize fallen Service members with ties to Washington State, underscores the Army's triple bottom line of Sustainability: mission, environment and community.

MG (R) James Collins, contributed to the Army Sustainability video emphasizing the importance of Army leaders in Sustainability planning, Sept. 2005.

LTG (R) Edward Soriano hosted a sustainability education conference for senior military and civilian leaders with keynote speaker, Gov. Gary Locke, Oct. 2003.

LTG (R) James T. Hill addressing the attendees at the Fort Lewis Sustainability Conference, Feb 2002.

"It's the right thing to do."

Community Events

Pierce County Livable Communities Fair—2004
The ISP team reaches more than 5,000 visitors from the Puget Sound Region at the bi-annual event.

Kids Fest—2005
Fort Lewis youth took a journey to Dr. Suess' "Land of the Lorax," for a lesson in protecting our natural resources.

Kids Fest—2006
At the watershed model youth sprinkled red and purple "Kool-Aide®" over the city simulating pollution.

Armed Forces Day—2006
One of our largest post-wide events, recyclers line up to jump into the bin and sort recyclables and win prizes.

America Recycles—2006
At the Pre-Cycle Center, Fort Lewis Commissary Manager, Janet Landon, shows young shoppers how to choose less packaging and more recyclable products.

America Recycles/ Wormworks—2007
Fort Lewis youth learn how to turn ordinary kitchen scraps into compost in a series of classes conducted by Pierce County and Fort Lewis Public Works.

Community Outreach

"Through education and outreach we inspire each other to take proactive measures to achieve excellence."

Boy Scouts—2005
Boy Scout Troop 62 constructed a raised-bed planter that highlights native plants and the use of recycled materials.

Barracks Furniture Showcase—2006
Single Soldiers were invited to view and evaluate barracks furniture designed to be more durable and recyclable.

Public Lands Day 2007
Volunteers joined Fort Lewis Fish and Wildlife staff in planting trees and building bird boxes at Muck Creek, Oct. 2007.

ECOS Tour—2006
Representatives from the Environmental Council of the States toured the Earthworks during their Sustainability Working Group meeting, Jun 2006.

Girl Scouts—2007
Girl Scouts Troop 473 toured the Earthworks' and discussed future projects in recycling, composting, habitat restoration, May 2007.

America Recycles Day—2007
Fort Lewis Soldiers took the Aluminum Can Challenge. More than 1,000 pounds of aluminum cans were recycled in a 6-week period, Nov. 2007.

Earth Day/
Green Vendor Day—2006 & 2007
Vendors showcased environmentally preferable products available for government purchase card holders, April.

News Media

In the past several years, Sustainable Fort Lewis programs and initiatives were featured in more than 60 local, regional and national publications. Major highlights:

2007—"Fort Lewis becomes new home for gray squirrels." The Olympian

2007— *"Joint effort helping rare butterfly."* The Olympian and The News Tribune

2006—Soldiers Radio and Television ran a series of Fort Lewis Sustainability stories covering a newly installed solar wall; alternative fuel; tracking Taylor's checkerspot butterfly; the Sustainable Interiors Showroom; sustainable construction; water conservation and native plant propagation

2006—"*Army Recycling World War II Buildings at Fort Lewis.*" Associated Press

2005—Fort Lewis was featured in the award-winning Army Sustainability Video

2005—Stories about the Illegal Dumping Investigator's efforts to reduce illegal dumping on post ran in the Environmental Update, the Olympian, and on KING 5 news

2003—"*Alternative Fuel Use begins at Fort Lewis.*" Environmental Update

2003—The Northwest Guardian, the post paper, ran a series of articles featuring the ISP between 2003-2004

Awards and Accomplishments

2007—Historic Preservation Award for Outstanding Achievement in Education

2007—Washington State Recycling Association Recycler of the Year

2007—Madigan Army Medical Center, Making Medicine Mercury Free Award

2007—EPA Integrated Pest Management STAR Program Certification

2006—Secretary of the Army Environmental Award for Pollution Prevention

2005—Secretary of Defense & Army Environmental Restoration Awards

2005—Secretary of the Army Energy and Water Management Award

2005—Fort Lewis accepted into the EPA Performance Track

2005—Fort Lewis released from Title V Air Operating Permit requirements under the Puget Sound Clean Air Agency

2004—Environmental Management Excellence Award

2003—Puget Sound Clean Air Coalition Sustainable Fuels Award

2003—EPA Champions for Environmental Leadership Award

Acknowledgements

The Fort Lewis Installation Sustainability Program continues through the support and partnerships of numerous agencies throughout the Puget Sound Region and beyond.

Local/Regional

- Clean Cities Coalition
- Pierce Transit
- Inter City Transit
- Puget Sound Clean Air Agency
- Puget Sound Energy
- Bonneville Power Administration
- Environmental Protection Agency
- General Services Administration
- US Green Building Council
- The Nature Conservancy
- Nisqually Indian Tribe
- Washington State Fish and Wildlife
- Washington State Native Plant Society
- Pacific Northwest National Laboratories (PNNL)
- Pierce County Solid Waste Advisory Committee
- Pierce County Environmental Educators
- Muck Creek Council
- Nisqually River Council
- Sequalitchew Creek Council
- Chambers-Clover Creek Watershed Planning Unit
- McChord Air Force Base
- Washington Department of Ecology
- Washington State University

Fort Lewis Specific:

- Directorate of Family, Morale, Welfare and Recreation
- Madigan Army Medical Center—Green Team
- Fort Lewis Commissary
- LeMay, Inc.
- Equity Residential

Installation Sustainability Program contacts:

Air Quality— (253) 967-5953

Energy — (253) 966–1772

Sustainable Community— (253) 966–1784

Products & Materials Management— (253) 966–3275

Sustainable Training Lands— (253) 967–1549

Water Resources— (253) 967–2837

Yakima Training Center EMS/Sustainability— (509)577-3889

Special thanks to the Fort Lewis Public Works staff, ISP Team members, I Corps & Fort Lewis Public Affairs and Directorate of Logistics staff who contributed to this report.

—Cover Photos by Jason Kaye, Northwest Guardian

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