# Malheur River Wildlife Mitigation Project

(BPA Project #2000-027-00, Contract #81111)

## 2019 Annual Report

Covering Activities from 1/1/19 – 2/28/20

**Created For:**

**Bonneville Power Administration**

**Submitted By:**

**Burns Paiute Natural Resources Department**

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# Table of Contents

# List of Figures

# List of Tables

# List of Appendices

# Introduction

In 1998, the Burns Paiute Tribe (BPT) submitted a proposal to Bonneville Power Administration (BPA) for the acquisition of the Malheur River Wildlife Mitigation Site (Project) or MRWMS for short. The proposed mitigation site was for the Denny Jones Ranch and included Bureau of Land Management (BLM) and Oregon Division of State Lands (DSL) leases and grazing allotments. The approval process and acquisition negotiations continued until BPT and BPA entered into a Memorandum of Agreement, which allowed for purchase of the MRWMS in November 2000.

MRWMS is 6,385-acres located seven miles east of Juntura, Oregon and is adjacent to the Malheur River (Figure 1.0.1). Elevation on MRWMS ranges from approximately 2731–5374 ft (Google, Inc.).

Associated with the deeded land are 4,154 acres of a DSL allotment and a 21,242 acre BLM allotment (Figure 1.0.2). In total two grazing allotments with eleven different pastures are leased between the two agencies. Deeded land stretches for seven miles along the Malheur River. It is the largest private landholding on the river between Riverside and Harper, Oregon. Approximately 938 acres of senior water rights are included with the ranch.

MRWMS is comprised of meadow, wetland, riparian and shrub-steppe habitats. The BLM grazing allotment, located south of the ranch, is largely shrub-steppe habitat punctuated by springs and seeps. Hunter Creek, a perennial stream, flows through both private and BLM lands. Similarly, the DSL grazing allotment, which lies north of the ranch, is predominantly shrub/juniper steppe habitat with springs and seeps dispersed throughout the upper end of draws (Figure 1.0.2).

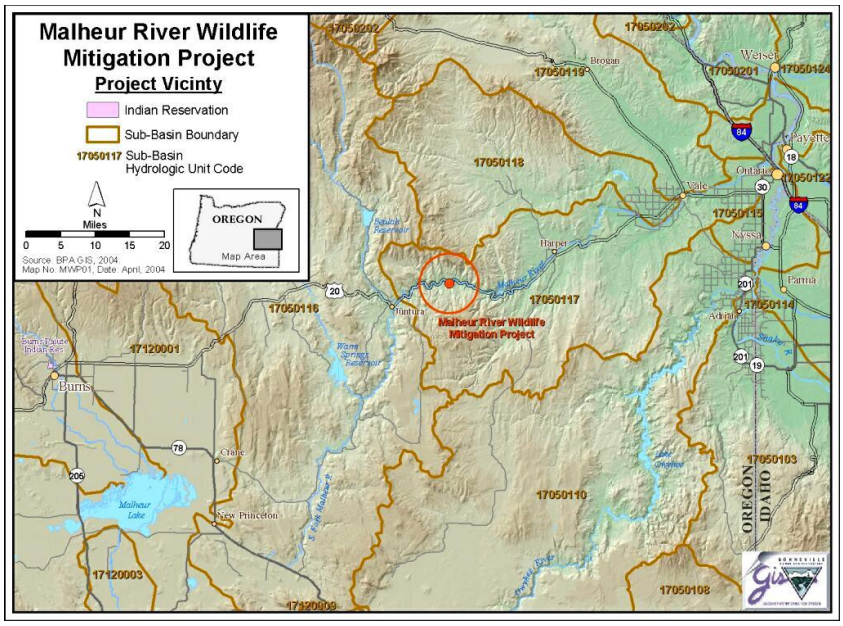

Figure 1.0.1. Location of the Malheur River Wildlife Mitigation Site.

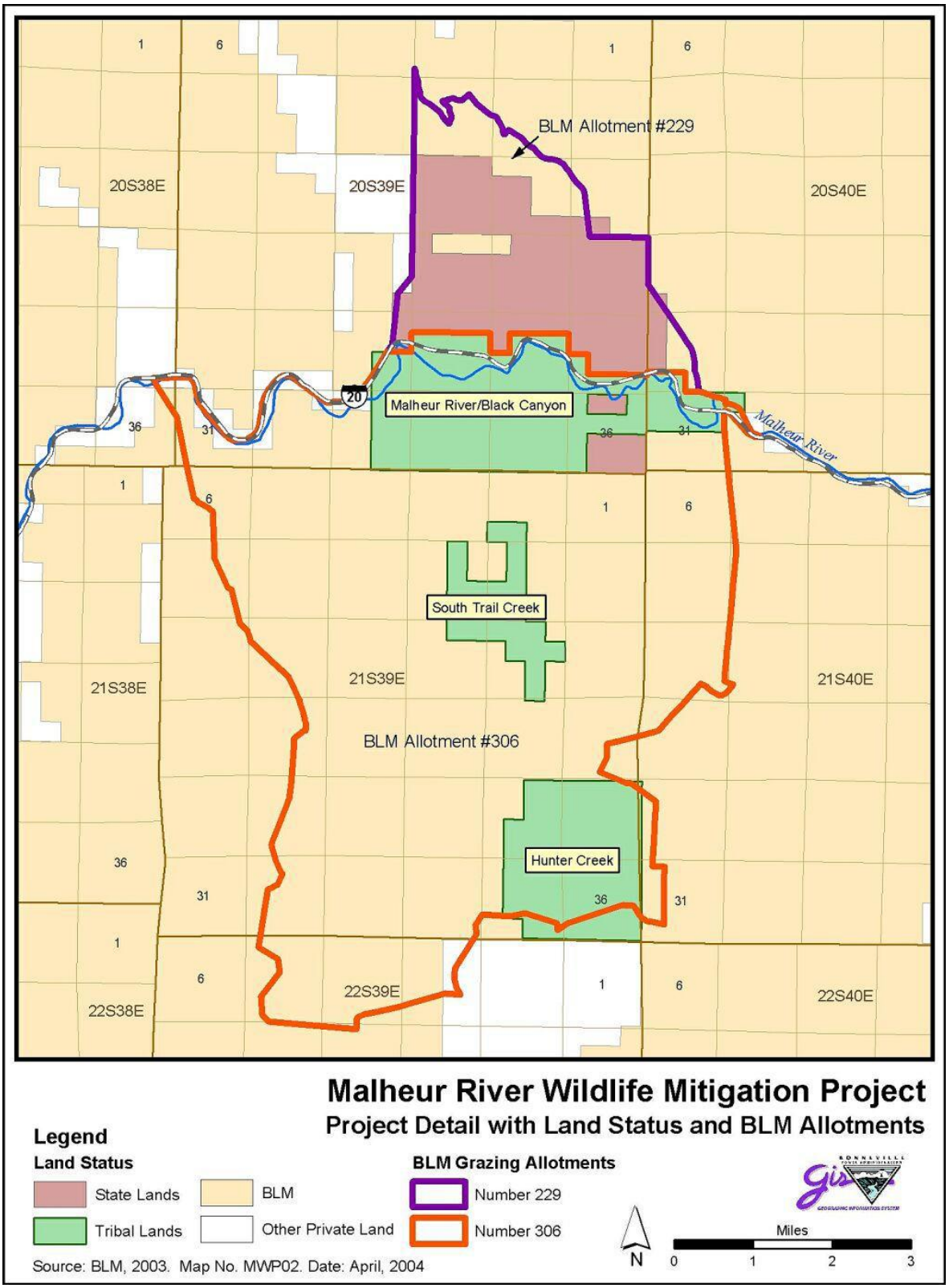


Figure 1.0.2. MRWMS and surrounding land ownership.

# Wildlife Value

*The Malheur Wild and Scenic River Management Plan* (U.S. Forest Service 1993a), *the North Fork Malheur Scenic River Management Plan* (U.S. Forest Service 1993b), and *the Malheur River Subbasin Assessment and Management Plan for Fish and Wildlife Mitigation* (Malheur Watershed Council and Burns Paiute Tribe 2004) identify the MRWMS area as a key component in the restoration of aquatic and terrestrial habitat within the Malheur River basin. Much of the habitat in the Malheur River basin has been marginalized by decades of intense grazing and agricultural practices, making the MRWMS of paramount importance to special status wildlife species present in the ecoregion. Table 1.1.1 outlines species in the ecoregion designated as sensitive, threatened, endangered, or of special concern by state and federal listings. Several species listed are known to occur on the MRWMS.

In 2015, an unprecedented effort to conserve and protect the Greater Sage-Grouse (*Centrocercus urophasianus*) reached its peak. An excerpt from the U.S. Fish and Wildlife Service statement for listing in 2015: "A status review conducted by the Service has found that the Greater Sage-grouse remains relatively abundant and well-distributed across the species' 173-million-acre range and does not face the risk of extinction now or in the foreseeable future. The Service's decision follows an unprecedented conservation partnership across the western United States that has significantly reduced threats to the greater sage-grouse across 90 percent of the species' breeding habitat (U.S. Fish and Wildlife Service, 10/2/2015). The Service has determined that protection for the Greater Sage-Grouse under the Endangered Species Act is no longer warranted and is withdrawing the species from the candidate species list." Large numbers of Greater Sage-Grouse located in designated core sage-grouse habitat have been surveyed annually in the past for lek activity on the Property. This effort will not subside with the recent listing change. The decision to remove the bird from being warranted for an endangered species listing arose due to the immense coordination between researchers, biologist, wildlife managers, and private landowners to protect the bird. BPT will be implementing future projects to further secure the sage brush habitat for this species of concern.

Migratory bird surveys conducted by BPT biologists have detected a suite of species currently listed as sensitive by the Oregon Department of Fish and Wildlife (Table 1.1.1) on the property including Willow Flycatchers (*Empidonax traillii adastus*), Long-billed Curlews (*Numenius americanus*), Black-necked Stilts (*Himantopus mexicanus*), Greater Sandhill Cranes (*Antigone canadensis tabida*), and Caspian Terns (*Hydroprogne caspia*).

Bat surveys conducted on the Property in 2008 (Kesling et al. 2008) potentially identified four sensitive bat species, the Pallid bat (*Antrozous pallidus*), Long-legged bat (*Myotis volans*), Hoary bat (*Lasiurus cinereus*), and California myotis (*Myotis californicus*).

Widespread water impoundments and agricultural diversions have led to the extirpation of three federally threatened anadromous fish in the Malheur River basin. Those are the Coho salmon (*Oncorhynchus kisutch*), Chinook salmon (*Oncorhynchus tshawytscha*) and Steelhead (*Oncorhynchus mykiss*). The Great Basin Redband Trout (*Oncorhynchus mykiss newberrii*) is an ODFW sensitive species and uses the Property (Schwabe et al. 2008). The federally threatened

Bull Trout (*Siphateles alvordensis*) now only exist at higher elevations in the subbasin (Schwabe et al. 2008).

The MRWMS is also known winter range for pronghorn (*Antilocapra americana*), Rocky Mountain elk (*Cervus elaphus*) and mule deer (*Odocoileus hemionus*).

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Endangered and threatened wildlife and plants; 12-Month finding on a petition to list Greater sage-grouse (*Centrocercus urophasianus*) as an endangered or threatened species. U.S. Fish and Wildlife Service, September 2, 2015.

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Schwabe, L., D. Brown, R.R. Perkins, B. Bangs, S. Gunkel, S. Jacobs, and D. Hawkins. 2008. Evaluate the Life History of Native Salmonids in the Malheur Subbasin. FY 2007 Annual Report. Burns Paiute Tribe. Burns, OR. 167p.

U.S. Forest Service. 1993a. Malheur wild and scenic river management plan. Malheur National Forest, John Day, Oregon.

U.S. Forest Service. 1993b. North Fork Malheur scenic river management plan. Malheur National Forest, John Day, Oregon.

Table 1.1.1. List of Oregon Department of Fish and Wildlife Sensitive Species for the Northern Basin and Range ecoregion.

| Common Name | Scientific Name | Oregon Department of Fish and Wildlife: Sensitive Species List |
|---|---|---|
| **Amphibians and Reptiles** | | |
| Columbia Spotted Frog | *Rana luteiventris* | Sensitive-Critical |
| Western toad | *Anaxyrus boreas* | Senstive |
| **Birds** | | |
| American White-Pelican | *Pelecanus erythrorhynchos* | Sensitive |
| Black-necked Stilt | *Himantopus mexicanus* | Sensitive |
| Bobolink | *Dolichonyx oryzivorus* | Sensitive |
| Burrowing Owl (Western) | *Athene cunicularia hypugaea* | Sensitive |
| Caspian Tern | *Hydroprogne caspia* | Sensitive |
| Ferruginous Hawk | *Buteo regalis* | Sensitive |
| Franklin's Gull | *Leucophaeus pipixcan* | Sensitive |
| Greater Sage-Grouse | *Centrocercus urophasianus* | Sensitive |
| Greater Sandhill Crane | *Antigone canadensis tabida* | Sensitive |
| Juniper Titmouse | *Baeolophus ridgwayi* | Sensitive |
| Long-Billed Curlew | *Numenius americanus* | Sensitive |
| Mountain Quail | *Oreortyx pictus* | Sensitive |
| Peregrine Falcon (American) | *Falco peregrinus anatum* | Sensitive |
| Snowy Egret | *Egretta thula* | Sensitive |
| Swainson's Hawk | *Buteo swainsoni* | Sensitive |
| Trumpeter Swan | *Cygnus buccinator* | Sensitive |
| Willow Flycatcher | *Empidonax traillii* | Sensitive |
| **Fish** | | |
| Alvord Chub | *Siphateles alvordensis* | Sensitive |
| Foskett Speckled Dace | *Rhinichthys osculus robustus* | Sensitive |
| Great Basin Redband Trout | *Oncorhynchus mykiss newberrii* | Sensitive |
| Pit Sculpin | *Cottus pitensis* | Sensitive |
| **Mammals** | | |
| American Pika | *Ochotona princeps* | Sensitive |
| California Myotis | *Myotis californicus* | Sensitive |
| Fringed Myotis | *Myotis thysanodes* | Sensitive |
| Hoary Bat | *Lasiurus cinereus* | Sensitive |
| Long-legged Myotis | *Myotis volans* | Sensitive |
| Pallid Bat | *Antrozous pallidus* | Sensitive |
| Pygmy Rabbit | *Brachylagus idahoensis* | Sensitive |
| Silver-haired Bat | *Lasionycteris noctivagans* | Sensitive |
| Spotted Bat | *Euderma maculatum* | Sensitive |
| Townsend's Big-eared Bat | *Corynorhinus townsendii* | Sensitive-Critical |
| White-tailed Jackrabbit | *Lepus townsendii* | Sensitive |

## Cultural Relationship

The MRWMS is culturally significant to BPT because it lies within the Tribes' former reservation and aboriginal territory. Historically, BPT members gathered roots, hunted, and fished along the Malheur River corridor.

Both BPT and the public have a shared interest in the MRWMS's permanent protection. Habitat protection and enhancement measures to the resident plant community will benefit diverse fish and wildlife assemblages. General management goals include: improving water quality, enhancing upland, wetland, floodplain meadow and riparian habitats; controlling noxious weeds; protecting springs and seeps; managing grazing on the BLM and DSL allotments to meet wildlife objectives; preserving cultural resources; and providing public hunting and recreation opportunities.

# Habitat Management

## Grass and Forb Production

Haying practices have been utilized as a management tool since the Tribe acquired the Project Area. Haying has been used to control weeds, remove decadent material, and improve foraging opportunities for avian species and ungulates throughout the Project area.

In Field IA (Figure 2.1.1), 17 acres of Ladak II alfalfa and red clover was planted 2018. In 2018, this field was irrigated throughout the summer and left standing as a forage source for wildlife in the fall. The field did not take as well as desired, and we are considering options for future plantings.

Wetland field, Field 2 and Triangle field are meadow grass pastures, mainly composed of Timothy (*Phleum pretense*), Orchard grass (*Dactylis glomerate*), and Meadow Foxtail (*Alopecurus pratensis*) and irrigated annually. One cutting was conducted on Field 2 and Triangle field producing hay that was sold locally to tribal members at a discounted price.


Figure 2.1.1. Map of field names for MRWMS.

## Vegetation Management

Under previous ownership this site was subject to high cattle stocking rates, lack of ecologically sound grazing, and an introduction of prolific noxious invasive weeds (Kesling et. al. 2014). This has severely impacted wildlife habitat on the Property. BPT expends a large amount of time and funds on controlling noxious weeds in this area, with various control

techniques, not only to restore MRWMS to a desirable ecological condition but to reduce the chance of spreading the invasive plant species to other areas (DiTomaso 2000, BLM 2015). Both chemical and mechanical methods were used to control different species of invasive plants in 2019.

### *Mechanical: Mowing and Burning*

Mowing and burning practices have been employed in order to reduce noxious weed numbers in native vegetation stands, provide accelerated growth for native vegetation, clear irrigation conveyances and provide foraging opportunities for wildlife (DiTomaso et al. 2006). Sections of Big, Upland field, Wildlife field, Hangar field, and CREP areas adjacent to Upland field were mowed to reduce decadent plant material and remove stands of broadleaf weeds. However, these pastures were not burned in 2019.

### *Mechanical: Grazing*

Appropriate grazing can be used as a management tool for wildlife habitat (Holechek et al. 1982, DiTomaso et al. 2000). Removal of decadent material in the spring and early fall can jump-start vegetative growth in the early spring which improves forage conditions for avian species and ungulates in the late spring and summer when forage growth is reduced due to dry conditions. Targeted grazing can also be used to reduce invasive plant seed production by stressing invasive plants and allowing native plants to compete more effectively. The Burns Paiute Tribe worked in conjunction with a cattle owner to graze the Road Gulch and Black Canyon State allotments and the 'Meadow' field during the times when native grasses were dormant and would benefit from removal of decadent material. A total of 126 AUM's were utilized in the Meadow Field (Table 2.2.1, Figure 2.2.2), 552 AUM's were utilized in the State allotment which has an annual AUM allotment of 484 AUM's, the overage was allowed due to upcoming medusahead treatments planned on state lands. (Table 2.2.2). The BLM allotments and the Tribal lands south of the river were grazed in the spring and summer. A total of 1,125 AUM's were utilized in the Jonesboro BLM allotment and the adjacent tribal lands which has an annual AUM allotment 2,661 AUM's (Table 2.2.4). In 2019, BPT staff managed stocking rates by using the estimated AUM/acre method, with the goal of 50% or less available forage utilization based on carrying capacity of each pasture.

Table 2.2.1. Pasture and grazing/supplement rotation schedule in Meadow field pastures at MRWMS in 2019.

| Start Date | # of AUM's | Pasture | Size (acres) | End Date | Supplement Rotation Date |
|---|---|---|---|---|---|
| 8/18/2019 | 73 | East | 60 | 8/29/2019 | 8/18–8/29 |
| 8/29/2019 | 53 | West | 40 | 9/06/2019 | 8/29–9/06 |

Table 2.2.2. Pasture and grazing/supplement rotation schedule in the State Allotments at MRWMS in 2019-2020.

| Start Date | # of AUM's | Pasture | Size (acres) | End Date |
|---|---|---|---|---|
| 3/1/2019 | 136 | Road Gulch/Black Canyon | 2,715 | 4/15/2019 |
| 11/16/2019 | 249 | Road Gulch/Black Canyon | 4,986 | 1/12/2020 |
| 1/13/2020 | 167 | Road Gulch/Black Canyon | 3,330 | 2/28/2020 |

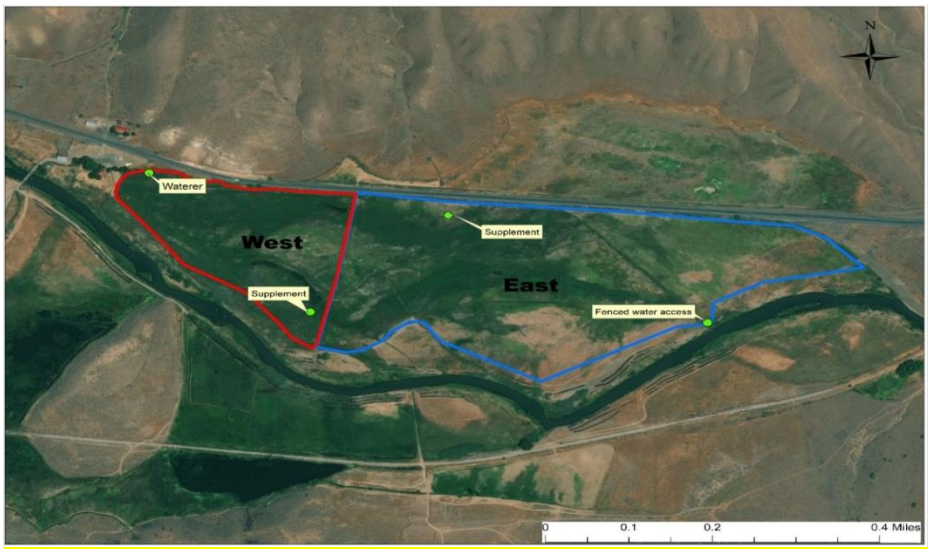


Figure 2.2.1. Meadow Field pastures with water and supplement locations at MRWMS in 2019.

Table 2.2.3. Pasture rotation schedule in BLM allotments at MRWMS in 2019.

| Start Date | # of Cow:calf pairs | Pasture | End Date |
|---|---|---|---|
| 4/19/2019 | 100 | Sperry Creek | 5/10/2019 |
| 5/10/2019 | 100 | Indian Creek | 6/20/2019 |
| 4/01/2019 | 100 | Saddle Horse | 6/20/2019 |
| 6/20/2019 | 200 | Horse Camp | 7/17/2019 |

Table 2.2.4. Deeded vs. total acres in BLM allotments at MRWMS.

| Pasture # | Deeded Land Size (acres) | Total Size (acres) |
|---|---|---|
| **Trail Creek** | 2,718 | 13,696 |
| **Tim's Peak** | 1,680 | 3,180 |
| **Total** | 4,398 | 16,878 |

***Chemical: Herbicide***

Using drift reducing nozzles, low pressures, lower boom height, and adjuvants to reduce herbicide drift, spot spraying was conducted wherever feasible to do so throughout the property (Bussan and Dyer 1999).

For control of broadleaf weeds in non-riparian areas staff spot sprayed by hand with a side-by-side tank sprayer using 432.9 fl. oz. of Milestone herbicide with an agricultural surfactant for control of broadleaf weeds including Canada thistle, Prickly lettuce, Flixweed, and Perennial pepper weed at a rate of 3.9 fl. oz./A over approximately 255.3 acres in total.

For control of broadleaf weeds in riparian adjacent areas staff spot sprayed by hand with a side-by-side tank sprayer using 1984.5 fl. oz. Weedmaster herbicide with an agricultural surfactant for control of poison hemlock, Canada thistle and puncture vine at a rate of 18.9 fl. oz./A over approximately 241.5 acres in total. (Table 2.2.4, Figure 2.2.4).

Staff spot sprayed by hand with a 100 gallon side-by-side tank sprayer using 96 fl. oz. of Roundup herbicide with an agricultural surfactant for non-selective control of broadleaf weeds including puncture vine at a rate of 16 fl. oz./acre. Approximately 13.8 acres in total were treated with Roundup.

Table 2.2.5. Herbicide type and estimated amount applied to pastures and Malheur River adjacent areas at MRWMS in 2019.

| Pasture Name | Herbicide Type | Application Rate (fl.oz./acre) | Estimated Area Applied (acres) | Estimated Amount Applied (oz.) |
|---|---|---|---|---|
| 203 | Weedmaster | 18.9 | 6.9 | 56.7 |
| 203 | Milestone | 3.9 | 6.9 | 11.7 |
| Black Canyon | Weedmaster | 18.9 | 62.1 | 510.3 |
| Black Canyon | Milestone | 3.9 | 62.1 | 105.3 |
| Field 1A | Weedmaster | 18.9 | 13.8 | 113.4 |
| Field 1A | Milestone | 3.9 | 13.8 | 23.4 |
| Field 2 | Weedmaster | 18.9 | 13.8 | 113.4 |
| Field 2 | Milestone | 3.9 | 13.8 | 23.4 |
| Hanger | Weedmaster | 18.9 | 27.6 | 226.8 |
| Hanger | Milestone | 3.9 | 27.6 | 46.8 |
| Hunter Creek Roadside | Weedmaster | 18.9 | 20.7 | 170.1 |
| Hunter Creek Roadside | Milestone | 3.9 | 20.7 | 35.1 |
| Meadow | Weedmaster | 18.9 | 34.5 | 283.5 |
| Meadow | Milestone | 3.9 | 34.5 | 58.5 |
| North | Weedmaster | 18.9 | 6.9 | 56.7 |
| North | Milestone | 3.9 | 6.9 | 11.7 |
| Parking Areas | Roundup | 16 | 13.8 | 96 |
| Parking Areas | Milestone | 3.9 | 13.8 | 23.4 |
| Railroad Grade | Weedmaster | 18.9 | 55.2 | 453.6 |
| Railroad Grade | Milestone | 3.9 | 55.2 | 93.6 |

# Notice of intent to spray herbicide:

The goal of this notice is to put into practice methods of control to minimize the spread of noxious weeds while informing the community and mitigating impact to important plant gathering areas or other community concerns.

The Burns Paiute Tribe Natural Resources Department will be mowing and spraying areas denoted in the maps at Jonesboro. Application will be either broadcast or spot sprayed depending on area. This herbicide application is meant to control broad leaf weeds encroaching in the riparian areas and parking areas on the property.

Target broadleaf species are: poison hemlock, knapweed, whitetop, perennial pepperweed, and goat heads.

Milestone and Weedmaster are labeled for use on rangeland, permanent grass pastures, Conservation Reserve Program (CRP) acres, non-cropland areas (such as roadsides), natural areas (such as wildlife management areas, wildlife openings, wildlife habitats, recreation areas, campgrounds, trailheads and trails), and grazed areas in and around these sites.

All herbicide applications must follow United States Environmental Protection Agency label instructions.

Application of herbicides will be suspended when any of the following conditions exists:

•wind velocity exceeds 6 miles per hour (mph)during application of liquids or 15 mph during application of granular herbicides;

•snow or ice covers the foliage of noxious weeds; and

•precipitation is occurring or is imminent (unless acceptable on the label).

Please contact Wildlife Program Manager, Calla Hagle: (541)573-8021, calla.hagle@burnspaiute-nsn.gov with any questions or comments.

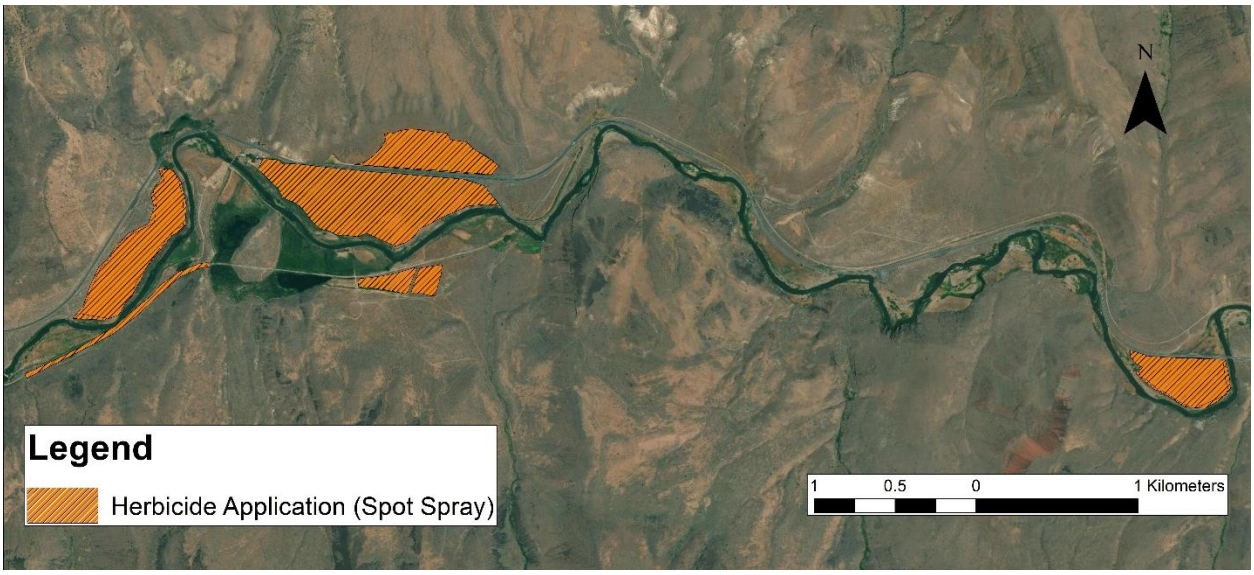


Figure 2.2.2. Location of herbicide application at MRWMS in 2019. See table for denotation of Milestone and Weed master applications.

***Rush-skeleton weed***

BPT staff coordinated with the Oregon Department of Agriculture and the Malheur County Weed Inspectors Office to treat rush skeleton weed (*Chondrilla juncea*) on the Property as well as adjacent State and BLM lands (Figure 2.2.3). The same sites that were treated in 2017 were checked and re-treated if necessary in 2019. Continued monitoring and treatment is necessary, as this plant is notoriously difficult to control (Gaskin et al. 2013) and its westward expansion along the Malheur River drainage means the Property is located on the front lines of the control effort. Rush skeleton plants are spot sprayed with Milestone at a rate of 7oz/ac with MSO surfactant.

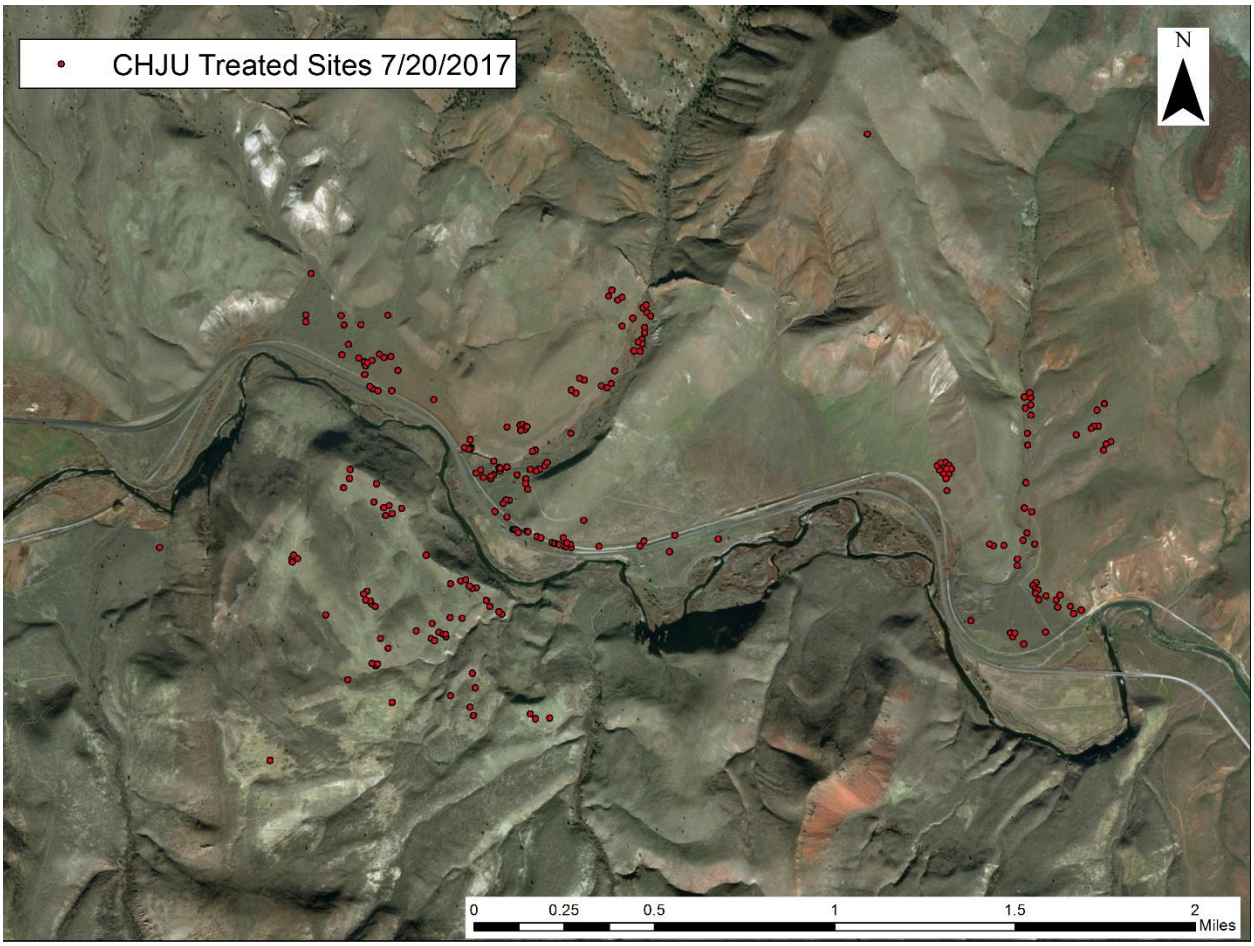


Figure 2.2.3. Rush skeleton weed (CHJU, *Chondrilla juncea*) sites treated in 2017 at MRWMS.

