ATTACHMENT P1-6
FISH AND WILDLIFE HABITAT MITIGATION PLAN

Fish and Wildlife Habitat Mitigation Plan

Boardman to Hemingway Transmission Line Project

1221 West Idaho Street
Boise, Idaho 83702

September 2018

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF APPENDICES

ACRONYMS AND ABBREVIATIONS

BLM	Bureau of Land Management
EFSC or Council	Energy Facility Siting Council
HMP	Habitat Mitigation Plan
ILF	in-lieu fee
IPC	Idaho Power Company
MZ	Management Zone
OAR	Oregon Administrative Rules
ODOE	Oregon Department of Energy
ODFW	Oregon Department of Fish and Wildlife
Project	Boardman to Hemingway Transmission Line Project
WAGS	Washington ground squirrel

1.0 INTRODUCTION

To obtain an Oregon Energy Facility Siting Council (EFSC or Council) site certificate for the Boardman to Hemingway Transmission Line Project (Project), Idaho Power Company (IPC) must show that the design, construction, and operation of the Project, taking into account mitigation, is consistent with the Oregon Department of Fish and Wildlife's (ODFW) Habitat Mitigation Policy at Oregon Administrative Rule (OAR) 635-415-0025 (see OAR 345-022-0060, EFSC's Fish and Wildlife Habitat Standard). This Fish and Wildlife Habitat Mitigation Plan (HMP) sets forth the mitigation measures IPC will implement to achieve the goals and standards of ODFW's Habitat Mitigation Policy with respect to fish and wildlife species other than the greater sage-grouse (*Centrocercus urophasianus)*, which is addressed in the Greater Sage-Grouse Habitat Mitigation Plan (Exhibit P2, Attachment P2-3).

As background, IPC considered avoidance of sensitive resources a priority throughout the siting process, as explained in the Project's Siting Study (Exhibit B, Attachment B-1), 2012 Siting Study Supplement (Exhibit B, Attachment B-2), and 2015 Supplemental Siting Study (Exhibit B, Attachment B-3). In particular, IPC's initial siting process avoided sensitive resource areas to the extent practical, including Bureau of Land Management (BLM) designated areas of critical environmental concern, BLM-designated wilderness study areas, waterbodies (including wetlands, wild and scenic rivers, streams that support special status species), areas with sensitive wildlife resources (e.g., sage-grouse leks, Washington ground squirrel colonies, raptor nests), U.S. Department of Agriculture Forest Service designated visual resource retention and preservation lands and inventoried roadless areas, city and town boundaries, and irrigated agriculture. Furthermore, the Project is designed to follow existing developments and utility corridors, such as existing roads and transmission lines, to the extent practical and without violating the Western Electricity Coordinating Council's reliability criteria, in order to consolidate impacts on areas that have already been disturbed as opposed to impacting undisturbed areas. IPC will also implement measures during construction and maintenance that are intended to minimize impacts on the environment, and specifically fish and wildlife habitat. Regardless of the efforts to site the Project to avoid high value fish and wildlife habitat and the implementation of measures to minimize impacts on fish and wildlife habitat, unavoidable impacts from the Project will occur.

This Fish and Wildlife HMP presents the direct and indirect impacts to fish and wildlife habitats, provides an approach for quantifying the impact debits resulting from the Project and the mitigation credits created through the proposed mitigation projects, and sets forth a schedule for implementing the necessary mitigation projects. Consistent with the ODFW Habitat Mitigation Policy, mitigation measures will be implemented and completed either prior to or concurrent with the Project.

If, after review and potential approval by EFSC of the Fish and Wildlife HMP, should the approved mitigation projects no longer be available, or if IPC decides to select another mitigation project not previously considered by EFSC, or if the reviewed mitigation projects do not provide sufficient mitigation credit and additional mitigation is necessary, IPC will amend the Fish and Wildlife HMP and submit the same to Oregon Department of Energy (ODOE) for its approval.

2.0 APPLICABLE RULES AND AGENCY GUIDANCE

2.1 General Standards for Siting Facilities

The Fish and Wildlife Habitat Standard at OAR 345-022-0060 states:

> *For the Council to issue a site certificate, it must find that the design, construction, and operation of the facility, taking into account mitigation, are consistent with the fish and wildlife habitat mitigation goals and standards of OAR 635-415-0025 in effect as of September 1, 2000.*

2.2 Implementation of ODFW Habitat Mitigation Recommendations

OAR 635-415-00252 provides the following:

> *(1) "Habitat Category 1" is irreplaceable, essential habitat for a fish or wildlife species, population, or a unique assemblage of species and is limited on either a physiographic province or site-specific basis, depending on the individual species, population or unique assemblage.*
>
> > *(a) The mitigation goal for Category 1 habitat is no loss of either habitat quantity or quality.*
> >
> > *(b) The Department shall act to protect Category 1 habitats described in this subsection by recommending or requiring:*
> >
> > > *(A) Avoidance of impacts through alternatives to the proposed development action; or*
> > >
> > > *(B) No authorization of the proposed development action if impacts cannot be avoided.*
>
> *(2) "Habitat Category 2" is essential habitat for a fish or wildlife species, population, or unique assemblage of species and is limited either on a physiographic province or site-specific basis depending on the individual species, population or unique assemblage.*
>
> > *(a) The mitigation goal if impacts are unavoidable, is no net loss of either habitat quantity or quality and to provide a net benefit of habitat quantity or quality.*
> >
> > *(b) The Department shall act to achieve the mitigation goal for Category 2 habitat by recommending or requiring:*
> >
> > > *(A) Avoidance of impacts through alternatives to the proposed development action; or*
> > >
> > > *(B) Mitigation of impacts, if unavoidable, through reliable in-kind, in-proximity habitat mitigation to achieve no net loss of either pre-development habitat quantity or quality. In addition, a net benefit of habitat quantity or quality must be provided. Progress towards achieving the mitigation goals and standards shall be reported on a schedule agreed to in the mitigation plan performance measures. The fish and wildlife mitigation measures shall be implemented and completed either prior to or concurrent with the development action.*
> >
> > *(c) If neither 635-415-0025(2)(b)(A) or (B) can be achieved, the Department shall recommend against or shall not authorize the proposed development action.*

(3) "Habitat Category 3" is essential habitat for fish and wildlife, or important habitat for fish and wildlife that is limited either on a physiographic province or site-specific basis, depending on the individual species or population.

(a) The mitigation goal is no net loss of either habitat quantity or quality.

(b) The Department shall act to achieve the mitigation goal for Category 3 habitat by recommending or requiring:

(A) Avoidance of impacts through alternatives to the proposed development action; or

(B) Mitigation of impacts, if unavoidable, through reliable in-kind, in-proximity habitat mitigation to achieve no net loss in either pre-development habitat quantity or quality. Progress towards achieving the mitigation goals and standards shall be reported on a schedule agreed to in the mitigation plan performance measures. The fish and wildlife mitigation measures shall be implemented and completed either prior to or concurrent with the development action.

c) If neither 635-415-0025(3)(b)(A) or (B) can be achieved, the Department shall recommend against or shall not authorize the proposed development action.

(4) "Habitat Category 4" is important habitat for fish and wildlife species.

(a) The mitigation goal is no net loss in either existing habitat quantity or quality.

(b) The Department shall act to achieve the mitigation goal for Category 4 habitat by recommending or requiring:

(A) Avoidance of impacts through alternatives to the proposed development action; or

(B) Mitigation of impacts, if unavoidable, through reliable in-kind or out-of-kind, in-proximity or off-proximity habitat mitigation to achieve no net loss in either pre-development habitat quantity or quality. Progress towards achieving the mitigation goals and standards shall be reported on a schedule agreed to in the mitigation plan performance measures. The fish and wildlife mitigation measures shall be implemented and completed either prior to or concurrent with the development action.

(c) If neither 635-415-0025(4)(b)(A) or (B) can be achieved, the Department shall recommend against or shall not authorize the proposed development action.

(5) "Habitat Category 5" is habitat for fish and wildlife having high potential to become either essential or important habitat.

(a) The mitigation goal, if impacts are unavoidable, is to provide a net benefit in habitat quantity or quality.

(b) The Department shall act to achieve the mitigation goal for Category 5 habitat by recommending or requiring:

(A) Avoidance of impacts through alternatives to the proposed development action; or

(B) Mitigation of impacts, if unavoidable, through actions that contribute to essential or important habitat.

(c) If neither 635-415-0025(5)(b)(A) or (B) can be achieved, the Department shall recommend against or shall not authorize the proposed development action.

(6) "Habitat Category 6" is habitat that has low potential to become essential or important habitat for fish and wildlife.

(a) The mitigation goal is to minimize impacts.

(b) The Department shall act to achieve the mitigation goal for Category 6 habitat by recommending or requiring actions that minimize direct habitat loss and avoid impacts to off-site habitat.

(7) For proposed developments subject to this rule with impacts to greater sage-grouse habitat in Oregon, mitigation shall be addressed as described in OAR 635-140-0000 through 635-140-0025, except that any energy facility that has submitted a preliminary application for site certificate pursuant to ORS 469.300 et seq. on or before the effective date of this rule is exempt from fulfilling the avoidance test contained in 635-140-0025, Policy 2, subsections (a), (b), (c) and (d)(A). Other mitigation provisions contained in 635-140-0025, Policy 2, subsections (d)(B) and (e), and Policies 3 and 4 remain applicable.

2.3 ODFW Mitigation Framework for Indirect Road Impacts to Rocky Mountain Elk Habitat

In April 2015, ODFW provided IPC with guidance on mitigation for impacts to Rocky Mountain elk (*Cervus canadensis nelsoni*). The guidance document is entitled *Mitigation Framework for Indirect Road Impacts to Rocky Mountain Elk Habitat* (Elk Mitigation Framework) (ODFW 2015). The Elk Mitigation Framework provides a methodology for quantifying the area of indirect impacts from energy facility roads and provides guidance for how ODFW will consider indirect impacts to elk habitat under their Habitat Mitigation Policy. Indirect impacts are calculated in Exhibit P3 and are presented in summary in this Fish and Wildlife HMP.

3.0 ANALYSIS

3.1 Avoidance

ODFW's Habitat Mitigation Policy sets forth a mitigation goal for each of Habitat Category 1 through 6, and provides recommendations or requirements ODFW shall take to achieve the mitigation goals. Depending on the habitat category, ODFW's recommendations or requirements provide that the project proponent must avoid impacts to the habitat or at least consider avoidance of the habitat.

3.1.1 Habitat Category 1

For Habitat Category 1, ODFW's recommendations or requirements provide that impacts to the habitat must be avoided through alternatives to the proposed development action or the project should not be authorized (see OAR 635-415-00252(1)(b)). Here, the Project Site Boundary includes Category 1 habitat associated with raptor nests. Although trees or structures with raptor nests are managed as Category 1 habitat, they are not included in the habitat categorization analysis for acres of Category 1 habitat because of their relatively small size on the landscape. To ensure that Category 1 raptor nests and raptor breeding activities are not

disturbed by Project activities, the seasonal and spatial restrictions identified in Exhibit P1, Attachment P1-10 and listed in Exhibit P1, Section 3.5.3.1 will be applied.

