2026 Secretary of the Army Environmental Award Submission

Category: Natural Resources Conservation – Joint Base Lewis-McChord - Team/Individual

Program Management

Technical Merit

Orientation to Mission

Transferability

Stakeholder Interaction

Program Impact

Partnerships & Innovation

Team: Derek Dapp, Christopher Beck*, Todd Zuchowski, Sara Jones, James Lynch, Dennis Buckingham, Timothy Leque, Sean Callahan, Krystal Austin, Gina Smith, Landon Sealey, Leif Wefferling, Jesse Kostecka, Aubin Duncan, John Richardson, Christopher Hassell

***Contact:** christopher.g.beck2.civ@army.mil, 1 (253) 966 1760

Introduction:

Joint Base Lewis-McChord (JBLM) is the Department of War's (DoW) only power projection installation on the west coast, offering cutting-edge training and infrastructure for warfighters. Spanning over 90,000 acres, JBLM includes a 10,000-acre cantonment area and approximately 80,000 acres of training ranges. It hosts two airfields: McChord Airfield, home to a C-17 transport fleet, and Gray Army Airfield, which supports helicopter operations. Beyond its military excellence, JBLM plays a pivotal role in conservation, protecting the largest remaining glacial outwash prairies in Washington state, with 95% of the land area of this rare ecotype occurring on JBLM. Additionally, JBLM is home to Oregon white oak woodlands, Ponderosa pine savannas, and kettle wetlands, all rare habitats no longer found elsewhere in Washington. These diverse habitats contribute significantly to the region's wildlife diversity, making JBLM a critical site for both military readiness and environmental conservation. The installation training ranges support more than 600 plant species, 233 migratory and resident bird species, 51 mammal species, and 23 reptile and amphibian species. JBLM prioritizes natural resource conservation, and our species management team is taking bold steps forward with innovative approaches to enhance both training objectives and environmental stewardship. This document aims to highlight the novel species management approach developed at JBLM and technical tools our team has built to support that approach.

Background:

There are seventeen threatened and endangered (T&E) species protected by the Endangered Species Act (ESA) associated with JBLM. The U.S. Fish and Wildlife Service (USFWS) is responsible for evaluating impacts of actions on and implementing recovery plans for T&E species. Historically, military activities with potential T&E impacts that fall outside the scope of established species recovery plans must undergo formal evaluation through regulatory

consultation prior to authorization. ESA consultation can have uncertain outcomes and can be a time-consuming process, often requiring between 9 and 24 months of agency review.

As there are evolving national security threats and technological advancements, the military's training protocols and needs must be adaptable. New and unanticipated military actions that are not considered in current T&E management plans require consultation with regulators. During the lengthy consultation process the Army is not authorized to perform actions that may be critical to national security or to maximizing soldier readiness.

Considering these challenges, JBLM was chosen as a pilot installation to develop the Mission Sustainment Program (MSP) as an alternative approach to the traditional ESA regulatory path. The MSP was designed to address all current and foreseeable future military activities, without the need for repeated species consultation. The JBLM MSP developed installation specific T&E species management goals. Species goals outline a tiered approach to management, where the installation receives regulatory relief and increased training flexibilities as certain species abundances are achieved. The JBLM MSP and species goal concepts were submitted to USFWS as a Biological Assessment for evaluation. JBLM received back a signed Programmatic Biological Opinion/Conference Opinion (PBO/CO) in March 2025 with the INRMP updated to reflect PBO/CO guidance in April 2025. The PBO/CO for JBLM is focused on six species, including Mazama pocket gophers (two subspecies, Roy Prairie and Yelm), Taylor's checkerspot butterfly, streaked horned larks, Oregon vesper sparrow, and Oregon spotted frog.

