



Environmental Awards

Natural Resources Conservation, Team
Malmstrom Natural Resources Team

Introduction

Malmstrom Air Force Base (MAFB), home to the 341st Missile Wing (MW), defends the United States with combat-ready Airmen and nuclear forces. Uniquely, the 341 MW hosts the 40th Helicopter Squadron (40 HS), which provides helicopter airlift support. The 40 HS performs aerial surveillance and security forces response, supports emergency war order taskings, transports priority personnel and logistics, and conducts search and rescue missions supporting local communities.

Located near Great Falls, MT, on the Missouri River, MAFB proper encompasses 3,278 acres and is home to 3,400 Airmen, civilians, and contractors. MAFB is one of three Air Force Intercontinental Ballistic Missile

(ICBM) installations, operating a network of 15 Missile Alert Facilities (MAFs) and 150 Minuteman III missile Launch Facilities (LFs) geographically separated over seven Montana counties. These two to three-acre sites are a critical component of America's on-alert strategic forces. This missile complex spans over 23,500 square miles with over 200 miles between the most distant launch facilities. Due to the size of the missile complex, MAFB's security forces are in continual deployment. MAFB also has a large amount of land (nearly 25,000 acres in total) under real estate agreements around the base and missile facilities.

The multi-disciplinary Malmstrom Natural Resources Team (hereafter referred to as the Team) consists of wildlife biologists,

environmental engineers, civil engineers, and physical scientists working hand in hand with city, county, state, and federal natural resources agencies such as the U.S. Forest Service, Bureau of Land Management (BLM), U.S. Fish and Wildlife Service (USFWS), and Montana Department of Fish, Wildlife and Parks (MFWP).



Malmstrom Natural Resources Team

The multi-disciplinary Team from Malmstrom AFB collaborates with on-base as well as local, state and federal partners to promote natural resource conservation and strives to be good stewards of our federal lands. Personnel pictured from left to right: Leo Semana, Tony Lucas, Roberta Anderson, Cody Koontz, Candace Ellsworth, and Don Delorme.

The Team includes:

- Tony Lucas, Chief-Environmental Element
- Roberta Anderson, Biologist, Natural Resources Manager
- Don Delorme, Environmental Management System (EMS) Program Manager
- Jason Garneau, Hazardous Waste Disposer
- Leo Semana, Hazardous Waste Program Manager
- Cody Koontz, Chief-Environmental Compliance
- Candace Ellsworth, Chief-Environmental Assets

Background

MAFB proper lies at 3,500 feet above sea level, near the Missouri River. The habitat is wind-swept, shortgrass prairie, the most arid of the mid-continental grasslands. The main

base is just east of Great Falls and is otherwise surrounded by agricultural fields. Over half of MAFB proper has been developed to support the military mission, while remaining open areas serve as security buffers for sensitive areas or reserves for future development. Open spaces include horse pastures leased for grazing (422 acres) and land previously used for hay-cutting (1,350 acres). While no federally threatened or endangered species occur on the main base, ten listed and sensitive species have ranges that overlap with numerous missile sites.

The missile field stretches from the Rocky Mountain Front on the west, to the Great Plains in the east; with missile sites found at elevations ranging from 2620 to 8220 feet. As such, MAFB encompasses four broad ecoregions, including the Middle Rockies, Canadian Rockies, Northwestern Glaciated Plains, and the Northwestern Great Plains. Each ecoregion contains diverse habitat types, characterized by coniferous forests and shrubs in mountainous locales. These areas tend to be higher elevation, wetter areas (e.g. Little Belt Mountains) with cold, wet winters and hot, dry summers. Other areas have a semiarid climate and are characterized by Great Plains-Palouse Prairie (shortgrass prairie, sage, shrubs, and some trees), with cold, dry winters, and hot, dry summers. The natural resources (e.g. plants, animals, soils) found throughout MAFB are diverse and many, requiring specific knowledge and attention from the Team.