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# Irrigation

Irrigation can be utilized to provide quality forage for ungulates and inundate seasonal ponds and meadow grass fields for migrating waterfowl and neo-tropical bird species. Irrigation waterways and culverts, headgates, and pumps were used to sustain wet meadow habitats and exercise water rights. There is an extensive ditch system at MRWMS (Figure 2.3.1). In 2019, 7.91 miles of irrigation ditch were assessed daily for general maintenance. Approximately 150 acres of the Project utilized flood irrigation in 2019. The direction and use of irrigation water was changed on a daily basis. Maintenance of irrigation systems is constant, tasks include; repair of breeches, cleaning of debris by hand or with prescribed fire in the fall i.e.; removing vegetation to prevent blockage and maintain water velocity and direction, tarp dams, canal linings, maintaining pumps, maintenance of dam structures, and v-ditching canals with farming equipment to remove sedimentation.

The new diversion dam constructed in 2015 has increased the efficiency of flow to the irrigation canals. Issues with damage to the diversion stanchions will have to continue to be addressed each year to keep the structure in working order. In addition, problems still remain with the ditch system. In 2015, the department received an OWEB grant to fund construction of a new head gate system which will divert water from the current wetland into the seasonal ones rather than using water seepage from the ditch system into the seasonal wetlands. Construction on this project began in the spring of 2018 and concluded March 2019. Monitoring for the OWEB implementation effectiveness monitoring will continue until at least spring of 2020. Continued efforts to improve the ditch system will allow water to reach fields, such as Field 1B, that have been degraded from insufficient irrigation since 2014.

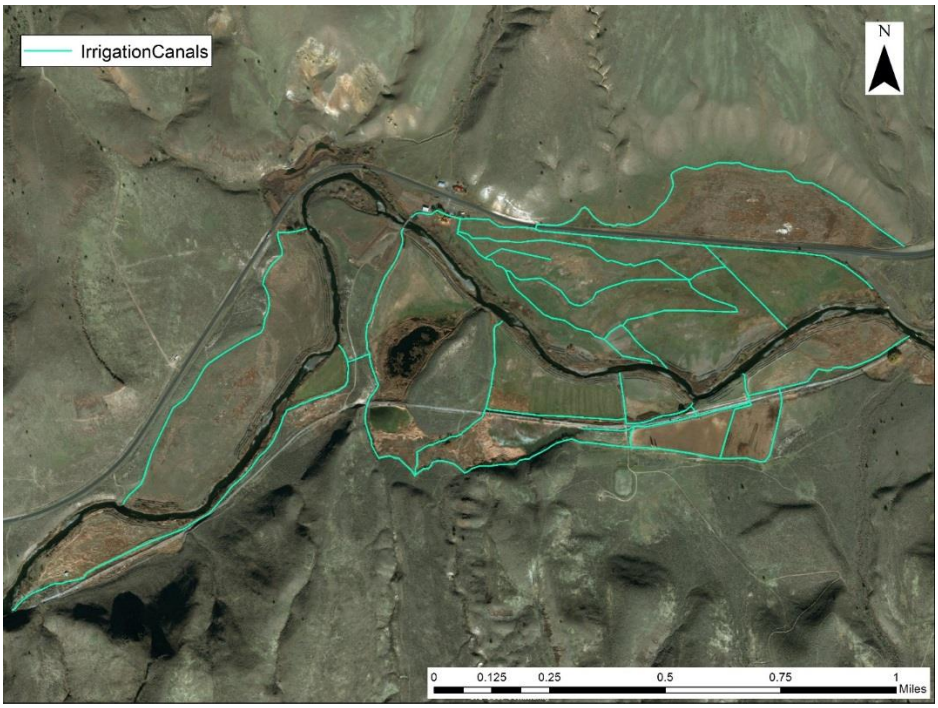


Figure 2.3.1. Irrigation canals (in use) located on the Property denoted in green.

## Native Species Plantings

On April 30th–May 1st, we planted willow stakes and Black Cottonwood (*Populus trichocarpa*) stakes along the river with Oregon Natural Desert Association (ONDA) volunteers. Some of these stakes appeared to have taken quickly.

In the past we have purchased plants for large scale plantings. In 2019, we started large scale propagation within the Department. We collected seeds from forbs and shrubs in 2018 and previous years from the MRWMS, primarily from the established CREP plantings. In 2019, we propagated many of these forbs and shrubs in cones and tree pots in the greenhouse (Figure 2.4.1). We planted these plants on October 15–16th, with 12 ONDA volunteers. Over two days of planting, we planted a total of 1,194 plants (Table 2.4.1). This in-house propagation was quite successful in its first year, and we plan to continue this in future years.

Figure 2.4.1. Native plant propagation in the greenhouse in 2019.

| Common name | Scientific name | Number planted |
|---|---|---|
| Blanketflower | *Gaillardia aristata* | 348 |
| Blue elderberry | *Sambucus cerulea* | 124 |
| Columbia Hawthorn | *Crataegus columbiana* | 9 |
| Chokecherry | *Prunus virginiana* | 1 |
| Golden currant | *Ribes aureum* | 420 |
| Showy Milkweed | *Asclepias speciosa* | 196 |
| Wood's Rose | *Rosa woodsii* | 96 |
| **TOTAL** | | **1,194** |

Table 2.4.1. Species and number of plants planted from October 15–16th, 2019.

## Juniper Treatment

In 2013, the Burns Paiute Tribe enrolled in a program sponsored by the Natural Resource Conservation Service (NRCS) to treat encroaching juniper on tribal and state lands. This program is part of the state-wide Sage Grouse Initiative (SGI) that aims to create partnerships between ranchers, agencies, universities and non-profit groups to work together with a shared vision of achieving wildlife conservation goals through sustainable ranching. The focus of this program is on habitat restoration to benefit Greater Sage-Grouse populations in Core Areas of habitat. The Malheur River Wildlife Mitigation Site falls in an area that has been designated as core area habitat for sage grouse. Juniper encroachment is a major threat to sage grouse, as pinyon and juniper encroachment leads to both avoidance and can negatively affect demographic variables (Doherty et al. 2010, Baruch-Mordo et al. 2013, Coates et al. 2017). Sage grouse leks that are monitored by BPT are located anywhere between 2 and 7 miles from proposed 2016-2018 treatment. Two leks are located within 2 miles and 11 leks are located within 5-7 miles of the Juniper cut treatment units.

In October 2018–January 2019, all the units in the 2013 and 2015 NRCS SGI EQIP contracts (1,307.8 acres, 764.8 acres and, 96.6 acres) were completed by either contractors or staff (Figure 2.5.1 and Figure 2.5.2). In the 2015 contract, CIN 2 was completed by staff and ONDA volunteers (Figure 2.5.2). Units will need to continue to be maintained for the life of the contracts (5 years).

In 2019, we secured an EQIP (Environmental Quality Incentives Program) contract to cut additional juniper acres. This contract will include cutting junipers on 858 acres from 2020–2023. We will begin cutting these units with volunteers in 2020.

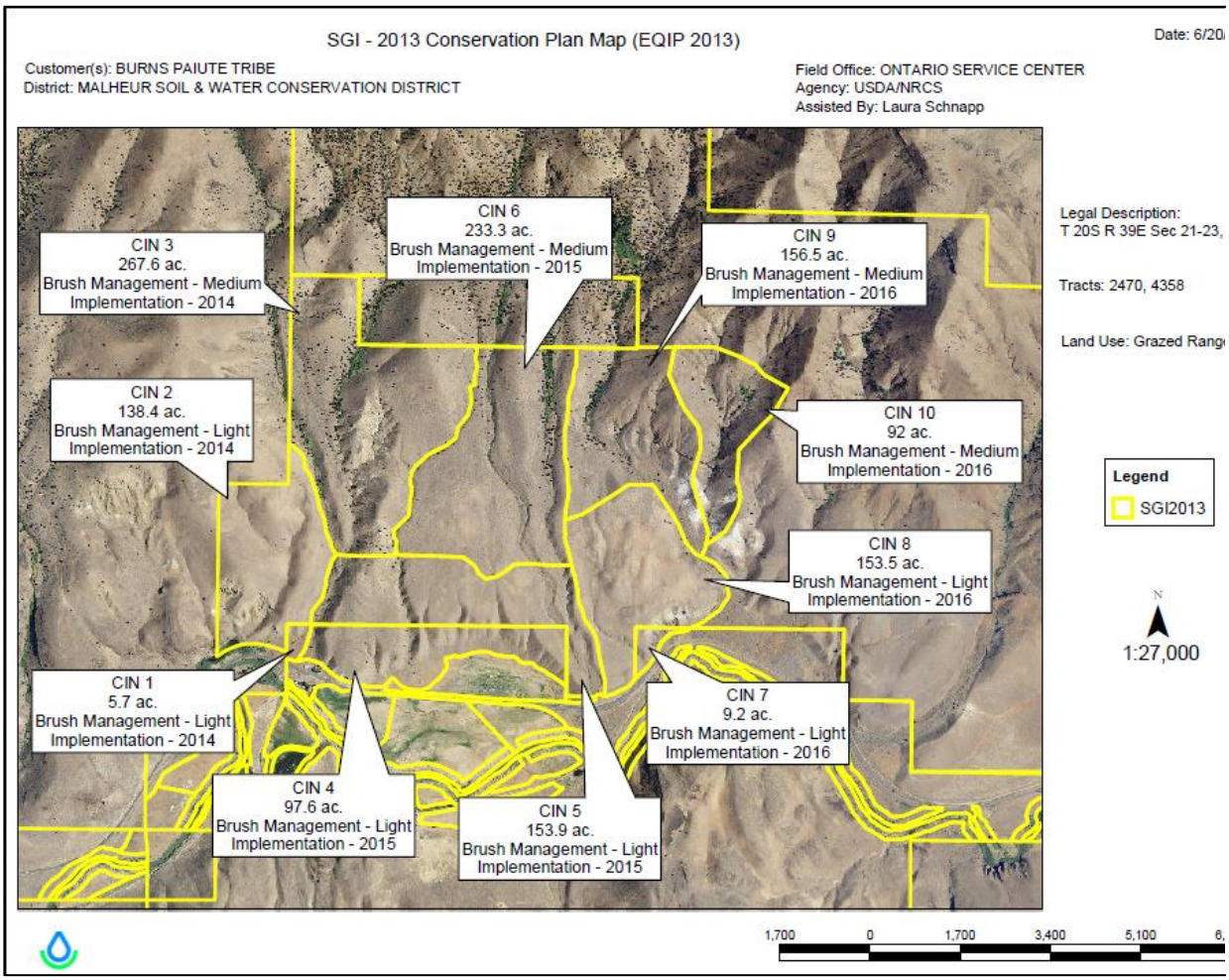


Figure 2.5.1. Sage Grouse Initiative juniper cutting contract with unit acres to be treated at MRWMS from 2014-2019. Completed October 2018-January 2019.

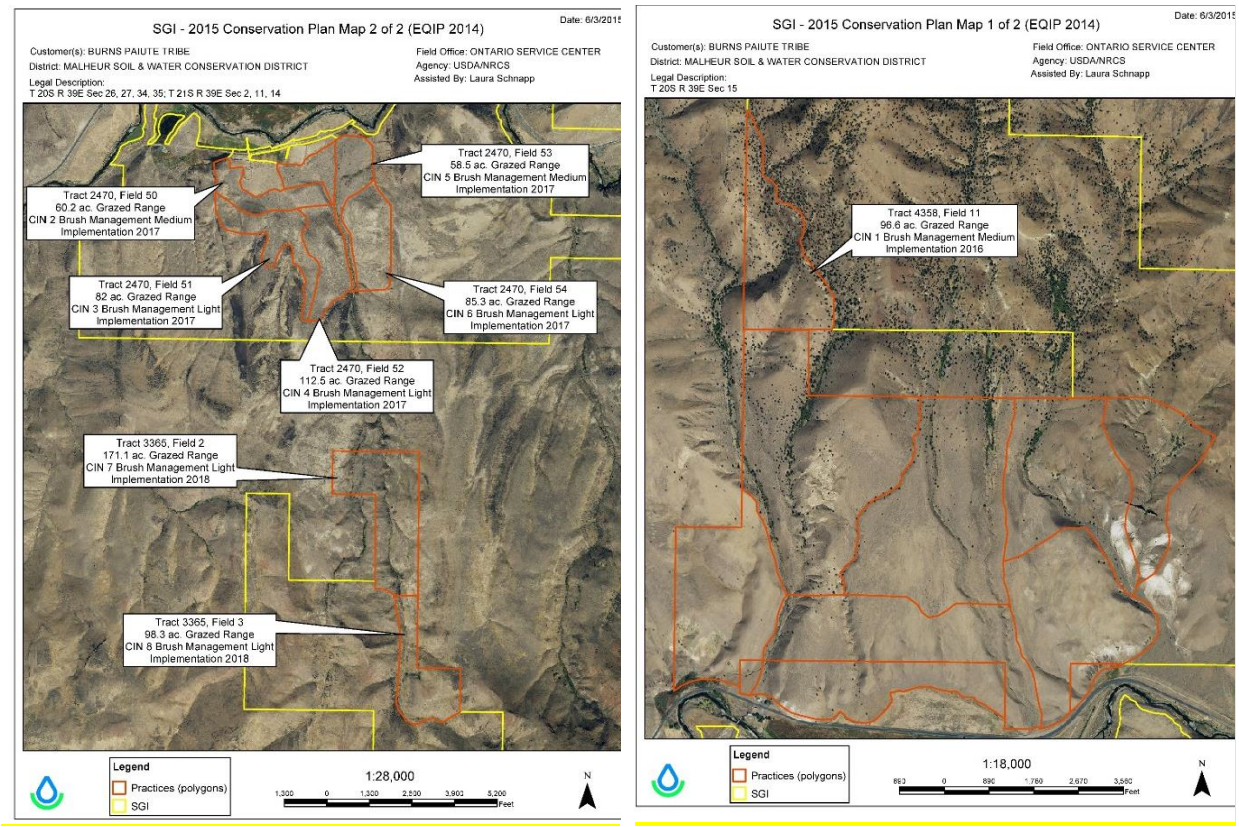


Figure 2.5.2. NRCS Sage Grouse Initiative current and future contract areas at MRWMS. Yellow is MRWMS property boundary, red is juniper cutting unit boundaries. Completed October 2018-January 2019.

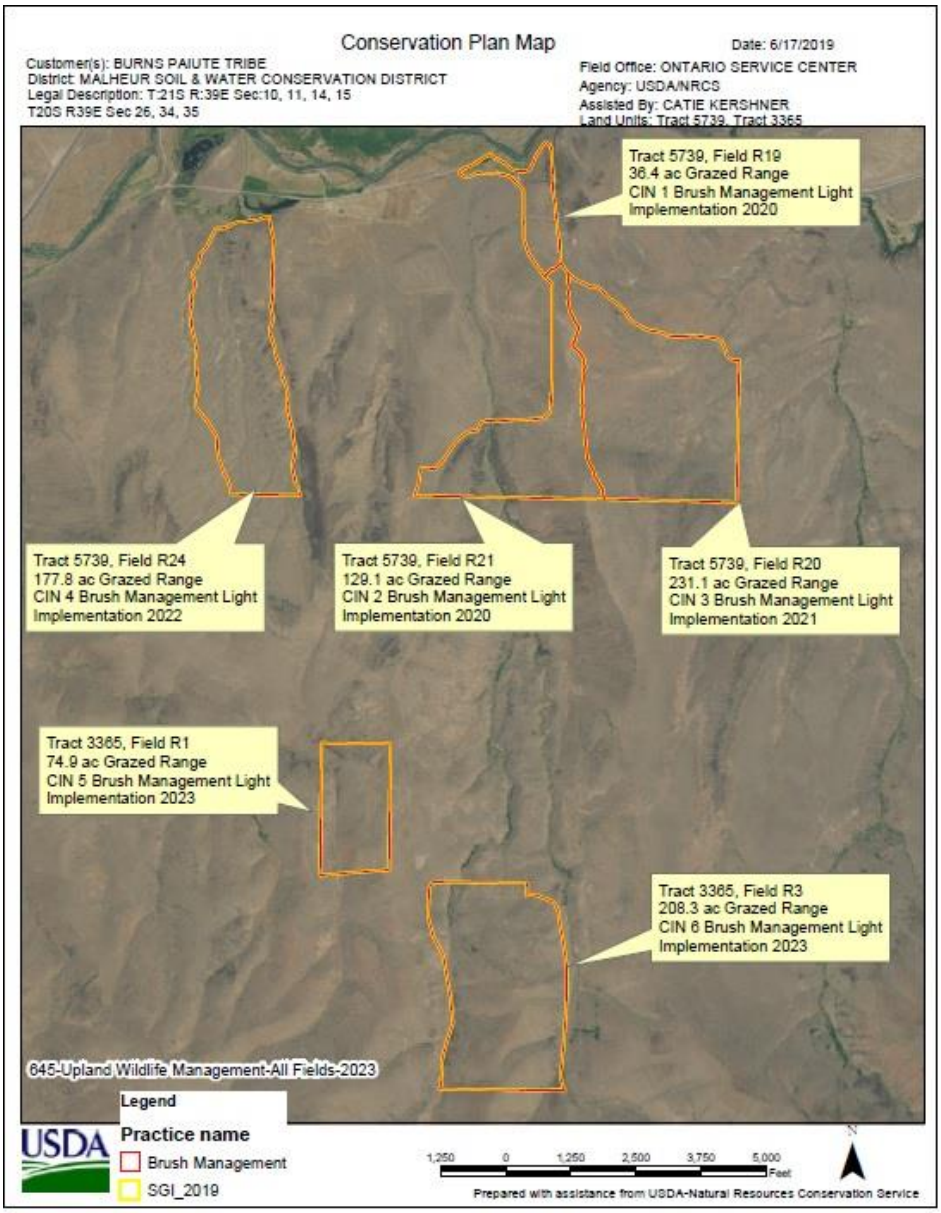


Figure 2.5.3. EQIP juniper cutting contract with unit acres to be treated at MRWMS from 2020-2023.

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# Infrastructure Management

## New Construction

In 2017, the Burns Paiute Tribe Wildlife Program oversaw the construction of a new greenhouse at the Burns Paiute Reservation. In 2019 this greenhouse was used extensively to grow and house plants for projects on the MRWMS and LVWMS.

## Waterline Project

In March 2017, a cow carcass was found in the spring that used to feed the water system for both houses. This prompted a serious concern for contamination at which time BPT staff instructed those on site not to consume or bathe in the water. Water was tested for contaminants. The levels of total dissolved solids in the water was above safe drinking water standards (500 ppm). Beyond the contamination issue, the design of the water system was poor, with both houses relying on hot spring water that fed into a spring box located 0.75 mi from the site manger's house on property administered by the Department of State Lands. With the old system the water flowed for 0.5 mi before pooling into a cistern (also on DSL property) that was damaged, containing holes large enough to allow small animals to fall inside, drown, and decay—a serious threat for bacterial contamination. Also, the use of schedule 40 PVC and it's above the ground location presented concerns for other contaminants leaching into the water supply both above and below the location of the cistern. Finally, the hot spring water also caused concern as the temperature of the tap water was very warm and contained a strong sulfur taste and smell when the water was used for the winter. The Budget Oversight Committee was receptive to these concerns in our FY17 request and awarded emergency quarterly funding to address them. Unfortunately, due to inadvertent discoveries of culturally sensitive resources during construction, the project remains incomplete and the water from the cistern is still the only water available to use in the bunkhouse. The ban on drinking or bathing in the bunkhouse water is still in effect.

Since 2017, Bonneville Power Administration (BPA) environmental compliance staff worked closely with BPT natural resources and cultural resources staff to ensure a clear understanding of the proposed project and compliance with various environmental regulations and requirements, specifically Section 106 of the National Historic Preservation Act, in preparation for funding the implementation of the water line construction project (Project).

During the fall of 2017, project implementation began and involved the excavation for a pipeline extending from a recently dug well to the Manager’s house (Figure 3.2.1). After a pause for winter weather, work continued in the spring of 2018, this pipeline work involved trenching and directional boring under a highway connecting one side of the property to the other. During implementation, culturally sensitive materials were identified in the vicinity of the project by the BPT cultural resources monitor resulting in the need to pause the project until BPA and the BPT could identify the appropriate next steps.

The project location, within the Malheur River Wildlife Mitigation Property (Jonesboro Ranch), is an area which contains an abundance of culturally significant resources and places to

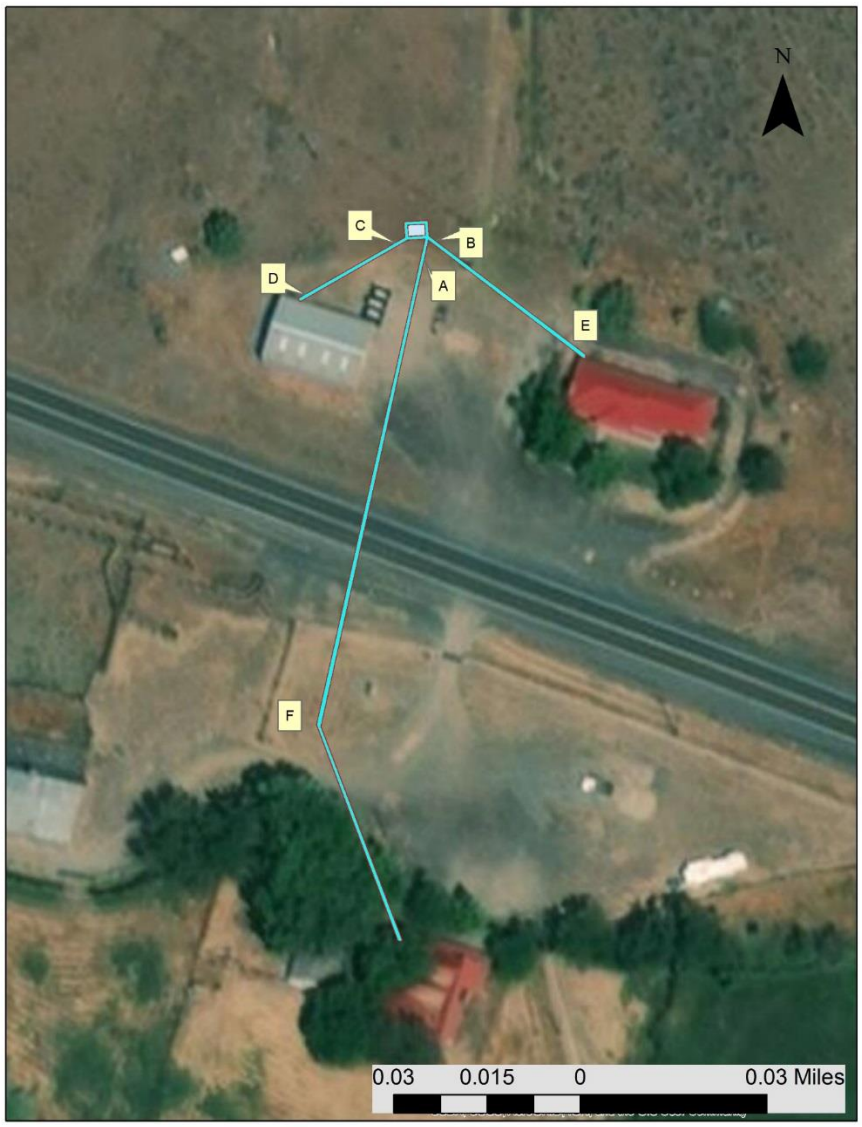
several Native American Tribes. Considering the impacts of project implementation actions on these resources and places is part of the Section 106 compliance process. If cultural resources are unexpectedly identified during project implementation, per the process outlined in the Section 106 regulations, project activities are halted until those entities that may have an interest in those resources (referred to as "consulting parties" in the regulations) are notified and BPA identifies the appropriate next steps.

In November 2018, following extensive coordination with BPT natural resources staff and Tribal Council and additional archaeological testing of the project area, project activities resumed. During implementation, an inadvertent discovery of cultural materials was identified by a BPA cultural resources monitor. BPA determined that activities could move forward in another portion of the project area that had been included in consultation. As project activities continued, it became clear that the directional boring crew would not be able to install the water pipe within the original boring path because of substrate type or density, resulting in the need to expand the project footprint further. Expansion of the project footprint and revision of design in turn will result in additional environmental compliance and consultation. BPA will not permit the project to proceed until this additional environmental compliance work is complete, namely, archeological subsurface testing.

Current Status:

Inadvertent discoveries of cultural resources during construction and changes in construction approaches created a series of delays that prevented the BPT from completing the water line project within the allotted 2017 and 2018 calendar year. As discussed, work has been completed on the new well, and waterline to the Manager's house, however, the waterline to the Bunkhouse remains unfinished in February 2020.

The requested funds in combination with the carried over funds available from the FY17 BOG request will include a lump sum of $50,000.00 set aside specifically for cultural resource support. The total funds needed will be off-set by the $40,814.00 left-over from the FY17 BOG request that will be transferred to our FY20 contract to complete the work needed. BPA recommends that the site identified as part of the post review discovery be tested in order to establish site boundaries, evaluate its eligibility for listing on the National Register of Historic Places (NRHP) and to document damages to the site. Due to the inadvertent discovery, BPA requires that subsurface testing be conducted prior to any additional ground disturbance and that a cultural monitor is present to monitor all future construction activities. Monitoring shall also include the screening of excavated soils for cultural material. This additional work will help provide the construction crew the flexibility to complete their work should unforeseen circumstances (decisions made in the field or additional post-review discoveries) occur. We will continue to work towards a resolution and safe drinking water in the bunkhouse.




**Fall 2017: Water system from new well to Managers house completed and functional.**

**Blue square:** Well. **Completed Fall 2017**

**Point C-D:** Electrical line from Well to Shop. **Completed Fall 2017**

**Point B-E:** Waterline from Well to Managers House. **Completed Fall 2017**

**Spring and Fall 2018: Water system from new well to Bunkhouse not completed due to inadvertent discoveries during construction.**

**Point A-F:** Waterline from well to south side of Hwy 20. Attempted **Spring 2018, Not Completed** due to inadvertent discovery. Attempted again, **Fall 2018**, **Not Completed** due to inadvertent discovery

**Point F- Bunkhouse House (South):** Waterline needed. **Fall 2018, Not Completed** due to inadvertent discovery

Figure 3.2.1. Map and timeline of work on water system at Malheur River Mitigation Site (2017-2018).

## Bunkhouse Renovations

In 2018-2019, Natural Resources staff oversaw the renovation of the Jonesboro Bunkhouse. Work was completed in June of 2019. The following list is a summary of work that was completed in the renovation by Burri Construction, Inc. (Table 3.3.1, Figure 3.3.1).

Table 3.3.1. Bunkhouse renovations by Burri Construction, Inc. in 2018 and 2019.

| |
|---|
| Exterior work: |
| Remove and replace all exterior windows |
| Remove exterior doors and replace with steel insulated doors and trim |
| Pressure wash exterior of residence, scrape and prep for paint. |
| Paint exterior (spray) 2 coats of latex exterior paint. |
| Electrical work: |
| New heating system |
| Remove and replace electrical panel plus sub panel, re-vamp electrical system. |
| Install new light fixtures |
| Remove and replace exhaust fans in bathroom and replace with 80 CFM Panasonic fans. |
| Plumbing and Bathrooms: |
| Add new bathroom |
| Install new cabinets with countertops in kitchen and utility room, new vanity in bathroom. |
| Remove all existing water and sewer lines and replace with PEX for water, ABS for sewer. |
| Install new toilets, wax rings, toilet valves, sinks and faucets. |
| Remove and replace bath tubs and caulk. |
| Remove and replace exhaust fans in bathroom and replace with 80 CFM Panasonic fans. |
| Interior work: |
| Repair all damaged drywall, tape and texture to match. |
| Paint two coats of semi-gloss latex on ceilings, walls, doors and trim. |
| Prep floor and install snap lock laminated flooring throughout residence and trim |
| Add new insulation |
| Clean up and dispose of all Construction related debris. |
| Demolition Work: |
| Remove floor, rotted sub flooring, kitchen cabinets, moldy drywall, light fixtures, toilets, sinks, water heater and baseboard heaters. |

Figure 3.3.1. Bunkhouse renovations in progress 2018.

## Annual Infrastructure Management

As a mitigation measure, BPT staff removed the dam boards and stanchions in the Malheur River diversion dam. This measure will be taken annually to prevent ice flows from damaging the dam. In the fall, dam boards and stanchions will be removed and be replaced in the spring following ice break-up and before Warmsprings and Beulah Reservoirs begin letting water for irrigation. A new garage door was installed in the Manager's house as a security and maintenance measure.

# Wildlife and Habitat Monitoring

## Fisheries Research

For fisheries work performed in the Malheur Subbasin including work performed on the Logan Valley Wildlife Mitigation Site, please reference BPT's FY2019 Annual Report for BPA Project# 1997-019-00 – Evaluate the Life History of Native Salmonids in the Malheur Subbasin.

## Greater Sage-Grouse Monitoring

### Greater Sage-Grouse Lek Surveys

Greater Sage-Grouse (*Centrocercus urophasianus*) surveys were conducted in coordination with the Oregon Department of Fish and Wildlife. We visited eight separate active and non-active lek locations: Roy Reservoir, Tim's Peak Reservoir, Upper Deacon Flat, Antelope Swale, Wildhorse Basin, and Lake Ridge (combined #1 and #2), Arrien Reservoir, and Big Swale (Figure 4.2.1).

Figure 4.2.1. Greater Sage-Grouse males on leks near the MRWMS in 2019.

***Protocol***

We follow the protocol from the Greater Sage-Grouse Conservation Assessment and Strategy for Oregon: A Plan to Maintain and Enhance Populations and Habitat (Hagen 2011). However, BPT staff has not always followed this protocol perfectly, as there are intervals both too short and too long between visits. BPT attempts to survey each of the active leks three times a year according to the protocol but has surveyed a lek as many as five times in past years and as few as one in other years.