Mathematical species population modeling is essential to the PBO/CO because it is necessary to quantify T&E species occupancy and abundance against management goals. If a particular species on the base is quantified as being in a higher tiered population status, regulatory constraints can be reduced and flexibility for military activities can increase. If a species is evaluated as in a lower tiered population status, quantification of mitigation action benefits (conservation credits) is key to leverage against regulatory requirements to reduce training restrictions. Quantification of military activity and training impacts on species is valuable because training can have a negative impact on species (e.g., artillery strikes and direct mortality) or a positive impact on species (e.g., artillery strikes causing fire, which can maintain prairie habitat). Thus, understanding tradeoffs between military training needs and species conservation on JBLM is critical.

Historically, modeling tools to quantify impacts of training on T&E species were either limited or reactionary. For the PBO/CO, JBLM is utilizing a Structured Decision Making (SDM) process (Peterson et al., 2019; Peterson et al., 2024) to build species models and explore tradeoffs across a range of military activities and species management goals. SDM engages resource managers through five general steps: 1) identify the decision situation, 2) identify the fundamental objectives, 3) identify actions that can affect the fundamental objectives, 4) develop a decision support model, and 5) evaluate tradeoffs and uncertainty among management actions using the models. JBLM is collaborating with several external partners for the PBO/CO SDM process

including USFWS, Washington Department of Fish and Wildlife (WDFW), the United States Geological Survey (USGS), Oregon State University (OSU), and Ecostudies Institute (ESI). Internally, the process includes participation from JBLM Environmental Division, Integrated Training Area Management, and Garrison Command. Outside of the SDM process, but to further support the PBO/CO, INRMP, and model development, the JBLM team engages in a wide variety of management and research activities. In this context, the Environmental Division collaborates with six regional species working groups, Colorado State University, six local universities, and Center for Natural Lands Management.

The result of the SDM process is a co-produced model that examines habitat availability for T&E species at JBLM, evaluates the theoretical species population size of that habitat, and identifies how different military activities affect those populations and habitat. The adoption of the model framework allows for rapid evaluation of training impacts, benefiting the mission and species, and allowing for a reduced timeline for military activities to occur. Moreover, because resource managers from multiple agencies are involved, the process is transparent, ensures documentation, provides rationale, is the culmination of expert consensus, and results in a greater likelihood of acceptance of results.

We envision that successful application of the PBO/CO and model framework at JBLM may result in implementation at other Department of War (DoW) installations and be based on our lessons learned. The overall aim of this project is that installations will be basing T&E management decisions on a scientifically defensible action that has a greater chance of being successful and satisfies regulatory requirements. This will lead to enhanced access opportunities on valuable training lands so that the military can meet its mission today, and into the future.

Summary of Accomplishments:

- The PBO/CO was signed by USFWS in March 2025. This enables an alternative approach to the traditional ESA pathway that allows for the evaluation and approval of training activities and associated species impacts on an expedited timescale (typically weeks rather than the 9-to-24-month consultation period).
- JBLM's INRMP was updated and signed by the JBLM Garrison commander in April 2025. The updates reflect natural resource management goals described in the PBO/CO.
- Since the adoption of the PBO/CO, the JBLM Environmental Division and senior command have explored options for achieving training flexibility to meet mission-first alignment. One example of such success is at an on-base drop zone. Historically, helicopter training activities in this area were prohibited within streaked horned lark buffered active nesting areas. Through the PBO/CO, and in collaboration with staff at an on-base airfield, Environmental Division increased species monitoring efforts at the drop zone. High-quality, real-time species data sharing increased the survey data resolution at the site. JBLM aviation assets now have a greater flexibility to conduct landing, hovering, air assault, forward arming, refueling, heavy drops and sling load operations in