Management and protection of natural resources on MAFB are essential to support mission requirements, and to provide for the long-term sustainability of the area. In accordance with the Sikes Act, the Integrated Natural Resources Management Plan (INRMP) is the principal tool for managing natural resources on a military installation. MAFB's INRMP highlights the key issues for mission support, including: improving the ecological integrity of the prairie grassland

and pond habitat; updating and maintaining awareness of wildlife species; protecting the Missouri River watershed; controlling the distribution of invasive species; minimizing bird/wildlife aircraft strike hazards, and sustaining opportunities for outdoor recreation. Annual reviews between the Team, the Air Force Civil Engineer Center (AFCEC), USFWS, and MFWP ensures that the INRMP remains current, relevant, and maintains MAFB's mission to be a leader in community conservation and stewardship of the Department of Defense (DoD) lands.

The following accomplishments for the Team are organized by Type, with specific accomplishments that fall under each category. Team accomplishments/projects are organized in terms of significance during the award period.

Accomplishments

Land Use Management

Alpha-01 (A01) Streambank Stabilization/Restoration

MAFB MAFs support the constant vigilance of America's national security. The Team was deeply involved in this mission critical project directly impacting MAF Alpha-01 (A01). Completing the project in September 2021 was a main Team focus for FY20/21. In May 2011, extremely heavy rainfall combined with an estimated 212% of normal snowpack in the Rocky Mountains, with record flooding throughout the missile complex, including Big Otter Creek, adjacent to the MAF A01 helipad. This flooding eroded the banks of Big Otter Creek, creating a 10-foot vertical drop, near the helipad and access road. The bank was too steep to establish stabilizing vegetation, and in the following years the bank continued to slough off toward the helipad. The erosion endangered the helipad and contributed significant siltation to stream fisheries, including native Cutthroat, wild Brown, and wild Rainbow Trout habitats. The Team elected to stabilize and restore the bank

of Big Otter Creek, due to the imminent threat to the A01 helipad.



Historic flooding created streambank erosion and encroachment of the mission critical helicopter landing pad. The Team worked with local engineers, construction contractor, and state/local partners to provide innovative solutions for conservation issues and stream bank restoration.

The Team worked closely with the engineering firm to develop project requirements that satisfied multiple agency Federal and State water quality permits while maintaining safe fish passage. Innovative solutions and best management practices included root wad placement within the riprap backfill for stabilization, temporary stream bypass, and final vegetation restoration. Root wads doubled as important fish habitat. Partnering with planners, engineers, contractors, and permit agencies early in the design and continuing through construction led to a highly successful project and ensured continued mission-critical access to the helipad.

MS4 Statewide General Permit Update

Recognizing the value and expertise of a MAFB Registered Professional Environmental Engineer, the Montana Department of Environmental Quality selected a Team member to assist with updating the Municipal Separate Storm Sewer System (MS4) Statewide General Permit. The technical subcommittee included Team members who worked side by side with state regulators and

municipalities, fostering a clear, effective permit update. The Team provided targeted input, identifying cost effective practices, while creating appropriate new permit language, but avoiding mission concerns of proposed requirements, while still enhancing stormwater quality. This input allowed the Team to retain flexibility in selecting best management practices for erosion and flow control that minimized impacts to mission while protecting the Missouri River watershed. The Team’s holistic approach to urban stormwater management utilizes Low Impact Development and natural infrastructure techniques tailored to the installation.

The Team fashioned and implemented an outfall inspection and sampling regimen that exceeds the minimum regulatory requirements in both scope and frequency. This approach allowed the Team to capture outfall infrastructure and pollutant issues early and expedite repairs to address flooding problems and receiving water body impairments. Targeting these impairments improves water quality and enhances riparian and aquatic ecosystems without mission impact. Through monitoring, MAFB documented the lowest total suspended solids stormwater discharge concentrations among all Montana regulated municipalities.