"The following lek counting procedures are based on the premise that once lek attendance begins, a high proportion of the males that attend any given lek do so each day. Some authors have indicated that each lek should be counted at least three (Jenni and Hartzler 1978) or four (Emmons and Braun 1984) times each season at 7 to 10-day intervals between mid-March and early to mid-May to reduce count variability within a given year. The highest of the three/four (lek or lek complex) counts should be used in population estimation/modeling exercises (Emmons and Braun 1984, Autenreith 1981).

The following criteria should guide lek counts in Oregon:

1. Counts should be conducted between March 15 and April 30 each year. (Note: There may be local variation between districts that will dictate minor modifications to these dates).

2. Counting ideally should be done within the first 2 hours after daybreak under clear, calm, and dry weather conditions.

3. Each lek/ lek complex should be counted at least 3 times at 7 to 10-day intervals.

4. If a lek complex is counted, all leks in the vicinity of the complex area should be counted on the same day. Count results for each individual lek site should be kept separate for individual lek trend comparisons. Data from all leks within lek complex should be summed, and the count day with the highest count for the entire complex will be reported for population trend analysis (Page 165, Hagen 2011)."

***Analysis***

In past analyses BPT staff has reported the average number of males on a lek in a year. However, in this report, like the past two years, we took the maximum number of males seen on that lek complex each year regardless of how many times it was surveyed (Range 1:5). This follows the protocol outlined by Hagen (2011). This methodology excludes data from days in which the weather was poor, unless weather was poor on all days that data was collected. Poor weather can lower abundance estimates, as weather can affect lek attendance (Bradbury et al. 1989, Fremgen 2014). Following methodology by Hagen (2011), we pooled data from lek complexes into a single point for this analysis, essentially treating lek complexes as one single expansive lek. For example, on April 3, 2012 BPT staff observed nine males on Upper Deacon Flat Reservoir #1 and 5 males on Upper Deacon Flat Reservoir #2. We treated this as 14 males

seen at the Upper Deacon complex on that day. In previous years, staff has taken the average of the parts of the complex, but we have rectified this in this report.

The primary, or most recently used, location was used as the coordinate for these complexes. For example, Lake Ridge #2 appeared to be the primary lekking point for the Lake Ridge complex in previous years. However, it has shifted to Lake Ridge #1 in recent years, so we used the coordinate for #1 as the complex point.

In 2019, we began to assess habitat suitability of each lek's location based on 4 habitat indicators (availability of sagebrush cover, proximity of detrimental land uses, proximity of tree or other tall structures, presence of annual grasses). Each habitat indicator was checked as suitable, marginal, or unsuitable. Based on the suitability of these indicators, we then checked whether the site was suitable, marginal, or unsuitable. We used the following worksheet:

Table 4.2.1.

| **Habitat Indicator** | **Suitable** | | **Marginal** | | **Unsuitable** | | **Notes** |
|---|---|---|---|---|---|---|---|
| **Availability of Sagebrush Cover** | **Lek has adjacent protective sagebrush cover within 100 m** | | **Sagebrush with in 100 m provides very little protective cover** | | **Adjacent sagebrush cover is > 100 m** | | |
| **Proximity of Detrimental Land Uses** | **Detrimental land uses are not within line of sight of lek and ascent to uncommon with in 3km of lek** | | **Detrimental land use are within line of sight of lek and uncommon or few within 3 km of lek** | | **Detrimental land uses are within the vicinity of the lek site** | | |
| **Proximity of Tree or Other Tall Structures** | **Trees or other tall structures are not within line of sight of lek and none to uncommon within 3 km of lek** | | **Trees or other tall structures are within line of sight of lek and uncommon or scattered within 3 km of lek** | | **Trees or other tall structures are within the vicinity of the lek site** | | |
| **Presence of Annual Grass** | **No annual grasses present at lekking area** | | **Lekking area partially covered in annual grasses** | | **Lekking area covered in annual grasses** | | |
| **Site-Scale Suitability Suitable** | | | **Marginal** | | **Unsuitable** | | |

| Date: | Lek #: | Lek Name: |
|---|---|---|
| UTM: | | Evaluator: |
| PAC: | | Land Cover Type: |
| Lek Status (circle one): Occupied / Occupied-Pending / Unoccupied-Pending / Unoccupied / Historic | | |

***Results***

The number of displaying males on each active lek surveyed in 2019 decreased from 2018 (Table 4.2.1, Figure 4.2.2.). Of the 7 active leks surveyed, only 2 contained numbers of lekking males that were above the long-term average. The leks with numbers of lekking males above the long-term average were those at Wildhorse Basin and the Lake Ridge Complex. The number of lekking males on these leks decreased after reaching the highest number recorded in 2018 since monitoring began. Antelope Swale had 0 lekking males for the third consecutive year. This is likely due to the lingering effects of the dam that was washed out in previous years which was fixed in the winter of 2017-2018. We will continue to monitor this lek into the future. Like in 2018, we noticed lekking activity in an area between Tim's Peak and Roy Reservoir, with 1 lekking male recorded. Bull Canyon and McCloud Reservoirs were not surveyed in 2019 as there have been 0 lekking males found in previous years.

We monitored one new active lek at Arrien Reservoir in 2019 which has been monitored by ODFW in years past. We recorded a maximum of 10 lekking males. We will continue to survey this lek in future years.

Roy Reservoir exhibited the sharpest decrease in number of lekking males. We observed 16 less males compared to the maximum number of males in 2018. The maximum number of displaying males at the Lake Ridge Complex decreased by 14 males between 2018 and 2019. Despite these declines, Roy Reservoir continues to exhibit the highest long-term average abundance of lekking males with a long-term (13 year) average maximum of 44.67 males. This is followed by the Lake Ridge complex with a long-term (6 year) average maximum of 25.75 lekking males.

Table 4.2.1. Maximum number of Greater Sage-Grouse males at lek locations from 2005–2019 and the long-term average maximum. A zero represents no birds seen, while a period (.) represents no data collected.

| | Roy Reservoir | Tim's Peak (Reservoir)* | Antelope Swale | Upper Deacon Flat Reservoir* | Wildhorse Basin | Lake Ridge* | McCloud Reservoir | Bull Canyon Reservoir | Big Swale Reservoir | Arrien Reservoir |
|---|---|---|---|---|---|---|---|---|---|---|
| 2005 | 41 | 5 | . | . | . | . | . | . | . | . |
| 2006 | 43 | 7 | . | . | . | . | . | . | . | . |
| 2007 | 20 | 16 | 0 | . | . | . | 0 | . | . | . |
| 2008 | 15 | 7 | 0 | 14 | . | . | 0 | 0 | . | . |
| 2009 | 24 | 5 | . | 11 | 12 | . | . | 0 | 0 | . |
| 2010 | 59 | 1 | 12 | 26 | 25 | . | 0 | . | . | . |
| 2011 | 57 | 0 | 8 | 25 | 25 | . | 0 | . | . | . |
| 2012 | 49 | 0 | 17 | 14 | 14 | 13 | 0 | . | . | . |
| 2013 | 40 | 7 | 10 | 18 | 8 | 26 | . | . | . | . |
| 2014 | 48 | 7 | 9 | 11 | 18 | 22 | . | . | . | . |
| 2015 | 67 | 11 | 9 | 13 | 16 | 28 | . | . | . | . |
| 2016 | 63 | 12 | 4 | 19 | 9 | 22 | 0 | 0 | 0 | . |
| 2017 | 54 | 10 | 0 | 10 | 12 | 23 | 0 | 0 | 0 | . |
| 2018 | 53 | 18 | 0 | 17 | 29 | 43 | 0 | 0 | 5 | . |
| 2019 | 37 | 6 | 0 | 7 | 20 | 29 | . | . | 0 | 10 |
| **Average** | **44.67** | **7.47** | **5.75** | **15.42** | **17.09** | **25.75** | **0.00** | **0.00** | **1.00** | **10.00** |

* Denotes a lek complex. There may be multiple lek locations within this complex that fluctuate over survey years.

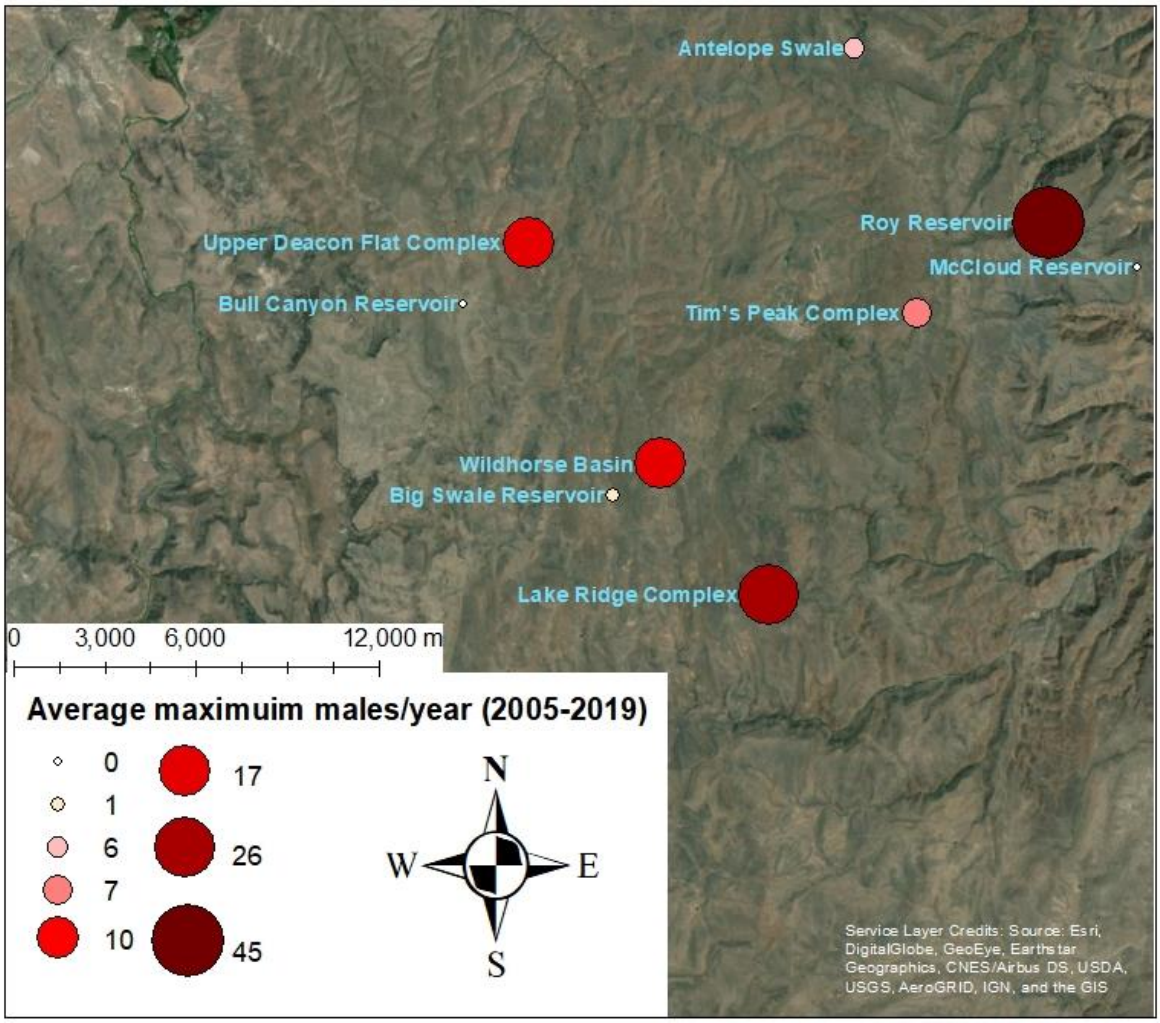



Figure 4.2.2. Maximum number of Greater Sage-Grouse males at lek locations at 6 active lek locations near the MRWMS from 2005–2019.

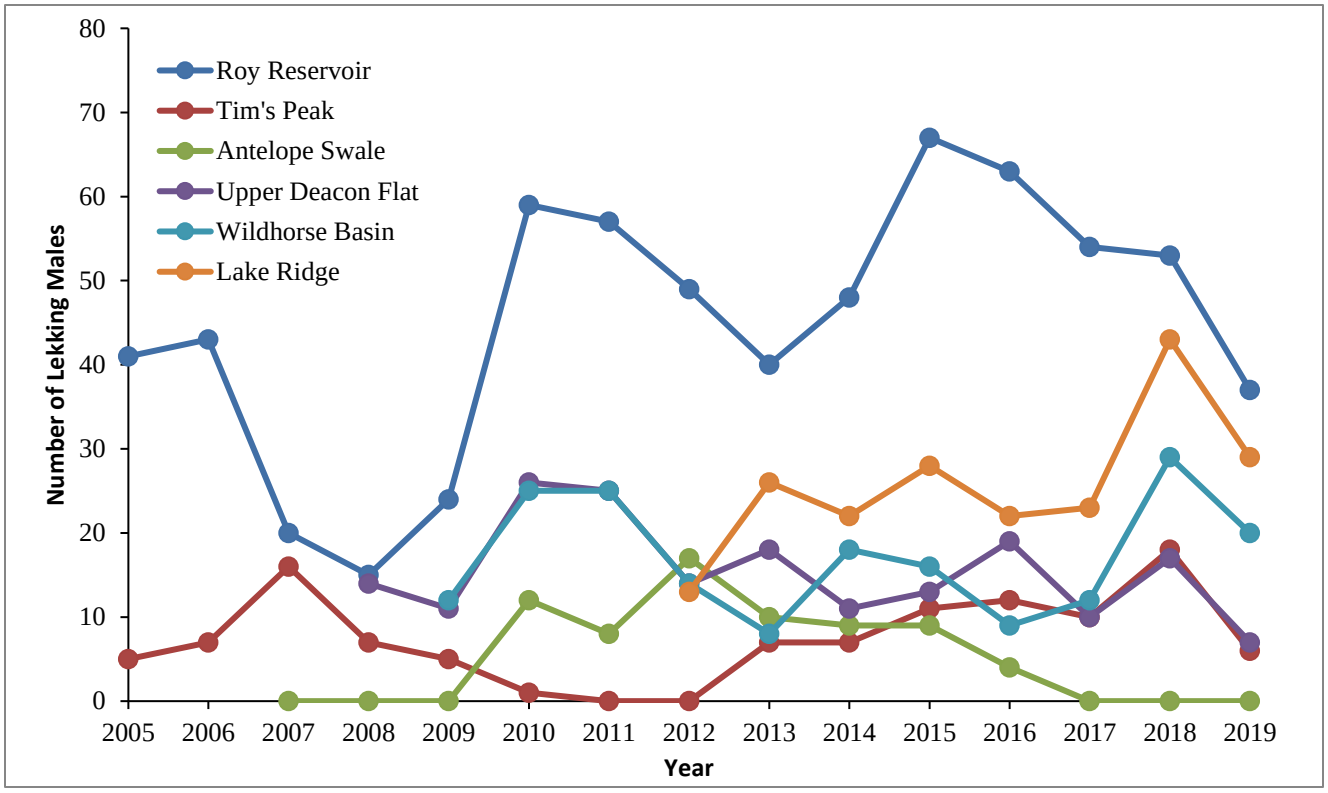



Figure 4.2.3. Long term (2005–2019) average of the maximum number of male Greater Sage-Grouse on lek locations near the MRWMS. The primary or most recently used location was used as the coordinate for the lek complexes. Note that coordinates are approximate and lek locations can move or drift over time.

***Discussion***

Overall, the number of lekking males on each active lek surveyed decreased from the previous year. Declines in the number of displaying males at certain leks may not be cause for immediate concern as some males can disperse between lek sites within and among years (Dalke et al. 1963, Dunn and Braun 1985, Schroeder and Robb 2003). Although, the percentage of males that switch lek sites appears to vary and can be rare. Gibson et al. (2014) determined that the annual probability of a male moving away from the lek it was captured on was 3% in a study conducted in Nevada. With that said, all the leks BPT monitors showed a drop from 2018. This appeared to be a statewide trend, due in part to a late winter affecting lekking behavior, but also likely due to an observable population decline.

Greater Sage-Grouse Study

Starting on June 1, 2017 a data and equipment sharing agreement was established between the Burns Paiute Tribe and Oregon State University. This agreement authorizes Oregon State University's use of GPS units provided by the Burns Paiute Tribe for this project. The GPS

units will be divided equally between female Sage-Grouse in the Bully Creek and Crowley Priority Areas for Conservation (PAC's). Very high frequency (VHF) transmitters are also deployed to supplement the sample size. OSU students are using this data to study Sage-Grouse response to fire and invasive plants and using a Before-After Control-Impact study design to assess the effects of reducing Common raven (*Corvus corax*) abundance on Sage-Grouse nest and chick survival.

During spring 2019, new GPS tags were attached to VHF necklaces on captured Sage-Grouse, which record 2-3 locations per day for a year. The use of 22 g units mounted on the rump of the birds was discontinued to reduce costs and to prevent negative effects on adult survival (Foster et al. 2018, Severson et al. 2019). At the onset of the 2019 nesting season, there were 9 and 6 VHF's deployed in the Crowley and Bully Creek PAC's respectively. On Crowley, there were only 2 nests monitored, both of which failed. At Bully Creek, there were a total of 4 nest monitored with 2 successfully hatching. There were no broods confirmed at Crowley while there were 3 confirmed at Bully Creek. At the end of 2019, 6 individuals marked in the Crowley PAC were still known to be alive while 8 remained alive at Bully Creek.

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# Migratory Bird Surveys

Migratory bird surveys were performed in an effort to estimate abundance change and Species Richness at MRWMS. We will use this data to detect possible benefits or consequences of land use and climate changes on bird abundance. Additionally, by collecting information on bird's abundance in relation to their associated vegetation communities, we may use certain "community indicator species" to assess the health of the surveyed communities. This data may be used to set priorities, allowing conservation effort to be focused on those communities most in need of attention.

### *Sampling design*

The Interactive Habitat and Biodiversity Information System for the Columbia Basin (IBIS) is no longer accepting data for inclusion in their database, so all 2019 data was submitted to eBird under the username BurnsPaiuteTribe. We will continue to submit annual data to eBird in the coming years. BPT also sent all avian data from 2006–2019 to a researcher (Dr. Robinson) from Oregon State University, for inclusion in a graduate project focused on statewide avian abundance, distribution, and habitat use. We did not hear back from him in 2018 to include this year's data so will submit only to eBird for the time being.

BPT staff utilized protocols developed by Huff et al. (2000). BPT staff monitored five transects in four different community types (wetland, meadow, riparian, and upland). Within each transect, BPT staff established five locations as points (stations) to conduct the counts, with the exception of the wetland community which had 4 points in all years except 2015 when BPT staff collected data at a 5$^{th}$ point (Table 4.3.1, Figure 4.3.1). Although staff attempt to visit each transect three times each year, these visits can be limited by weather. Each transect was surveyed three times in 2019 (Table 4.3.2). In 2019, we conducted bird surveys on May 20$^{th}$, May 21$^{st}$, June 10$^{th}$, June 11$^{th}$, June 24$^{th}$, and June 26$^{th}$.

Table 4.3.1. Spatial locations in UTMs and decimal degrees for migratory bird survey points by community type at MRWMS.

| Vegetation Community | GPS identity | X | Y | Latitude | Longitude |
|---|---|---|---|---|---|
| Wetland | WETLAND1 | 425078 | 4849586 | 43.796 | -117.931 |
| Wetland | WETLAND2 | 425171 | 4849730 | 43.797 | -117.930 |
| Wetland | WETLAND3 | 425292 | 4849468 | 43.794 | -117.929 |
| Wetland | WETLAND4 | 425594 | 4849483 | 43.795 | -117.925 |
| Meadow | MEADOW 1 | 425308 | 4850130 | 43.800 | -117.929 |
| Meadow | MEADOW 2 | 425425 | 4850076 | 43.800 | -117.927 |
| Meadow | MEADOW 3 | 425552 | 4850029 | 43.800 | -117.925 |
| Meadow | MEADOW-4 | 425702 | 4849942 | 43.799 | -117.924 |
| Meadow | MEADOW-5 | 425841 | 4849848 | 43.798 | -117.922 |
| Riparian | RIPBIRD-1 | 426109 | 4849630 | 43.796 | -117.918 |
| Riparian | RIPBIRD-2 | 426222 | 4849661 | 43.796 | -117.917 |
| Riparian | RIPBIRD-3 | 426293 | 4849728 | 43.797 | -117.916 |
| Riparian | RIPBIRD-4 | 426399 | 4849810 | 43.798 | -117.915 |
| Riparian | RIPBIRD-5 | 426528 | 4849880 | 43.798 | -117.913 |
| Upland1 | UP1-1 | 425679 | 4849166 | 43.792 | -117.924 |
| Upland1 | UP1-2 | 425914 | 4849006 | 43.790 | -117.921 |
| Upland1 | UP1-3 | 426074 | 4848894 | 43.789 | -117.919 |
| Upland1 | UP1-4 | 426292 | 4848866 | 43.789 | -117.916 |
| Upland1 | UP1-5 | 426599 | 4848956 | 43.790 | -117.912 |
| Upland2 | UP2-1 | 426514 | 4847655 | 43.778 | -117.913 |
| Upland2 | UP2-2 | 426606 | 4847865 | 43.780 | -117.912 |
| Upland2 | UP2-3 | 426603 | 4848092 | 43.782 | -117.912 |
| Upland2 | UP2-4 | 426518 | 4848247 | 43.784 | -117.913 |
| Upland2 | UP2-5 | 426534 | 4848446 | 43.785 | -117.913 |

Points in NAD_1983_UTM_Zone_11N. Note a slight shift (< 2 m) in points due to data shift when projecting data into a different coordinate system. Upland points were moved to these new locations in 2015.

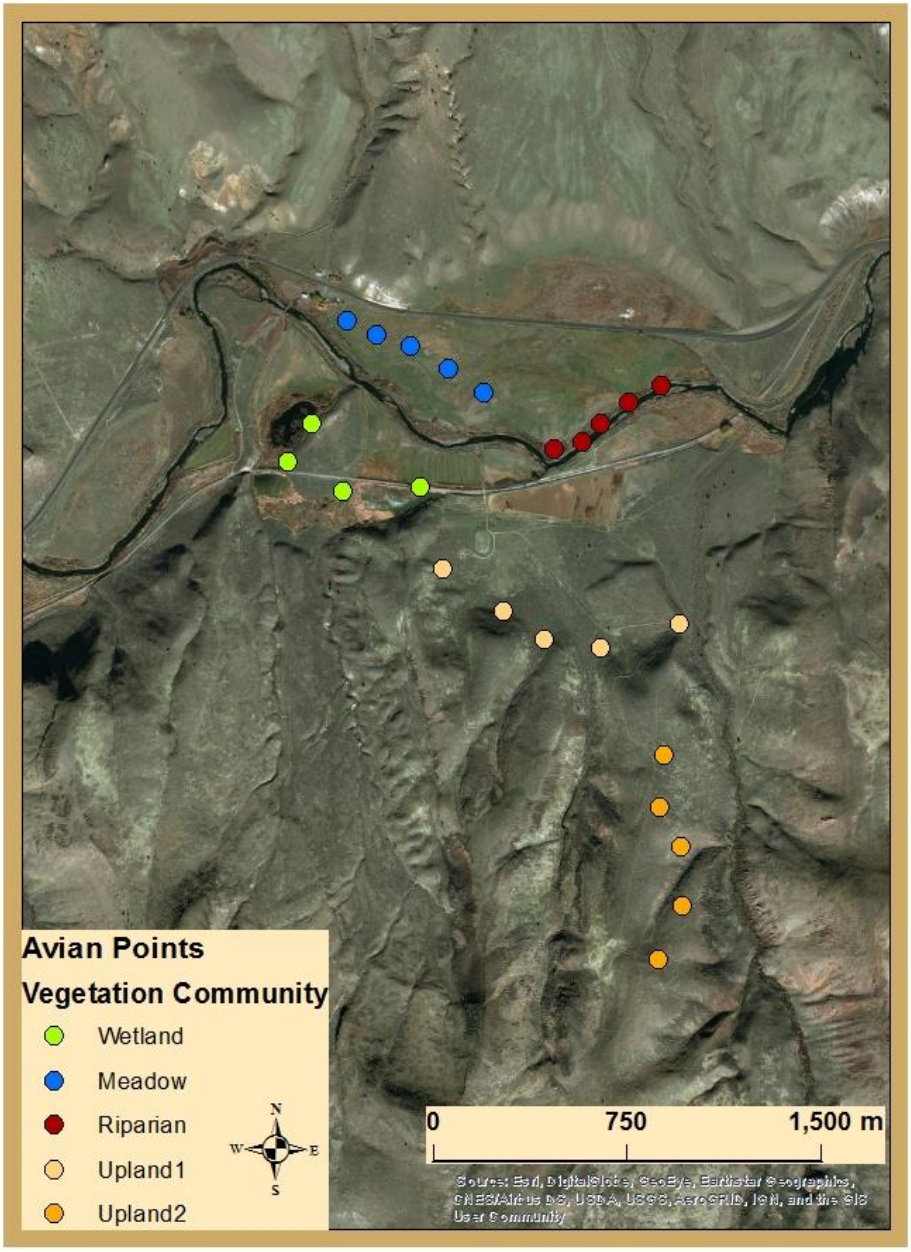


Figure 4.3.1. Location of each migratory bird survey station separated by community type at MRWMS. The upland sites were moved in 2015 to these new locations.

Table 4.3.2. Number of times avian transects were surveyed by year, separated by community type at MRWMS.

| Year | Meadow | Riparian | Upland1 | Upland2 | Wetland |
|---|---|---|---|---|---|
| 2006 | 1 | 1 | 1 | 1 | 1 |
| 2007 | 3 | 3 | 3 | 3 | 3 |
| 2008 | 3 | 3 | 3 | 3 | 3 |
| 2009 | 3 | 3 | 3 | 3 | 3 |
| 2010 | 2 | 2 | 2 | 2 | 2 |
| 2011 | 3 | 3 | 3 | 3 | 3 |
| 2012 | 3 | 3 | 2 | 2 | 2 |
| 2013 | 3 | 3 | 3 | 3 | 3 |
| 2014 | 3 | 3 | 3 | 3 | 3 |
| 2015 | 3 | 3 | 3 | 3 | 3 |
| 2016 | 2 | 2 | 2 | 2 | 2 |
| 2017 | 1 | 1 | 1 | 1 | 1 |
| 2018 | 3 | 3 | 3 | 3 | 3 |
| 2019 | 3 | 3 | 3 | 3 | 3 |

Individual birds detected by sight or sound during the five minutes at each survey point were counted only once. Detections were classified as a Typical Detection, a Flyover Detection, or a Flush Detection. Typical Detections were further classified by distance from the survey point (0–50m or >50m) and by the timeframe the detection was recorded (during minutes 0–3 or during minutes 3–5). Flyover Detections were further classified by the timeframe the detection was recorded (similar to Typical) and then as an Associated Flyover or Independent Flyover. An Associated Flyover occurs when a bird is detected in flight that could be found utilizing the community in which the survey is taking place. Conversely, an Independent Flyover is categorized as when a bird is detected in flight that is likely just passing through the community type and not utilizing it. Independent Flyovers could also be a bird observed in the distance, like a soaring raptor, that is not currently using the area but potentially could. Flush detections are explained as, “Birds encountered for this detection usually are disturbed, or flushed, by the observer as that person enters or leaves a point-count station and are not detected again during any of the station point counts. Flush detections are limited to birds detected only within the 0–50-m band from the center of the point-count station. The flush detection provides additional information on bird occurrence at the site that is not obtained from point counts (Huff et al. 2000).” Birds heard that were suspected of being within earshot but using a different community type adjacent to the one being surveyed are not counted in the survey. For instance, the calls of a

Sandhill Crane from the riparian area that could be heard while surveying the upland community are not counted as a detection. For all analyses, we included all data regardless of detection type.

As this is a habitat (community) based point count, this year we made a concerted effort to only include birds using the community type we were surveying. This appears to have been done inconsistently in previous sampling years, contradicting the methodology in Huff et al. 2000. Excluding birds in other communities is particularly challenging in the Meadow and Riparian communities due to their proximity. If a bird was on the edge of these communities or flying back and forth over the two communities, we included it. This involves some in the field judgment, but we feel the data will be more representative of the birds using particular vegetative communities.

***Data limitations and recommendations***

In 2015, "upland habitat points were relocated to better represent healthy sage steppe habitat (2015 Annual Report for the Malheur River Wildlife Mitigation Project)." In both 2016 and 2017, BPT staff continued to survey these new locations. This move was ill advised from an experimental design standpoint. It also limits staff's ability to draw conclusions on trend data in these sites, as an unnecessary source of variation (location) has been added. It has also come to BPT staff's attention that some of the points are located less than the 150 m minimum distance (>250 is ideal) between point count stations given by Huff et al. (2000). The minimum distance between points is 171.8 m in wetland community, 128.9 m in the meadow community, 97.6 m in the riparian community, 195.4 m in the upland 1 community, and 177.0 m in the upland 2 community. This may limit the independence between points and increases the likelihood of counting an individual on multiple points. Given these limitations, BPT staff has decided to continue monitoring the current sites without any more alterations. These sites should still provide metrics of relative abundance and species richness that BPT can monitor in the coming years. If in the future there is a desire to switch or move transects, we recommend adding new transects while following the methodology of Huff et al. (2000) to establish a transect and points, as opposed to moving current transects.

In 2015, a 5$^{th}$ wetland point was added to the wetland community transect but was not surveyed in subsequent years. Due to this inconsistency, data from this point were removed for this report. In future years, we will continue to collect data at the initial 4 points and exclude this 5$^{th}$ point.

In 2018, we corrected mistakes as they were found in the database. These mistakes were primarily made due to use of the 4 letter code in the database. For instance, we changed all instances of Red-necked Phalarope (*Phalaropus lobatus*) to Ring-Necked Pheasant (*Phasianus colchicus*). These fixes led to some changes in the species richness data presented in the 2017 report. It has also come to our attention that many of the tally types were entered incorrectly (i.e. > 50 m detections, reported as < 50 m detections and vice versa in many years). Since this

mistake doesn't affect how we are analyzing and reporting the data, we have not corrected this mistake yet, but wanted to make a note of it in case future analyses take the tally type into consideration.

### *Analysis*

*Community indicator species*

Indicator species were chosen for each of the communities surveyed. These species were chosen to represent certain vegetation communities based on their habitat preferences. These species will help to act as barometer of change in the abiotic and biotic conditions of that community over time. We continued to use the same indicator species that were selected in 2015 for this analysis, with the addition of the Wilson's Snipe (*Gallinago delicata*) as a meadow community species. In past analyses, species that were not as ecologically dependent on representative community types were chosen; this was rectified in 2015 by choosing species that may act as better indicators of community health.

To analyze changes in abundance of indicator species from 2006–2019, we analyzed and graphed the average abundance observed/transect annually in Excel. We only included the detections of indicator species that were in their respective community type for this analysis. Due to a low sample size of many indicator species, we pooled abundance on each transect instead of graphing average abundance/point annually.

*Species richness and species accumulation curves*

Species richness is the number of species observed in a site and species accumulation curves represent an accumulation of species throughout the sampling years. To analyze species richness and species accumulation curves in each community type, we analyzed and graphed these data in Excel. Although some years were sampled more often than others, for visual simplicity we treated years equally in the species accumulation graph. BPT staff will continue to monitor avian species richness and species accumulation curves in 2020.