There is potential for Category 1 Washington ground squirrel (*Urocitellus washingtoni*, WAGS) habitat to be identified within the Site Boundary during future surveys. IPC has modified the Project location to avoid Category 1 WAGS habitat in the past and will perform WAGS surveys in the future within previously unsurveyed areas to identify Category 1 WAGS habitat for avoidance. IPC is proposing site certificate conditions that will ensure that surveys for raptor nests and WAGS are conducted within an appropriate timeframe prior to construction, that seasonal restrictions are applied to raptor nests to avoid impacts to Category 1 habitat, and that all construction activities avoid Category 1 WAGS habitat. WAGS surveys will be used to complete final design, facility layout, and micrositing of facility components and IPC will not construct any facility components within areas of Category 1 habitat and will avoid temporary disturbance of Category 1 habitat. Refer to Fish and Wildlife Condition 18, Fish and Wildlife Condition 19, and Threatened and Endangered Species Condition 1 in Exhibit P1 and Exhibit Q, Section 4.0. Accordingly, the Project will avoid impacts to Category 1 habitat consistent with ODFW's Habitat Mitigation Policy, and no compensatory mitigation is required or proposed.

3.1.2 Habitat Categories 2 through 6

ODFW's recommendations or requirements for meeting the mitigation goals for Habitat Categories 2 through 6 provide that the project proponent must consider avoiding impacts to the relevant habitats. However, unlike with Habitat Category 1, strict avoidance is not a requirement in Habitat Categories 2 through 6. Rather, unavoidable impacts to Habitat Categories 2 through 5 may be excused by showing the impacts will be mitigated for, and unavoidable impacts to Habitat Category 6 need only be minimized (see OAR 635-415-00252(2)(b)(B), (3)(b)(B), (4)(b)(B), (5)(b)(B), and (6)(b)). Here, as discussed in Exhibit P1, Section 3.5.6, IPC considered avoidance of sensitive resources related to fish and wildlife habitat during initial routing of the Project. IPC is proposing measures to be implemented during construction and operation that will avoid and minimize impacts to fish and wildlife habitats (see Exhibit P1, Section 3.5.6).

3.2 Minimization

3.2.1 Habitat Categories 2 through 5

ODFW's Habitat Mitigation Policy does not specify that unavoidable impacts to Habitat Categories 2 through 5 must be minimized, in addition to being mitigated. Regardless, the minimization measures that IPC is proposing (Exhibit P1, Section 3.5.6) will be implemented Project-wide and across all habitat categories. Therefore, the measures will minimize impacts to Habitat Categories 2 through 5 even though the Habitat Mitigation Policy does not expressly provide for the same.

3.2.2 Habitat Category 6

ODFW's Habitat Mitigation Policy provides for minimizing impacts to Habitat Category 6 and does not require compensatory mitigation for such impacts (see OAR 635-415-00252(6)(b)). Implementation of the Reclamation and Revegetation Plan (Exhibit P1, Attachment P1-3) will minimize impacts to Habitat Category 6 consistent with ODFW's Habitat Mitigation Policy, and no compensatory mitigation is required or proposed.

3.3 Compensatory Mitigation

For unavoidable impacts to Habitat Categories 2 through 5, compensatory mitigation will be required. The following discussion presents the potential impacts to Habitat Categories 2 through 5 and proposed mitigation projects that could be used to offset the Project impacts.

3.3.1 Quantifying Project Impacts

IPC determined the number of fish and wildlife habitat acres impacted by the Project as follows:

- ***Direct impacts to habitat***: IPC identified habitat types within the Site Boundary consistent with the Habitat Mitigation Policy (see Exhibit P1 and Attachment P1-1). IPC then identified the direct impacts of the Project to each habitat type by calculating the number of acres of each habitat type within the construction and operation footprints. Direct impacts are defined as the impacts that will have an adverse effect upon species habitat or individuals, and that will occur at the same, or in close proximity to, time and place. Direct impacts may be permanent or temporary. Permanent impacts will exist for the entire life of the Project. Temporary impacts are those impacts that will last for a time less than the life of the Project. Here, permanent direct impacts may occur in the form of vegetation clearing at the transmission line, communication stations, and access roads; and direct mortality. Temporary direct impacts may occur in the form of vegetation clearing at construction areas used during construction or retirement. For a more-detailed description of the types of activities considered under direct impacts, see Exhibit P1, Section 3.5.3. The analysis of direct impacts to the habitat types is discussed in more detail below in Section 3.3.1.1, and the resulting impact acres are set forth below in Table 1.
- ***Indirect impacts to elk summer and winter range***: Indirect impacts are defined as the impacts that will have an adverse effect upon fish and wildlife habitat or individuals, and that will occur later in time or in a different place than the Project activities. Indirect impacts may be permanent or temporary. Permanent impacts will exist for the entire life of the Project. Temporary impacts are those impacts that will last for a time less than the life of the Project. In this instance, permanent indirect impacts may occur in the form of habitat fragmentation at the transmission line and access roads. Temporary indirect impacts may occur in the form of noise, traffic, dust, and other nuisances resulting from construction activities at the access roads; and potential invasive species introduction during construction. For a more-detailed description of the types of activities considered under indirect impacts, see Exhibit P1, Section 3.5.4. Consistent with ODFW guidance, IPC did not quantify indirect impacts to fish and wildlife habitat, except with respect to elk and sage-grouse. Exhibit P2 discusses sage-grouse impacts and mitigation. IPC quantified the indirect impacts of the Project to elk summer and winter range based on the methodology and principles set forth in the Elk Mitigation Framework. Indirect impacts are calculated in Exhibit P3 and presented in summary in this Fish and Wildlife HMP.
- ***Impacts to greater sage-grouse***: IPC addresses impacts to sage-grouse in Exhibit P2 and Attachment P2-3.

3.3.1.1 Impacts to Habitat

The location of the Project presented in this application is based on a preliminary design developed in September of 2016. Direct and indirect impacts, both temporary and permanent, to fish and wildlife habitat have been estimated using the preliminary design. IPC will update the estimated impacts contained within this Fish and Wildlife HMP based upon the final design of the Project which will occur after issuance of a site certificate and prior to construction. In the third year of operation, IPC will submit a report to ODOE presenting the final compensatory

mitigation calculations based on the as-constructed footprint of the Project and showing mitigation is commensurate with those final numbers. The report will come in the third year of operation and not sooner, because the elk mitigation calculations are dependent on the post-construction traffic study that will take place during Year 2 of operation.

Direct Impacts to Habitat

Exhibit P1, Section 3.5.2.4 quantifies the direct impacts of the Proposed Route and alternatives by habitat category, habitat type, and impact type (temporary or permanent). Table 1 quantifies the direct impacts of the Proposed Route and alternatives by habitat category, general vegetation type, and impact type. The general vegetation types are groupings of similar habitat types (see Exhibit P1, Attachment P1-1).

Table 1. Estimated Acreage of Temporary and Permanent Direct Impacts by General Vegetation Type

Habitat Category and General Vegetation Type	Proposed Route		West of Bombing Range Road Alternative 1		West of Bombing Range Road Alternative 2		Morgan Lake Alternative		Double Mountain Alternative	
	Temp[1]	Perm	Temp	Perm	Temp	Perm	Temp	Perm	Temp	Perm
Category 2										
Agriculture / Developed[2]	95.0	10.6								
Bare Ground	2.0	0.3	–	–	–	–	–	–	2.0	0.5
Forest / Woodland	6.8	536.1	–	–	–	–	68.1	12.5	–	–
Open Water / Wetlands	1.0	0.5	–	–	–	–	0.0	0.0	0.0	0.0
Riparian Vegetation	0.6	0.4	–	–	–	–	0.0	0.0	–	–
Shrub / Grassland	1,990.9	334.2	6.3	0.4	6.3	0.4	137.9	19.3	21.9	1.2
Subtotal	*2,123.1*	*882.7*	*6.3*	*0.4*	*6.3*	*0.4*	*206.1*	*31.9*	*23.9*	*1.6*
Category 3										
Agriculture / Developed	10.1	0.8	–	–	–	–	–	–	–	–
Bare Ground	0.3	0.1	–	–	–	–	–	–	0.1	0.0
Forest / Woodland	16.0	458.0	–	–	–	–	31.4	5.8	–	–
Open Water / Wetlands	0.4	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Riparian Vegetation	5.5	0.1	–	–	–	–	–	–	–	–
Shrub / Grassland	312.4	29.9	0.0	0.0	0.8	0.8	–	–	36.5	3.5
Subtotal	*344.6*	*489.1*	*0.0*	*0.0*	*0.8*	*0.8*	*31.4*	*5.8*	*36.6*	*3.5*
Category 4										
Open Water / Wetlands	0.0	0.0	–	–	–	–	–	–	–	–
Shrub / Grassland	165.3	26.1	4.9	0.7	6.2	1.2	–	–	15.8	2.5
Subtotal	*165.3*	*26.1*	*4.9*	*0.7*	*6.2*	*1.2*	–	–	*15.8*	*2.5*

Habitat Category and General Vegetation Type	Proposed Route		West of Bombing Range Road Alternative 1		West of Bombing Range Road Alternative 2		Morgan Lake Alternative		Double Mountain Alternative	
	Temp[1]	Perm	Temp	Perm	Temp	Perm	Temp	Perm	Temp	Perm
Category 5										
Forest / Woodland	–	–	–	–	–	–	0.0	0.0	–	–
Shrub / Grassland	329.3	43.3	13.4	2.5	5.7	1.7	–	–	57.3	16.3
Subtotal	*329.3*	*43.3*	*13.4*	*2.5*	*5.7*	*1.7*	–	–	*57.3*	*16.3*
Category 6										
Agriculture / Developed	310.5	259.8	2.3	1.6	1.9	1.5	0.3	15.5	0.1	4.8
Subtotal	*310.5*	*259.8*	*2.3*	*1.6*	*1.9*	*1.5*	*0.3*	*15.5*	*0.1*	*4.8*
TOTAL	**3,272.9**	**1,701.0**	**26.9**	**5.3**	**20.9**	**5.7**	**237.8**	**53.3**	**133.7**	**28.8**

[1] Temporary impacts will be reclaimed as described in Exhibit P1, Attachment P1-3, Reclamation and Revegetation Plan.
[2] The Category 2 Agriculture / Developed general vegetation type includes areas that appear to be in CRP within elk or mule deer winter range.
0.0 = less than 0.05 acre; – = 0.

In categorizing fish and wildlife habitat pursuant to the ODFW Habitat Mitigation Policy, ODFW directed IPC to overlay the following species-specific habitats on the Site Boundary: WAGS habitat, elk winter and summer range, mule deer (*Odocoileus hemionus*) winter and summer range, and California bighorn sheep (*Ovis canadensis californiana)* herd range (see Exhibit P1, Attachment P1-1, Appendix A). The preceding quantification of direct impacts includes, in part, impacts to those species-specific habitats. However, in many instances, those species-specific habitats overlap with each other—for example, a particular acre may be considered both elk winter range and mule deer winter range. For purposes of quantifying total acres of direct impacts, IPC counted each acre within the construction and operation footprint only once, even though certain acres may include more than one of the relevant species-specific habitats. Even so, Table 2 shows the acres of direct impacts that occur within each species-specific habitat.