Invasive Species Control and Pest Management

Russian Olive Removal

Malmstrom Natural Resource managers made a proactive decision to strive to eradicate invasive Russian olive from MAFB landscape. Although not listed as a noxious weed in Montana, the sale of Russian olive is now prohibited in the state, due to negative impacts this invasive species has on native trees, shrubs, and grasses. Russian olive alters soil chemistry through a process known as allelopathy, releasing chemicals it synthesizes into the soil through its roots. These allelopathic chemicals prevent native plants

from germinating and can kill already established native vegetation. Russian olive can also be detrimental to the natural hydrology of riparian areas such as stream banks. The Montana Department of Natural Resources and Conservation encourages landowners to eliminate this species from their land, and Malmstrom’s INRMP goals include invasive species, habitat rehabilitation, and restoration to native habitats and ecosystems. In collaboration with AFCEC and Ellsworth Wildland Fire Group, the Team removed over 50 large diameter and over 500 small diameter Russian olive on 80 acres of MAFB proper in September 2021. All stumps were treated with herbicide to prevent resprouting. The Team assisted, directed, and provided hard labor, coordination, and the work plan for Russian olive removal, making way for native trees, shrubs, and grasses. The Team will evaluate the efficacy of these efforts as part of future year invasive species inventories.



A non-native invasive species, Russian Olive shrubs/trees are removed from Malmstrom AFB.

Forest Management

Native Habitat Restoration

While MAFB is not forested in the traditional sense, urban forest management strategies identified in the INRMP have led to 29 consecutive Tree City USA awards including FY20/21. Following Air Force guidance and INRMP goals, in FY20 (August 2020), the Team focused on replacing trees, shrubs, and grasses with native plants suited to local environmental conditions. Ninety non-native trees and shrubs surrounding Powwow Pond were replaced with 45 pollinator-friendly Silver Buffaloberry.



Tree Planting at Powwow Pond

Traditionally, Malmstrom AFB landscape consisted of wind-swept, grass covered prairies. Over the years, non-native trees have struggled to flourish at Powwow Pond with several years of drought and ineffective watering systems. The Malmstrom Team is committed to replace these trees and shrubs with more suitable, drought resistant alternatives to save both water resources and manpower.

Silver Buffaloberry is a shrub native to Montana, uniquely adapted to the MAFB shrub-grassland ecosystem. This plant plays

an important ecological role, enhancing the establishment of native grasses and forbs. Buffaloberry supports native pollinators, provides forage for sharp-tailed grouse and mule deer, and provides shelter and nesting sites for native small mammals and grassland songbirds. Silver Buffaloberry also has cultural significance to Indigenous peoples in Montana. This plant was traditionally used to supplement overwinter diets (as an herb flavoring sauce for bison meat), for medicines, and to dye clothing.

The Team demonstrates environmental stewardship through inventory, nurturing, and enhancing trees and the human environment through varied silvicultural practices (pruning, planting, using natives). Choice of native species reduces water demand of the urban forest. Non-native species require frequent hand-watering during the first five years of planting, further increasing manpower costs. Experience has taught us native species demonstrate a significantly higher drought tolerance and winter survival rate. Healthy trees provide green space for recreation, and green space improves the mental and physical well-being of the people living near them. Trees also reduce heat island impacts from climate change exacerbated by impervious surfaces, and absorb and sequester carbon dioxide. Furthermore, trees reduce energy consumption and associated costs through shading in summer and by providing windbreaks in winter.

Overall Natural Resources Management

FAA Qualified Airport Wildlife Biologist Certification in support of BASH

MAFB's Natural Resources Manager (NRM) obtained Federal Aviation Administration Qualified Airport Wildlife Biologist certification to perform in-house wildlife hazard assessments essential to an effective Bird Aircraft Strike Hazard (BASH) Plan. Having in-house qualified personnel will save MAFB approximately \$100K every five years in contract labor and execution costs. A Ph.D.

with substantial wildlife and ecological experience, the MAFB NRM supports the National Military Fish and Wildlife Association, serving as the Military Lands Working Group co-chair. This cross-installation and agency involvement brings new ideas and collaboration efforts to Malmstrom while sharing MAFB expertise with other DoD Natural Resource Managers.