### *Results*

*Species richness and species accumulation curves*

Since monitoring began in 2006, a total of 109 bird species have been detected on MRWMS. Over the 14 years of surveys, 70 species have been observed in the wetland community, 59 species in the meadow community, 61 in the riparian community, 50 in the upland #1 community, and 40 in the upland #2 community (Figure 4.3.2). BPT staff had 582 detections of 1,090 individuals, representing 53 different species at MRWMS in 2018. Similarly, in 2019 BPT staff had 580 detections of 1,074 individuals, representing 56 different species.

Notable additions to the species accumulation curves in 2019, included Western Kingbird (*Tyrannus verticalis*) in the Wetland community, Ash-throated Flycatcher (*Myiarchus cinerascens*) and Eastern Kingbird (*Tyrannus tyrannus*) in the Meadow community, an out of range Gray Catbird (*Dumetella carolinensis*) in the Riparian community, a distant singing Black-headed Grosbeak (*Pheucticus melanocephalus*) in the Upland 1 community, and a flyover Brown-headed Cowbird (*Moluthrus ater*) in the Upland 2 community. The Gray Catbird and the Black-headed Grosbeak were also new species to MRWMS in 14 years of bird surveys. The Black-headed Grosbeak was heard from the Upland 1 community, but due to the distance it is unclear if it was at the edge of the upland or in the riparian community, which would be more suitable habitat for that species.

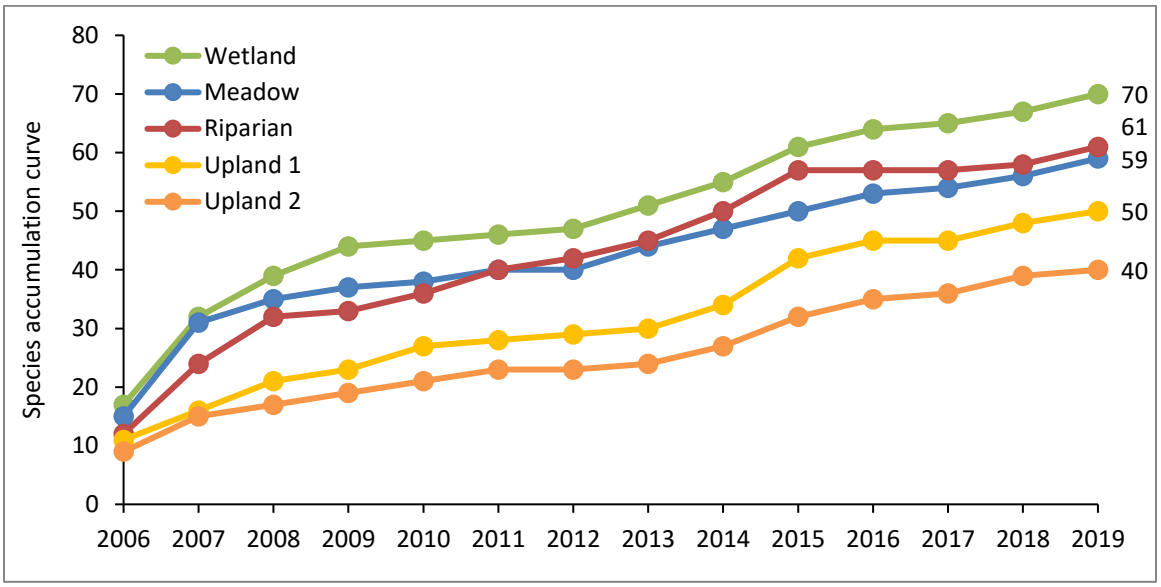


Figure 4.3.2. Avian species accumulation curves of the five vegetation communities at MRWMS from 2006–2019. Note that only 4 points were included in the wetland habitat in all years except 2015 when a 5th point was included.

*Community indicator species*

Wetland community

In the wetland community, the Mallard (*Anas platyrhyncos*) and Marsh Wren (*Cistothorus palustris*) were selected as indicator species. Mallards use a variety of wetland habitats, while the Marsh Wren typically utilizes dense wetland and marsh vegetation. Surveys conducted from 2006–2018 have shown fluctuating numbers of Mallards. As in 2018, Mallard abundance was well below the 14 year average in 2019 (Figure 4.3.3). Given the mobility of Mallards, this result should be interpreted cautiously. Marsh Wren abundance was above the 14 year average abundance in 2019 (Figure 4.3.4).

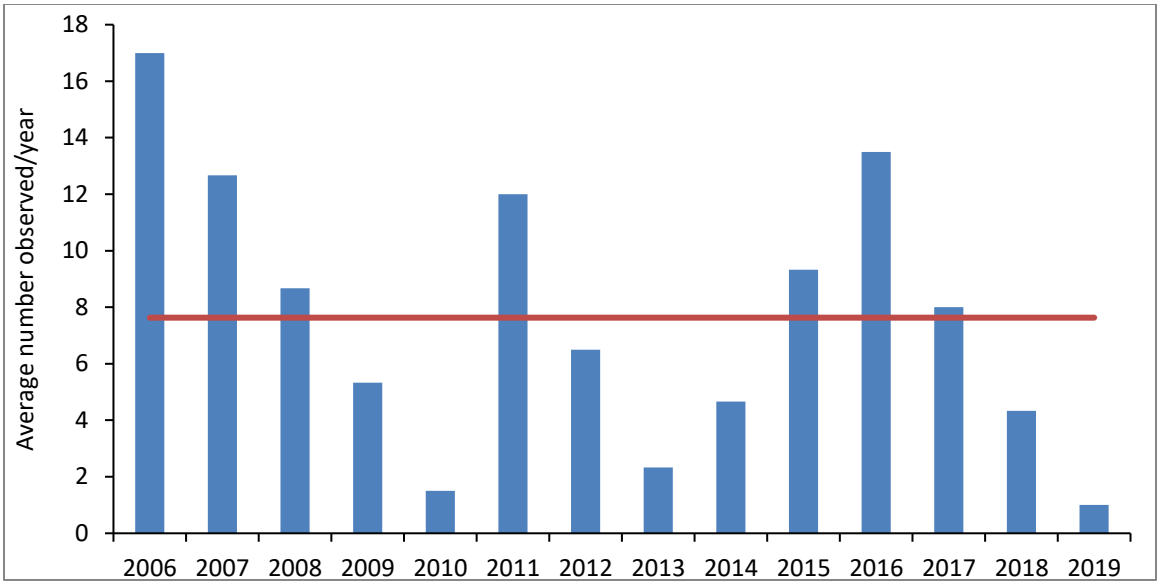


Figure 4.3.3. Average number of Mallards observed in the wetland community at MRWMS from 2006–2019. The red line represents the 14-year average abundance. Note that only 4 points were included in the wetland habitat in all years (5th point from 2015 excluded). SEs available, but not included.

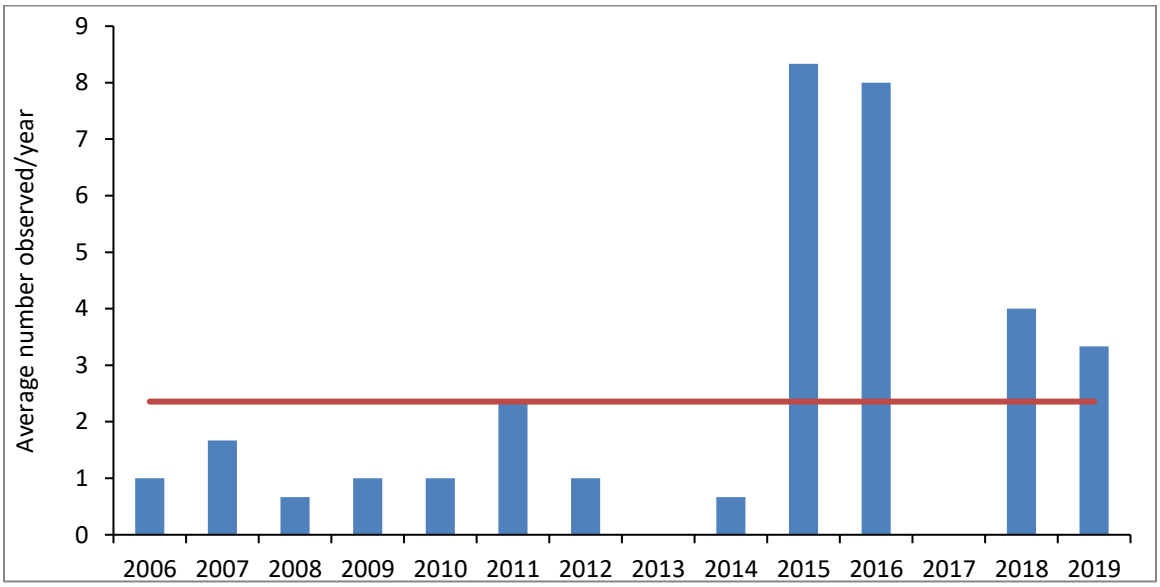


Figure 4.3.4. Average number of Marsh Wrens observed in the wetland community at MRWMS from 2006–2019. Note that only 4 points were included in the wetland habitat in all years (5th point from 2015 excluded). The red line represents the 14-year average abundance. SEs available, but not included.

Meadow community

In the meadow community, the Wilson's Snipe and Long-billed Curlew (*Numenius americanus*) were selected as indicators of meadow community health, as these species often

associate with wetlands. Although abundance is variable from year to year, Wilson's Snipes have been declining over the 14 years of monitoring, however we did detect higher numbers in 2019. (Figure 4.3.5). Wilson's Snipes have undergone a significant decline in Breeding Bird Surveys in the state of Oregon from 1966–2015 (Sauer et al. 2017). Surveys conducted from 2006–2019 have also shown a variable but declining annual abundance of Long-billed Curlews in the meadow community, and for the past 3 years no curlews were observed (Figure 4.3.6). It should be noted, we excluded curlews from a count in the meadow because they were outside of the meadow community across the highway in the upland. They flew into the meadow shortly after the survey ended.

Wilson's Snipe tend to avoid tall dense vegetation (Mueller 1999) and Long-billed Curlews typically utilize short or mixed grass prairie during the breeding season but move to taller denser grass during brood rearing (Dugger and Dugger 2002). Note that this habitat preference information differs from the information presented in the 2015 and 2016 report. Given these habitat preferences, management practices (late season grazing) and dense meadow vegetation may be limiting Wilson's Snipe and Long-billed Curlew use of this vegetation community.

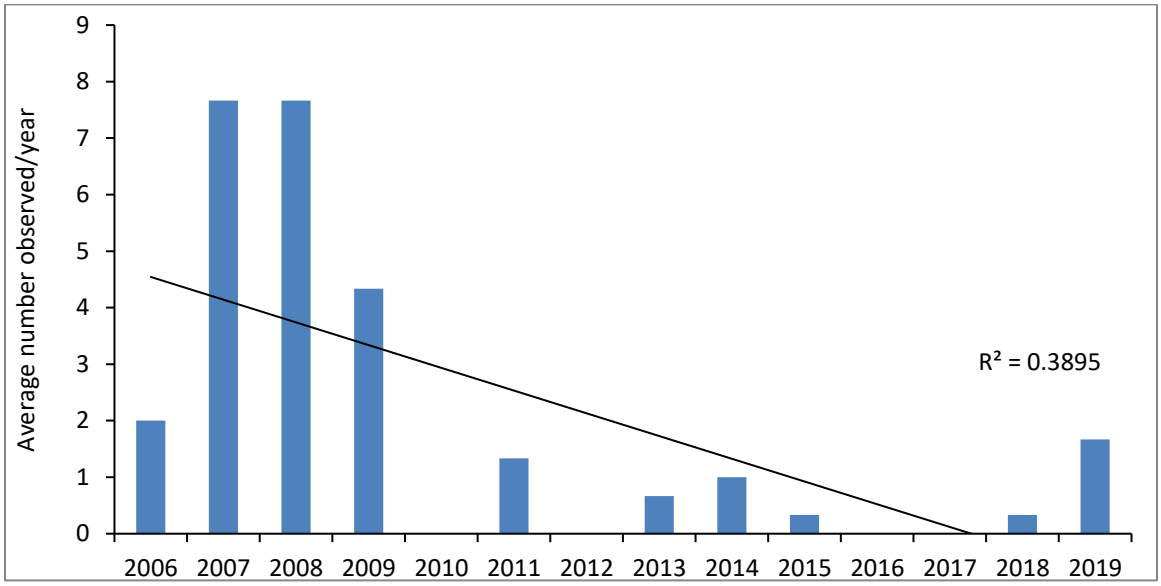


Figure 4.3.5. Average number of Wilson's Snipes observed in the meadow community at MRWMS from 2006–2019, with linear trend and associated $R^2$ included. SEs available, but not included.

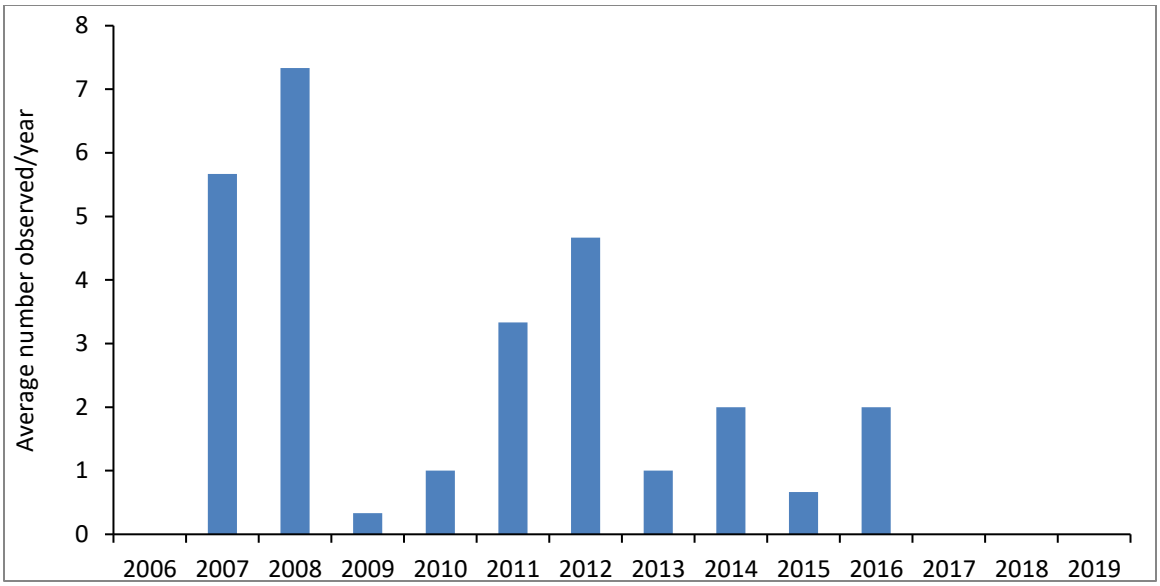


Figure 4.3.6. Average number of Long-billed Curlews observed in the meadow community at MRWMS from 2006–2019. SEs available, but not included.

Riparian community

In the riparian community, Yellow Warblers (*Setophaga petechial*) and Song Sparrows (*Melospiza melodia)* were selected as an indicator of community health. Yellow Warblers are often found in riparian communities, including willow lined streams, while Song Sparrows utilize a wide variety of habitats including thickets. Surveys conducted from 2006–2019 have shown variable abundance of Yellow Warblers, but BPT staff has documented abundances over the long term average in the last five years of surveying (Figure 4.3.7). Song Sparrow abundance has been fairly stable over the last 14 years with some annual variation. BPT staff will continue to manage invasive plant species, in particular the control of poison hemlock *(Conium maculatum)* in the riparian area (Figure 4.3.8).

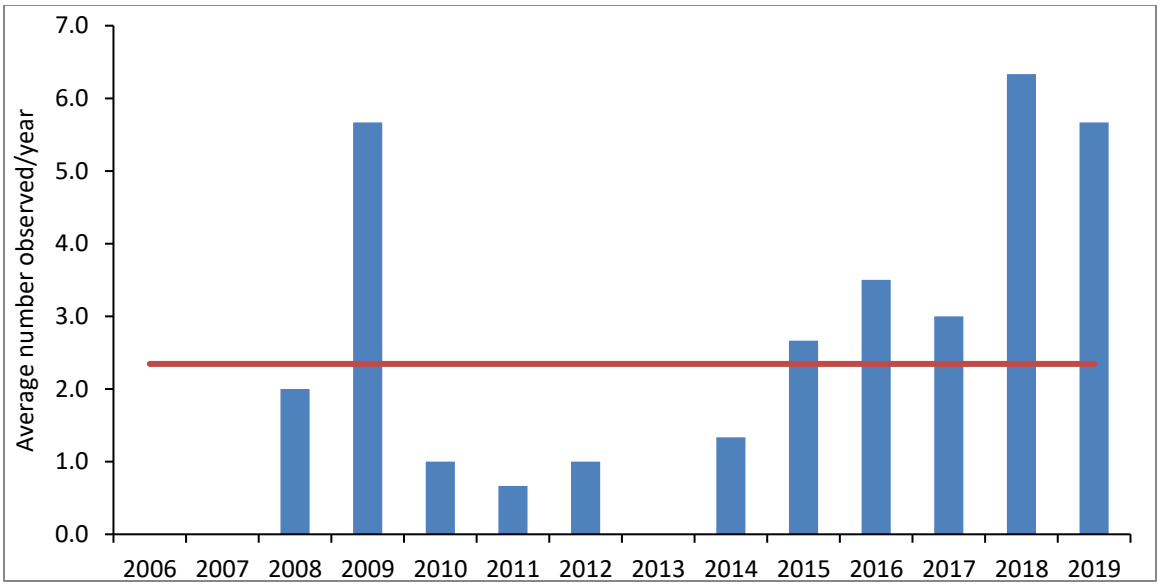


Figure 4.3.7. Average number of Yellow Warblers observed in the riparian community at MRWMS from 2006–2019. The red line represents the 14-year average abundance. SEs available, but not included.

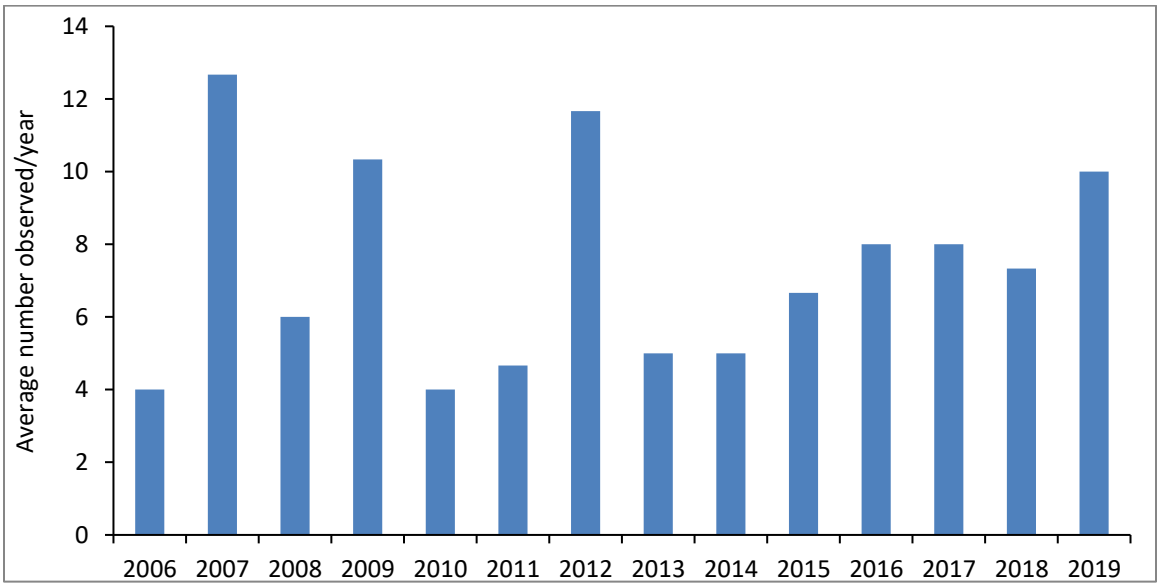


Figure 4.3.8. Average number of Song Sparrows observed in the riparian community at MRWMS from 2006–2019. SEs available, but not included.

Upland community

The Lark Sparrow (*Chondestes grammacus*) and the Brewer's Sparrow (*Spizella breweri*) were selected as an indicator of condition in the upland sage steppe community. Both species are

common avifauna that inhabit the sage steppe ecosystem and rely on dense shrub cover and an abundance of native grasses to build their nests. The Brewer's Sparrow is one of a few sagebrush obligate bird species, and they rely on this vegetation community during the breeding season. Two upland community transects were surveyed. Upland #1 is located at lower elevation, a northern aspect and gradual slopes with a higher grass/forb understory as compared to upland #2 which is located at a higher elevation, an eastern aspect and steeper slopes with more sagebrush spp. composing the understory. Surveys conducted from 2006–2019 have shown a stable abundance of Lark Sparrows utilizing both upland sites (Figure 4.3.9). No Brewer's Sparrows were detected in either upland sites in 2019 (Figure 4.3.10). Brewer's Sparrows will be further monitored in 2020.

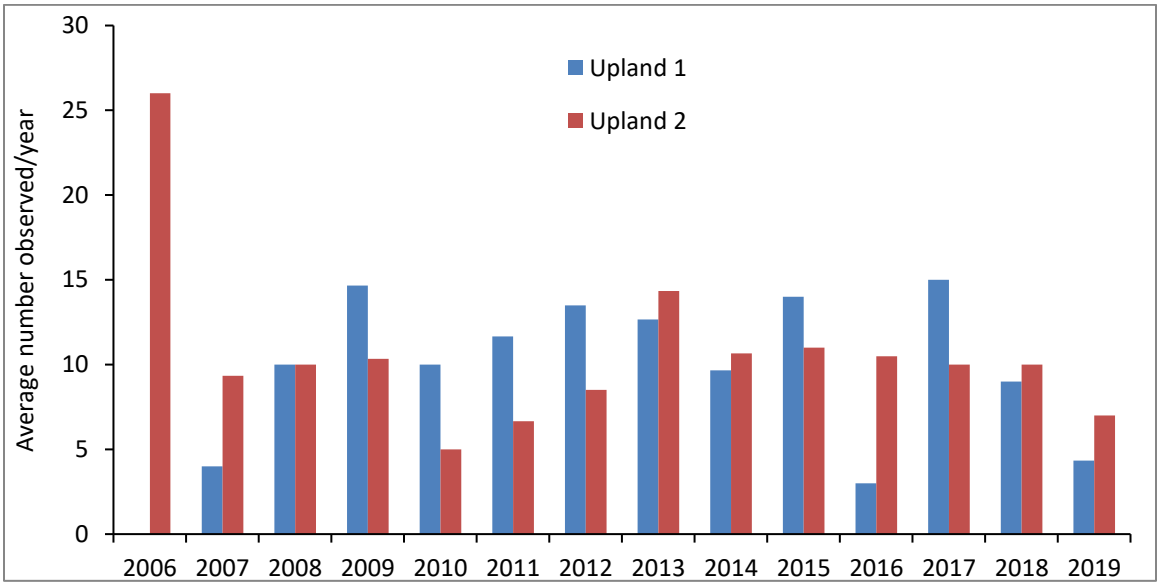


Figure 4.3.9. Average number of Lark Sparrows observed in the upland #1 and upland #2 community at MRWMS from 2006–2019. SEs available, but not included.

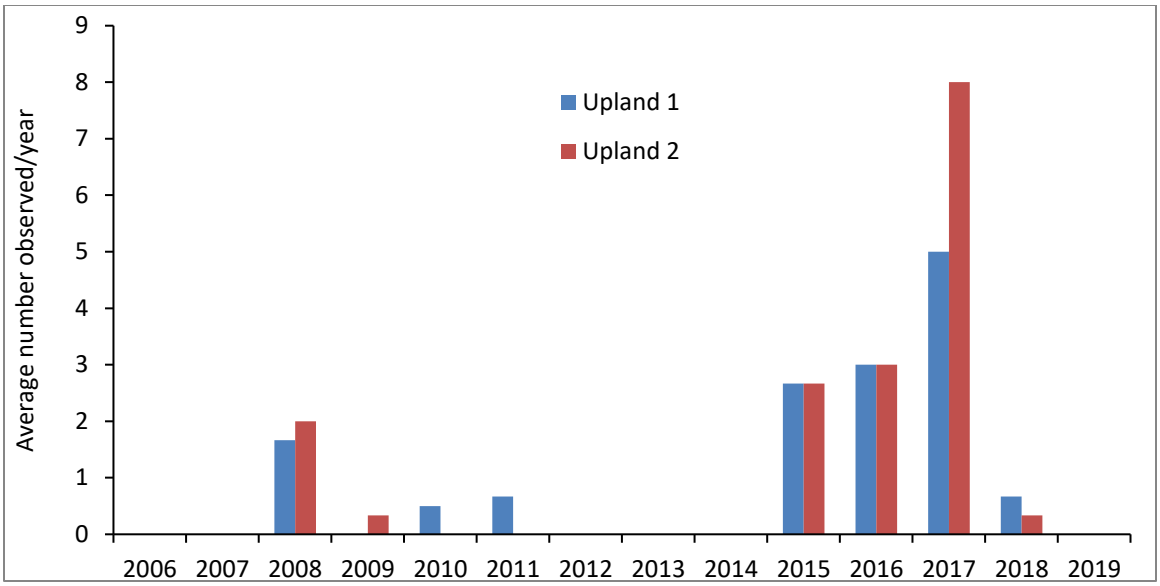


Figure 4.3.10. Average number of Brewer's Sparrows observed in the upland #1 and upland #2 community at MRWMS from 2006–2019. SEs available, but not included.

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Dugger, B.D. and K.M. Dugger. 2002. Long-billed Curlew (*Numenius americanus*), version 2.0. In The Birds of North America (P. G. Rodewald, editor). Cornell Lab of Ornithology, Ithaca, New York, USA. https://doi.org/10.2173/bna.628

Huff, M.H. Bettinger, K.A., Ferguson, H.L., Brown, M.J., Altman, B. 2000. A habitat-based point-count protocol for terrestrial birds, emphasizing Washington and Oregon. Gen. Tech. Rep. PNW-GTR-501.Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station. 39 p.

Mueller, H. 1999. Wilson's Snipe (*Gallinago delicata*), version 2.0. In The Birds of North America (P. G. Rodewald, editor). Cornell Lab of Ornithology, Ithaca, New York, USA. https://doi.org/10.2173/bna.417

Sauer, J.R., D.K. Niven, J.E. Hines, D.J. Ziolkowski, Jr, K.L. Pardieck, J.E. Fallon, and W.A. Link. 2017. The North American Breeding Bird Survey, Results and Analysis 1966 – 2015. Version 2.07.2017 USGS Patuxent Wildlife Research Center, Laurel, MD. Available at: https://www.mbr-pwrc.usgs.gov/bbs/

## Wetland Brood Surveys

BPT staff conducted the fourth year of wetland brood surveys in 2019. The objectives of this survey are to monitor waterfowl brood use and number in association with water management including associated practices such as implementation of a new culvert system, moist soil management, disking, and burning. Efforts include counting the number of chicks per brood and number of broods per water body. Shorebirds and additional waterbirds are also

counted in conjunction with broods. This survey will produce a summary of annual waterfowl brood, shorebird, and waterbird trends within the two identified water bodies (Wetland 1 and Wetland 2).

### *Sampling design*

Five observation points were established at the two main wetland areas (Table 4.4.1, Figure 4.4.1). Three surveys were conducted with three weeks between survey data in 2019. We conducted brood surveys on June 19, July 11, and July 31.

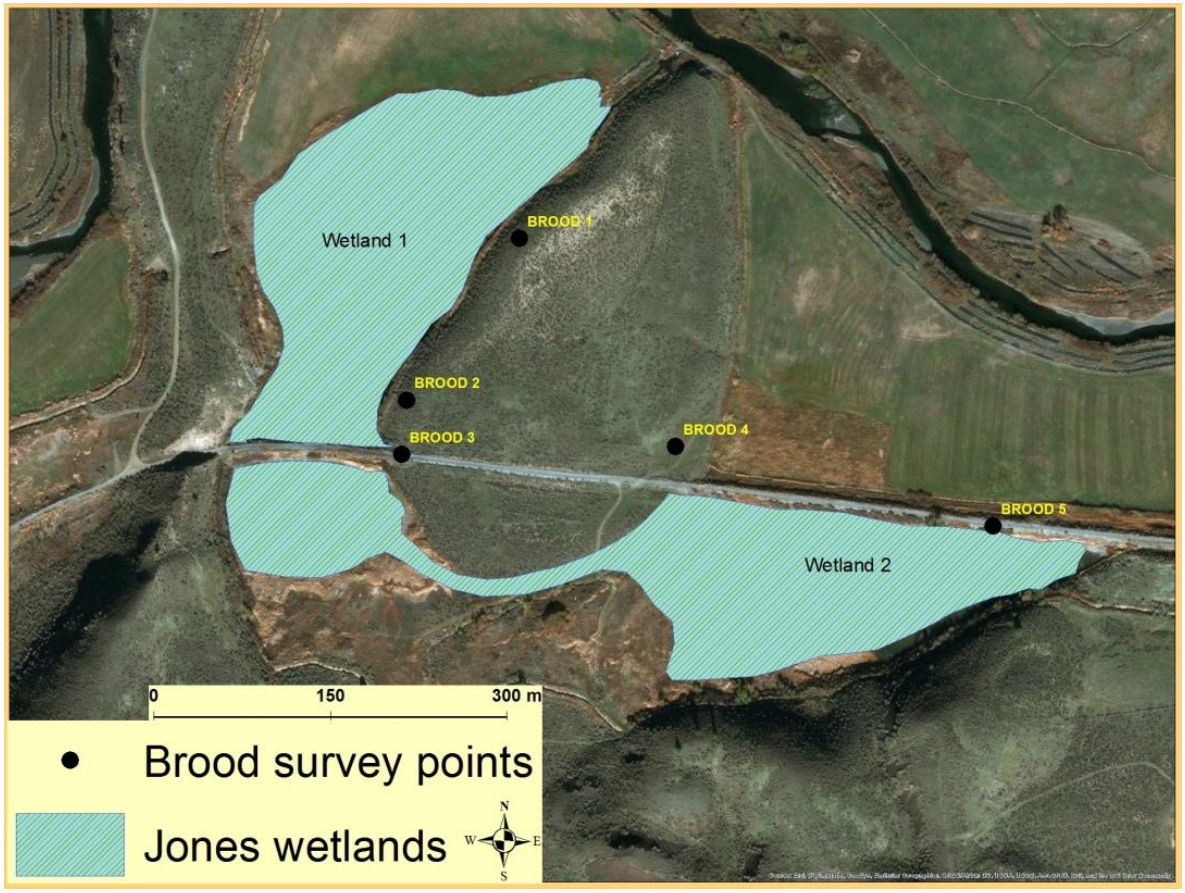


Figure 4.4.1. Map of wetland brood survey locations. Observation points Brood 1 and Brood 2 survey Wetland 1, while observation points Brood 3–Brood 5 survey Wetland 2 on MRWMS.

Table 4.4.1. Spatial locations in UTMs and decimal degrees for Brood survey points at MRWMS.

| Name | X (UTM E) | Y (UTM N) | Latitude | Longitude |
|---|---|---|---|---|
| BROOD 1 | 425192 | 4849727 | 43.7968 | -117.9299 |
| BROOD 2 | 425096 | 4849589 | 43.7956 | -117.9311 |
| BROOD 3 | 425092 | 4849543 | 43.7952 | -117.9311 |
| BROOD 4* | 425288 | 4849555 | 43.7953 | -117.9287 |
| BROOD 5 | 425595 | 4849482 | 43.7947 | -117.9249 |

UTM points in NAD_1983_UTM_Zone_11N.
*Note a slight movement from previous reports. The new coordinates provide a better view.