Table 2. Estimated Acreage of Direct Impacts within Wildlife Habitat Layers

Wildlife Habitat Layer	Habitat Category	Acres of Impact				
		Proposed Route	West of Bombing Range Road Alt. 1	West of Bombing Range Road Alt. 2	Morgan Lake Alternative	Double Mountain Alternative
WAGS Habitat	2	22.4	6.7	6.7	–	–
Elk Winter Range	2	416.3	–	–	89.6	–
Elk Summer Range	3	132.1	–	–	61.3	–
Mule Deer Winter Range	2	2,951.8	–	–	235.2	25.6
Mule Deer Summer Range	3	894.6	–	–	100.3	–
California Bighorn Sheep Herd Range	2	15.8	–	–	–	–

Indirect Impacts to Habitat

Indirect impacts to fish and wildlife habitat will occur during construction and operation of the Project as described in Exhibits P1 and P3. The nature and extent of indirect impacts varies depending on the species and habitat being affected. There is no guidance on quantifying indirect impacts to fish and wildlife species or their habitat, other than for elk (see Exhibit P3) and sage-grouse (see Exhibit P2). Further, ODFW has advised IPC that ODFW does not require compensatory mitigation for indirect impacts to habitat beyond such impacts to elk habitat and sage-grouse habitat. Therefore, compensatory mitigation for indirect impacts is required only for elk habitat and sage-grouse habitat to meet the goals and objectives of ODFW's Habitat Mitigation Policy. IPC is only proposing compensatory mitigation for indirect impacts to elk habitat within this HMP. Compensatory mitigation for indirect impacts to sage-grouse is presented in Exhibit P2, Attachment P2-3.

3.3.1.2 Impacts to Elk Summer and Winter Range

Direct Impacts to Elk Summer and Winter Range

Direct impacts to elk summer and winter range are included in the direct impacts set forth above in Section 3.3.1.1, Table 2.

Indirect Impacts to Elk Summer and Winter Range

The description and quantification of indirect impacts to elk are detailed in Exhibit P3, Section 3.5.4. For the Proposed Route, indirect impacts to summer range total 5.6 acres and indirect impacts to winter range total 428.0 acres. For the Morgan Lake Alternative, indirect impacts to summer range total 152.7 acres and indirect impacts to winter range total 175.8 acres.

3.3.1.3 Direct and Indirect Impact Summary

Approximately 5,052 acres of Category 2 through Category 6 habitat will be directly affected during construction of the Proposed Route and approximately 434 acres of elk habitat will be indirectly affected due to anticipated traffic increases from new and improved roads associated with the Proposed Route. These disturbances will occur over 270.8 miles of transmission line, crossing five counties in Oregon. The Project crosses four Level III ecoregions: the Columbia Plateau, the Blue Mountains, the Snake River Plain, and the Northern Basin and Range (EPA 2011).

Summarizing impacts within an ecoregional framework will assist in describing potential mitigation (Section 4.2) and accounting for mitigation debits and credits (Section 4.3). For purposes of this Fish and Wildlife HMP, the boundaries of the four ecoregions crossed by the Project are modified slightly and referred to as mitigation zones (MZ) (Figure 1). Mitigation Zone 1 (MZ1) corresponds to the Columbia Plateau ecoregion. MZ2 corresponds to the Blue Mountain ecoregion, without its Continental Zone Foothills Level IV ecoregion. MZ3 combines the Snake River Plain, Northern Basin and Range, and the Continental Zone Foothills of the Blue Mountains ecoregion into a single zone. This was done to group the mitigation debits and credits from the shrub/grassland vegetation type within the Baker, Keating, and Durkee valleys with those in the Northern Basin and Range and Snake River Plain.

Impacts are summarized for the Proposed Route only. The two West of Bombing Range Road alternatives are in MZ1, the Morgan Lake Alternative is in MZ2, and the Double Mountain Alternative is in MZ3. Since each of the alternatives is wholly contained within an MZ, Table 1 and Table 2 above can be referenced for direct impacts. Section 3.3.1.2 quantifies the indirect impacts on elk habitat associated with the Morgan Lake alternative contained within MZ2.

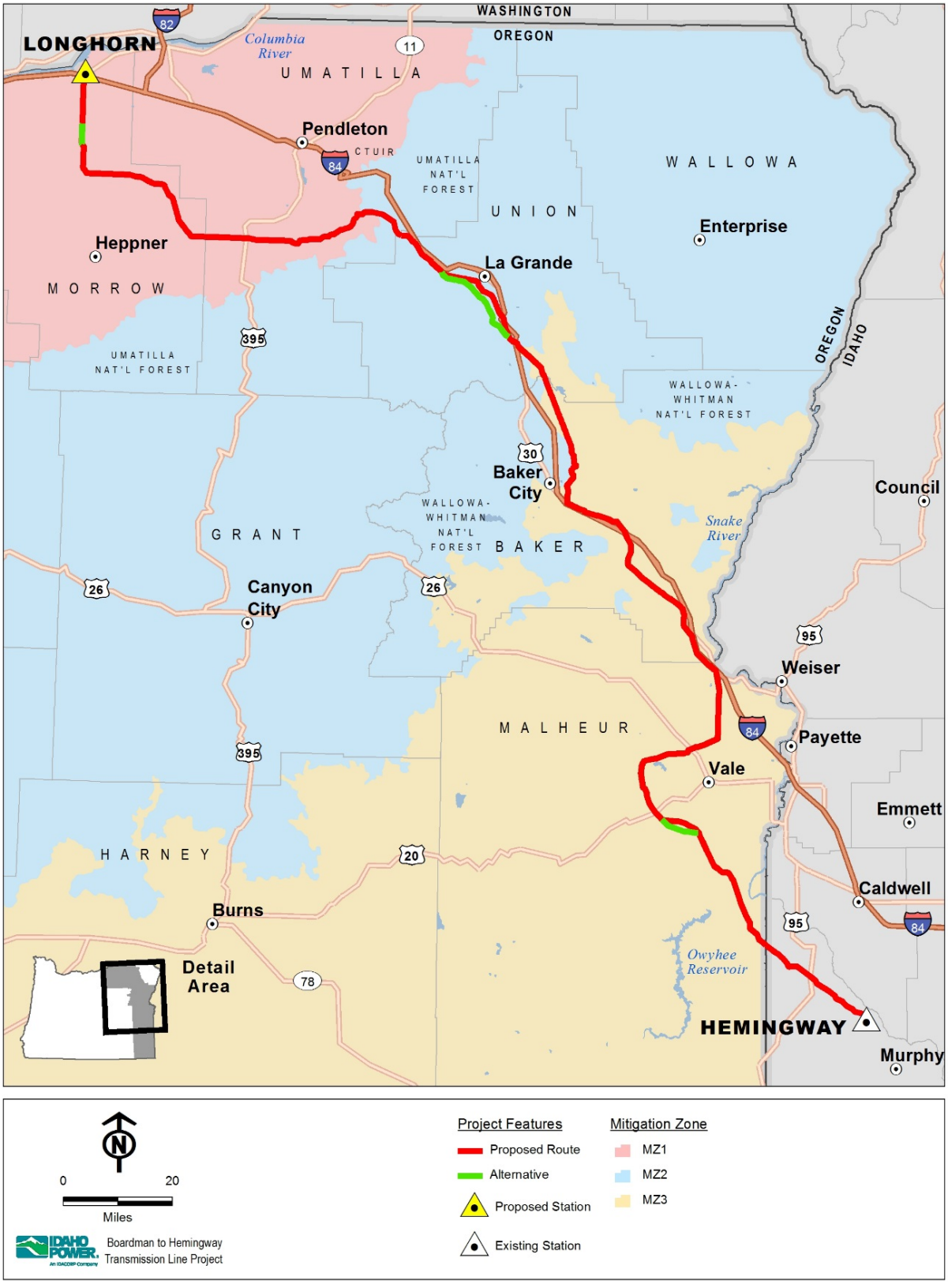

Figure 1. Mitigation Zones

MZ1 Impacts

MZ1 encompasses the northern portion of the Proposed Route from the Longhorn Station, through the Naval Weapons System Training Facility Boardman, east from Morrow County into Umatilla County, across highway 395 and into the foothills of the Blue Mountains south and east of Pilot Rock, Oregon. Approximately 1,173 acres of direct impacts and 0 acres of indirect impacts are anticipated within MZ1, with a majority of impacts occurring within agriculture/ developed and shrub/grassland general vegetation types (Table 3). Impacts on the shrub/grassland general vegetation type occur mostly within the introduced upland vegetation and native grassland habitat types, with fewer impacts occurring in shrubland habitat types. The impact acreage in MZ1 originates from the proposed construction of 60 miles of existing roads requiring substantial modification, 66.9 miles of new roads, 336 tower structures to support 77.6 miles of transmission line, and 13 multi-use areas.

Table 3. Direct and Indirect Impacts from the Proposed Route on General Vegetation Types by ODFW Habitat Categories in MZ1

General Vegetation Type	ODFW Habitat Categories (acres)					Total	*General Veg. Type Subtotal Temporary*	*General Veg. Type Subtotal Permanent*
	2	**3**	**4**	**5**	**6**			
Direct Impacts								
Agriculture/ Developed	105.6	10.9	–	–	290.9	**407.4**	***300.8***	***106.7***
Forest/ Woodland	7.6	–	–	–	–	**7.6**	**–**	***7.6***
Open Water/ Wetlands	0.5	0.0	–	–	–	**0.5**	***0.3***	***0.2***
Riparian Vegetation	0.5	0.1	–	–	–	**0.6**	***0.4***	***0.2***
Shrub/ Grassland	609.0	14.6	19.2	113.8	-	**756.5**	***643.5***	***113.0***
Indirect Impacts								
Impact Area[1]	–	–	–	–	–	**–**	**–**	**–**
Totals								
Total	**724.0**	**25.6**	**19.2**	**113.8**	**290.9**	**1,173.4**	***945.7***	***227.7***
Category Subtotal Temporary	***614.1***	***21.5***	***15.8***	***98.8***	***195.6***	***945.7***	–	–
Category Subtotal Permanent	***109.9***	***4.1***	***3.5***	***15.0***	***95.2***	***227.7***	–	–

[1]The vegetation composition of the indirect impact area in elk summer and winter range has not been attributed at this time. Currently, no indirect impacts to elk summer or winter range have been identified within MZ1.
Note: 0.0 = less than 0.05 acre; – = 0

Within MZ1, impacts overlap with habitat for WAGS, elk, and mule deer. Table 4 identifies the acreage of each wildlife habitat layer within MZ1 that will be affected by the Proposed Route. MZ1 contains all of the Project's impacts on WAGS habitat.