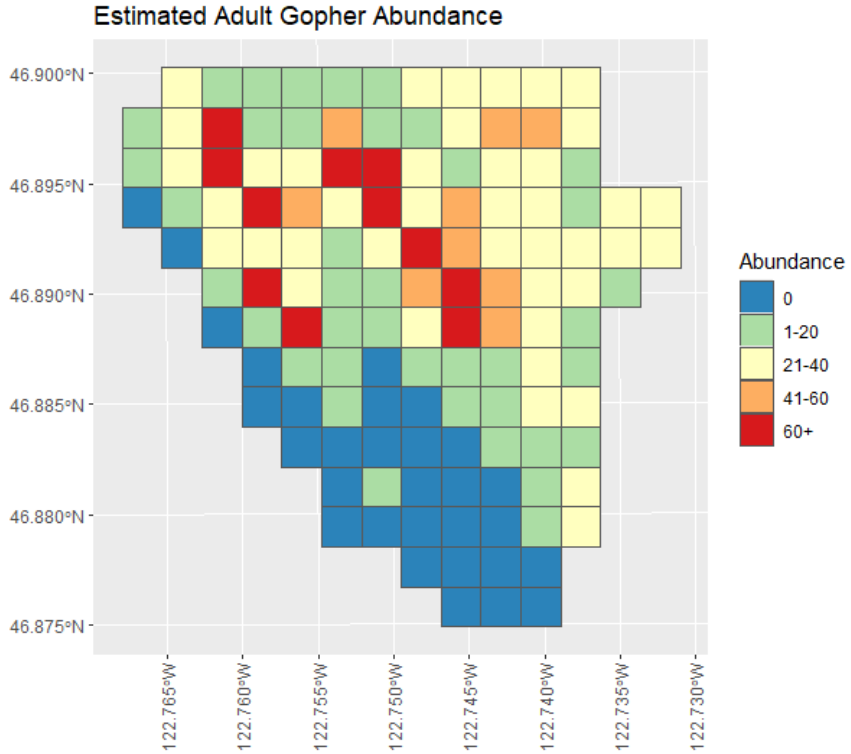
the drop zone, which were previously restricted. Enhanced data collection is also beneficial to the streaked horned lark population, as we now have a greater understanding of when and where nesting activities occur within the airfield. Managing and optimizing a strong data-driven endangered species monitoring program by eliminating burdensome legacy restrictive structures and providing clear, quick communications with other installation management partners is essential for maintaining JBLM's obligations under USFWS agreements but is also critical for stewarding these training areas so that new generations of soldiers and trainers will have increased functional training areas to meet their needs.

- SDM partners (JBLM, USFWS, WDFW, USGS, OSU, and ESI) had 11 full group meetings between April 2024 and November 2025 to discuss PBO/CO modeling development. There were an approximate additional 20 coordination meetings between subgroups of SDM partners to collaborate on model development.
- Version 1 of the species model framework was disseminated for internal use by the SDM group in June 2025. The model framework was coded in-house by JBLM Environmental Division, with support from USGS, and review by USFWS, WDFW, and ESI. It utilizes a habitat-based population modeling approach, where JBLM is divided into 10-acre plots. Each 10-acre plot contains habitat information (such as vegetation type, soil type, soil density, soil porosity, % area developed, and road lengths) and species occupancy data (initial values from field surveys). Populations are simulated forward into the future considering demographic parameters (e.g., adult survival rate, juvenile survival rate, fecundity, density dependent mortality) and probability of dispersion (dependent on habitat parameters). Built into the framework is the ability to model a variety of training, management, and land-use scenarios, including but not limited to, weapons testing, artillery training, off-road driving, building temporary or permanent structures, constructing roads, fire, habitat restoration, species translocation planning, building drone launch/landing sites, and acquiring off-base conservation sites (example below). This framework allows JBLM leadership to rapidly evaluate the effect of a proposed action on a species. For actions modeled as low impact, the modeling can be used to ease regulatory constraints. For actions modeled as high impact, but deemed essential, risks to the species can be quantified and mitigation can be developed accordingly. The model framework was initially developed for a pilot T&E species, the Mazama pocket gopher, *Thomomys mazama*, considering future scalability to other species, locations, and installations. The next SDM group meeting is scheduled for mid-January and will focus on application of the model framework to a second species at JBLM.
- One example of an Environmental Division success that demonstrates the utility of the PBO/CO and model framework was to evaluate the potential acquisition of a property south of JBLM. The PBO/CO includes language where off-base acquisitions can contribute to on-base species goals. The Army can remove all on-base regulatory requirements if a species goal is met off-base at an Army-funded site. For the Mazama

pocket gopher (Yelm subspecies), the PBO/CO goal to remove all regulatory requirements on-base at JBLM is 1,000 individuals.