Observers completed the following protocol for each of the five observation points:

1. Navigate to the survey point using the GPS unit.
2. Wait for a couple minutes to allow the birds to settle before beginning the count.
3. Record number of individuals, broods, number of chicks per brood, and brood age class by waterfowl species (Table 4.4.2).
4. Record age and sex (where dimorphic) of individual shorebirds and waterbirds

Table 4.4.2. Age of young was classified by plumage; using these classifications (Gollop and Marshall 1954).

| Plumage class | Description | Subclasses |
|---|---|---|
| I. Downy young | No feathers visible | Ia, Ib, Ic |
| II. Partially feathered | Feathers now visible | IIa, IIb, IIc |
| III. Fully Feathered | Feathered but flightless | III |

In 2019, like the previous year, we tried to stay at each point for five minutes, however if we were still counting birds or seeing new birds the count time was often extended. We also had to count many adults and broods while walking between the established brood survey points. These data were noted as between points in the dataset but treated the same in the analysis. We had an instance where we saw a previously undetected brood while driving past the survey point after the survey had ended, we also noted this in the dataset but treated it the same as the rest of the data.

### *Analysis*

*Species richness and species accumulation curves*

We report species richness estimates and accumulative number of species observed on the wetlands including all species regardless of whether broods were present or not. We also graphed the species accumulation curves and species richness for species observed with broods in each survey period.

*Mallard and Gadwall brood numbers*

Since Mallards (*Anas platyrhynchos*) were the most commonly detected species with broods, we graphed the number of Mallard broods at each wetland during each visit. In 2019, we added an analysis of Gadwall (*Mareca strepera*) broods at each wetland visit, Gadwalls are the second most commonly detected species with broods over 4 years of surveys. This will allow us to compare brood production through the years on these two common breeding species.

***Results***

*Species richness and species accumulation curves*

Nine waterbird species were detected during brood surveys on MRWMS in 2018. In 2019, 14 species were detected during brood surveys, including 6 species of waterfowl, 1 species of grebe, 2 species of terns, 3 species of wading birds, the American Coot (*Fulica americana*), and the American White Pelican (*Pelcanus erythrorhynchos*). Twenty-three species of waterfowl, shorebirds, and other waterbirds have been detected during brood surveys over the past four years, and the Caspian Tern (*Sterna caspia*) and White-faced Ibis (*Plegadus chihi*) were new additions in 2019. We have documented 11 avian species with broods over the last four years on MRWMS, 6 species with broods on wetland 1, and 10 species with broods on wetland 2 (Figure 4.4.2). In 2019, American Coot broods (3 broods) were documented for the first time on wetland 1, and an American Wigeon (*Anas americana*) brood was documented for the first time on wetland 2. The American Wigeon brood was also the first time this species has been documented with broods on the MRWMS in four years of surveys.

On June 19, 2019, BPT staff documented no species with broods. The cooler spring weather may have delayed breeding this year. On July 11, 2019 BPT staff documented 4 species on wetland 1, the Gadwall, Mallard, American Coot, and Pied-billed Grebe (*Podilymbus podiceps*) and 3 species on wetland 2, the American Wigeon, Gadwall, and Mallard. On July 31, 2019, BPT staff documented 4 species on wetland 1, the American Coot, Gadwall, Mallard, and Pied-billed Grebe and 4 species on wetland 2, the Cinnamon Teal, Gadwall, Mallard, and Pied-billed Grebe (Figure 4.4.3).

*Mallard and Gadwall brood numbers*

A total of 8 Mallard broods were observed between the two wetlands in 2019, which is fewer than the 15 observed in 2018. This difference is primarily due to the 0 broods observed on the first survey day (Figure 4.4.4). A total of 7 Gadwall broods were observed between the two wetlands in 2019, similar to the 8 observed in 2018 (Figure 4.4.5).

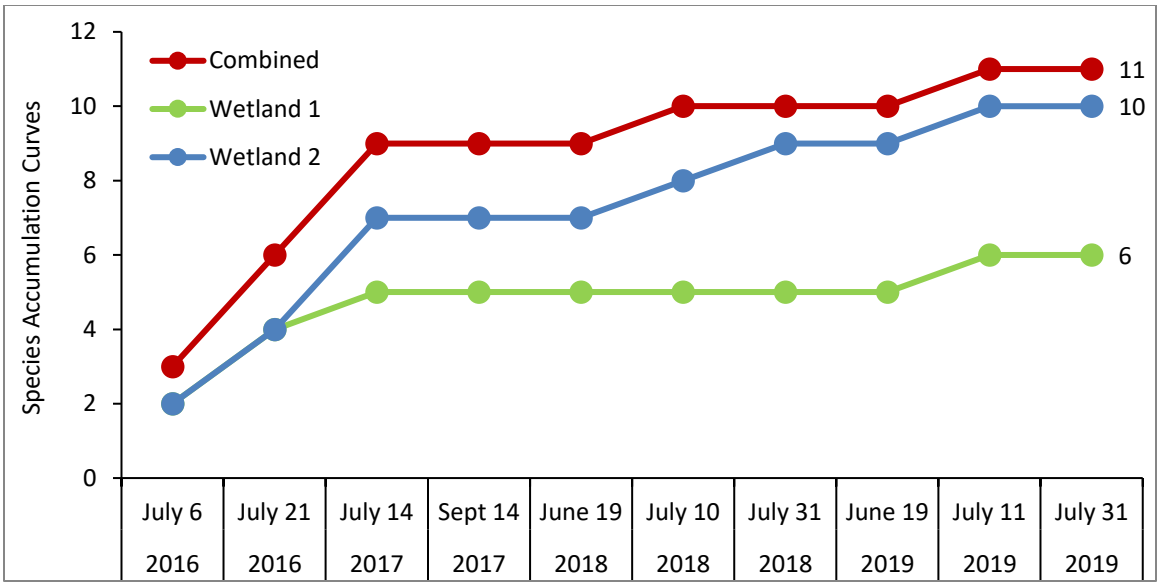


Figure 4.4.2. Species accumulation curves of species with broods on wetland 1, wetland 2, and those sites combined at MRWMS in the 10 survey days during 2016–2019.

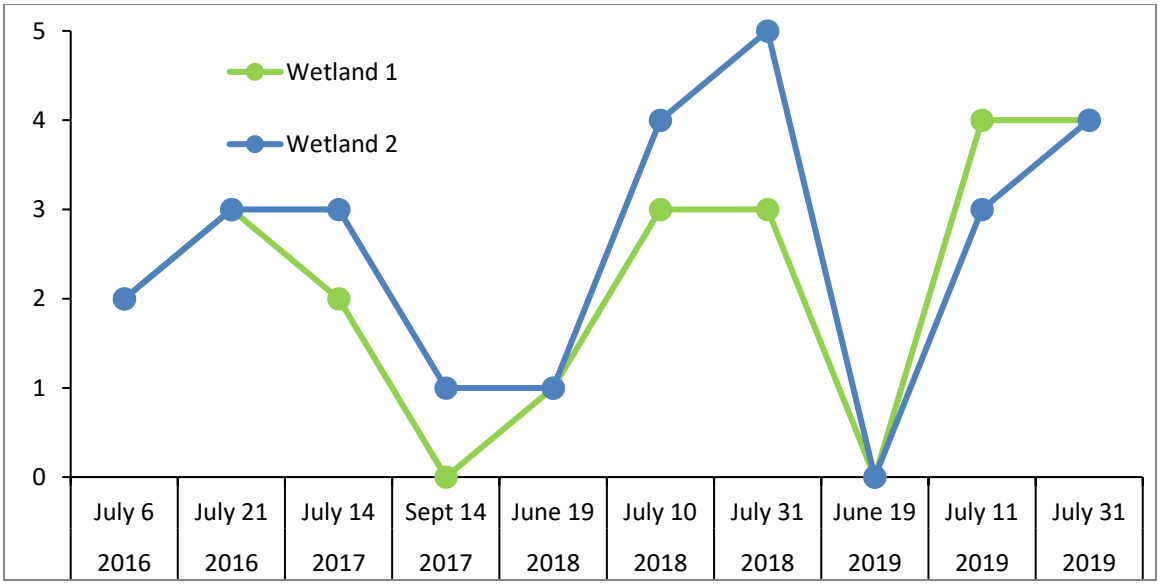


Figure 4.4.3. Species richness for species with broods on wetland 1 and wetland 2 at MRWMS on the 10 survey days during 2016–2019.

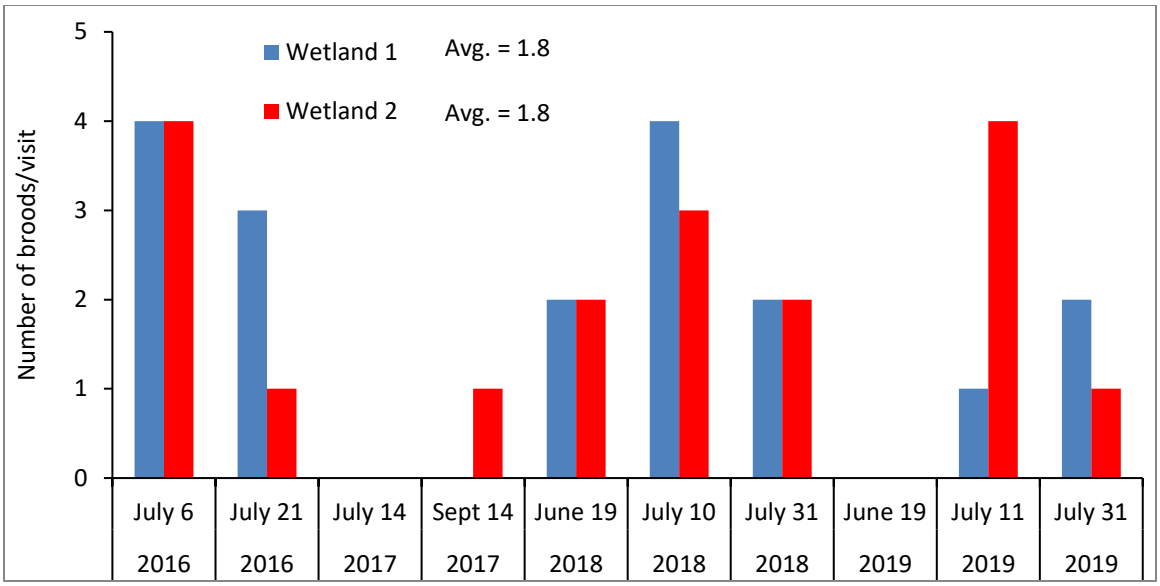


Figure 4.4.4. Number of Mallard broods observed on wetland 1 and wetland 2 at MRWMS in the 10 survey days during 2016–2019. The average number of Mallard broods/visit is also included for each wetland.

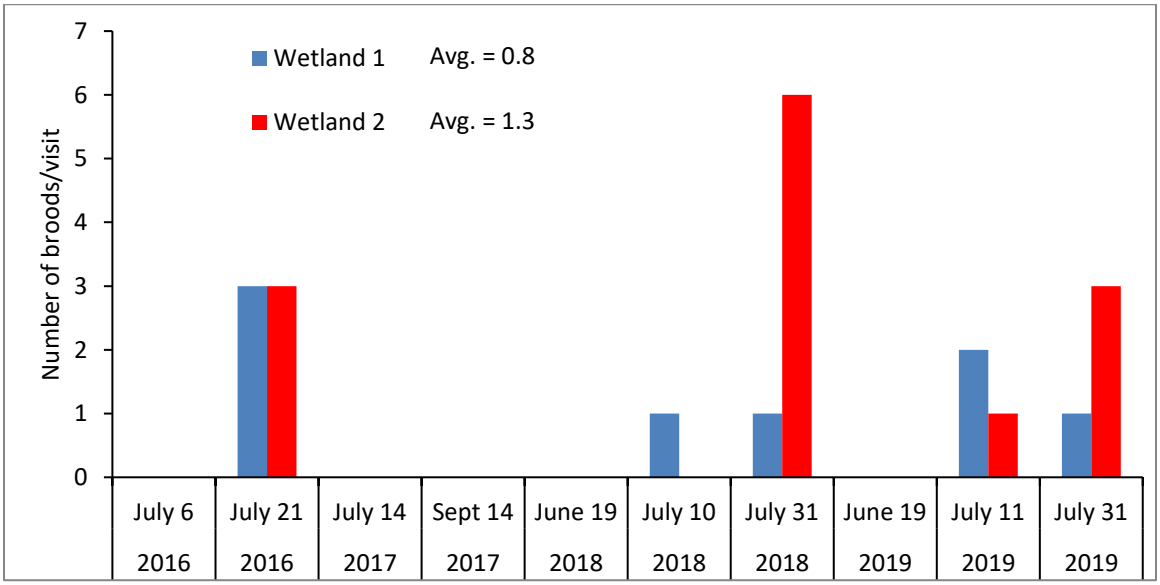


Figure 4.4.5. Number of Gadwall broods observed on wetland 1 and wetland 2 at MRWMS in the 10 survey days during 2016–2019. The average number of Gadwall broods/visit is also included for each wetland.

### *Discussion*

Although we know that we likely missed both some early broods and late broods, the dates used in 2018 and 2019 appeared to capture the pulse of brood activity at MRWMS. The three-week gap between survey days also seems appropriate, so we will continue to use similar dates in future years. This will also help make comparisons between years more valid.

In 2019, BPT implemented alterations to the wetlands on MRWMS with funding through an Oregon Watershed Enhancement Board (OWEB) awarded grant. These alterations will allow BPT staff to have greater control of water depth, wetland size, and longevity of inundation. Brood surveys will continue in future years to capture the effects of these wetland alterations.

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# Small Mammal Surveys

An assessment of small mammal population trends continued in 2016 on the Malheur River Wildlife Mitigation Site. Three different vegetation communities are surveyed for small mammals. Survey locations for all these communities remained the same in 2019. These include the sagebrush community, agricultural fields (dominated with native grass), and riparian community. The trapping protocol followed the Monitoring and Evaluation Plan for the Albeni Falls Wildlife Mitigation Project (2002) with some modifications.

### *Sampling design*

Capture was accomplished using Sherman live traps and a rolled oat and peanut butter bait. For each community, 100 Sherman live traps were spaced 10 m apart in a 100 m x 100 m area. The origins for the trap areas were established from previous years. The first trap was set at the origin. From the origin, traps were set every 10 m along two perpendicular lines running along an established azimuth 100 m in each direction. We continued with the azimuths used since at least 2017 (Table 4.5.1). Traps were then set within the right angle of the two lines created to make grid design of 100 traps.

Table 4.5.1. Origin coordinates for small mammal trapping at MRWMS in the agricultural field, riparian, and sagebrush communities (Coordinates in NAD_1983_UTM_Zone_11N).

| Site | GPS Name | X (UTM E) | Y (UTM N) | Azimuth |
|---|---|---|---|---|
| Agricultural Field | MAMMALFIELD | 426335 | 4849667 | S & E |
| Riparian | MAMMRIPMR | 425684 | 4849685 | N & W |
| Sagebrush | SAGE MAMM | 425798 | 4849131 | S & W |

In 2019, BPT staff sampled small mammals on July 16th and 17th. Upon capture of each small mammal, we weighed, sexed, and aged all individuals. Individuals trapped on the first night are then marked for potential recapture by marking them with a non-toxic fabric marker. By marking mammals captured on the first capture event BPT can accumulate recapture data for use as a potential secondary analysis tool for future trapping projects.

### *Analysis*

*Species richness and species accumulation curves*

In past reports, we have relied on the Simpsons Diversity Index to calculate diversity and evenness. However, due to the low number of individuals caught each year, we have decided to report only the annual species richness and species accumulation curves to illustrate how many small mammal species we document using the forest and meadow/riparian vegetation communities. Species richness is the number of species trapped in a site and species accumulation curves represent an accumulation of species throughout the sampling years. For example, in the sagebrush community in 2012 BPT staff caught a Great Basin pocket mouse (*Perognathus parvus*). Since this species had not been caught in the sagebrush community in previous years, the curve raises by one species in 2012.

*Abundance*

In the past, we have used the small mammal data to report the estimated number of a species that would be caught in 1,000 traps. In the 2017 report, we decided that this extrapolation of the data is unnecessary, and the only benefit appears to be the ability to report whole numbers. For reporting abundance in this report, we used the abundance/trap nights as a metric for relative abundance. Trap nights are equal to the number of traps set * the number of nights that these traps were set. We summarized trap effort from 2007-2019 in Table 4.5.2. Please note that the riparian community has had less than 100 traps set in a few years, but since we report abundance/trap night we are correcting for the difference between the number of traps set between communities.

After looking at the number of recaptures in the data set, we have concluded that use of the Lincoln-Petersen mark-recapture method would not be biologically meaningful. For this report we treat individuals the same regardless of if they were a new capture or a recapture. However, we will continue to mark individuals and obtain mark-recapture data in the coming years.

Table 4.5.2. Small mammal trapping effort at MRWMS in the agricultural field, riparian, and sagebrush communities from 2007–2019 (note that no traps were set in 2013).

| | | Traps | Nights | Trap Nights |
|---|---|---|---|---|
| Agricultural Field (reseeding field) Moved in 2015 | 2007 | 100 | 2 | 200 |
| | 2008 | 100 | 2 | 200 |
| | 2009 | 100 | 2 | 200 |
| | 2010 | 100 | 2 | 200 |
| | 2011 | 100 | 2 | 200 |
| | 2012 | 0 | 0 | 0 |
| | 2014 | 100 | 1* | 100 |
| | 2015 | 100 | 2 | 200 |
| | 2016 | 100 | 2 | 200 |
| | 2017 | 100 | 2 | 200 |
| | 2018 | 100 | 2 | 200 |
| | 2019 | 100 | 2 | 200 |
| Riparian | 2007 | 100 | 2 | 200 |
| | 2008 | 83 | 2 | 166 |
| | 2009 | 83 | 2 | 166 |
| | 2010 | 100 | 2 | 200 |
| | 2011 | 81 | 2 | 162 |
| | 2012 | 79 | 2 | 158 |
| | 2014 | 100 | 1* | 100 [a] |
| | 2015 | 75 | 2 | 150 |
| | 2016 | 50 | 2 | 100 |
| | 2017 | 100 | 2 | 200 |
| | 2018 | 100 | 2 | 200 |
| | 2019 | 100 | 2 | 200 |
| Sagebrush | 2007 | 100 | 2 | 200 |
| | 2008 | 100 | 2 | 200 |
| | 2009 | 100 | 2 | 200 |
| | 2010 | 100 | 2 | 200 |
| | 2011 | 100 | 2 | 200 |
| | 2012 | 100 | 2 | 200 |
| | 2014 | 100 | 1 | 100 |
| | 2015 | 100 | 2 | 200 |
| | 2016 | 100 | 2 | 200 |
| | 2017 | 100 | 2 | 200 |
| | 2018 | 100 | 2 | 200 |
| | 2019 | 100 | 2 | 200 |

* report said sampled twice, but only have data for one sampling period, so we are treating it as 1 sampling period
[a]unclear if 100 traps were set.

***Results***

*Species richness and species accumulation curves*

Throughout the 11 years of sampling we have documented two species of small mammals in the agricultural field, four species in the sagebrush community, and five in the riparian community. We have also documented five species at MRWMS (Figure 4.5.1). These species represent two small mammal families, Cricetidae and Heteromyidae.

In 2019, BPT staff caught zero species in the sagebrush community and the agricultural field, and one species, the deer mouse (*Peromyscus* spp.) in the riparian community. The long-term average number of species caught/year is 0.64 species in the agricultural field, 1.83 species in the riparian community, and 1.17 species in the sagebrush community.

Figure 4.5.1. Small mammal species accumulation curves in the agricultural field, riparian and sagebrush communities on the MRWMS from 2007–2019 (note differences in trapping effort between years and sites, see Table 4.5.2).

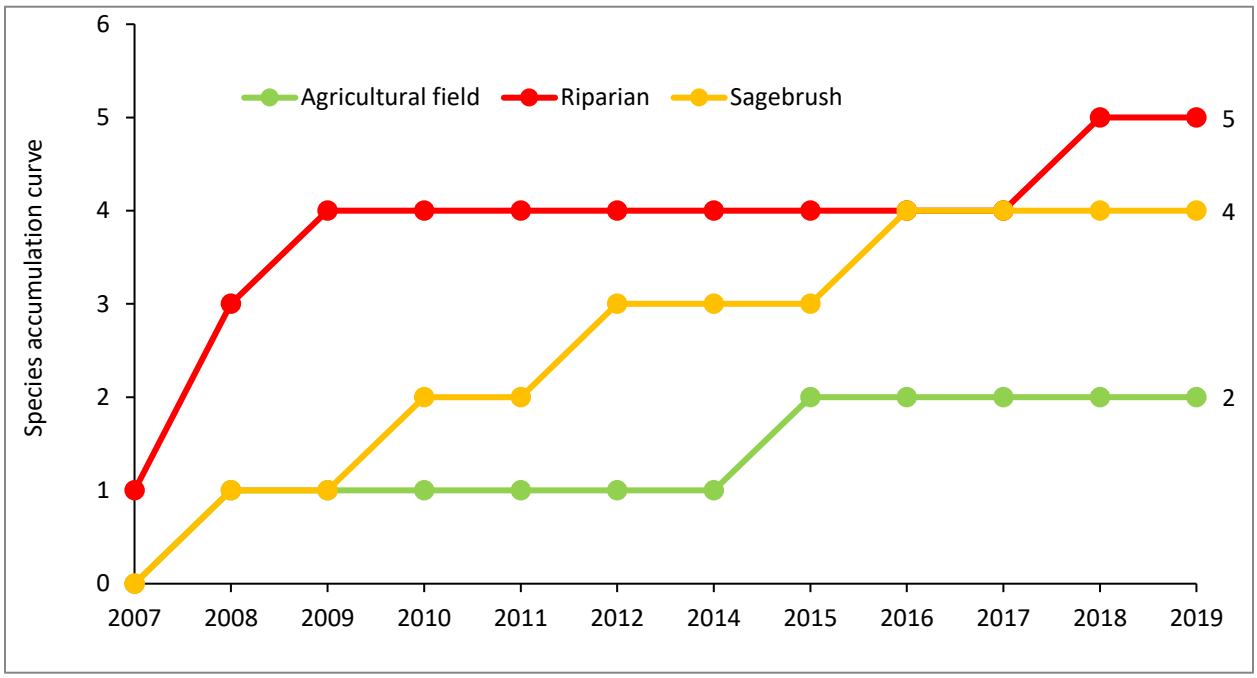
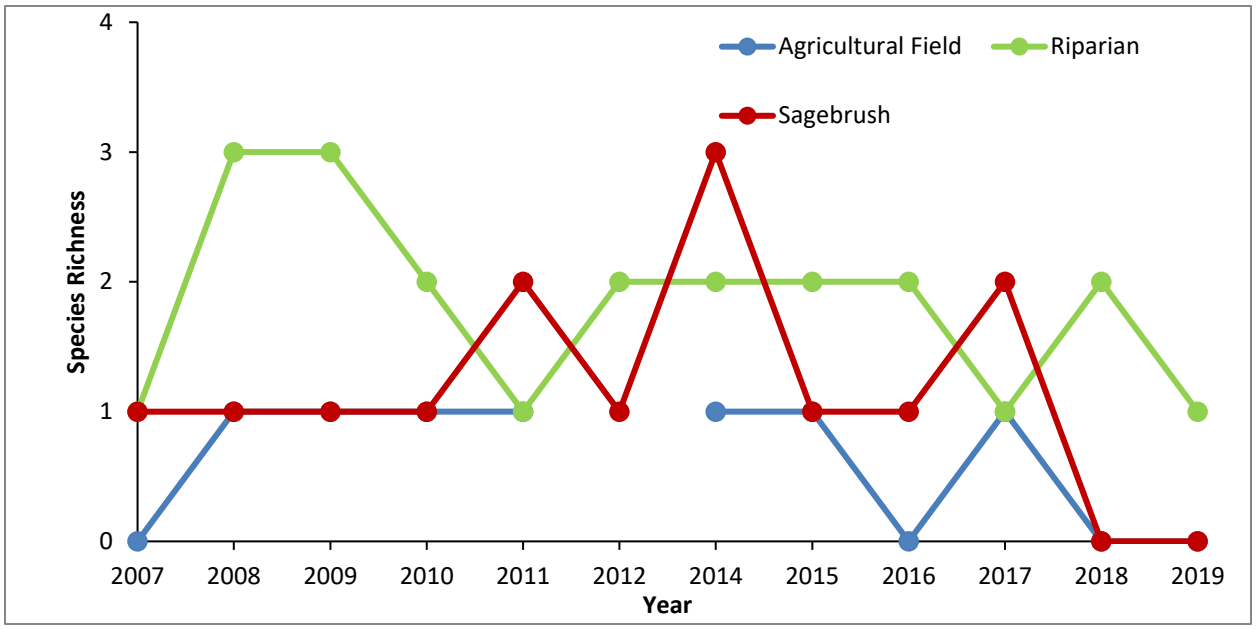


Figure 4.5.2. Species richness of small mammals in the agricultural field, riparian and sagebrush communities on the MRWMS from 2007–2019 (note differences in trapping effort between years and sites, see Table 4.5.2).




*Abundance*

BPT staff caught 2 individuals in 2019, both in the riparian community. Abundance of small mammals/trap night was lower for all three communities in 2019 than the long-term average (Table 4.5.3). We captured two deer mice in the riparian community.

Table 4.5.3. Abundance and abundance/trap night of all small mammals, deer mice, and montane voles trapped on MRWMS from 2006–2019 (note that no traps were set in 2013).

| | | Small mammals | | Deer mouse | | Montane vole | |
|---|---|---|---|---|---|---|---|
| | | # | #/trap night | # | #/trap night | # | #/trap night |
| Agricultural Field (reseeding field) Moved in 2015 | 2007 | 0 | 0.000 | 0 | 0.000 | 0 | 0.000 |
| | 2008 | 1 | 0.005 | 1 | 0.005 | 0 | 0.000 |
| | 2009 | 11 | 0.055 | 11 | 0.055 | 0 | 0.000 |
| | 2010 | 1 | 0.005 | 1 | 0.005 | 0 | 0.000 |
| | 2011 | 10 | 0.050 | 10 | 0.050 | 0 | 0.000 |
| | 2012 | NA | NA | NA | NA | NA | NA |
| | 2014 | 1 | 0.010 | 1 | 0.010 | 0 | 0.000 |
| | 2015 | 1 | 0.005 | 0 | 0.000 | 0 | 0.000 |
| | 2016 | 0 | 0.000 | 0 | 0.000 | 0 | 0.000 |
| | 2017 | 2 | 0.010 | 2 | 0.010 | 0 | 0.000 |
| | 2018 | 0 | 0.000 | 0 | 0.000 | 0 | 0.000 |
| | 2019 | 0 | 0.000 | 0 | 0.000 | 0 | 0.000 |
| | **Average** | 2.45 | 0.01 | 2.36 | 0.01 | 0.00 | 0.00 |
| Riparian | 2007 | 1 | 0.005 | 1 | 0.005 | 0 | 0.000 |
| | 2008 | 18 | 0.108 | 15 | 0.090 | 1 | 0.006 |
| | 2009 | 25 | 0.151 | 23 | 0.139 | 1 | 0.006 |
| | 2010 | 17 | 0.085 | 12 | 0.060 | 5 | 0.025 |
| | 2011 | 12 | 0.074 | 12 | 0.074 | 0 | 0.000 |
| | 2012 | 21 | 0.133 | 16 | 0.101 | 1 | 0.006 |
| | 2014* | 10 | 0.100 | 9 | 0.090 | 0 | 0.000 |
| | 2015 | 21 | 0.140 | 18 | 0.120 | 3 | 0.020 |
| | 2016 | 18 | 0.180 | 17 | 0.170 | 0 | 0.000 |
| | 2017 | 7 | 0.035 | 7 | 0.035 | 0 | 0.000 |
| | 2018 | 11 | 0.055 | 9 | 0.045 | 0 | 0.000 |
| | 2019 | 2 | 0.010 | 2 | 0.010 | 0 | 0.000 |
| | **Average** | 13.58 | 0.09 | 11.75 | 0.08 | 0.92 | 0.01 |
| Sagebrush | 2007 | 0 | 0.000 | 0 | 0.000 | 0 | 0.000 |
| | 2008 | 2 | 0.010 | 2 | 0.010 | 0 | 0.000 |
| | 2009 | 3 | 0.015 | 3 | 0.015 | 0 | 0.000 |
| | 2010 | 10 | 0.050 | 0 | 0.000 | 10 | 0.050 |
| | 2011 | 5 | 0.025 | 4 | 0.020 | 1 | 0.005 |
| | 2012 | 1 | 0.005 | 0 | 0.000 | 0 | 0.000 |
| | 2014 | 10 | 0.100 | 8 | 0.080 | 1 | 0.010 |
| | 2015 | 3 | 0.015 | 3 | 0.015 | 0 | 0.000 |
| | 2016 | 3 | 0.015 | 0 | 0.000 | 0 | 0.000 |
| | 2017 | 2 | 0.010 | 1 | 0.005 | 0 | 0.000 |
| | 2018 | 0 | 0.000 | 0 | 0.000 | 0 | 0.000 |
| | 2019 | 0 | 0.000 | 0 | 0.000 | 0 | 0.000 |
| | **Average** | 3.25 | 0.02 | 1.75 | 0.01 | 1.00 | 0.01 |

*Unclear if 100 traps were set

***Discussion***

The lack of trapping success on the three communities on MRWMS is of concern as we have captured very few to almost none of the designated indicator species. We will continue trapping into 2020.

The partnership with the Tribal Stewards Program was immensely helpful. It provided the Tribal participants with experience with small mammal trapping, and it provided BPT staff with much needed help in setting trap grids. It was far more efficient than doing it with 1 to 2 staff only. We plan to continue this partnership in future years, and schedule trips around our small mammal trapping.

Literature Cited:

Albeni Falls Interagency Work Group. 2002. Monitoring and evaluation plan for the Albeni Falls Wildlife Mitigation Project.

# Amphibian Surveys

The goal for amphibian monitoring at the MRWMS is to document presence and breeding of amphibians present, with particular emphasis on Columbia spotted frog (*Rana luteiventris*). Columbia spotted frogs are considered to be a sensitive species in the state of Oregon (Oregon Conservation Strategy 2016). In October of 2015, the Great Basin Distinct Population Segment (DPS) of Columbia spotted frogs was removed from the list of Endangered Species Act candidate species by the U.S. Fish and Wildlife Service (USFWS 2015a). This decision was based on the discovery of additional populations, fairly stable populations and distribution, as well as the conservation practices occurring throughout the range of the DPS (USFWS 2015a, 2015b). Columbia spotted frog data can help aid BPT staff in future management decisions and assessing management effects on this important species. Information obtained on other amphibian species can also frame future management decisions.

In 2018–2019, BPT implemented wetland alterations on MRWMS with funding through an Oregon Watershed Enhancement Board (OWEB) awarded grant. These alterations should allow BPT staff to have greater control of water depth, wetland size, and longevity of inundation. This will allow BPT staff to provide additional Columbia spotted frog habitat in wetlands located on the MRWMS.

### *Methods*

In 2019, the Burns Paiute Tribe (BPT) was issued an Oregon Department of Fish and Wildlife scientific take permit to complete amphibian surveys. Visual encounter amphibian surveys conducted on the MRWMS were adapted from methods used by Pearl at al. (2010) to survey for Oregon spotted frogs (*Rana pretiosa*). In 2019, one egg mass survey was conducted. We surveyed on April 24th. Weather was mostly sunny with a light wind. A summer adult and juvenile survey was not conducted in 2019.