Table 4. Direct and Indirect Impacts from the Proposed Route on Wildlife Habitat in MZ1

Wildlife Habitat Layer[1]	Habitat Category	Impact Type			*Total*
		Temp	Perm	Indirect	
WAGS	2	19.7	2.7	–	***22.4***
Elk winter range	2	54.6	8.5	–	***63.2***
Elk summer range	3	20.4	2.8	–	***23.2***
Mule deer winter range	2	593.8	106.4	–	***700.2***
Mule deer summer range	3	–	–	–	**–**

[1] Habitat layers overlap each other; therefore, acres of impact between habitat layers should not be added together.
Note: – = 0

MZ2 Impacts

MZ2 encompasses the central portion of the Proposed Route from the foothills of the Blue Mountains east of Pilot Rock, Oregon, from Umatilla County across the Blue Mountains into Union County past La Grande, Oregon, to where the Project crosses Interstate 84 near Ladd Canyon and Craig Mountain in the Clover Creek Valley area. Approximately 1,453 acres of direct impacts and 6.3 acres of indirect impacts are anticipated within MZ2, with a majority of impacts occurring within forest/woodland and shrub/grassland general vegetation types (Table 5). Impacts on the forest/woodland general vegetation type occur mostly within the Douglas-fir / mixed grand fir habitat type, as well as ponderosa pine habitat type. A 250-foot-wide corridor around the centerline is assumed to be a permanent disturbance to the forest/woodland general vegetation type within MZ2 because of the vegetation management that will occur under the line. To keep vegetation clear of the conductors, a 250-foot-wide area will be treated and maintained such that a forest/woodland vegetation type cannot reestablish. This is reflected by the greater amount of permanent impacts than temporary impacts to forest/woodland in MZ2. Impacts on shrub/grassland general vegetation type occur mostly within the native grassland and shrub-steppe habitat types. The impact acreage in MZ2 originates from the proposed construction of 42 miles of existing roads requiring substantial modification, 20.4 miles of new roads, 217 tower structures to support 49.6 miles of transmission line, and 9 multi-use areas.

Table 5. Direct and Indirect Impacts from the Proposed Route on General Vegetation Types by ODFW Habitat Categories in MZ2

General Vegetation Type	ODFW Habitat Categories (acres)						Total	*General Veg Type Subtotal Temporary*	*General Veg Type Subtotal Permanent*
	1	2	3	4	5	6			
Direct Impacts									
Agriculture/ Developed	–	–	–	–	–	100.7	**100.7**	***59.2***	***41.4***
Bare Ground	–	–	–	–	–	–	**–**	**–**	**–**
Forest/ Woodland	–	388.5	474.0	–	–	–	**862.5**	***22.2***	***840.4***
Shrub/ Grassland	–	187.8	163.5	15.4	12.6	–	**379.4**	***345.7***	***33.7***
Open Water/ Wetlands	–	26.1	0.2	0.0	–	–	**26.3**	***25.9***	***0.4***
Riparian	–	0.0	5.4	–	–	–	**5.4**	***5.4***	***0.1***

General Vegetation Type	ODFW Habitat Categories (acres)						Total	*General Veg Type Subtotal Temporary*	*General Veg Type Subtotal Permanent*
	1	2	3	4	5	6			
Vegetation									
Indirect Impacts									
Impact Area[1]	–	–	6.3	–	–	–	***6.3***	–	***6.3***
Totals									
Total	–	**602.4**	**649.4**	**15.4**	**12.6**	**179.2**	**1,380.6**	***458.3***	***922.3***
Category Subtotal Temporary	–	***198.5***	***176.4***	***12.5***	***11.6***	***137.7***	***458.3***	–	–
Category Subtotal Permanent	–	***403.9***	***473.0***	***2.9***	***1.1***	***41.4***	***922.3***	–	–

[1]The vegetation composition of the indirect impact area in elk summer and winter range has not been attributed at this time.
Note: 0.0 = less than 0.05 acre; – = 0.

Within MZ2, impacts overlap with habitat for elk and mule deer. Table 6 identifies the acreage of each wildlife habitat layer within MZ2 that will be affected by the Proposed Route. Table 6 includes the indirect impacts within elk winter range and elk summer range. Elk and deer seasonal ranges cover a vast majority of the impacts from the Proposed Route that occur within MZ2, speaking to the importance of this zone to big game species.

Table 6. Direct and Indirect Impacts from the Proposed Route on Wildlife Habitat in MZ2

Wildlife Habitat Layer[1]	Habitat Category	Impact Type			*Total*
		Temp	Perm	Indirect	
Elk winter range	2	83.2	137.9	–	***221.1***
Elk summer range	3	23.0	86.2	6.3	***115.6***
Mule deer winter range	2	169.8	403.2	–	***573.0***
Mule deer summer range	3	180.0	503.4	–	***683.4***

[1] Habitat layers overlap each other; therefore, acres of impact between habitat layers should not be added together.
Note: – = 0

MZ3 Impacts

MZ3 encompasses the southern portion of the Proposed Route, from south of Ladd Canyon and Craig Mountain in the Clover Creek Valley area, across the Union/Baker county line, east of the Baker Valley across the Burnt River Canyon towards Huntington, Oregon and the remainder of the Project area in Malheur County. MZ3 is the largest mitigation zone and is where most of the Project's direct impacts occur. Approximately 2,642 acres of direct impacts and 432.7 acres of indirect impacts are anticipated within MZ3, with a vast majority of impacts occurring within the shrub/grassland general vegetation type (Table 7). Impacts on the shrub/grassland general vegetation type occur mostly within the shrub-steppe with big sage and introduced upland vegetation habitat types, with fewer impacts in native grassland and other shrub habitat types. The impact acreage in MZ3 originates from the proposed construction of 121.2 miles of existing roads requiring substantial modification, 118.9 miles of new roads, 635 tower structures to support 145.4 miles of transmission line, and 22 multi-use areas.

Table 7. Direct and Indirect Impacts from the Proposed Route on General Vegetation Types by ODFW Habitat Categories in MZ3

General Vegetation Type	ODFW Habitat Categories (acres)						Total	General Veg Type Subtotal Temporary	General Veg Type Subtotal Permanent
	1	2	3	4	5	6			
Direct Impacts									
Agriculture/ Developed	–	–	–	–	–	178.8	**178.8**	***55.7***	***123.2***
Bare Ground	–	2.3	0.5	–	–	–	**2.7**	***2.3***	***0.4***
Forest/ Woodland	–	146.8	–	–	–	–	**146.8**	***0.6***	***146.2***
Shrub/ Grassland	–	1,528.3	164.3	156.8	246.1	–	**2,095.6**	***1,808.7***	***286.9***
Open Water/ Wetlands	–	1.6	0.3	0.0	–	–	**1.9**	***1.3***	***0.6***
Riparian Vegetation	–	0.5	0.0	–	–	–	**0.5**	***0.3***	***0.2***
Indirect Impacts									
Impact Area[1]	–	427.3	–	–	–	–	**427.3**	**–**	***427.3***
Totals									
Total	–	**2,106.7**	**165.0**	**156.8**	**246.1**	**178.8**	**2,853.5**	***1,868.9***	***984.6***
Category Subtotal Temporary	**–**	***1,310.5***	***146.7***	***137.1***	***219.0***	***55.7***	***1,868.9***	–	–
Category Subtotal Permanent	**–**	***796.2***	***18.3***	***19.7***	***27.2***	***123.2***	***984.6***	–	–

[1] The vegetation composition of the indirect impact area in elk summer and winter range has not been attributed at this time.
Note: 0.0 = less than 0.05 acre; – = 0

Within MZ3, impacts overlap with habitat for elk, mule deer, and California bighorn sheep. Table 8 identifies the acreage of impacts to each wildlife habitat layer within MZ3 that will be affected by the Proposed Route. Table 8 includes the indirect impacts within elk winter range and elk summer range. The East Beulah Management Unit is managed by ODFW as an elk de-emphasis area and occurs within MZ3. Project impacts' habitat categories are not modified by overlap with elk winter and summer range within the de-emphasis area.

Table 8. Direct and Indirect Impacts from the Proposed Route on Wildlife Habitat in MZ3

Wildlife Habitat Layer[1]	Habitat Category	Impact Type			*Total*
		Temp	Perm	Indirect	
Elk winter range	2	100.8	32.3	427.3	***566***
Elk summer range	3	–	–	–	**–**
Mule deer winter range	2	1,309.9	368.7	–	***1,678.7***
Mule deer summer range	3	108.7	102.5	–	***211.2***
California Bighorn Sheep Herd Range	2	1.6	14.2	–	***15.8***

[1] Habitat layers overlap each other; therefore, acres of impact between habitat layers should not be added together.
Note: – = 0

3.3.2 Calculating Debits

Permanent impacts will be mitigated through the restoration, establishment, enhancement, and/or preservation of similar habitat. Table 9 outlines the approach to calculating the mitigation debit accrued from permanent impacts.

Table 9. Accounting for Mitigation Debit for Permanent Direct Impacts

Habitat	Impact Acres	Mitigation Debit	Mitigation Explanation
Category 2	1	>1	The mitigation goal for Category 2 habitat is "no net loss" and "net benefit." Accordingly, mitigation for permanent impacts on Category 2 habitat needs to demonstrate a net benefit in quality or quantity. Mitigation debits are accrued at a greater amount of acreage than what is impacted by the Project.
Category 3 & Category 4	1	1	The mitigation goal for Category 3 & 4 habitat is "no net loss" in quantity or quality. Mitigation debits are accrued at an equal amount of acreage to what is impacted by the Project.
Category 5	1	<1	The mitigation goal for Category 5 habitat is a "net benefit in habitat quantity or quality." Mitigation debits are accrued at a lesser amount (but greater than zero) of acreage than what is impacted by the Project; however, mitigation actions performed to offset the Category 5 debits will be improving the quality of Category 2, 3, or 4 habitats and result in a net benefit to quality.
Category 6	1	0	The mitigation goal for impacts on Category 6 habitat is minimization; no compensatory mitigation proposed. A majority of impacts on Category 6 habitat occurs within agricultural areas. IPC has prepared an Agricultural Impacts Mitigation Plan (Exhibit K, Attachment K-1) to address these impacts.

Temporary impacts will be restored during reclamation. IPC plans for reclamation to be successful. IPC will mitigate beyond reclamation for temporary impacts on Category 2 habitat to meet the net benefit requirement. IPC is also proposing to mitigate beyond reclamation for the temporal loss of Category 2, 3, and 4 habitat functionality that occurs from temporary impacts during recovery of habitat. Table 10 outlines the approach to calculating the mitigation debit accrued from temporary impacts.