Fish and Wildlife

Burrowing Owl Presence on MAFB

Burrowing owls, a migratory species native to Montana, have been a confirmed, summer breeding resident on MAFB for FY20/21. The MAFB burrowing owls are one of the few scientifically confirmed breeding pairs in residence in Cascade County, Montana. Burrowing owls are not listed under the Endangered Species Act (ESA). However, they are federally protected under the Migratory Bird Treaty Act (MBTA). The MBTA prohibits the take (including killing, capturing, selling, trading, and transport) of protected migratory bird species without prior authorization by the USFWS. The USFWS recognizes the burrowing owl as a Bird of Conservation Concern, which indicates this species is likely to become a candidate species for ESA listing without further conservation action. Other federal agencies, such as the BLM and the U.S. Forest Service, recognize the burrowing owl as Sensitive. MFWP lists this owl as a Species of Concern (SOC), specifically as a Species of Greatest Conservation Need, due to steep population declines across their geographic range in North America. Population decline is driven by habitat loss, destruction, and conversion, pesticides (bioaccumulation and biomagnification through the food web), illegal killing, and non-native predators (e.g., house cats).

MAFB's NRM provides educational outreach, Leadership input and guidance to protect these owls, and other avian species protected by MBTA, implementing specific management practices for installation and missile field

complex projects. The Team maintains a survey and inventory of the burrowing owl population on base and continues to monitor and survey for these birds on a project-specific basis. The Team ensures surveys are conducted during project planning and initiation, assessing species presence in the project area, particularly during the summer nesting season.



Sunset of Powwow Pond

Powwow Pond is not only a local recreational fishing pond but serves as a resting place for birds during the spring and fall migrations. Malmstrom is committed to providing habitat for a variety of bird species while maintaining a safe and effective helicopter mission.

Avian Protection Plan

Under a cooperative agreement with Colorado State University, the Team developed an Avian Protection Plan to identify problem power poles to aid prioritization in retrofitting or underground burial of utility lines. Additionally, the Team is developing a migratory bird deterrent strategy, specifically using MODUS radar detection. The Plan also assists with training base personnel and protecting migratory birds. Unique large raptor issues are nearly an annual occurrence at Malmstrom, including a juvenile Swainson's hawk in a garage bay, and a Northern harrier involved in a vehicle collision. The NRM continues to work with the Airfield Manager to improve deterrent techniques, educate base personnel, and proactively manage and plan for birds, particularly during fall and spring migration.

Community Outreach and Education

National Kids Fishing Day Community Event

In June 2021, the Team collaborated with MAFB Outdoor Recreation, MFWP Giant Springs Hatchery, USFWS Ennis National Fish Hatchery, and USFWS Montana Fish and Wildlife Conservation Office (MFWCO) to host our annual National Kid's Fishing Day at Powwow Pond, during COVID restrictions. To ensure fishing success, MAFB partnered with both the USFWS Ennis National Fish Hatchery and MFWP to stock Powwow Pond with 200 Rainbow Trout from Giant Springs, and 300 retired broodstock from USFWS. Prizes, along with live demonstrations, promoted base and community outreach, highlighting natural resource issues. The event drew over 200 young fishermen, and the Team was on hand to help measure and weigh each fisherman's big catch.



The Malmstrom Team partners with local MFWP and USFWS to stock Powwow Pond prior to Kid's Fishing Day. Retired brood stock provide for exciting catches for all.

"No Dumping" Community Education

In October 2019, the Team, supported by 14 base housing residents, placed "No Dumping, Drains to River" decals on 150 stormwater inlets in the MAFB housing areas. This multi-faceted outreach and participation event actively engaged residents on the importance of reducing pollutants from entering the base stormwater system and, ultimately, the Missouri River. Over the past two years, the Team utilized the base housing authority to distribute 600 stormwater awareness brochures. These brochures provided targeted information to each new housing resident on the importance of stormwater management and what they can do to reduce their impact on the watershed.

In addition to volunteerism and brochures, the Team created a [public webpage](#) for base environmental information and utilized the marquees on base to provide conservation awareness to virtually all base personnel, contractors, and MAFB visitors.

Earth Day Celebration

To celebrate Earth Day 2021, the Team partnered with MAFB Youth Center to provide a natural resource presentation and watershed protection demonstration. The Team educated over 50 students, ages 5 to 12, on their effects on the environment and what we can do to reduce pollutants from entering the Missouri River watershed. The event concluded with the students removing trash in the area around the building to engage them in simple and local conservation practices.