Much of the wetland cannot be surveyed due to dense cattail coverage and deep waters. Instead, the amphibian surveys focus on the edges and fringe areas with shallow water. Columbia spotted frogs tend to breed in shallow water and the warmer parts of a pond (USFWS 2015b, and citations therein), so these edges are the most important places to check. This is likely where the frogs would breed. As in 2019, two surveyors conducted the amphibian survey. The surveyor walked along and in the shallows of the available wetlands and water-filled ditches and counted all egg masses and individual amphibians observed. For each observation the relative age of each individual is also noted. In every year, all surveyors are educated in egg mass identification or carry an amphibian guide with them to aid in identification (Stebbins 2003).

In 2018, we began tracking each surveyor's route on GPS units. After surveying, we deleted the parts of the track where we weren't actually surveying (i.e. walking back to the vehicle away from the wetland). This allows us to map the route, and have a total distance surveyed in addition to the total time. We continued with this methodology in 2019.

### *Results*

On April 24th, 2019 we surveyed from 1250 to 1432 and surveyed a combined total of 4159.3 m (Figure 4.6.1). We found 12 Columbia Spotted Frog egg masses (all late stage) in 2 locations (Figure 4.6.1). We also found one adult. All egg masses were located in the northern wetland in shallow water (3-6 inch), in open areas near cattails and grass, not too far from where egg masses were found in 2018 (Figure 4.6.2).

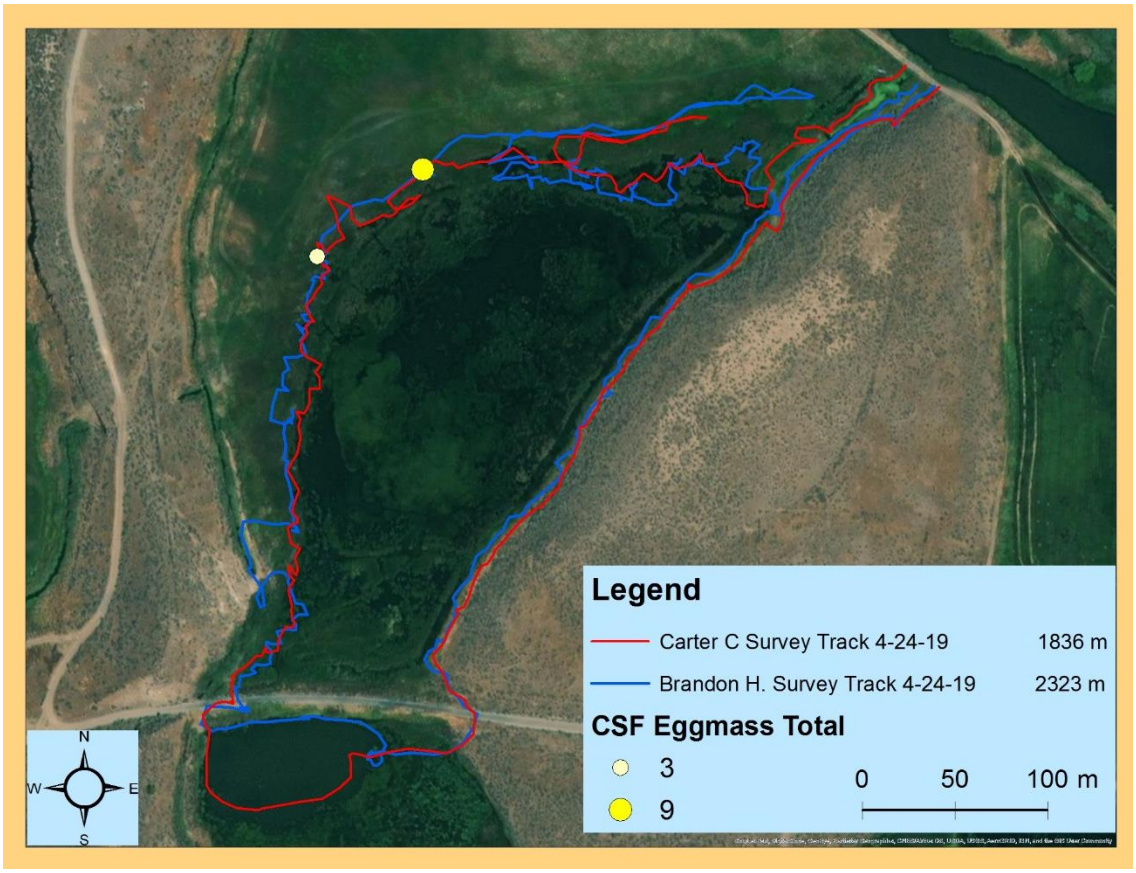



Figure 4.6.1. Map of amphibian survey routes on April 24th, 2019 at the MRWMS (includes surveyor and distance). Map also includes Columbia Spotted Frog egg mass locations and numbers.

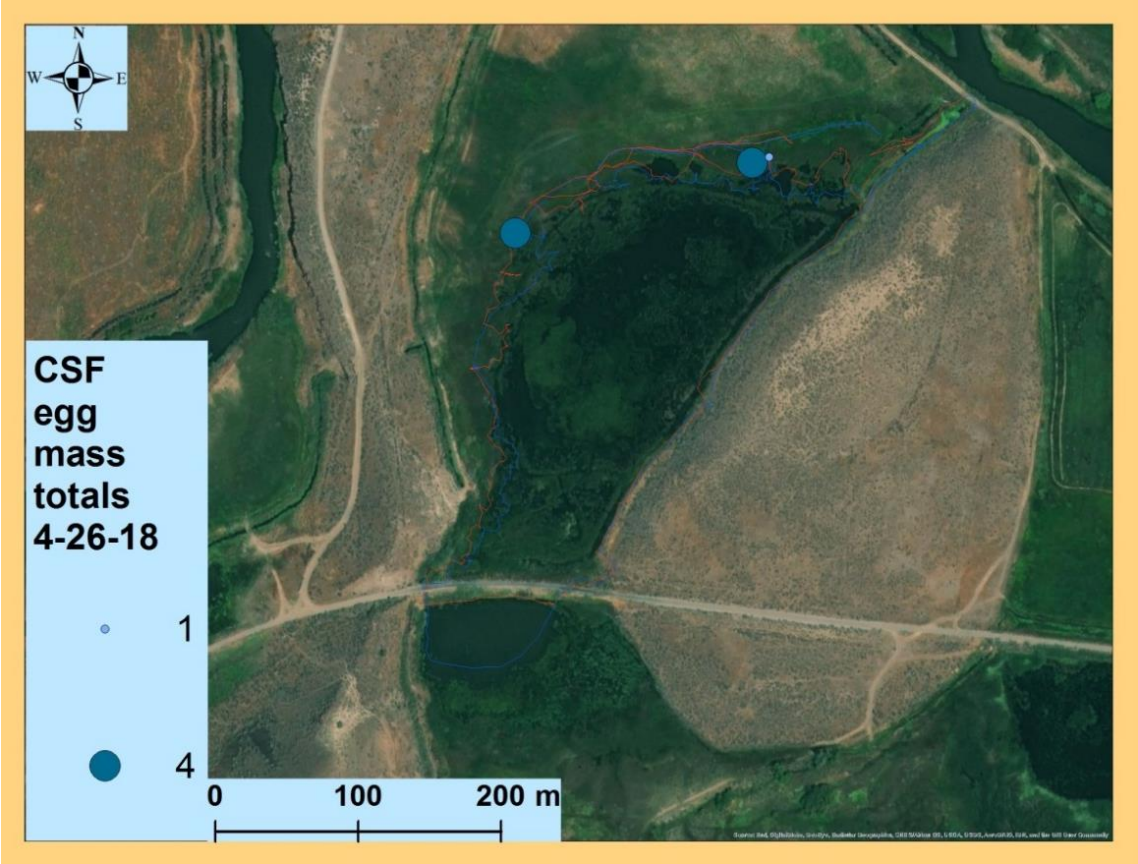



Figure 4.6.2. Columbia Spotted Frog egg mass locations and numbers on April 26th, 2018 at the MRWMS.

***Discussion***

The finding of 12 Columbia spotted frog egg masses is a promising find. The use of the northern wetland exclusively is not all that surprising as it is a permanent wetland. Permanent wetlands are preferred by Columbia spotted frog. Through a literature review, the USFWS (2015b) states that this species utilizes clear, slow moving steams and pond surfaces with permanent hydroperiods (USFWS 2015b). While, Arkle and Pilliod (2015) found ephemeral hydroperiods were negatively associated with Columbian spotted frog occupancy.

***Recommendations***

One of the primary limitations for spring egg mass surveys for Oregon spotted frogs is the short time frame available to detect egg masses (Pearl et al. 2010), and surveys for the similar Columbian spotted frog likely suffer from the same limitation. If time permits, running multiple cycles of surveys could help prevent missing the critical breeding interval. GPS points should continue to be taken at each location. This information may be helpful in mapping breeding locations in the MRWMS wetlands. We also recommend continuing to track and map survey

routes in future years as it provides useful data on survey effort and will allow for better year to year comparisons.

The wetland alterations were implemented in 2018–2019. Amphibian surveys should continue following this after implementation to track changes through the years. Management will focus on keeping the south wetland inundated for longer periods of the year. Keeping standing water in parts of the south wetland throughout the year, as opposed to the ephemeral wetland management strategy we currently utilize, should benefit Columbia spotted frogs. This is likely the best way to increase Columbia spotted frogs on the MRWMS, as it would represent an addition of a wetland with a permanent hydroperiod.

The MRWMS is located near the edge of the range for both the Great Basin and Northern DPS clades of Columbia spotted frogs (USFWS 2015b). Collection of Columbia spotted frog genetic samples should be considered as a future avenue for Columbia spotted frog research on the MRWMS.

Literature Cited:

Arkle, R. S. and D. S. Pilliod. 2015. Persistence at distributional edges: Columbia spotted frog habitat in the arid Great Basin, USA. Ecology and Evolution 5:3704-3724.

Oregon Conservation Strategy. 2016. Columbia spotted frog. Oregon Department of Fish and Wildlife, Salem, Oregon. http://oregonconservationstrategy.org/strategy-species/columbia-spotted-frog/ Accessed: January 24, 2018.

Pearl, C.A., D. Clayton, and L. Turner. 2010. Surveys for presence of Oregon spotted frog (*Rana pretiosa*): Background information and field methods. Interagency Special Status Sensitive Species Program (ISSSSP). 48 p. Portland, Oregon.

Stebbins, Robert C. 2003. A Field Guide to Western Reptiles and Amphibians. 3rd ed. Houghton Mifflin. New York, New York.

[USFWS] U.S. Fish and Wildlife Service. 2015a. Endangered and Threatened Wildlife and Plants; 12-Month Findings on Petitions To List 19 Species as Endangered or Threatened Species. Federal Register 80: 60834-60850.

[USFWS] U.S. Fish and Wildlife Service. 2015b. Species status assessment report for the Columbia spotted frog (*Rana luteiventris*), Great Basin Distinct Population Segment. Reno Fish and Wildlife Office, Reno, Nevada. vii + 86 pp.

## Vegetation Assessment

In the past several years, BPT has employed several methods to evaluate and monitor the efficacy of noxious weed treatments, including the step test and photo point monitoring method. These methods are both appropriate for a weed monitoring program; however, implementing both surveys in tandem may not translate to consistent methodology in future survey years. Therefore, in 2016 with the guidance of the Agricultural Resources Service and Oregon State University Extension Service, we modified the current weed monitoring protocol to include a quadrat plot design (similar to that of the step test) with regular photo monitoring points at the

start and end of the transects (similar to that of photo point monitoring). We adopted this survey method as our main objective to track changes in vegetation composition in response to invasive plant treatment efforts. This method is similar to a belt transect sampling method that is used to measure the presence of invasive plants and provides an adequate means of monitoring brush or shrub encroachment. However, because some seedlings, small annuals and other species are hard to see, we substituted the belt with a quadrat placed at regular intervals along the transect (Elzinga et al. 1998). This sampling design yields a frequency estimate that will be comparable to past records obtained during photo point monitoring.

### *Sampling Design*

We used the monitoring transects that were previously established throughout treatment areas. Currently, there are 17 Dry-land pastures, 12 medusahead treated, and 9 CREP transects located on the Malheur River Wildlife Mitigation Site. However, we ended sampling on the medusahead treated transects, focusing solely on the CREP and dry-land pasture transects. Transects are 200m in length and have been identified by a starting waypoint and azimuth to follow throughout the transect length (Table 4.7.1, Figure 4.7.1). Identifying physical features near the starting point (i.e. fence posts, trees, etc.) have been recorded along with the waypoint to help orient the surveyor. We recorded percent cover and species of plant occurring in each quadrate placed at regular intervals bisecting the transect line.

Surveyor completed the following protocol for each transect.

1. Find waypoint and Azimuth
   2. Pull out the tape (200 m), keeping it straight and close to the ground.
   3. Record date, time, transect number, names of observers, and azimuth on whiteboard and take a picture.
   4. Take a picture (landscape orientation) of the transect “start” -- beginning at the “0m” end of the line.
   5. Beginning at the 20m mark lay down the quadrate plot with its center on the tape (i.e., the line bisects the quadrat plot—with the 20 m mark centered within the quadrate plot)
   6. All plant species/soil surface types, and the percent cover of each, should be recorded to the nearest 5% of percent cover with all percent cover types equaling 100% of the quadrate.
   7. Continue to record quadrat plots every 20 m, for a total of 10 plots/200m transect.
   8. Take a picture (landscape orientation) of the transect “end” -- at the “200 m” end of the line.

In 2019, vegetation sampling was conducted on 5 sampling days conducted from June 26$^{th}$–July 2$^{nd}$.

Table 4.7.1. Spatial information (NAD_1983_UTM_Zone_11N) for the 26 vegetation transects on MRWMS.

| Transect | Treatment | UTMe (X) | UTMn (Y) | Azimuth | Landmarks |
|---|---|---|---|---|---|
| M1 | CREP | 423882 | 4849072 | 46 | Photo point M1 |
| M02 | CREP | 425566 | 4849636 | 86 | Photo point M2 |
| M03 | CREP | 426369 | 4849712 | 42 | Photo point M3 |
| M04 | CREP | 424657 | 4849612 | 198 | Photo point M4 |
| M05 | CREP | 425681 | 4849679 | 285 | Photo point M5 |
| M06 | CREP | 427913 | 4850189 | 107 | Photo point M6 |
| M07 | CREP | 428430 | 4849484 | 106 | Photo point M7 |
| M08 | CREP | 430760 | 4848741 | 99 | Photo point M8 |
| M09 | CREP | 429459 | 4849507 | 212 | Photo point M9 |
| T10 | Dry-land Pasture | 431109 | 4848958 | 218 | West Brace of East Gate |
| T11 | Dry-land Pasture | 430135 | 4849737 | 102 | East of Cottonwood |
| T11-B | Dry-land Pasture | 428577 | 4849492 | 288 | South of large Juniper |
| T12 | Dry-land Pasture | 426139 | 4850135 | 358 | North of power pole |
| T13 | Dry-land Pasture | 424656 | 4849749 | 359 | Power pole #685 |
| T14 | Dry-land Pasture | 424055 | 4849017 | 244 | Power pole #024045 |
| T15 | Dry-land Pasture | 425827 | 4849573 | 90 | ditch on w. fence |
| T16 | Dry-land Pasture | 426691 | 4849757 | 234 | Brace near old R&R |
| T17 | Dry-land Pasture | 430685 | 4848889 | 100 | 20 m east of cottonwood |
| T18 | Dry-land Pasture | 430766 | 4848974 | 144 | Second wood post east of gate |
| T19 | Dry-land Pasture | 428339 | 4849719 | 128 | Juniper on west end |
| T20 | Dry-land Pasture | 426005 | 4850348 | 97 | East of ditch NE corner |
| T21 | Dry-land Pasture | 426567 | 4850101 | 332 | Middle of H Brace |
| T22 | Dry-land Pasture | 424383 | 4849613 | 164 | Power pole 688 |
| T23 | Dry-land Pasture | 424252 | 4849209 | 358 | 28 m north of cottonwoods |
| T24 | Dry-land Pasture | 423881 | 4848961 | 36 | 12 m north of hanger |
| T25 | Dry-land Pasture | 426509 | 4849671 | 236 | South bend of north ditch |

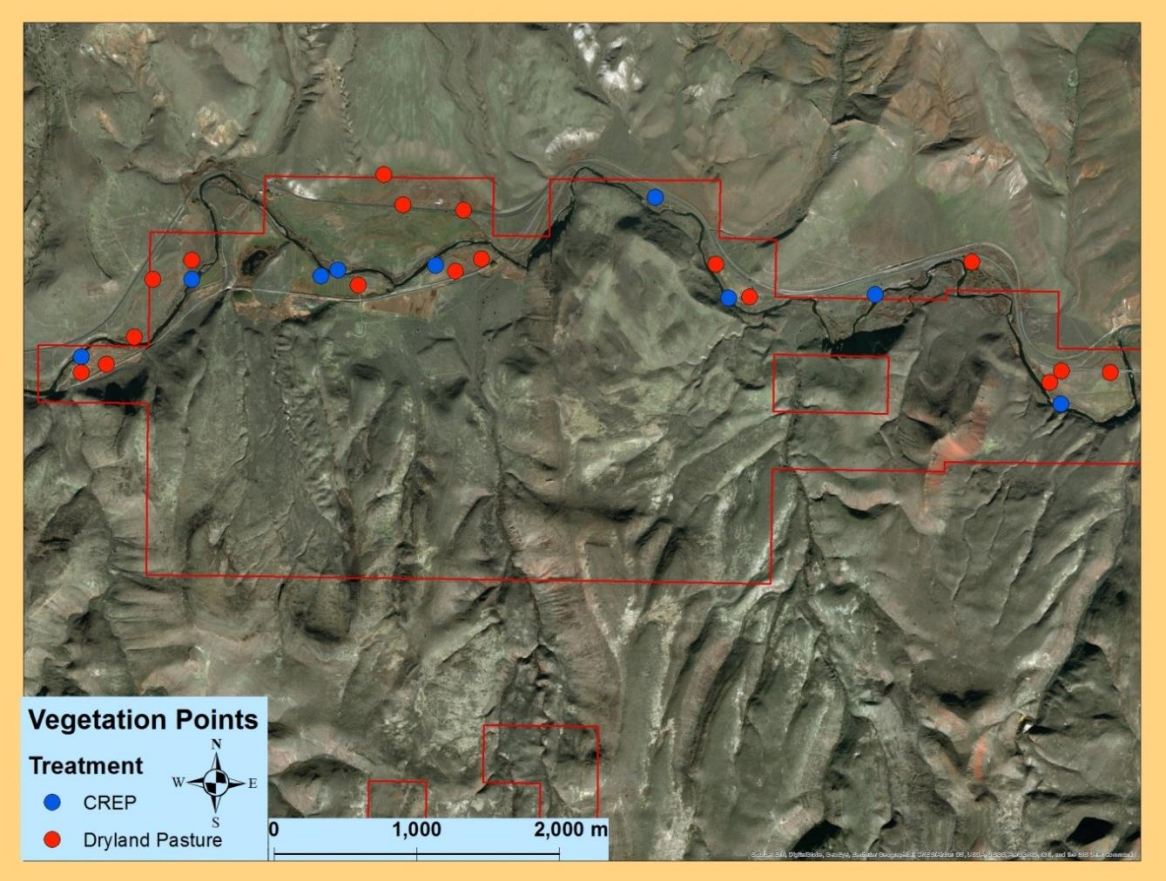



Figure 4.7.1. Locations (in NAD_1983_UTM_Zone_11N) for the start of each vegetation transect (segregated by treatment) at MRWMS.

### *Analysis*

Like in 2017 and 2018, we split our data by the treatment, (CREP transect and Dry-land pastures) for reporting all data (Table 4.7.1, Figure 4.7.1).

This analysis consists of two parts. The first part was to calculate the frequency (proportion of quadrats in which a species occurs) of invasive and non-invasive plants. Good sensitivity to change is obtained for frequency values between 20 percent and 80 percent. Frequency values between 10 percent and 90 percent are still useful, but values outside this range were used only to indicate species presence, not to detect change (Despain et al. 1991). The 2016 report conveyed frequency values, but the wrong number of total quadrats was used in the denominator. Due to this error the values reported in the 2016 report for frequency were reported as lower than they were. We rectified this in the 2017 report and continued with the same analysis in 2018 and 2019.

The second part of this analysis was to calculate the relative canopy cover for the most frequently detected invasive and native or non-invasive species. In future years, the change in the relative canopy cover may be used to indicate the effectiveness of treatments. We calculated the

relative canopy cover percentage by dividing the species cover by the total canopy cover at a transect (10*100) for each of the 26 transects. In the 2016 report, the relative canopy cover was calculated for all the quadrats as opposed to by transect. However, it was calculated incorrectly, and we have rectified this in the 2017 report and continued with this in the 2018 report and in 2019.

### *Results*

The most frequently detected invasive species across sites and years was cheatgrass (*Bromus tectorum*), and we saw increases in frequency in both the CREP and dry-land pastures (Fig 4.7.2 and Fig. 4.7.4). The most frequently detected native or non-invasive species was Basin wildrye (*Leymus cinereus*), a native perennial bunchgrass. We noticed a slight increase of Basin wildrye in the CREP and a slight decrease in frequency in the dry-land pastures (Fig. 4.7.3 and Fig. 4.7.5). We also saw an increase of Intermediate wheatgrass (*Thinopyrum intermedium*) in both the CREP but not in the dry-land pastures. Intermediate wheatgrass is a cool season perennial bunchgrass, and while it is not a native it is commonly planted to compete with invasive annual grasses like cheatgrass (Fig 4.7.3 and Fig. 4.7.5). It should be noted that we have had some difficulty in differentiating Intermediate wheatgrass and Western wheatgrass, (*Pascopyrum smithii*) a native species. This likely has affected our results over the past few years.

In addition to an increase in frequency of cheatgrass in both the CREP and dry-land pastures, we also noticed a slight increase in canopy cover of cheatgrass (Table 4.7.2). We also saw an increase in canopy cover of Basin wildrye in the dryland pastures and a small decrease in the CREP treatments (Table 4.7.3).

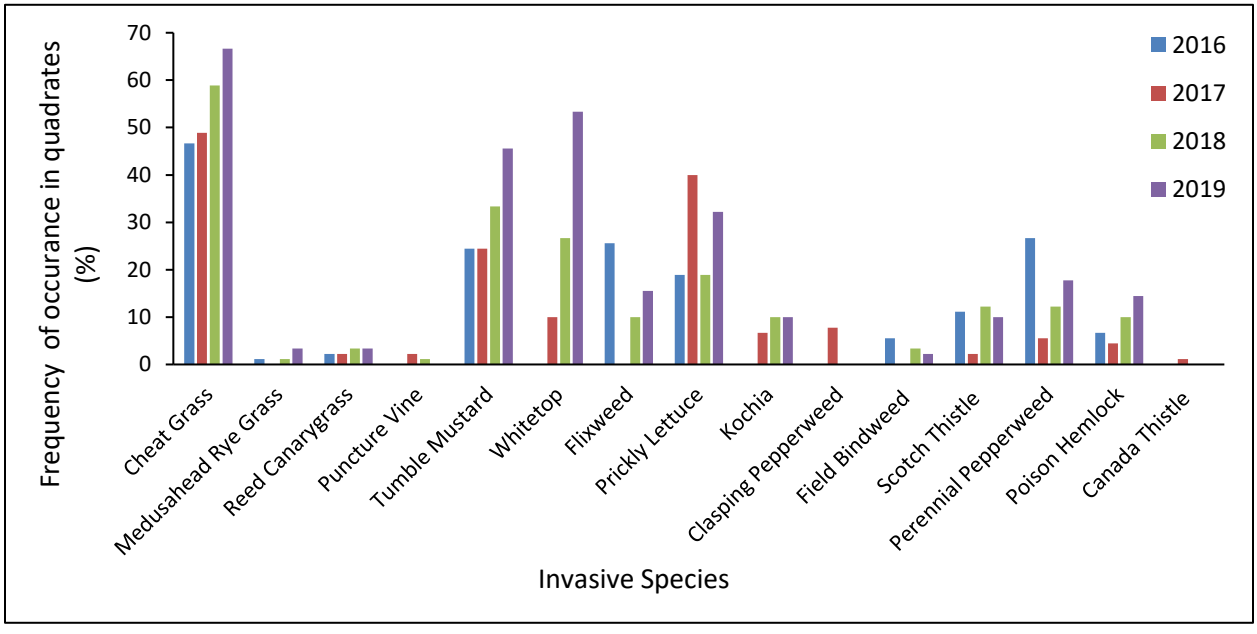



Figure 4.7.2. Frequency of invasive plants occurring in quadrats in the CREP treatment in 2016–2019 at MRWMS.

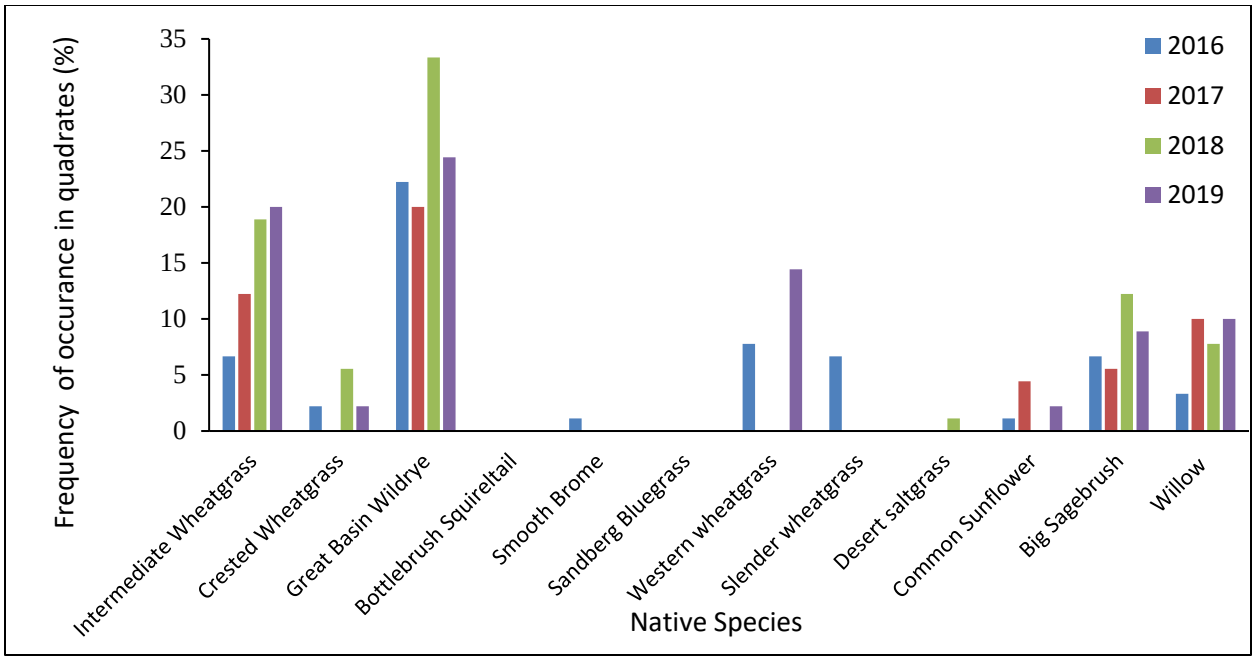



Figure 4.7.3. Frequency of native/non-invasive plants occurring in quadrats in the CREP treatment in 2016–2019 at MRWMS.

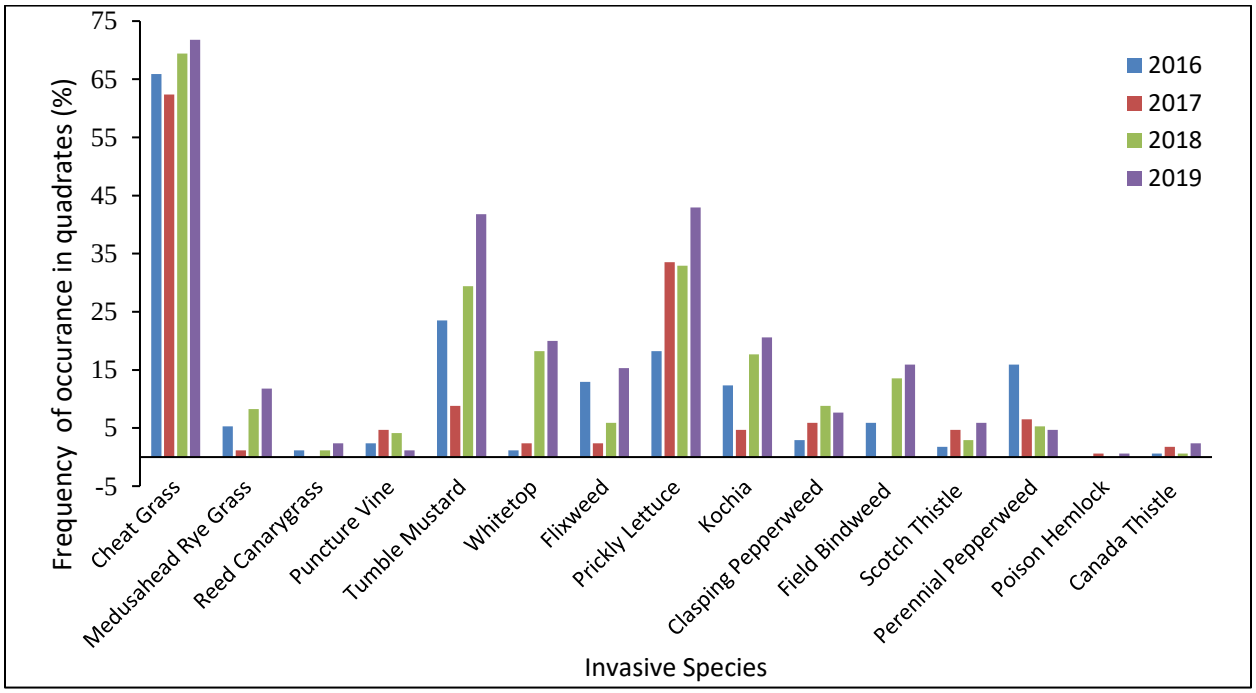



Figure 4.7.4. Frequency of invasive plants occurring in quadrats in the dry-land pasture treatment in 2016–2019 at MRWMS.