Table 10. Accounting for Mitigation Debit for Temporary Direct Impacts

Habitat	Impact Acres	Mitigation Debit	Mitigation Explanation
Category 2	1	>1	The mitigation goal for Category 2 habitat is "no net loss" and "net benefit." Accordingly, mitigation for temporary impacts on Category 2 habitat needs to demonstrate a net benefit in quality or quantity. Mitigation debits are accrued at a greater amount of acreage than what is impacted by the Project. All areas of temporary disturbance will be revegetated at the site of impact. Mitigation debits are accrued to meet the "net benefit" requirement and to account for the temporal loss of habitat function during reclamation.
Category 3 & Category 4	1	<1	The mitigation goal for Category 3 & 4 habitat is "no net loss" in quantity or quality. Mitigation debits are accrued at a lesser amount (but greater than 0) of acreage than what is impacted by the Project. All areas of temporary disturbance will be revegetated at the site of impact. Mitigation debits are accrued to account for the temporal loss of habitat function during reclamation.
Category 5	1	0	The mitigation goal for Category 5 habitat is a "net benefit in habitat quantity or quality." IPC assumes that reclamation activities will result in a higher functioning habitat and therefore be a "net benefit" in habitat quality for all temporary impacts on Category 5 habitat; therefore, no mitigation debits are accrued.
Category 6	1	0	The mitigation goal for Category 6 habitat is minimization; no mitigation debits are accrued. A majority of impacts on Category 6 habitat occurs within agricultural areas. IPC has prepared an Agricultural Impacts Mitigation Plan (Exhibit K, Attachment K-1) to address these impacts.

Indirect impacts on elk winter range, a Category 2 habitat, and elk summer range, a Category 3 habitat, will be mitigated similar to permanent impacts. Table 11 outlines the approach to calculating the mitigation debit accrued from indirect impacts. The elk and deer habitat layers contain significant overlap, so the mitigation debits accrued for each should not be considered additive. Section 3.3.4.3 includes a discussion on how the wildlife habitat layer overlap may be addressed in the accounting process.

Table 11. Accounting for Mitigation Debit for Indirect Impacts

Habitat	Impact Acres	Mitigation Debit	Mitigation Explanation
Elk winter range Category 2	1	>1	The mitigation goal for Category 2 habitat is "no net loss" and "net benefit." Accordingly, mitigation for impacts on Category 2 habitat needs to demonstrate a net benefit in quality or quantity. Mitigation debits are accrued at a greater amount of acreage than what is impacted by the Project.
Elk summer range Category 3	1	1	The mitigation goal for Category 3 habitat is "no net loss" in quantity or quality. Mitigation debits are accrued at an equal amount of acreage to that impacted by the Project.

3.3.3 Purchasing Credits

IPC proposes offsetting fish and wildlife habitat impacts by either purchasing credits or conducting its own compensatory mitigation projects. With respect to purchasing credits, IPC proposes that it may do so through one or both of the following mechanisms:

- **Mitigation Banking**. Purchasing mitigation credits from mitigation banks to address Project impacts where available; no mitigation banks are currently available within the mitigation service area. In the event that a habitat mitigation bank becomes available within the mitigation service area, IPC would seek to accomplish all or part of its mitigation for the Project by participation in the bank.
- **In-Lieu Fee (ILF)**. Fees paid to an approved ILF sponsor which are then used to develop an on the ground mitigation project within a certain time period. IPC is not aware of any ILF sponsors within the Project's mitigation service area. In the event that an ILF sponsor becomes available within the mitigation service area, IPC would seek to accomplish all or part of its mitigation for the Project by participation through an ILF sponsor.

3.3.4 Creating Credits through Mitigation Projects

If IPC creates credits through a mitigation project or projects rather than purchase all of the required credits, IPC will secure the necessary mitigation sites prior to commencing construction on the Project. In this section, IPC describes the mitigation site selection process, the mitigation credit score assessment approach, the standards for each mitigation project, and the documentation and verification processes for the mitigation projects. In Appendix A, IPC provides a desktop analysis of certain potential mitigation sites that currently are on the market, demonstrating there are mitigation site opportunities sufficient to meet the needs of the Project.

3.3.4.1 Mitigation Project Standards

Mitigation Zones and Service Area

Because the Project crosses multiple habitat types and habitat categories, mitigation will need to occur at multiple locations. The mitigation zones and the mitigation service area[1] were developed to support mitigation planning. As an example, for impacts to the shrub/grasslands general vegetation type within MZ3, IPC will make every effort to identify mitigation within the portion of the service area that is within MZ3 that provides uplift to the shrub/grasslands general vegetation type. Following this approach will simplify the presentation of and accounting for potential mitigation. It may not be possible or necessary to mitigate for all impacts within a MZ with mitigation actions within that same MZ and it may not be possible or necessary to locate all mitigation actions within the mitigation service area (for instance, mitigation for impacts to Category 4 and Category 5 habitat can be located off-proximity).

Bare Ground General Vegetation Habitat

IPC will not seek out specific mitigation opportunities for the bare ground general vegetation type. The bare ground general vegetation type is made up of features that are typically found within the shrub/grassland and forest/woodland general vegetation types; such as rock outcrops, scree slopes, cliffs or canyons, and bare soil. Proposed mitigation of shrub/grassland

[1] The mitigation service area consists of the subbasins (i.e., hydrologic unit boundary 8) in Oregon that are crossed by the Project. See discussion in Section 4.1.1 for a list of subbasins crossed.

and forest/woodland general vegetation types will contain features that are part of the bare ground general vegetation type. Mitigation actions that provide ecological uplift to shrub/grassland and forest/woodland general vegetation types will provide a benefit to those species that utilize bare ground. Bare ground is found within most of the potential mitigation that IPC has identified to date (Appendix A).

Agriculture/Developed Habitat

To address mitigation for areas identified as agriculture/developed, IPC has prepared an Agricultural Impacts Mitigation Plan (Exhibit K, Attachment K-1). Impacts on agricultural habitats presented in this Fish and Wildlife HMP did not consider the methods used to assess impacts on agricultural land in Exhibit K.

Agency Input

IPC has requested input from the following federal, state, and local agencies regarding potential mitigation actions and areas within the mitigation service area. The agencies and organizations that have been or will be contacted include:

- BLM Vale, Oregon Field Office
- BLM Idaho State Office
- Wallowa-Whitman National Forest
- ODFW, La Grande Field Office,
- Idaho Department of Fish and Game
- Natural Resources Conservation Service
- Grande Ronde Model Watershed
- Various Rural Fire Protection Districts that occur along the Project
- Various land trusts
- Private individuals

IPC has worked closely with ODFW to identify potential mitigation for consideration in this Plan. IPC will continue to work with all the listed agencies and organizations as mitigation continues to be developed.

Conservation Actions

Credits may be generated by a combination of the following types of conservation actions:

- **Enhancement**: Measures that increase the quantity and/or quality of fish and wildlife habitat and are aimed at transitioning an area of habitat from a less than desirable state to something more desirable. Appropriate enhancement measures may vary among sites, depending on the initial and desired states of a site.
- **Avoided loss**: Measures that prevent undesirable state changes in areas that are at a demonstrated risk of degradation from threats such as development, wildfire, and invasive species. Depending on the current and anticipated future threats at a given site, appropriate avoided loss activities may include legal protection, fire prevention, and management of invasive species. Avoided loss is not being proposed as a stand-alone mitigation action; it will be considered alongside enhancement actions.

Specific conservation actions will be developed upon identification of a mitigation site and formal valuation of site conditions and possible habitat improvement measures. Table 12 below includes a preliminary list of potential conservation actions that IPC might apply to its mitigation projects.

Further, IPC will continue to seek out mitigation opportunities that would fund private, state, or federal programs and/or projects that would not necessarily involve a land acquisition component. IPC will work with the stakeholders to identify any unfunded or underfunded projects that could benefit from additional funding sources, as well as determining how much mitigation credit each of these projects will represent to the Project. These types of mitigation must remain functional and legally protected through the duration of impacts being mitigated and cannot include programs that have sufficient funding now or are likely to have sufficient funding in the future.

Table 12. Other Potential Mitigation Actions

Mitigation Action	Habitat Benefit	General Vegetation Type[1]	MZ	Size (acres)
Road Closure or Decommissioning	Reduces chronic sediment delivery to riparian areas, reduces potential of human caused fire and invasive species introduction	All	Unknown	Unknown
Stream Habitat Enhancement	Improve water quality, and fish and riparian wildlife habitat	Open Water/Wetlands	Unknown	Unknown
Culvert Removal / Replacement	Improve water quality and aquatic species passage	Open Water/Wetlands	Unknown	Unknown
Upland Habitat Enhancement	Multiple benefits	Shrub/Grassland Forest/Woodland	Unknown	Unknown
Juniper Removal	Improve/restore native grassland and shrub-steppe habitats, improve sage-grouse habitat	Shrub/Grassland	Unknown	Unknown
Fence Removal / Marking	Reduce wildlife collisions	Shrub/Grassland	Unknown	Unknown
Boardman Conservation Area	Preservation and enhancement of native grasslands, WAGS habitat	Shrub/Grassland	MZ1	22,642

3.3.4.2 Mitigation Project Documentation

Mitigation Management Plan

For each habitat mitigation site (mitigation site), IPC will produce a site-specific Mitigation Management Plan that identifies the extent, type, and description of all proposed conservation actions, including the following:

- **Introduction and background** – mitigation site name, date acquired, time period covered by the management plan, plan preparer, mitigation site manager and technical staff, mitigation site size, location, access, and adjacent land use. Also describe the purpose of the mitigation site and how it relates, if at all, with other mitigation properties or existing agency management areas.

- **Mitigation Durability** – description of the management, legal protection, and financial assurances that ensure the mitigation will be in place and effective for the intended duration. The mitigation duration should be commensurate with the duration of the impact, which can range from 3 to 5 years through the Project life.[2]
- **Baseline Ecological Setting** – vegetation mapping via field visit or some combination of remote classification and field verification, wildlife species that are likely to be present, mapped soil types, and a description of hydrologic features and current water rights and usage. Invasive species and noxious weed locations should also be identified and discussed.
- **Proposed Mitigation Goals and Actions** – description of the desired future condition for each habitat type. Describe the mitigation actions and operation and maintenance activities being proposed to achieve the desired future condition (juniper removal, seeding, noxious weed treatment, land management change).
- **Effectiveness** - proposed mitigation actions should be effective or reasonably likely to deliver expected conservation benefits. Mitigation actions should follow reliable methods. Reliable mitigation methods, meaning "a mitigation method that has been tested in areas with site factors similar to the area proposed for mitigation and that has been found (e.g., through field trials, demonstration projects or scientific studies) to produce the habitat effects required to meet the mitigation goal for that action." OAR 635-415-0005(29). The mitigation methods should be clearly stated or included by reference.
- **Monitoring and Performance Measures** – description of monitoring procedures (including baseline data collection), timeframes, and success criteria. Monitoring plans will incorporate standard monitoring procedures, timeframes, and success criteria. The purpose of the monitoring plans will depend on the mitigation action, but in general they will address long-term project monitoring, corrective actions, and maintenance responsibilities, if apple, including performance objectives, methods for measuring effectiveness/success, reporting requirements, funding source, and responsible parties. IPC will implement monitoring efforts as soon as is reasonable depending on the mitigation action being implemented. Monitoring efforts will occur at appropriate intervals for each individual mitigation action for the life of the Project. Below are some examples of generalized monitoring schedules and success criteria. Inclusion of these examples does not commit IPC to following them during implementation of mitigation.
    - **Monitoring:** Monitoring will occur annually until success criteria are met. Annual reports will be supplied to agencies for review. If the mitigation is not trending towards the defined success criteria within the first 3-5 years, adaptive management strategies will be implemented. Long-term monitoring and reporting will occur at 5 to 10 year intervals after success criteria are met.
    - **Performance Measures:** performance measures are typically very specific to the mitigation site where actions are being applied and the desired outcomes determined in consultation with a permitting agency. However, the following is a non-specific list of examples.
        - Native grass establishment with greater than 25 percent total canopy cover with 60 percent of the plant cover from planted species within 4 years.