The JBLM team used modeling and publicly available data sets to classify the vegetation, soil properties, and roads at the site. We found that portions of the site (particularly the north sections) were suitable for Mazama pocket gophers (Fig.1). The overall capacity of the site was estimated to be between 2,700 and 2,800 adult individuals (Fig. 1), considerably higher than the goal of 1,000 specified by the PBO/CO. While the entire site is valued at approximately $60 million dollars, modeling significantly reduced potential acquisition costs because the Army can prioritize land parcels that are suitable for gophers and do not need to acquire the whole site to meet mission objectives.

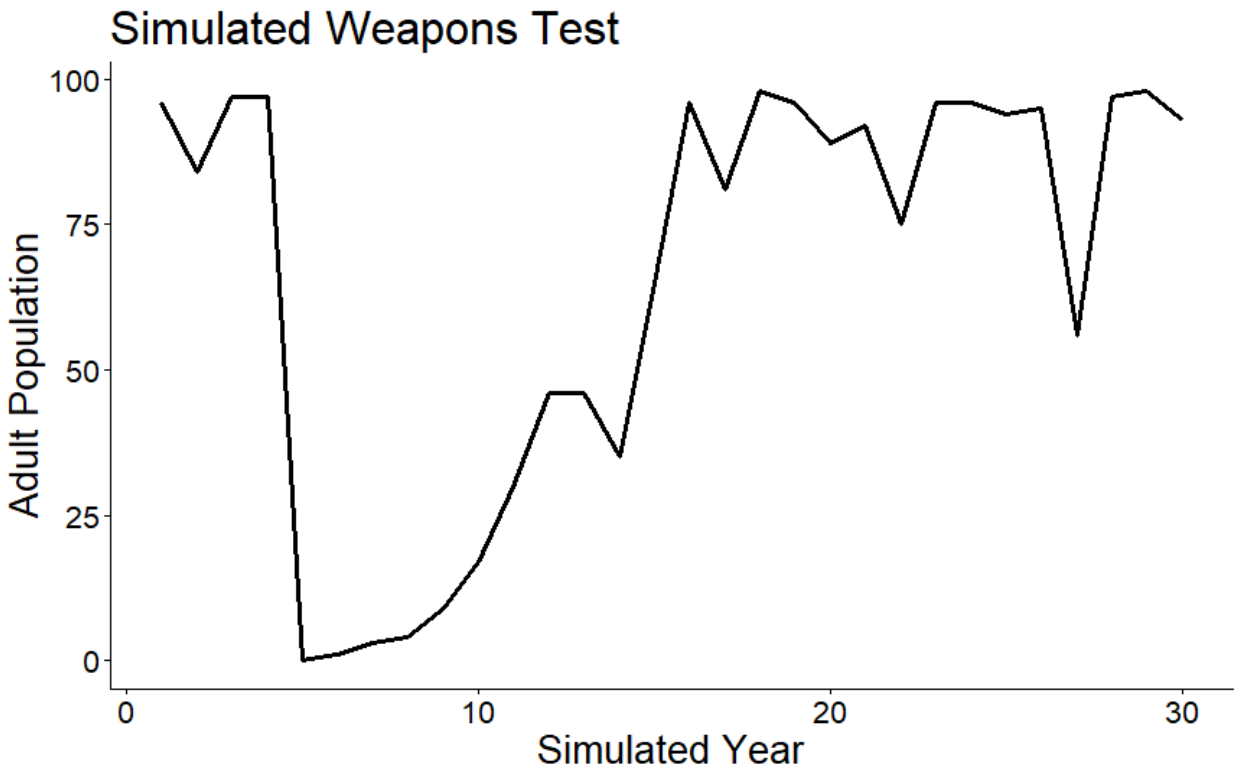
Figure 1. Estimated adult Mazama pocket gopher abundance at a proposed conservation acquisition site. Each cell represents 10 acres with color corresponding to model-estimated adult population sizes given habitat parameters.