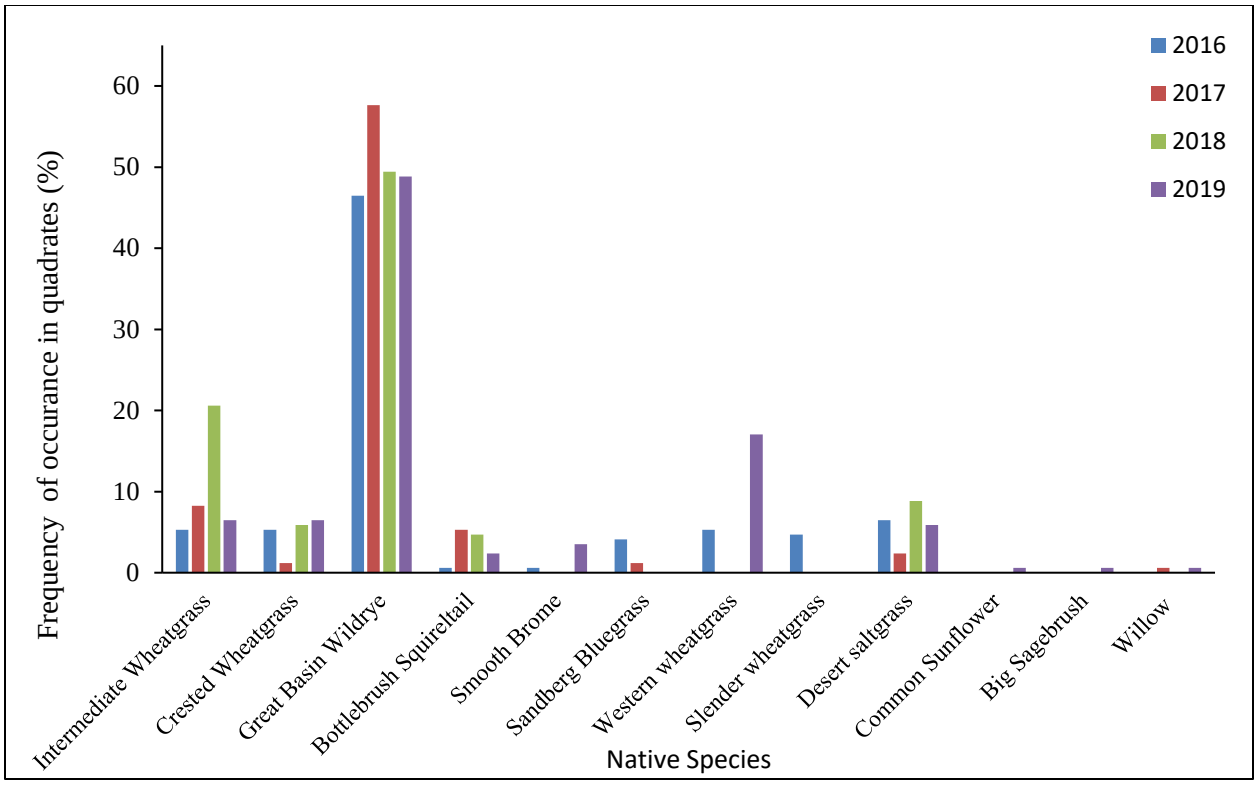



Figure 4.7.5. Frequency of native/non-invasive plants occurring in quadrats in the dry-land pasture treatment in 2016–2019 at MRWMS.

Table 4.7.2. Relative canopy coverage percentages in 2016–2019 for cheatgrass on the MRWMS.

| Treatment | Transect | Cheatgrass Canopy % 2016 | Cheatgrass Canopy % 2017 | Cheatgrass Canopy % 2018 | Cheatgrass Canopy % 2019 |
|---|---|---|---|---|---|
| CREP | M1 | 19.5% | 11.0% | 9.5% | 16.0% |
| CREP | M02 | 0.5% | 6.0% | 0.0% | 6.0% |
| CREP | M03 | 1.5% | 5.0% | 14.5% | 5.5% |
| CREP | M04 | 20.5% | 15.0% | 10.0% | 17.0% |
| CREP | M05 | 1.0% | 18.5% | 3.0% | 3.5% |
| CREP | M06 | 27.5% | 38.0% | 22.5% | 25.0% |
| CREP | M07 | 11.5% | 9.0% | 14.0% | 38.0% |
| CREP | M08 | 21.5% | 1.5% | 1.0% | 12.5% |
| CREP | M09 | 25.5% | 11.0% | 33.5% | 17.5% |
| **CREP** | **Average** | **14.3%** | **12.8%** | **12.0%** | **15.7%** |
| Dryland Pasture | T10 | 36.5% | 20.0% | 25.0% | 25.5% |
| Dryland Pasture | T11 | 45.5% | 78.0% | 62.0% | 63.0% |
| Dryland Pasture | T11-B | 29.0% | 21.0% | 20.0% | 37.0% |
| Dryland Pasture | T12 | 0.0% | 5.0% | 0.5% | 0.0% |
| Dryland Pasture | T13 | 68.5% | 56.5% | 16.0% | 42.0% |
| Dryland Pasture | T14 | 9.0% | 19.5% | 10.0% | 13.0% |
| Dryland Pasture | T15 | 6.5% | 51.0% | 5.5% | 3.5% |
| Dryland Pasture | T16 | 11.5% | 1.0% | 2.5% | 0.0% |
| Dryland Pasture | T17 | 20.0% | 25.5% | 18.0% | 16.0% |
| Dryland Pasture | T18 | 26.0% | 20.0% | 16.0% | 10.0% |
| Dryland Pasture | T19 | 41.0% | 74.0% | 41.0% | 34.0% |
| Dryland Pasture | T20 | 8.0% | 22.5% | 6.0% | 10.5% |
| Dryland Pasture | T21 | 0.5% | 0.5% | 0.0% | 11.5% |
| Dryland Pasture | T22 | 53.5% | 49.5% | 22.5% | 20.0% |
| Dryland Pasture | T23 | 53.0% | 63.5% | 28.0% | 22.0% |
| Dryland Pasture | T24 | 9.5% | 24.0% | 11.0% | 10.0% |
| Dryland Pasture | T25 | 69.0% | 0.0% | 23.5% | 3.0% |
| **Dryland Pasture** | **Average** | **28.6%** | **31.3%** | **18.1%** | **18.9%** |
| **Combined** | **Average** | **23.7%** | **24.9%** | **16.0%** | **17.8%** |

*The raw data for these transects only shows data for 5 points, but the Access file shows data for 10 points. This analysis was done with the Access data with all 10 points.

Table 4.7.3. Relative canopy coverage percentages in 2016–2019 for Basin wildrye on the MRWMS.

| Treatment | Transect | Basin Wildrye Canopy % 2016 | Basin Wildrye Canopy % 2017 | Basin Wildrye Canopy % 2018 | Basin Wildrye Canopy % 2019 |
|---|---|---|---|---|---|
| CREP | M1 | 4.5% | 16.0% | 20.0% | 7.5% |
| CREP | M02 | 5.0% | 2.0% | 0.0% | 6.0% |
| CREP | M03 | 2.5% | 0.0% | 5.0% | 8.0% |
| CREP | M04 | 17.0% | 8.0% | 12.5% | 7.0% |
| CREP | M05 | 15.5% | 0.0% | 20.5% | 1.5% |
| CREP | M06 | 1.0% | 2.0% | 1.5% | 0.0% |
| CREP | M07 | 3.5% | 7.0% | 10.0% | 14.0% |
| CREP | M08 | 9.0% | 6.5% | 2.0% | 7.5% |
| CREP | M09 | 0.0% | 0.0% | 0.0% | 0.0% |
| **CREP** | **Average** | **6.4%** | **4.6%** | **7.9%** | **5.7%** |
| Dryland Pasture | T10 | 0.5% | 0.0% | 1.0% | 10.0% |
| Dryland Pasture | T11 | 0.0% | 2.5% | 0.5% | 1.0% |
| Dryland Pasture | T11-B | 24.5% | 38.0% | 35.0% | 29.0% |
| Dryland Pasture | T12 | 39.0% | 48.5% | 37.0% | 31.5% |
| Dryland Pasture | T13 | 7.0% | 9.5% | 5.0% | 7.5% |
| Dryland Pasture | T14 | 3.0% | 31.5% | 27.5% | 24.5% |
| Dryland Pasture | T15 | 3.5% | 16.0% | 31.0% | 12.0% |
| Dryland Pasture | T16 | 26.0% | 44.0% | 39.0% | 53.0% |
| Dryland Pasture | T17 | 13.0% | 39.5% | 9.0% | 15.0% |
| Dryland Pasture | T18 | 20.5% | 20.5% | 5.0% | 23.5% |
| Dryland Pasture | T19 | 4.0% | 4.5% | 7.0% | 10.0% |
| Dryland Pasture | T20 | 18.5% | 13.0% | 20.5% | 8.5% |
| Dryland Pasture | T21 | 15.5% | 21.5% | 14.0% | 13.5% |
| Dryland Pasture | T22 | 9.5% | 8.5% | 0.0% | 1.0% |
| Dryland Pasture | T23 | 6.0% | 5.5% | 3.0% | 16.5% |
| Dryland Pasture | T24 | 14.0% | 31.0% | 24.5% | 20.5% |
| Dryland Pasture | T25 | 6.5% | 61.0% | 0.5% | 0.0% |
| **Dryland Pasture** | **Average** | **12.4%** | **23.2%** | **15.3%** | **16.3%** |
| **Combined** | **Average** | **10.3%** | **16.8%** | **12.7%** | **12.6%** |

*The raw data for these transects only shows data for 5 points, but the Access file shows data for 10 points. This analysis was done with the Access data with all 10 points.

Literature Cited

Despain, D.W., P.R. Ogden, and E.L.Smith, 1991. Plant Frequency Sampling for Monitoring Rangelands. Pg 17—21. In: G.B. Ruyle (*editor*) 1991. Some methods for monitoring rangelands. University of Arizona.

Elzinga, C.L., D.W. Salzer, and J.W. Willoughby. 1998. Measuring and Monitoring Plant Populations. Bureau of Land Management, Denver, CO. BLM Technical Reference 1730–1.

## Stream Photos

There are 14 stream photo points on the Project to monitor vegetative components and changes in stream structure. An upstream and downstream azimuth is used to make the photograph repeatable. The purpose of the stream photos is for qualitative analysis for visual historic reference, see Appendix A. A noticeable growth in riparian vegetation is present in many photo points when comparing 2007 to 2019.

## Nest Box Program

Densities of cavity nesting birds can be limited by the number of cavities available, with densities in areas correlated to the number of nest sites, and populations changing with experimental manipulations of nest site density (Newton 1994). Supplemented nest sites can be a valuable conservation tool. Nest box programs have demonstrated the ability to increase population numbers for American Kestrels (*Falco sparverius*) (Hamerstrom et al. 1973, Shave and Lindell 2017), and the recovery of the Eastern Bluebird (*Sialia sialis*) has been attributed in part to the promotion of nest boxes (American Bird Conservancy 2018).

In 2018, we initiated a nest box program on MRWMS, LVWMS, other tribal properties, and private property in southeastern Oregon. We have continued to expand this program. We monitor these nest boxes and collect the data requested by the American Kestrel Partnership (AKP) on all boxes (regardless of which species the boxes were intended).

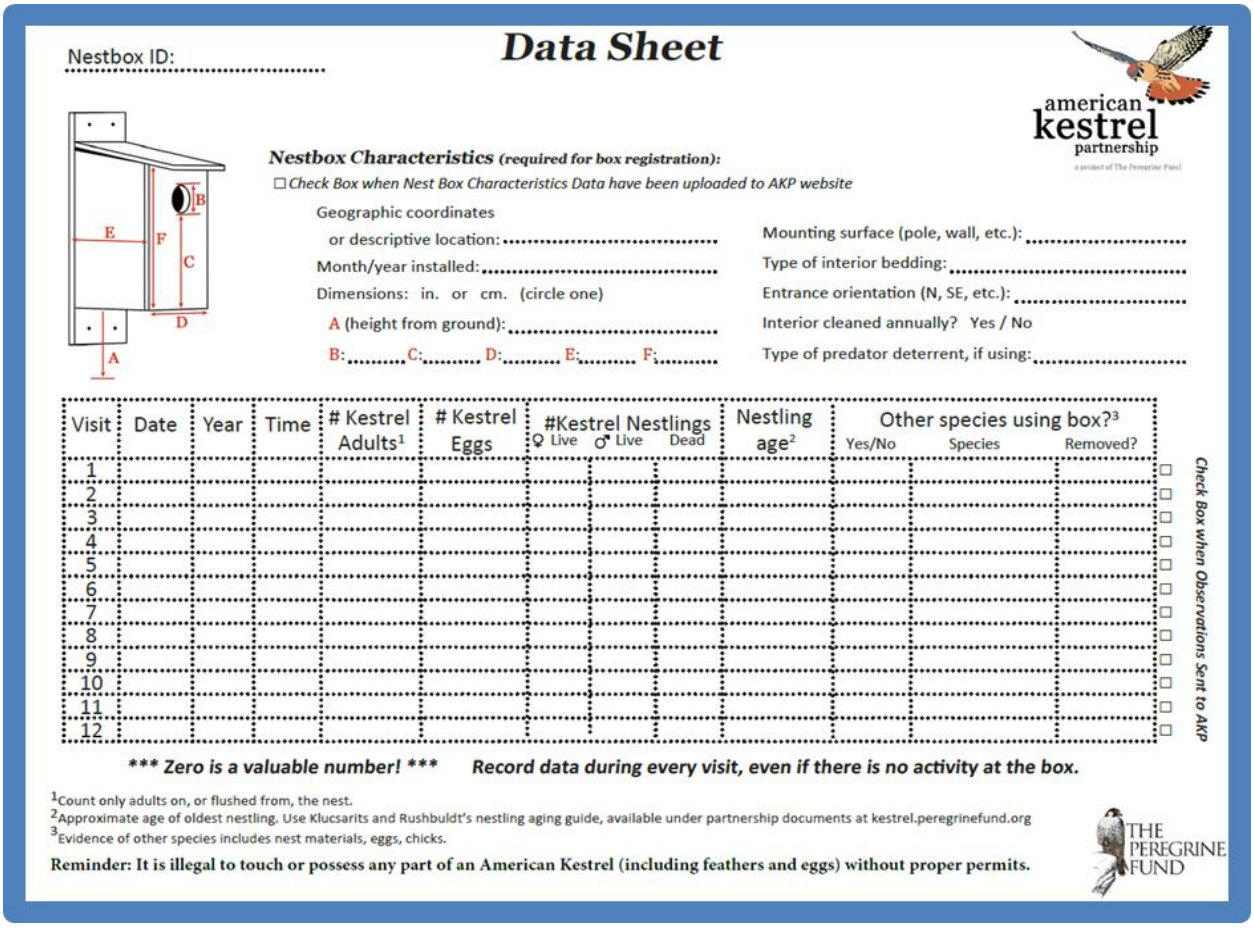
In 2018, Carter obtained a Bird Banding Lab subpermit and a state permit to band American Kestrels, Mountain Bluebirds (*Sialia currucoides*), Western Bluebirds (*Sialia mexicana*), Northern Saw-whet Owls (*Aegolius acadicus*), Flammulated Owls (*Psiloscops flammeolus*), Northern Pygmy Owls, and Violet-green Swallows (*Tachycineta thalassina*). With these permits he will band nestlings from the nest box program and incorporate bird banding field days with Tu Wa-kii Nobi for education and outreach. In 2020, Carter received his Master Bander permit and will continue banding under this permit.

Due to his research background with American Kestrels (*Falco Sparverius*), Carter was asked to take on the role of state coordinator for the American Kestrel Partnership (AKP) in Oregon. "Launched 2012 in response to long-term population declines of kestrels in North America, The Peregrine Fund's American Kestrel Partnership is a network of citizen and professional scientists working to collaboratively understand kestrel demographics and advance kestrel conservation (https://kestrel.peregrinefund.org/)." With this role, Carter oversees field questions, and encourage folks to collect data according to protocol and submit soon after the breeding season, as well as recruiting new Partners for the AKP. Most of the recruiting will take place in southeastern Oregon. Carter will manage the nest box program for the Burns Paiute Tribe, as well as collaborate with other partners and help them run their own programs. With his banding permit he will also help them band nestlings from other partner's nest boxes. The experience with the BPT nest boxes will help him guide others.

***Methods***

For installation and monitoring, we collect the data requested by the AKP on all boxes, regardless of it was for kestrels (Figure 4.6.1). These data include measurements and other data on the box, as well as what occupies it through the breeding season. The AKP recommends checking the box every two weeks during the breeding season but leaves the decisions up to the party managing the box. It is unlikely we will be able to check every two weeks, but we will check as frequently as our schedule allows. We will submit data from the kestrel boxes to the AKP each year. If nests contain European Starlings (*Sturnus vulgaris*) or House Sparrows (*Passer domesticus*) nests, we will remove them and try to trap the adults, as these non-native species can negatively affect native birds.

Before fledging, we will band all kestrel nestlings. Bluebirds and swallows have short banding windows so we will band them opportunistically. Banding will take place near the end of the nestling stage but early enough to avoid force fledging any nestlings. For kestrels this will take place when nestlings are 17–26 days old.



Nestbox ID: .....

# Data Sheet

american kestrel partnership




**Nestbox Characteristics** *(required for box registration):*

☐ *Check Box when Nest Box Characteristics Data have been uploaded to AKP website*

Geographic coordinates
or descriptive location: .....
Month/year installed: .....
Dimensions: in. or cm. (circle one)
A (height from ground): .....
B: ..... C: ..... D: ..... E: ..... F: .....

Mounting surface (pole, wall, etc.): .....
Type of interior bedding: .....
Entrance orientation (N, SE, etc.): .....
Interior cleaned annually? Yes / No
Type of predator deterrent, if using: .....

| Visit | Date | Year | Time | # Kestrel Adults[1] | # Kestrel Eggs | #Kestrel Nestlings ♀ Live | #Kestrel Nestlings ♂ Live | #Kestrel Nestlings Dead | Nestling age[2] | Other species using box?[3] Yes/No | Other species using box?[3] Species | Other species using box?[3] Removed? | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | | | | | | | | | | | | | ☐ |
| 2 | | | | | | | | | | | | | ☐ |
| 3 | | | | | | | | | | | | | ☐ |
| 4 | | | | | | | | | | | | | ☐ |
| 5 | | | | | | | | | | | | | ☐ |
| 6 | | | | | | | | | | | | | ☐ |
| 7 | | | | | | | | | | | | | ☐ |
| 8 | | | | | | | | | | | | | ☐ |
| 9 | | | | | | | | | | | | | ☐ |
| 10 | | | | | | | | | | | | | ☐ |
| 11 | | | | | | | | | | | | | ☐ |
| 12 | | | | | | | | | | | | | ☐ |

*Check Box when Observations Sent to AKP*

*** Zero is a valuable number! *** **Record data during every visit, even if there is no activity at the box.**

[1]Count only adults on, or flushed from, the nest.
[2]Approximate age of oldest nestling. Use Klucsarits and Rushbuldt's nestling aging guide, available under partnership documents at kestrel.peregrinefund.org
[3]Evidence of other species includes nest materials, eggs, chicks.

**Reminder: It is illegal to touch or possess any part of an American Kestrel (including feathers and eggs) without proper permits.**

THE PEREGRINE FUND

Figure 4.9.1. Example data sheet used for box deployment and monitoring.

## *Results*

*Box deployment*

Prior to the 2019 breeding season we have deployed 7 kestrel boxes and 10 bluebird boxes on or near the MRWMS (Figure 4.9.2). We have deployed 11 kestrel boxes, 1 Northern-Pygmy Owl box, and 15 bluebird boxes on or near the LVWMS (Figure 4.9.3). We deployed 2 kestrel boxes at tribal employees' houses in Harney County, and 5 kestrel boxes on Beech Creek, tribal property in Grant County. We have also monitored 4 kestrel boxes that had already been deployed on private properties in Burns, OR, and we have also assisted Crane Middle/High School, Portland Audubon, and the U.S. Forest Service Prairie City Ranger District Office in deploying their own boxes to manage.

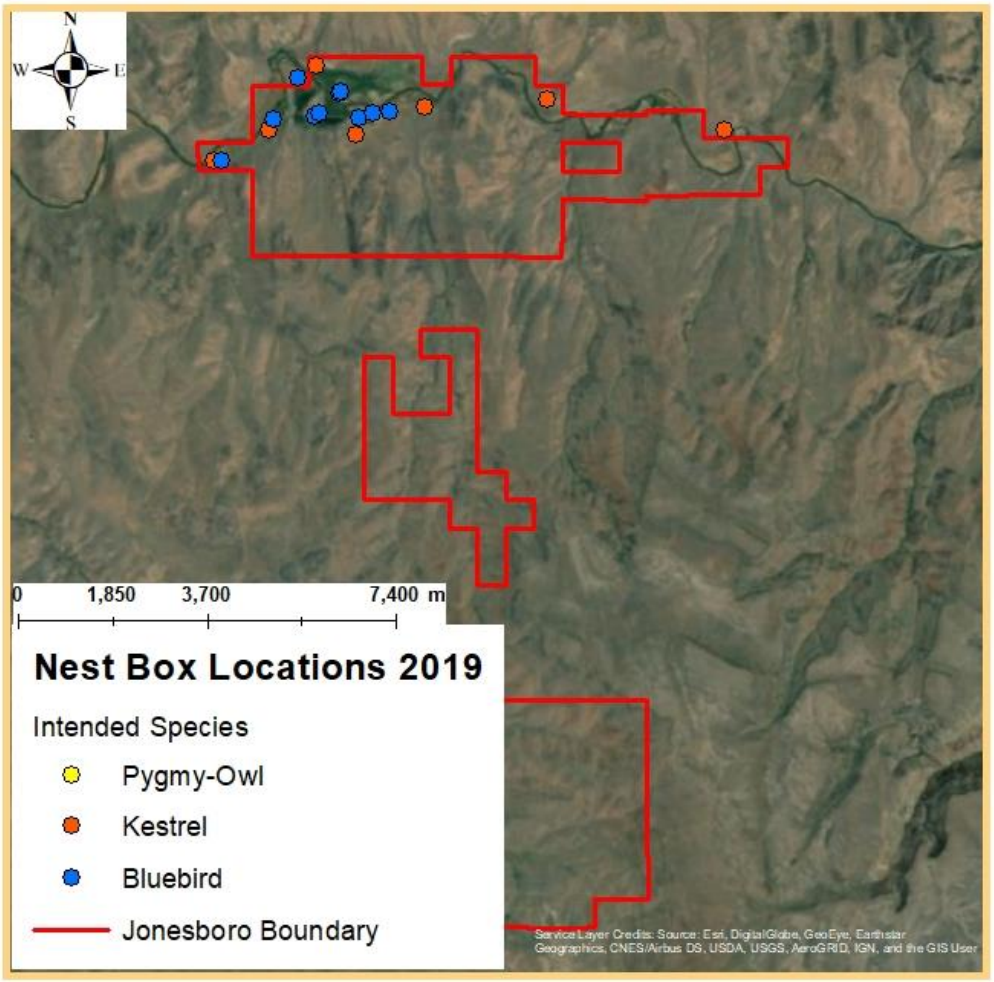



Figure 4.9.2. Nest box locations on the MRWMS.

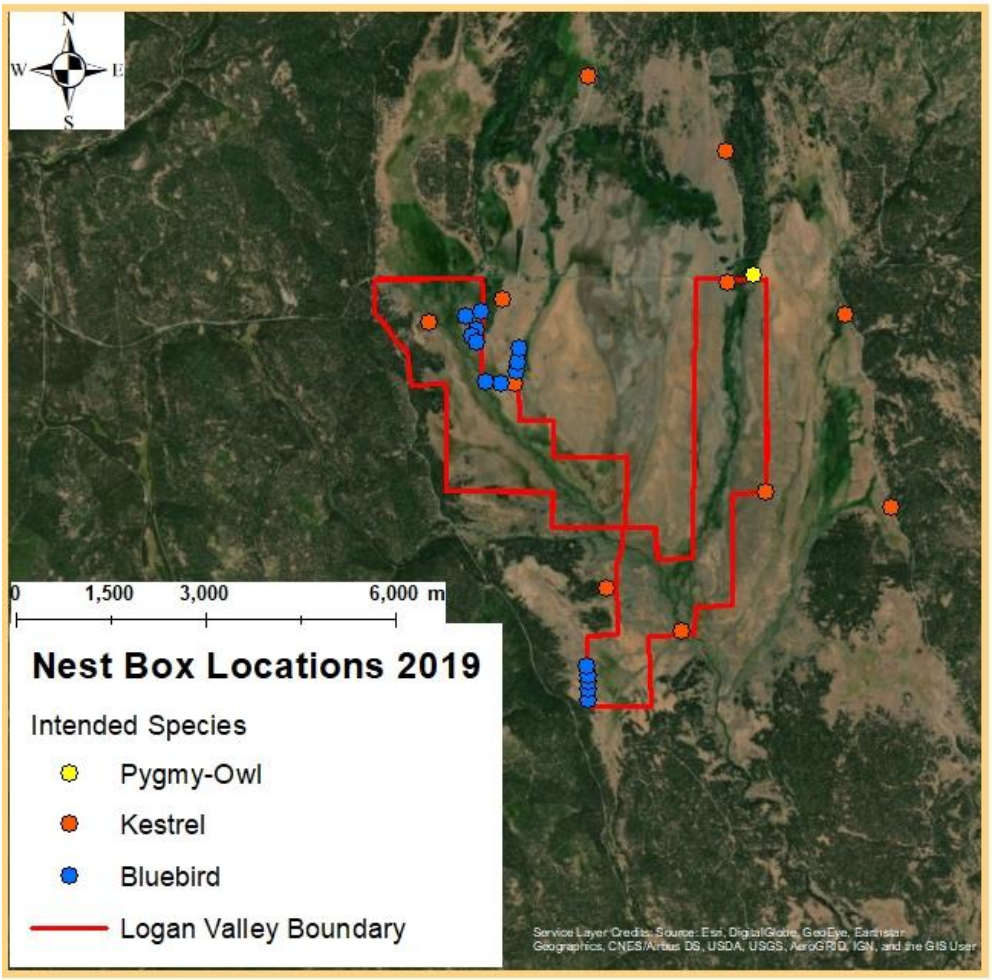



Figure 4.9.3. Nest box locations on the LVWMS.

*Box occupancy and success*

All data from the kestrel boxes, even unoccupied boxes, were submitted to the AKP database for inclusion in their large-scale nest box monitoring program.

On the MRWMS, all 7 kestrel boxes deployed were occupied by kestrels. These 7 nests successfully fledged 23 young. We also monitored a nest found in a hole in a barn at headquarters, that appeared to fledge 2-3 young. On the LVWMS, 9 of 11 kestrel boxes deployed were occupied by kestrels which initiated nests. Four of these boxes successfully hatched and fledged kestrels. One of the kestrel boxes deployed was occupied by a Mountain Bluebird which laid 5 eggs, and likely fledged 4 young. One of 5 boxes at Beech Creek, was occupied by kestrels and only fledged 1 young. Three of 6 boxes monitored at private residences around Burns, were occupied by kestrels and 2 of 6 boxes fledged a total of 8 nestlings. Occupancy, nesting activity, and fledging success are all displayed in Table 4.9.1.

Table 4.9.1. Occupancy and nesting and fledging success at kestrel nest boxes deployed at each site.

| Property | % & # of boxes occupied 2019 | Total number of eggs 2019 | % hatched 2019 | Number of nestlings 2019 | % of boxes that fledged ≥1 nestling 2019 | Number of nestlings fledged in 2019 | TOTAL number of nestlings fledged since 2018 |
|---|---|---|---|---|---|---|---|
| MRWMS | 7/7 = 100% | 30 | 7/7 | 24 | 7/7 | 23 | 29 |
| LVWMS | 9/11 = 82% | 34 | 5/11 | 10 | 4/11 | 12 | 16* |
| Beech Creek | 1/5 = 20% | 4 | 1/5 | 1 | 1/5 | 1 | 1** |
| Other | 3/6 = 50% | 8 | 2/6 | 8 | 2/6 | 8 | 13*** |

*Only 2 kestrel boxes were deployed in 2018
**No kestrel boxes were deployed in 2018
***Nestlings found at 1 of 3 nest boxes deployed in Burns before other sites deployed nest boxes

None of the 10 bluebird boxes deployed at MRWMS were occupied by bluebirds. However, 9 of these boxes were occupied by native species including Ash-throated Flycatchers and Tree Swallows (*Tachycineta bicolor*). Tree Swallows occupied 7 of these boxes while Ash-throated Flycathcers occupied 3 of these boxes. Of these boxes, only 2 successfully fledged young with 3 failing and the rest unknown. The unknown status of nesting at boxes is due to gaps in monitoring and a short window between hatching and fledging. At LVWMS, Mountain Bluebirds were found at 9 out of 15 boxes deployed. Other native species found using these nest boxes included House Wren and Tree Swallow. Again, the high number of unknown outcomes at these boxes is likely due to gaps in monitoring and short window to monitor between hatching and fledging. Occupancy and success are shown in Table 4.9.2 below.

Table 4.9.2. Occupancy and success at bluebird boxes deployed at each site. Some boxes are occupied more than once in a year.

| Property | % Occupied 2019 | Species (# of boxes) * | # Success | # Fail | # Unk. |
|---|---|---|---|---|---|
| MRWMS** | 9/10 = 90% | TRES (7), ATFL (3) | 2 | 3 | 6 |
| LVWMS*** | 11/15 = 73% | MOBL (9), HOWR (1), TRES (6) | 4 | 3 | 11 |

*Each species labeled by its 4 letter Alpha code
**Jones BB4 – ATFL and TRES both occupied box on 6/10/2019
***Logan BB1 – HOWR occupied box after MOBL successfully fledged young

One of the bluebird boxes deployed was occupied by a House Wren which had 2 nestlings. Tree Swallows (*Tachycineta bicolor*) occupied 5 bluebird boxes containing nestlings about to fledge.

Figure 4.9.4 Tree swallow nestlings in a box.

Figure 4.9.5. Kestrel adult and eggs in one box and nestlings in another box.

*Bird Banding*

On 9 days during the summer of 2019, we hand-captured and banded kestrel and Mountain Bluebird nestlings at MRWMS and LVWMS (Table 4.9.3.). At MRWMS, we banded a total of 23 kestrel nestlings across 7 nest boxes. We banded 12 kestrel nestlings at 4 nest boxes and banded 3 nestling Mountain Bluebirds at 1 nest box at LVWMS. At Beech Creek we banded 1 kestrel nestling, and we banded 12 other kestrels at other locations.

Table 4.9.3. Total number of each species captured and banded at MRWMS, LVWMS, and other locations.

| Species | MRWMS | LVWMS | Beech Creek | Other |
|---|---|---|---|---|
| American Kestrel | 23 | 12 | 1 | 12 |
| Mountain Bluebird | 0 | 3 | 0 | 0 |

*Outreach*

On February 12th, Carter gave a presentation on kestrel biology and nest boxes to Crane Middle/High School and then helped them deploy their own box to manage (Figure 4.9.6). On July 1st, 2019 we banded nestlings with 2 Tu-Wa-kii Nobi (Kid's House) youth, BPT staff, and Burn's resident. On July 9th, we banded 4 nestlings with a few Crane Middle and High School Students at a box they have monitored this year. On July 20th, the wildlife program banded 3 nestlings with Tribal youth at Culture Camp. On July 17th and 25th, we banded nestlings with ONDA and their Tribal Stewards Program. On August 1st, we banded 3 kestrel nestlings and 3 Mountain Bluebirds with Forest Service Staff. At each banding event, we teach kids and adults present about kestrel biology and how to tell the difference between male and female kestrels. We explain why we band birds, what can be gained from banding, and what data we collect (Figure 4.9.7). When appropriate, we allow participants to help us collect some of the data.

Figure 4.9.6. Successful deployment of a kestrel nest box with Crane High School.

Figure 4.9.7. Kestrel and Bluebird banding days.

***Discussion***

Our nest box program has shown great promise with kestrel, Tree Swallow, and Ash-throated Flycatcher, and House Wren nests shortly after deployment. This speedy occupancy by kestrels is especially promising as occupancy rates can take a few years to build up after installing boxes (according to the AKP director). The high depredation rate of kestrel nests at LVWMS is of concern. We will keep an eye on this in 2020 and will consider using a smaller entrance hole to deter predators. We will continue to monitor these nest boxes into 2020 to determine occupancy 2 years post-deployment.

Literature Cited

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Hamerstrom, F., F. N. Hamerstrom, and J. Hart. 1973. Nest boxes: an effective management tool for kestrels. The Journal of Wildlife Management 37:400-403.

Newton, I. 1994. The role of nest sites in limiting the numbers of hole-nesting birds: a review. Biological Conservation 70:265-276.