[2] Under OAR 635-415-0005(27), "Project life" means "the period of time during which a development action is subject to regulation by local, state or federal agencies." For the B2H Project, that period will be continuously until the facility site is restored and the site certificate is terminated in accordance with OAR 345-027-0110.

  - Increase in density or cover of desirable native species.
  - Increase in desirable perennial plants over five years.
  - Elimination of noxious weeds or other undesirable plant species or reduced to a level that does not interfere with mitigation goals.
  - 20 to 40 percent of planted sagebrush seedlings survey after the third growing season following planting.
  - Site is trending toward its ecological site description over five years.
  - Juniper is removed form a site and long-term treatment maintains the absence of juniper trees.
  - Natural recruitment of sagebrush is occurring.
  - Successful establishment of important shrub species for big game winter range.
  - Demonstrate effectiveness in excluding livestock from and allowing big game access to the mitigation site.
  - Demonstrate effectiveness of new water source in providing water.
  - Demonstrate effectiveness in reducing erosion.
  - The conditions on the rest of the mitigation site do not pose a threat to maintaining the habitat quality where mitigation actions have improved habitat.
  - Fencing has been properly constructed and continues to be effective.
  - Traffic volume is reduced through access control device or road decommissioning.
- **Management Restriction and Prohibitions** – if the mitigation site is a conservation easement, describe landowner reserved rights and when, where, how much, and how those rights are managed. Define each prohibited use and explain any exceptions. Describe any findings from the Phase I environmental site assessment that may affect management.
- **Other Management Actions** – water usage and water rights management, infrastructure management, proposed access control, describe existing access rights or easements, and protection of historical resources.
- **Adaptive Management** – describe potential issues that could delay or eliminate the mitigation site from achieving mitigation goals and provide a framework process to address the issues.
- **Reporting** – list all reporting requirements for baseline, mitigation monitoring, and general management reports.
- **Appendices** – include all pertinent supporting information (mining permits, water rights certificates, access easements, previous baseline studies, etc.)

Legal Protections and Financial Assurances

Mitigation projects must be durable—that is, the period of time that mitigation is effective must be commensurate with the duration of the impacts being offset. Demonstrating project durability requires that legal protections be put in place to ensure the mitigation project benefits are not disturbed for the life of the credits. Legal protection may be demonstrated through term or permanent conservation easements or through other tools ensuring the protections will last for the duration of the impacts.

Financial assurances must be in place to ensure appropriate management will occur throughout the life of the credits. Funding for site management may occur through various mechanisms, provided they ensure management will persist throughout the life of the mitigation project.

Each Mitigation Management Plan will either include or reference all of the documentation of legal protections and financial assurances.

3.3.4.3 Calculating Credits

IPC will accrue one credit for one acre of habitat acquired or put into easement. For instance, if a 100-acre mitigation site is acquired, IPC would receive 100 credits once certain success criteria are met for the mitigation site. The type and area of ecological uplift actions necessary to meet success criteria and secure mitigation credits will be determined on a site-specific basis. However, IPC assumes that mitigation actions may occur on a portion, but not the entirety, of the mitigation site. That is, IPC does not need to conduct mitigation actions on all 100 acres of the mitigation site to receive 100 credits.

IPC will account for the location (MZ), general vegetation type, wildlife habitat layer, and habitat category when evaluating mitigation sites against the mitigation debit balance. IPC may need to account at the habitat type level instead of the general vegetation type level, such as to ensure adequate credits are developed in habitat types with a big sagebrush component to account for mitigation debits accrued within big sagebrush habitat types. The habitat type and category attributed to acres within each mitigation site will follow the same methodology performed to attribute Project impacts (Exhibit P1, Attachment P1-1).

The mitigation sites included in Appendix A have had a desktop assessment performed that identified habitat types and habitat categories within the mitigation site. Most of the mitigation sites in Appendix A were selected by IPC with input from ODFW because of their overlap with the wildlife habitat layers used to attribute habitat categories to Project impacts. Therefore, a vast majority of the available mitigation credits within the mitigation sites occurs within Category 2 and Category 3 habitats.

Stacking

In calculating credits accrued by a mitigation site, IPC will provide for “stacking” of habitat credit requirements (FWS 2014). Credit stacking occurs where more than one resource or credit type occurs on spatially overlapping areas. Here, IPC must offset Project impacts to habitat types (Table 1), WAGS habitat, elk winter and summer range, mule deer winter and summer range, California bighorn sheep herd range (Table 2), and sage-grouse (Exhibit P2 and Attachment P2-3). To the extent a mitigation site includes an area comprising more than one of those habitats, IPC will receive credit towards each of the habitats. For example, a single credit may satisfy compensatory mitigation needs on an impact site where elk winter range and mule deer winter range overlap. IPC may propose mitigation that enhances one acre of habitat that is within elk winter range and mule deer winter range that would count as 1 credit against the total debits for both elk winter range and mule deer winter range as well as the total debits for Category 2 habitat. Within the geographical information system used to maintain the project impacts and resulting habitat categorization of those impacts, IPC is able to identify how much wildlife habitat overlap occurs on each acre impacted and the types of habitat overlapping.

3.3.4.4 Verification

Monitoring conducted at reclamation sites related to temporarily disturbed areas, and the associated annual reports to the applicable agencies, are discussed in IPC’s Reclamation and Revegetation Plan (Exhibit P1, Attachment P1-3). The following discussion addresses monitoring related to mitigation sites. Mitigation site monitoring is also part of the Mitigation Management Plan discussed in Section 3.3.4.2.

Performance Measures

The criteria used to measure success will depend on the extent of impacts and the final mitigation strategy (e.g., success criteria could be different if mitigation is conducted through payments to a conservation bank as opposed to permittee-responsible mitigation sites). The criteria used to measure mitigation success will be site-specific, will depend on the goals and objectives of the mitigation site, and will need to be developed for each individual mitigation site prior to the onset of mitigation efforts.

Reporting

IPC will document the progress of mitigation efforts to applicable federal and state-management agencies in a progress report that will be provided following the periodic monitoring surveys. These reports will also contain recommendations from IPC regarding any additional remedial actions that may be necessary. It is expected that the applicable federal and state management agencies will provide comments and counter suggestions, or approval of IPC's suggestions if remedial efforts are required (i.e., corrective measures if revegetation or mitigation efforts were not successful). Separate monitoring reports may be prepared for each individual mitigation site. Reports will contain information regarding the mitigation actions taken during the reporting period, the success of these actions (based on predefined success criteria established for that mitigation site), and a description of the methods used to monitor the mitigation site.

4.0 DRAFT MITIGATION SITE ASSESSMENTS

Prior to commencement of construction, IPC will secure mitigation sites with sufficient credits to offset the impacts of the Project. In order to show there are mitigation site opportunities sufficient to meet the needs of the Project and to demonstrate how IPC's debiting and crediting approach will be implemented, in the following discussion and in the HMP appendices, IPC discusses potential mitigation sites and provides a desktop-level assessment of the credits available at each site.

4.1 Desktop Habitat Mitigation Site Assessment

There are a number of factors that influence the suitability of potential mitigation. In order to assess the potential mitigation opportunities consistently, IPC (in cooperation with ODOE) developed a desktop habitat mitigation site assessment (desktop assessment) form that was used to assess more than 40 potential mitigation properties. Properties that passed the desktop assessment were then reviewed by IPC and ODOE to determine which properties provided the greatest opportunity for IPC to meet its mitigation needs for the Project. IPC has included in this HMP the properties that provide the greatest opportunity, with their respective desktop assessment forms in Appendix A.

The desktop assessment has two parts, as described below.

4.1.1 Desktop Assessment – Part 1

The first part of the desktop assessment is to complete the desktop assessment worksheet that describes the location and ecological setting of the property. During this step, a determination is made as to whether a property passes or fails the desktop assessment. If the property passes, because it is located in an appropriate ecological setting, the second part of the desktop assessment is completed.

Location – When reviewing the location of a property, preference is given to a location that:

- Is within the mitigation service area (Figure 2). The mitigation service area consists of the subbasins (i.e., hydrologic unit boundary 8) in Oregon that are crossed by the Project. Implementing mitigation projects within this area will ensure that ecological uplift will result in a beneficial effect to species and habitat impacted by the Project. The mitigation service area includes the following subbasins: Umatilla; Middle Columbia-Lake Wallula Subbasin (restricted to Oregon); Upper Grande Ronde; Burnt; Powder; Bully; Willow; Lower Malheur; Lower Owyhee; and Brownlee Reservoir (the area south of where the Burnt River enters the reservoir). Mitigation actions and areas outside of the mitigation service area will still be considered if agreement is reached with permitting agencies that the mitigation would benefit species/habitats affected by the Project.
- Involves large parcels of land, or parcels whose size corresponds to specific mitigation needs.
- Is adjacent to existing wildlife management areas or parcels sought after by a state or federal land management agency to achieve wildlife habitat goals.
- Is not located close to land uses that will obviate long-term success of the mitigation. A qualitative discussion is presented regarding adjacent land use and infrastructure occurrence.

Ecological Setting – When reviewing the ecological setting of a property, preference is given to settings where:

- Baseline habitat quality and conditions are similar in kind to habitat structures and functions that will be displaced by the Project.[3]
- Regional Gap Analysis Project (USGS 2011) data were used to identify the habitat types that occur within the mitigation site and correspond to habitat disturbed by the Project.
- Potential mitigation sites within designated wildlife habitat ranges disturbed by the Project were prioritized. These included those for WAGS, sage-grouse, elk, and deer.
- Implementation of mitigation on the property is likely to create a “net benefit” as defined in OAR 635-415-0005(21).
- Soil types – The Soil Survey Geographic database (NRCS 2011) contains soil maps that provide insight into the potential vegetation that may be considered during restoration efforts.
- Hydrologic features – The National Hydrography Dataset (USGS 2010) and the Oregon Wetlands Cover (Oregon Natural Heritage Information Center & The Wetlands Conservancy 2009) data were reviewed to identify potential wetland and water resources within each potential mitigation site.

[3] "In-kind Habitat Mitigation" means habitat mitigation measures that recreate similar habitat structure and function to that existing prior to the development action (OAR 635-415-0005(12)).