- In addition to land acquisition, the model can be utilized to simulate a wide range of training scenarios. Imagine there is a hypothetical weapons test at JBLM planned 5 years from now. The weapon has a blast radius of 164 feet and is fired 25 times. In the hypothetical test, Training Area 18 (Site ID 1649) is determined as the best location. Modeling assesses the impact of the test on the adult Mazama pocket gopher (Roy Prairie subspecies) population and estimates that the test would on average result in approximately 97 mortalities (Figure 2 below). JBLM informs regulators that the

expected recovery time of the site's population is approximately 11 years. JBLM evaluates that 97 mortalities relative to their conservation goal (3 populations of 1,000 Roy Prairie pocket gophers) is low. Therefore, a weapons test is deemed appropriate for the site. Weapons testing is just one example of potential model utility, and it can simulate many land-use/training situations. The mathematical model can simulate and estimate impacts for off-road driving, building structures, road construction, fire, artillery training, habitat restoration, drone launch/landing sites, and off-base habitat.

Figure 2: Average effects of a simulated weapons test (164 ft. blast radius, 25 rounds, fired on year 5 at Training Area 18) on the adult Roy Prairie pocket gopher population at the site.



- JBLM, USFWS, WDFW, USGS, OSU, and ESI aim to jointly produce a peer-reviewed publication on the developed species modeling framework.(target journal: PLOS One). Code used to develop the model framework will be provided with the publication, enabling other DOW installations to utilize and build upon species modeling work started at JBLM, considering their own installation's species, needs, and unique challenges. A draft of the manuscript was circulated to co-authors in November 2025, and the intended submission date for the publication is late January 2026. The species modeling framework was disseminated to an internal audience at the December 2025 Army Innovation Forum.

Concluding Remarks:

Innovation and collaboration are core to JBLM's approach to natural resource conservation. By combining JBLM's natural resource and technical expertise with collaborative partners at USFWS, USGS, WDFW, ESI, and OSU we developed impactful and effective conservation strategies that utilize novel methods. Our innovative approach sets a benchmark for other DoW installations, illustrating how conservation and mission goals can seamlessly align to promote both ecological sustainability and military success. By integrating conservation strategies with operational objectives, JBLM demonstrates that supporting species recovery and enhancing military readiness can align for long-term benefits.

In addition to the management and modeling framework described above, JBLM Environmental Division also engages in extensive management activities to support these frameworks. On average, 1,700 acres are burned annually to combat invasive species and maintain threatened ecosystems. Extensive species and habitat surveys are performed at JBLM, supported by both partners and volunteers (over 10,000 volunteer hours were contributed to JBLM in 2025). JBLM supports a native seed production farm and undertakes herbicide application, mowing, weed removal, and native reseeding to restore grassland areas. Over 7,000 endangered Taylor's checkerspot butterfly are released annually in South Puget Sound via a captive breeding program funded by the DoW. Partnering with Texas A&M University, JBLM is exploring using drone technology to conduct species surveys in areas that are inaccessible due to unexploded ordinance, to cost-save on ground-based surveys, and to fully account for T&E populations on-base. Timber harvests are used on-base to promote a diversity of tree sizes and age classes across the landscape, generating $4-5 million dollars of revenue annually for the DoW. These activities support and enhance the management and modeling framework at JBLM.