Shave, M. E., and C. A. Lindell. 2017. Occupancy modeling reveals territory-level effects of nest boxes on the presence, colonization, and persistence of a declining raptor in a fruit-growing region. PLoS ONE 12(10): e0185701.

# Golden Eagle Nest Monitoring

The Oregon Eagle Foundation, Inc. initiated a statewide nest monitoring program for Golden Eagles in 2011, this project has continued and is planned to continue for a total of 10 years. To accomplish such a large-scale project many volunteers have been recruited to help collect data, in 2017, 658 people contributed to the project, including 337 volunteers and 321 people representing 54 different organizations. In 2019, BPT staff was asked to monitor 4 Golden Eagle (*Aquila chrysaetos*) breeding territories on or near tribal properties.

1. Logan Valley is a historical tree nest south of the LVWMS, and it has been visited since 2010 with no eagles or nests observed. The coordinate precision is unclear.

2. Jonesboro is a cliff nest that has been active between 2011–2017. It is located on the MRWMS.

3. Pole Creek is a historical cliff nest that has not been visited between 2011–2017, it has not been visited between 2011–2017 and the precision is unclear. It is located northwest of the MRWMS.

4. Fenwick Canyon is a historical cliff nest, north of Burns. It has been visited since 2010 with no eagles or nests observed. The coordinate precision is unclear.

***Methods and reminders***

1. DO NOT DISTURB EAGLES or LANDOWNERS. If you disturb eagles leave the area promptly. Try to stay 1/2 mile from nests. Do not go onto private property without owner permission.

2. Nest SEARCHING can be done any time of year. MONITORING is done during the breeding season (mid-February–July). A BREEDING AREA includes one or more nests used by one breeding pair. NESTS are large and can be on cliffs, in trees, or on manmade structures.

3. The SURVEY GOAL is to locate and monitor golden eagle nests. The MONITORING GOAL is to determine nesting status and outcome at breeding areas.

4. Report nest observation on a REPORT FORM (e-mail, standard, your own format) or in field notes. If you don't like filling out forms, at least report DATE, NEST LOCATION and EAGLE ACTIVITY by whatever means suits you.

5. Be properly equipped for observing and recording your observations (BINOCULARS, SPOTTING SCOPE, FIELD NOTEBOOK, FORMS, MAPS, GPS RECEIVER, COMPASS, CAMERA). Remember... "Even the worst field notes are better than the best memory." – S. Postupalsky

6. Be prepared to SURVIVE harsh weather in a remote location in case you become stranded. Carry plenty of water, food, warm clothing, and EMERGENCY SURVIVAL GEAR.

7. Nests can be observed anytime during the breeding season; however, TIMING IS IMPORTANT and MORE THAN TWO VISITS MAY BE REQUIRED to determine nesting outcome. (See: Nesting Phenology Chart).

8. TIMING of first annual nest observations should coincide with early nesting behavior, including courtship, incubation, and downy young (mid-February–April). TIMING of subsequent observations (generally late May–July) at occupied breeding areas should be based on nesting status determined during previous observations, with the goal of determining nesting outcome (failure or number of eaglets at least 51 days old).

9. AGE EAGLETS by comparing them to pictures found in Hoechlin, D.R. 1976. Development of golden eaglet nestlings in southern California. Western Birds 7:137–152, which can be found at: http://elibrary.unm.edu/sora/wb/v07n04/p0137-p0152.pdf

10. Eaglets must be at least 51 DAYS OLD to be counted as SUCCESSFULLY FLEDGED; however, it is still important to DETERMINE AND REPORT NUMBER AND AGE OF ALL EAGLETS observed.

11. CLASSIFYING A BREEDING AREA AS UNOCCUPIED is valuable. Doing so requires two properly-executed, four-hour observation periods at least 30 days apart conducted between mid-February and early May that includes all known nests within the breeding area. (The head of this project gave us flexibility on this and said the 4 hour time frame was not practical for volunteers, so we searched but did not follow the 4 hour search period).

The monitoring form includes the following data that should be collected:

1. OBSERVER(S) NAME(S) and AFFILIATION(S) include contact information if not already submitted:

2. BREEDING AREA NAME and/or NUMBER if known:

3. DATE(S) of the observation(s):

4. METHOD(S) of observing:

5. DURATION of the observation(s):

6. OBSERVATION POINT LOCATION(S) (GPS coordinates or map; include x and y coordinates, datum, and UTM Zone if applicable):

7. NEST LOCATION(S) (GPS coordinates or map; include x and y coordinates, datum, and UTM Zone if applicable):

8. NEST LOCATION ACCURACY (actual coordinates at the nest, or estimated from the air or an observation point?):

9. NUMBER OF NESTS at each location (usually 1 unless 2 or more nests are tightly clumped and represented by one location):

10. NEST SUBSTRATE(S) (cliff, tree, manmade structure, ground, etc.):

11. NUMBER & BEHAVIOR OF ADULT and SUBADULT GOLDEN EAGLES by date:

12. NUMBER, AGE* & BEHAVIOR OF NESTLING GOLDEN EAGLES by date:

*Simple guide to AGE OF NESTLING(S):
0-7 days (0-1 week) Short grayish-white down.
8-14 d (1-2 w) Long, wooly, white down developing.
15-21 d (2-3 w) Long, wooly, white down nearly complete.
22-28 d (3-4 w) Pin feathers begin to show as dark spots on edges of wings and tail.
29-35 d (4-5 w) Body evenly mottled dark and white; head and neck white.
36-42 d (5-6 w) Body nearly feathered (dark) except for head and legs.
43-49 d (6-7 w) Body nearly feathered and head partly feathered.
50-56 d (7-8 w) Feathers nearly complete; tufts of down on head.
57-63 d (8-9 w) Feathers complete; "golden" hackles and white at base of tail.
64+ d (9+ w) Feathered and ready to fledge or fledged.

13. OTHER RELEVANT NOTES (For example: access information, human activity, other eagles (bald or golden), other species interacting with golden eagles, weather or lighting affecting the observation, etc.):

14. VOLUNTEER HOURS & MILES (for each observer and each observation):

15. OTHER OBSERVATIONS OR COMMENTS:

***Results***

In 2019, we searched/monitored the Logan Valley breeding territory only once (5-23-19) for a total of 7 minutes. We did not see any evidence that Golden Eagles were breeding in the area. We searched/monitored the Jonesboro breeding territory 1 time on 4-11-18 with no evidence of eagles. We did notice a pair of Golden eagles soaring over the Jonesboro cliff on the 1-24-19 and we saw 1 flying a few miles to the north on 6-10-19. We did not see any evidence that Golden Eagles were breeding in the area this year. We searched/monitored the Pole Creek breeding territory 3 times (4-11-19, 6-11-19, and 6-27-19). On the second visit, we noticed two adults with one carrying a snake. However, based on time constraints, we could not determine whether eagles were nesting at this location. We searched/monitored the Fenwick Canyon breeding territory only once (5-8-19). We did not see any evidence that Golden Eagles were breeding in the area. We visited Big Swamp Creek after BPT staff noticed a possible nest in the fall of 2018. We searched the area on 4-23-19, and we confirmed the presence of an apparent nest (Figure 4.10.1). On the way down from a lek survey, BPT staff saw a Golden Eagle on Shumway road on 4-11-19. We were unable to locate a nest. Finally, Tim's Peak was monitored twice in 2019 (4-23-19 and 6-10-19). At Tim's Peak, it was uncertain whether there was an eagle nest present without additional signs. However, whitewash was noticed on large rock face west of Tim's Peak but it is uncertain whether it was an old eagle nest or possibly an old Common Raven nest (Figure 4.10.2). While we did not see an eagle in the immediate vicinity, we did see an adult Golden Eagle approximately 1.4 miles from Tim's Peak, while visiting Hunter's Creek. We will continue to monitor these territories in 2020.

Figure 4.10.1. Possible nest was found at Big Swamp Creek.

Figure 4.10.2. Photo of a possible nesting location on a ridge west of Tim's Peak.

***Discussion***

All the data collected will be helpful for the Golden Eagle nest monitoring project in the coming years. The finding of a Golden Eagle nest at Big Swamp Creek is useful in documenting nesting activity in these territories. The documentation of adult eagles at the Pole Creek territory is helpful, but they did not appear to be using the same nest as 2018. It is possible they nested within the territory at a different nest site, and we will put in more of an effort to locate the nest in this breeding territory in 2020. Despite not finding any concrete evidence of nesting at Shumway and Tim's Peak, we will continue to monitor these breeding territories in 2020.

# Winter Raptor Surveys

In 2019, staff was asked to take on a route for the winter raptor survey by the project coordinator.

The following provides a brief introduction, of the winter raptor survey:

"In an effort to get a better understanding of the biology of wintering birds of prey in Oregon, the southern portions of Washington, the California portion of the Klamath Basin, and in Idaho, the East Cascades Audubon Society located in Bend, OR sponsors an extensive survey project designed to reveal population levels and densities for the species that choose to winter in the project area. Volunteers in this citizen science project conduct surveys during November through March on established route transects under the guidance of a Project Coordinator who assists with volunteers needs as well as receives all data collected on the surveys which is then displayed in various project charts and graphs."

### *Methods*

Staff agreed to survey the Double OO route that runs south and west of Burns; it is approximately 102 miles long (Fig 4.11.1).

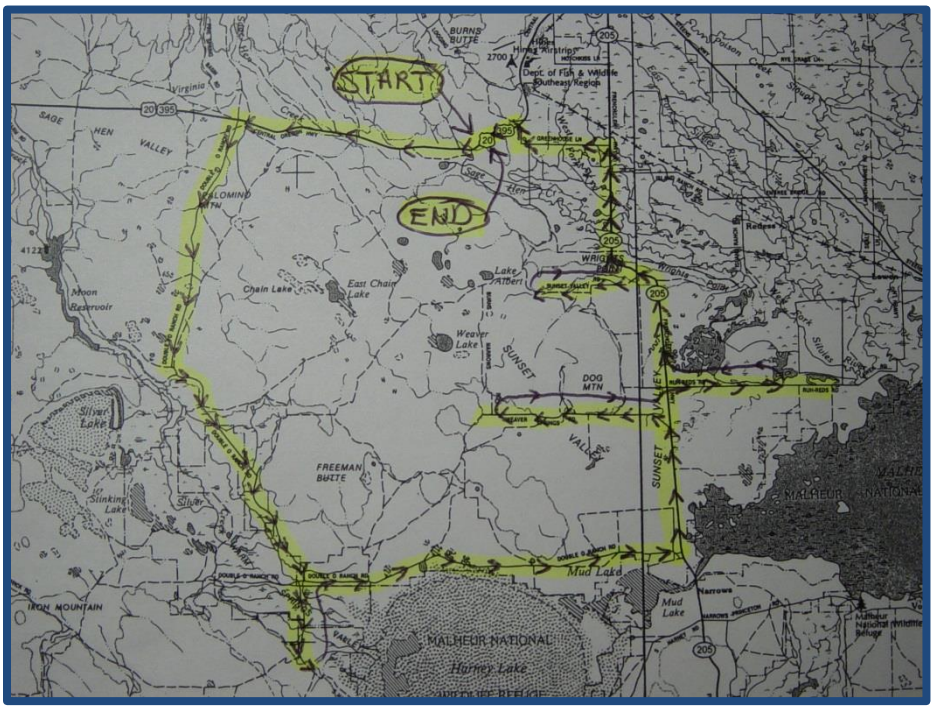


Figure 4.11.1. Double OO winter raptor survey route located south and west of Burns, OR.

*Survey methods*

1. Routes will be surveyed once a month during the months of December, January, and February. Additional survey options decided on by each volunteer include surveys conducted during November and March and doing more than one survey in a given month. All survey dates will be determined by each volunteer based on their own life schedules.

2. Surveys should be conducted during favorable weather conditions to get the most return for the effort expended. Excessive wind, fog, and precipitation will force birds to shelter and thus make them less visible to see. If a volunteer's life schedule dictates conducting a survey during inclement weather, it will be better to have the survey completed versus having no data for that given month.

3. Volunteers are encouraged to make stops along the route path in order to scan favorable habitat for birds. These stops will be at the discretion of the volunteer, most routes do not have planned stopping points built into the route path.

4. Volunteers should drive slow enough to be able to properly scan all available habitat that they can see that might hold birds. This includes viewing power poles, fence posts, trees, water wheel lines, trees, and any other structure that a bird can perch on. In addition, the skies should be scanned for soaring birds and the ground should be scanned for perching/feeding birds.

5. Suggested driving speeds range up to 30-35 mph to insure viewing coverage. Driving SAFETY will dictate if these slower speeds are safe to do. Volunteers should not compromise their or anyone else's safety on the roads. ECAS will not be held responsible for any accidents resulting from unsafe driving by volunteers. When in doubt, do not drive in an unsafe manner. Volunteers should also make sure that when stopped to view birds, they are parked in a safe and legal manner so as not to disrupt traffic flow around them and compromise their individual safety.

6. All birds observed along the route path should be counted. Every attempt should be made to determine species of the bird viewed. If that is not possible, an attempt should be made to determine the type of bird it is, ie, falcon, eagle, buteo, owl, accipiter, etc and reported as UNID falcon, etc. If that is not possible, birds can then be classified as unidentified raptors.

7. Birds viewed at some distance may have the possibility of being counted from another part of the survey route depending on the design of the route path. Volunteers should be aware of possible double counting in these circumstances. If there is concern about the possibility of double counting a bird, it will be best to be conservative and not count the bird.

8. Some routes will have circumstances where it will be necessary to back track over previously surveyed roads. In these instances, any NEW birds viewed on the second pass can be added to the survey.

9. Age and sex information of birds counted is not necessary with the exception of aging Bald Eagles. For them, the only age differentiation that we would like to have would be if the bird is a white headed/tailed adult bird (A) or a dark subadult bird (S). Age differentiation for the first four years of a Bald Eagles life, when they do NOT have a white head or tail, is not necessary.

Each route will have their own specific data collection form to be used during surveys. These forms display a sequential list of roads that are driven for each route as well as a suggested list of the more common species that will be seen in the area. Four letter codes are used to denote different species that have been found in this project. Following are codes to be used on the data forms:

The data collection forms are to be completed as follows:

1. Each time a bird is located, it should be entered on the appropriate road line and in the appropriate species column on the form.

2. Each form will have a few columns designated for family groupings of birds, ie, falcons, accipiters, owls. To keep the data form to a manageable size in the field, these family grouping columns are included for the less apt to be seen species. When one of these species is encountered, the bird should be entered into the appropriate family column on the appropriate road line using one of the above listed codes to indicate what species was seen.

3. Because owls are the least likely birds to be seen on any given survey, the owl column can be used to record other species found.

4. In addition to bird data, the top of the form displays other data that must be entered as well. These include the DATE that the survey was completed, the amount of TIME that the survey took to complete (minutes recorded in 5 minute increments), and the MILES that were driven to conduct the survey (recorded down to tenths of a mile). Miles driven to get to the start of the route from home and to get from the end of the route back to home should NOT be included.

5. Additional voluntary information that could be included on the form would be weather conditions, other species of interest seen on the survey, non-route miles, or anything of note that you thought would be of interest to record. All of this information can be added to the bottom of the form below the TOTALS line.

6. When the survey is completed, the TOTALS line needs to be filled out accurately.

7. Completed forms need to be submitted to the Project Coordinator as soon after each survey as possible. The reason for timely submission is because at the end of each month a summary chart is prepared that will include all the data collected for all of the routes surveyed. This summary chart is then sent to all of the project volunteers as soon as possible to keep everyone informed as to what is being seen and where in as close to real time as possible. Preparation of this summary chart is much quicker if the data is submitted throughout the month rather than waiting until the end when I would have to deal with data from close to 200 routes.

Although we are not required to count corvids, we made the decision to count Common Ravens (*Corvus corax*) due to their importance to sage-grouse and potential population management in the future.

### *Results*

Three days of survey routes were run in the winter of 2019–2020. The December survey was conducted on the 26th with temperatures in the upper 20's, light wind and cloud cover starting at approximately 95% but switching to 45% as the day progressed. A Short-eared Owl (*Asio flammeus*) was the highlight of the day. The January survey was conducted on the 10th with temperatures at approximately 21º F, little to no wind, and cloud cover about 95%. We tallied a total of 23 Rough-legged Hawks (*Buteo lagopus*). The February survey was conducted on the 21st with temperatures ranging from approximately 20–43º F, 1–6 mph wind, and cloud cover around 95%. Four Ferruginous Hawks (*Buteo regalis*) and 25 eagles were the highlights (Table 4.11.1, Figure 4.11.2)

Table 4.11.1. Winter raptor road survey results for the Double OO route in the winter of 2019–2020. Un-identified (UNID) birds were not seen well enough to accurately identify the species but were put in the most precise grouping.

| Group | Buteos | | | | Falcons | | Eagles | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Species | Red-tailed Hawk | Rough-legged Hawk | Ferruginous Hawk | UNID Buteo | American Kestrel | Prairie Falcon | Bald Eagle | Golden Eagle | Northern Harrier | Short-eared Owl | UNID Raptor | Common Raven |
| 12-26-19 | 24 | 16 | 0 | 3 | 1 | 2 | 13 | 7 | 0 | 1 | 1 | 56 |
| 1-10-20 | 23 | 23 | 0 | 1 | 2 | 0 | 4 | 9 | 0 | 0 | 1 | 77 |
| 2-21-20 | 20 | 11 | 4 | 2 | 1 | 2 | 15 | 10 | 3 | 0 | 1 | 157 |

Figure 4.11.2. Golden Eagle, Bald Eagle, Rough-legged Hawk and Short-Eared Owl observed during winter raptor surveys.

***Discussion***

Data collected during these surveys will provide data from an area with an abundance of wintering raptors and will be included in a large-scale data set. The high numbers of Common Ravens in each count is of interest, as ODFW is currently discussing the possibility of lethal and non-lethal raven control.

# Administration

## Cultural Resources

Federally funded projects require an environmental review of all ground disturbing activities before project implementation can begin. This often entails a cultural resources survey with Tribal and State Historic Preservation Office (SHPO) consultation. Much of the Malheur

River Wildlife Mitigation Site has been surveyed for significant cultural resources since its acquisition, however, each year there are new projects that require additional surveys or have never been surveyed before. All ground disturbing activities were monitored by BPT Tribal Staff under the Cultural Department.

## Hunting Tags

In January 2019, the Wildlife Program successfully facilitated the negotiations to secure 8 deer, 6 elk and 4 antelope ceremonial hunting tags for Burns Paiute tribal members with Oregon Department of Fish and Wildlife. Seasons open January 1st and end August 8th, or three days before the start of archery season for each game species. Tribal Council and elders will decide on how tags will be distributed and the traditional nature of the hunts. We have secured ceremonial tags in 2020 and will continue to support this process in whatever role is designated by the Council.

Landowner Preference Tags will continue to be distributed in the same manner as currently conducted. Tribal members cannot draw for the same tag (species) two years in a row.

2. Tribal members sign up to draw for LOP deer and elk tags (around May 5th)
3. Names are randomly drawn using a random number generator
4. Submit DEER Tag Distribution Form (must arrive at Salem before May 15th)
5. Tribal members must purchase their hunting license before their names can be submitted (must enter hunter ID on form)
6. Submit ELK Tag Distribution Form (must arrive in Salem before September 15th, address is at bottom of form)
7. Tribal members must purchase their hunting license before their names can be submitted (must enter hunter ID on form)

## Outreach and Education

In 2019, the BPT Natural Resources Department participated in several outreach and education activities (Figure 5.3.1.). In January, Wildlife staff helped Tu-Wa-kii Nobi make their own snowshoes and hosted a snowshoe relay race. In April, we partnered with Portland Audubon staff, and took tribal youth to the Malheur Wildlife Refuge to view owls, a Bald Eagle (*Hailaeetus luecocephalus*) nest, and a Golden Eagle nest. We got excellent looks at nestling Golden Eagles and watched a Prairie Falcon (*Falco mexicanus*) dive bomb the parent. Other activities and field trips with Tu-Wa-Kii Nobi youth included: visiting Malheur cave in March, banding kestrels in June & July, fishing at Fish Lake in August and the Trout Farm in September, and Creatures of the Night II in October. Creatures of the Night II celebrated our nocturnal friends and included dissecting owl pellets, making bat rockets, and playing Bats vs. Moths (a game that highlights bat's use of echolocation). We ended 2019 with a short practice of bird identification with our own BPT CBC 4 Kids (Christmas Bird Count). We highlight many of these activities in Figure 5.3.1.

Figure 5.3.1. Highlights from 2019 with Tu-Wa-Kii Nobi. Snow-shoe relay, bat rockets, visit to Malheur Cave, and Christmas Bird Count for Kids.

Using an Oregon Chapter of the Wildlife Society Grant, we took 8 tribal youth, 3 grandparents, and 1 parent to the High Desert Museum and the Pine Mountain Observatory in June. We explored the Museum for about an hour, before sitting down to watch the Desert Dwellers show. During the show we got up close and personal with 3 of the High Desert's native mammals, the striped skunk (*Mephitis mephitis*), badger (*Taxidea taxus*), and porcupine (*Erethizon dorsatum*). We got to learn about the biology of these three species, and we also got

to see them show off some of their skills, such as the digging prowess of the badger and the tree climbing ability of the porcupine. After the Desert Dwellers show we took an hour-long private tour with High Desert Museum Staff, Erica and Kelsey. During the Private Tour we focused on the Natural History exhibits of the Museum. We got to see and learn about birds of prey, reptiles, amphibians, and river otters. The Museum Staff even brought along educational materials that weren't part of the exhibit. We got to hold porcupine quills, snake skins, and a model eyeball to show how big our eyes would be if we had Great-horned Owl eyes. We also got eye to eye with a Western rattlesnake, an activity I don't recommend outside of the museum. We saw Gila monsters, turtles, Desert tortoises, kingsnakes, leopard frogs, Bald Eagles, Golden Eagles, and a feeding Burrowing Owl (Figure 5.3.2).

Around sundown we headed up to meet Alton, the Operations Manager at the Pine Mountain Observatory. Alton told us the history of both the Observatory and some of the telescopes on site. As the night sky darkened, we got our first looks through the telescopes. The first stop was Jupiter and we could see 4 of Jupiter's moons as well as the equatorial belts. Next stop was Saturn, and it was incredible! Saturn was the highlight for most of the group, and it certainly was for me. I still cannot believe how visible Saturn's rings were, they did not look real. We checked out the Wild Duck Cluster, a constellation that supposedly resembles a flock of flying ducks. While I'm skeptical of this resemblance, it was an impressive constellation, nonetheless. We also viewed a globular cluster, which was 200,000 stars all in a tight cluster. The next stop was the moon. While an almost full moon, hindered our views of other things throughout the night it may have been worth it for the views it provided. We viewed some of the "seas" on the moon including the Sea of Tranquility (Figure 5.3.3).


Figure 5.3.2. Highlights from the High Desert Museum. Photos by Teresa Wicks.

Figure 5.3.3. Some highlights from the Pine Mountain Observatory. Photos by Teresa Wicks.

BPT wildlife staff also took part and in other tribal events such as the annual carnival, Trunk or Treat, and Culture Camp, as well as the release of salmon into the Malheur River by the Fisheries Department. At Culture Camp the Fisheries Program showed the kids how to sample invertebrates and the Wildlife Program banded kestrels with youth.

In addition to working with Tu-Wa-Kii Nobi, staff worked with other youth. In January, Carter gave a presentation on American Kestrels to Crane Middle and High School and then helped them set up two nest boxes for them to monitor. He returned in June to band nestlings with a few students. Carter also banded nestlings with young adults working through ONDA's Tribal Stewards Project. Calla assisted the Agricultural Research Station with the Fair in the Field Event and Range Camp.

The Wildlife Staff also hosted a non-lead hunting demonstration with the Oregon Zoo's Non-Lead Hunting Education coordinator. The demonstration was held at the local gun range. Staff also attended and represented the tribe at local collaboratives and meetings such as the Harney County Restoration Collaborative, Harney Basin Wetlands Initiative, Harney County Wildland Fire Collaborative, Vale Local Implementation Team meetings (sage-grouse), Tribal Council and all staff meetings. Tribal staff also attended a field-based science workshop hosted by Greater Oregon STEM. At this workshop, we learned methods to more efficiently work with youth on educational activities. Wildlife staff also attended the Oregon Wildlife Society Conference and the SageCon Summit.

In 2019, BPT staff partnered with multiple agencies and entities in their work at MRWMS and eastern Oregon. We collected lek data for inclusion in ODFW sage-grouse lek monitoring, kestrel nest box data for inclusion in the American Kestrel Partnership's monitoring program, Golden eagle nest monitoring data for inclusion in the Oregon Eagle Foundation, Inc. statewide monitoring effort, and winter raptor survey data for inclusion in the East Cascades Audubon Society winter raptor monitoring efforts. The Wildlife Program Manager also continued the role as Oregon State Coordinator for The American Kestrel Partnership, to help streamline nest box data collection in the state and recruit interested partners. BPT staff also hosted 3 volunteer trips with the Oregon National Desert Association (ONDA) at MRWMS, where we removed vexar from plants from previous plantings, planted willows and cottonwoods, and planting shrubs and forbs that we propagated through the year. We hosted the Tribal Stewards for a week at MRWMS, where they helped with small mammal trapping and with bucking hay. Wildlife staff also assisted the Crane Middle and High School and Portland Audubon/Malheur National Wildlife Refuge in deploying kestrel nest boxes.

BPT Wildlife Program continued their data sharing agreement with Oregon State University in order to receive assistance with sage grouse trapping, data collection, and analysis. This agreement will benefit both parties with a larger and more comprehensive dataset on sage-grouse movement and habitat use.

## Access Permits

The property had a record snow pack in the winter of 2016/2017. Due to this usually difficult and long winter upland bird numbers appeared to be greatly reduced. During the 2017 hunting season, staff decided that it may be important to limit the number of upland game bird hunters, and the amount of hunting pressure on chucker and quail populations for the next 2 years while those populations rebound and disperse on MRWMS. Due to these concerns staff issued permits in a 1:1 manner with an equal number of members of the public granted access as tribal members that hunted the property. In 2019, 6 permits were given, not all of them were used (Table 5.4.1). Upland bird populations appear to be increasing gradually based on staff observations as well as hunter reports.

Table 5.4.1. Access permits issued for MRWMS from 2005–2019 (calendar year, not hunting season).

| Year | Permits Issued | Returned Reports | Hours Hunting Waterfowl | Hours Hunting Upland | Waterfowl Harvest | Upland Harvest | Avg. Birds/Hunter Hour |
|---|---|---|---|---|---|---|---|
| **2005** | 47 | 24 | | 230 | | 200 | 0.87 |
| **2006** | 58 | 36 | 51.5 | 225.25 | 61 | 238 | 1.08 |
| **2007** | 35 | 29 | 73 | 205 | 66 | 122 | 0.68 |
| **2008** | 30 | 15 | 45.5 | 105 | 35 | 63 | 0.65 |
| **2009** | 19 | 12 | 25.5 | 74.5 | 54 | 101 | 1.55 |
| **2010** | 18 | 13 | 57 | 152 | 32 | 78 | 0.53 |
| **2011** | 12 | 8 | 22.5 | 48 | 36 | 32 | 0.96 |
| **2012** | 21 | 19 | 11.5 | 62.5 | 19 | 35 | 0.73 |
| **2013** | 14 | 10 | 11.5 | 20 | 14 | 7 | 0.67 |
| **2014** | 16 | 11 | 76.5 | 34.5 | 30 | 40 | 0.63 |
| **2015** | 20 | 20 | 36 | 26.5 | 57 | 39 | 1.54 |
| **2016** | 27 | 23 | 49.5 | 68.5 | 98 | 138 | 2.00 |
| **2017** | 6 | 6 | 4 | 10.5 | 7 | 5 | 0.83 |
| **2018** | 5 | 5 | 4 | 6 | 7 | 0 | 0.70 |
| **2019** | 6 | 2* | 3 | 14 | 4 | 6 | 0.59 |

*One hunter only traveled through the property, one hunter cancelled their hunt due to an emergency, another hunter ended up hunting somewhere else, and one hunter didn't respond to emails.

# Project Income

Table 5.5.1 Accounting of project generated income for MRWMS in 2019.

| **2019 Beginning Balance** | | **$155,297.71** |
|---|---|---|
| CSP Payment | $25,732.00 | $181,029.71 |
| Malheur CREP | $15,971.00 | $197,000.71 |
| Hunter CreeK CREP | $3,841.00 | $200,841.71 |
| Haying | $330.00 | $201,171.71 |
| Grazing | $10,927.50 | $212,099.21 |
| Equipment disposal | $2,800.00 | $214,899.21 |
| Plant sales | $1,549.35 | $216,448.56 |
| Salaries | ($6,970.07) | $209,478.49 |
| Fringe | ($2,311.17) | $207,167.32 |
| Employee Travel | ($715.99) | $206,451.33 |
| Office Supplies | ($1,390.58) | $205,060.75 |
| F&W Supplies | ($921.88) | $204,138.87 |
| Grazing Lease | ($4,579.92) | $199,558.95 |
| Vehicle Operating Expense | ($513.66) | $199,045.29 |
| Miscellaneous Expense | ($240.21) | $198,805.08 |
| Indirect Expenses | ($3,407.46) | $195,397.62 |
| Capital Equipment | ($58,000.00) | $137,397.62 |
| Property Tax | ($645.05) | $136,752.57 |
| Special Program Fees | ($5,164.28) | $131,588.29 |
| Subcontracts | ($245.25) | $131,343.04 |
| **2019 Ending Balance:** | | **$131,343.04** |

# Staff

The Projects success can be attributed to the following staff members:

**Calla Hagle**– Natural Resource Director
**Carter Crouch** – Wildlife Program Manager
**Brandon Palmer**– Wildlife Biologist
**Lucas Samor**– MRWMS Site Manager
**Eric Hawley** – LVWMS Lead Technician
**Gabe First-Raised**- Fish and Wildlife Technician
**Brandon Haslick**– Fisheries Program Manager
**Rebecca Fritz** – Fisheries Biologist

Appendix A. Photo points at MRWMS comparing 2007 to 2019 riparian vegetation and stream bank condition.

M1: Upstream 2007


M1: Upstream 2019

M1: Downstream 2007


M1: Downstream 2019

M2: Upstream 2007


M2: Upstream 2019

Appendix A. Photo points at MRWMS comparing 2007 to 2019 riparian vegetation and stream bank condition.

M2: Downstream 2007


M2: Downstream 2019

M3: Upstream 2007


M3: Upstream 2019

M3: Downstream 2007


M3: Downstream 2019

Appendix A. Photo points at MRWMS comparing 2007 to 2019 riparian vegetation and stream bank condition.

M4: Upstream 2007


M4: Upstream 2019

M4: Downstream 2007


M4: Downstream 2019

M5: Upstream 2007


M5: Upstream 2019

Appendix A. Photo points at MRWMS comparing 2007 to 2019 riparian vegetation and stream bank condition.

M5: Downstream 2007


M5: Downstream 2019

M6: Upstream 2007


M6: Upstream 2019

M6: Downstream 2007


M6: Downstream 2019

Appendix A. Photo points at MRWMS comparing 2007 to 2019 riparian vegetation and stream bank condition.

M7: Upstream 2007


M7: Upstream 2019

M7: Downstream 2007


M7: Downstream 2019

M8: Upstream 2007


M8: Upstream 2019

Appendix A. Photo points at MRWMS comparing 2007 to 2019 riparian vegetation and stream bank condition.

M8: Downstream 2007


M8: Downstream 2019

M9: Upstream 2007


M9: Upstream 2019

M9: Downstream 2007


M9: Downstream 2019