Figure 2. Mitigation Service Area and Mitigation Zones

Pass/Fail – Parameters associated with a property's failure to pass the desktop assessment include:

- 40 percent or more of the property is within the agriculture/developed general vegetation type.
- Infrastructure on the property significantly increased the market value of the property above other properties with similar habitat and similar potential mitigation credit value.
- Property contains a high-voltage transmission line(s).
- Property is too far removed from the mitigation service area.
- Property is made up of disjunct parcels that could not be effectively managed.

4.1.2 Desktop Assessment – Part 2

The second part of the desktop assessment discusses how the property would function as a mitigation site, lists the mitigation actions that may be implemented on the mitigation site, and provides a financial outline.

Mitigation Function – A general description of the Project impacts that the mitigation site would mitigate for:

- Identifies the general vegetation type or specific habitat types the site would offer mitigation for;
- Identifies the wildlife habitat layers that overlay with the mitigation site (e.g., elk winter range); and
- Identifies the ODFW habitat categories that the mitigation site contains.

Mitigation Actions – Lists potential mitigation actions that may be performed within the mitigation site to provide an ecological uplift to the habitat. These potential mitigation actions were often discussed during field visits to the mitigation site. If no field visits occurred, applicable mitigation actions were listed based on known land use and land cover. In general, IPC considered mitigation actions that would improve habitat quality, such as:

- Preserve essential habitats through acquisition and easements;
- Provide general improvement of habitat condition through revegetation efforts;
- Perform treatments to prevent, reduce, or eradicate invasive plants and noxious weeds;
- Implement access control to the mitigation area;
- Implement grazing management techniques that could improve habitat;
- Conduct Phase 1 and Phase 2 juniper removal;
- Remove or mark (e.g., fence marking to avoid collision) anthropogenic structures;
- Conduct fire rehabilitation with native vegetation; and
- Reduce risk of catastrophic fire with creation of a fire readiness plan and use of fire breaks.

Financial Outline – The cost of acquisition of the property and yearly operation and maintenance costs were estimated for each mitigation site. In some instances, the cost of acquisition is unavailable.

4.1.3 Further Development of Desktop Assessments

One desktop assessment has been further developed as an example of how mitigation sites will be brought forward for consideration and ultimately inclusion in a final Fish and Wildlife HMP. IPC sees this format as the next step in the mitigation process from identifying opportunities to proposing mitigation sites that account for the balance of mitigation debits accrued per Section 4.3. The Wolf Creek mitigation site expanded assessment (Appendix B) has been further developed to include mitigation actions that IPC is proposing to gain full mitigation credit for the site (one credit for each acre within the property's boundary). Ongoing coordination with ODOE will identify other mitigation sites, either from those currently included in Appendix A or new opportunities brought to IPC's attention, to move forward in a similar fashion as part of a formal mitigation proposal to be included in the final Fish and Wildlife HMP.

4.2 Habitat Mitigation Sites

Through the desktop assessment and field reviews, IPC has brought forward 14 mitigation sites, which demonstrate that adequate mitigation opportunities exist to address all of the Project's impacts on wildlife habitat. The 14 mitigation sites included in this Fish and Wildlife HMP collectively exceed the quantity of mitigation that will ultimately be needed for the Project by approximately ten- to twenty-fold. IPC will continue to coordinate with ODOE in preparation of a final Fish and Wildlife HMP that will be sufficient to compensate for the Project's impacts on wildlife habitats and achieve the mitigation goals set forth in ODFW's Habitat Mitigation Policy. IPC will begin funding mitigation once a site certificate is issued by EFSC and prior to construction of the Project.[4]

Mitigation sites are presented by their location relevant to the MZs described under Section 3.3.1.3. Presentation of mitigation sites by the MZ will show which Project impacts are being mitigated for at each mitigation site.

4.2.1 MZ1 Mitigation Sites

Within MZ1, IPC has identified four mitigation sites. These include Government Mountain, Olex, Ione, and Eightmile (Appendix A). The Olex and Ione mitigation sites are both potential conservation easements while the Government Mountain and Eightmile mitigation sites are currently for sale and would be fee simple title acquisitions. Government Mountain is also partially within MZ2. For purposes of this HMP, the mitigation site will be considered under MZ1.

All four mitigation sites within MZ1 are outside of the mitigation service area (Figure 3). The focus of mitigation efforts within MZ1 have been to address Project impacts on WAGS habitat. The availability of mitigation sites that contain WAGS habitat is lacking within the mitigation service area in MZ1; therefore, IPC went outside of the mitigation service area to identify mitigation sites. Both the Olex mitigation site and Ione mitigation site were recommended to IPC by ODFW as potential WAGS mitigation.

[4] For all mitigation, IPC will provide ODOE with proof of funding prior to construction. For actions involving land acquisition, IPC will acquire the legal right to create, maintain, and protect habitat mitigation areas for the life of the facility by means of an outright purchase, conservation easement, or similar conveyance or contract.

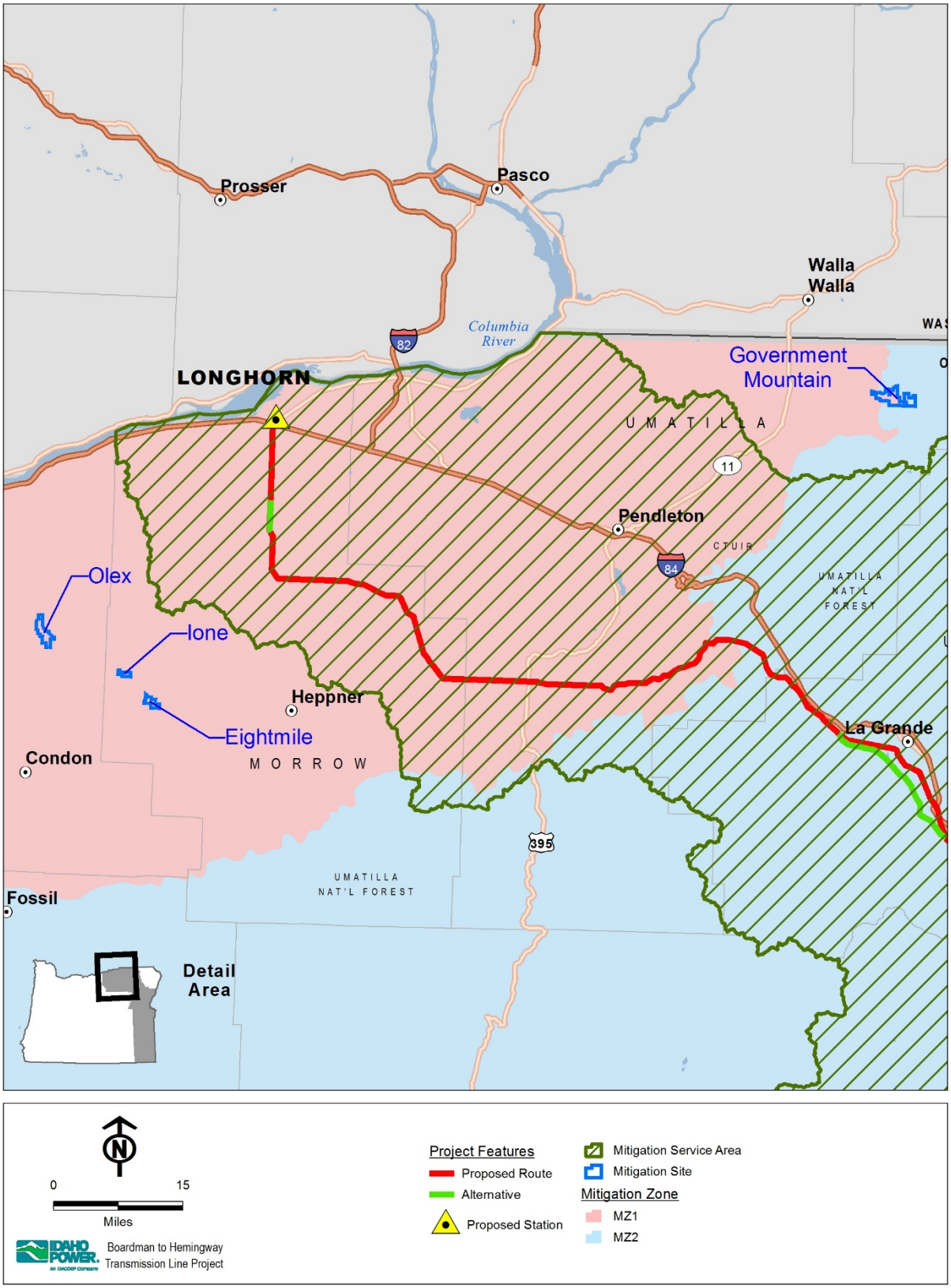

Figure 3. Mitigation Sites within MZ1

Table 13 shows that the mitigation sites identified by IPC within MZ1 provide abundant opportunity to mitigate for Project impacts based on general vegetation types and habitat categories. When considering wildlife habitat layers, the mitigation sites identified within MZ1 provide abundant opportunity to mitigate for Project impacts on WAGS habitat, mule deer winter range, elk winter range, mule deer summer range, and elk summer range (Table 14).

Table 13. Acres of General Vegetation Types by Habitat Category for Mitigation Sites in MZ1

Mitigation Site	General Vegetation Type	ODFW Habitat Categories (acres)						Total
		1	2	3	4	5	6	
Government Mountain	Forest/Woodland	–	1,243.0	399.7	–	–	–	**1,642.7**
	Shrub/Grassland	–	1,572.0	13.8	–	–	–	**1,585.8**
	Agriculture/Developed	–	–	–	–	–	82.7	**82.7**
	Open Water/Wetlands	–	141.2	–	–	–	–	**141.2**
Olex[1]	Agriculture/Developed	–	–	–	–	–	68.2	**68.2**
	Shrub/Grassland	418.6	1,583.2	–	–	–	–	**2,001.8**
Ione	Agriculture/Developed	–	–	–	–	–	–	**–**
	Shrub/Grassland	–	108.0	–	–	–	–	**108.0**
Eightmile	Agriculture/Developed	–	429.9	–	–	–	36.7	**466.6**
	Shrub/Grassland	–	369.5	–	–	–	–	**369.5**
MZ1 Mitigation Site Total		**418.6**	**5,446.8**	**413.5**	**–**	-	**187.6**	**6,466.5**

[1] IPC is aware that significant portions of the Olex site are not available for mitigation but the exact amount is not currently known.
Note: – = 0

Table 14. Acres of Wildlife Habitat within Mitigation Sites of MZ1

Wildlife Habitat Layer[1]	Mitigation Site				
	Gov. Mtn.	Olex[2]	Ione	Eightmile	MZ1 Mitigation Site Total
WAGS	–	1,406.4[3]	–	–	**1,406.4[3]**
Elk winter range	3,038.3	–	–	–	**3.038.3**
Elk summer range	2,774.3	–	–	–	**2,774.3**
Mule deer winter range	1,626.4	2,070.0	–	836.1	**2,906.1**
Mule deer summer range	1,822.2	–	–	–	**1,822.2**

[1] WAGS = Category 1 and Category 2; elk winter range = Category 2; elk summer range = Category 3; mule deer winter range = Category 2; mule deer summer range = Category 3.
[2] IPC is aware that significant portions of the Olex site are not available for mitigation but the exact amount is not known at this time.
[3] This includes 418.6 acres of Category 1 habitat and 987.8 acres of Category 2 habitat for WAGS. However, not all this habitat is available for mitigation; the exact amount is not currently known.
Note: – = 0

4.2.2 MZ2 Mitigation Sites

Within MZ2, IPC has identified five mitigation sites (Figure 4). These include High Valley, Glass Hill, County Line, Wolf Creek, and Antelope Mountain (Appendix A). All of these mitigation sites would be fee simple title acquisitions. Only the Antelope Mountain mitigation site is currently for sale, the remaining properties' owners have been contacted and have shown some interest in selling all or a portion of their property. In addition to the five mitigation sites, IPC is developing the wetland mitigation property within MZ2. The Government Mountain mitigation site is partially within MZ2, but a majority is within MZ1 and therefore addressed above.

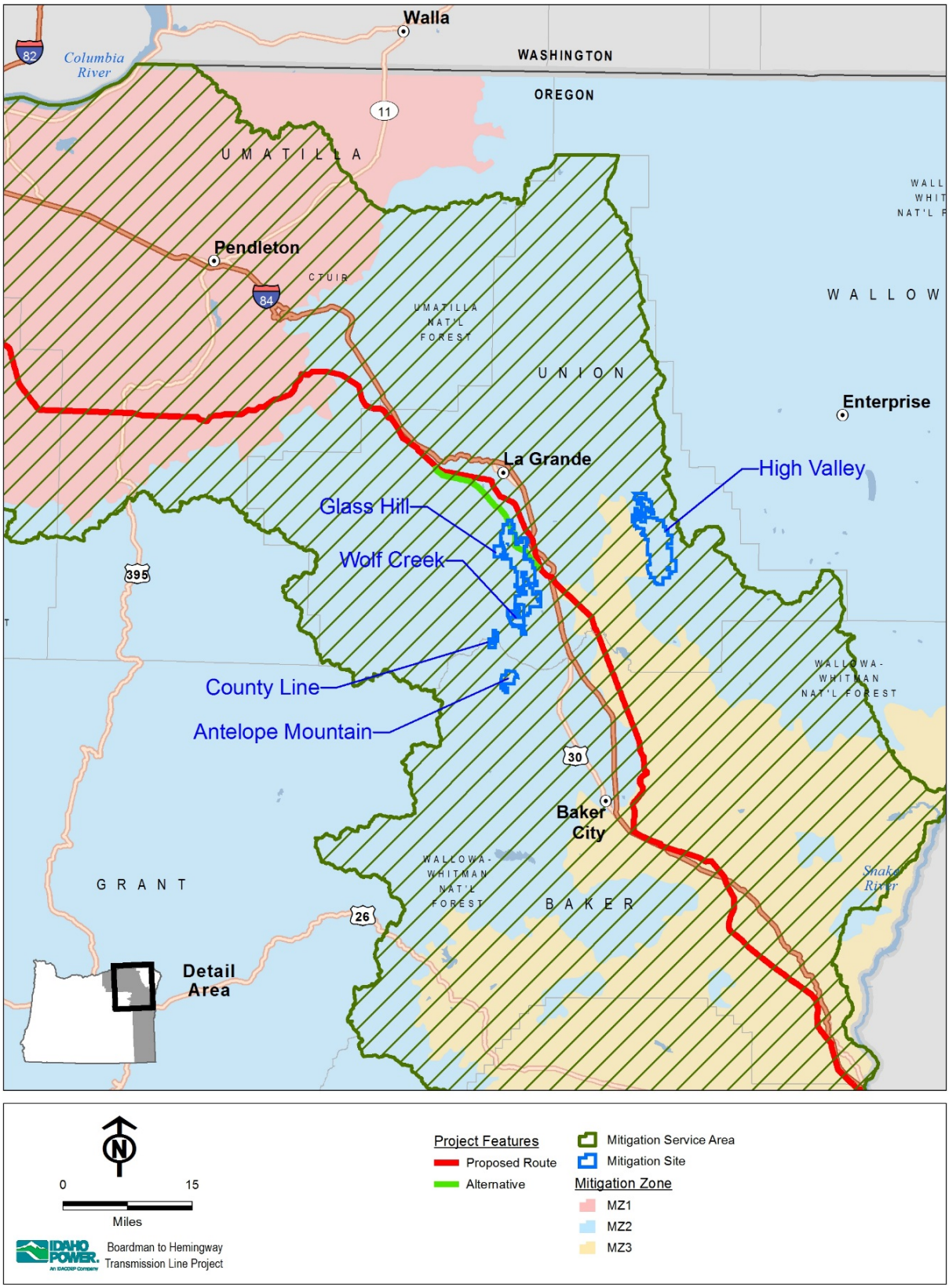

Figure 4. Mitigation Sites within MZ2

The focus of mitigation efforts within MZ2 have been to address Project impacts on the forest/woodland general vegetation type and impacts on elk and mule deer winter and summer range.

Table 15 shows that the mitigation sites identified by IPC within MZ2 provide abundant opportunity to mitigate for Project impacts based on general vegetation types and habitat categories. When considering wildlife habitat layers, the mitigation sites identified within MZ2 provide abundant opportunity to mitigate for impacts on mule deer winter range, elk winter range, mule deer summer range, and elk summer range (Table 16).

Table 15. Acres of General Vegetation Types by Habitat Category for Mitigation Sites in MZ2

Mitigation Site	General Vegetation Type	ODFW Habitat Categories (acres)						Total
		1	2	3	4	5	6	
Antelope Mountain	Forest/Woodland	–	1,239.8	–	–	–	–	**1,239.8**
	Shrub/Grassland	–	325.4	–	–	–	–	**325.4**
	Open Water/Wetlands	–	37.3	–	–	–	–	**37.3**
Wolf Creek	Forest/Woodland	–	1,361.4	–	–	–	–	**1,361.4**
	Shrub/Grassland	–	344.2	–	–	–	–	**344.2**
	Open Water/Wetlands	–	66.9	–	–	–	–	**66.9**
County Line	Forest/Woodland	–	707	–	–	–	–	**707**
	Shrub/Grassland	–	40	–	–	–	–	**40**
	Open Water/Wetlands	–	24.9	–	–	–	–	**24.9**
Glass Hill	Forest/Woodland	–	8,458	3,734	–	–	–	**4,002**
	Shrub/Grassland	–	1,306	96	–	–	–	**1,402**
	Open Water/Wetlands	–	211	80	–	–	–	**291**
High Valley	Forest/Woodland	–	6,934	7,083	–	–	–	**14,017**
	Shrub/Grassland	–	212	126	–	–	–	**338**
	Open Water/Wetlands	–	268	196	–	–	–	**464**
	Agriculture/Developed	–	**–**	–	–	–	**12**	**12**
MZ2 Mitigation Site Total		**–**	**21,536**	**11,315**	–	–	**12**	**32,863**

Note: – = 0

Table 16. Acres of Wildlife Habitat within Mitigation Sites of MZ2

Wildlife Habitat Layer[1]	Mitigation Site					
	Antelope Mtn.	Wolf Creek	County Line	Glass Hill	High Valley	MZ2 Mitigation Site Total
Elk winter range	1,602.5	1,772.5	771.9	9,975.0	7,426.0	**21,547.9**
Elk summer range	1,079.5	1,263.4	771.9	13,215.0	11,850.0	**28,179.8**
Mule deer winter range	1,602.5	2,070.0	771.9	5,498.0	745.0	**10,687.4**
Mule deer summer range	–	1,772.5	771.9	13,823.0	14,516.0	**30,883.4**

[1] Elk Winter Range = Category 2; Elk Summer Range = Category 3; Mule Deer Winter Range = Category 2; Mule Deer Summer Range = Category 3.
Note: – = 0

4.2.3 MZ3 Mitigation Sites

Within MZ3, IPC has identified five mitigation sites (Figure 5). These include Trail Creek, Glasgow, Upper Timber, Pole Creek, and Alder Creek (Appendix A). The mitigation sites within MZ3 would all be fee simple title acquisitions.

The focus of mitigation efforts within MZ3 have been to address Project impacts on the shrub/grassland general vegetation type and specifically the shrub-steppe with big sagebrush habitat type and impacts on sagebrush obligate species and big game species.

Table 17 shows that the mitigation sites identified by IPC within MZ3 provide abundant opportunity to mitigate for Project impacts based on general vegetation types and habitat categories. When considering wildlife habitat layers, the mitigation sites identified within MZ3 provide abundant opportunity to mitigate for impacts on mule deer winter range, elk winter range, mule deer summer range, and elk summer range (Table 18).

Table 17. Acres of General Vegetation Types by Habitat Category for Mitigation Sites in MZ3

Mitigation Site	General Vegetation Type	ODFW Habitat Categories (acres)						Total
		1	2	3	4	5	6	
Pole Creek	Forest/Woodland	–	1,527.9	–	–	–	–	
	Shrub/Grassland	–	1,652.1	–	–	–	–	
	Open Water/Wetlands	–	47.4	–	–	–	–	
Alder Creek	Forest/Woodland	–	18.6	–	–	–	–	
	Shrub/Grassland	–	2,704.3	–	–	–	–	
	Open Water/Wetlands	–	18.9	–	–	–	–	
Glasgow	Forest/Woodland	–	30.7	–	–	–	–	
	Shrub/Grassland	–	1,404.2	–	–	–	–	
	Open Water/Wetlands	–	1.8	–	–	–	–	
Trail Creek	Forest/Woodland	–	20.9	–	–	–	–	
	Shrub/Grassland	–	600.9	–	–	–	–	
	Open Water/Wetlands	–	0.7	–	–	–	–	
Upper Timber	Forest/Woodland	–	4.5	–	–	–	–	
	Shrub/Grassland	–	1,556.4	–	–	–	–	
	Open Water/Wetlands	–	8.9	–	–	–	–	
	Agriculture/Developed	–	7.1	–	–	–	–	
MZ3 Mitigation Site Total		**–**	**9,605.3**		–	**–**	–	**9,605.3**

Note: – = 0

Table 18. Acres of Wildlife Habitat within Mitigation Sites of MZ3

Wildlife Habitat Layer[1]	Mitigation Site					
	Pole Creek	Alder Creek	Glasgow	Trail Creek	Upper Timber	MZ3 Mitigation Site Total
Elk winter range	–	2,947.0	611.8	624.5	153.8	**4,337.1**
Elk summer range	2,287.7	–	622.7	624.5	888.6	**4,423.5**
Mule deer winter range	3,227.4	773.8	1,436.7	–	1,576.9	**7,014.8**
Mule deer summer range	3,178.5	–	–	624.5	–	**3,803.0**

[1] Elk winter range = Category 2; Elk summer range = Category 3; Mule deer winter range = Category 2; Mule deer summer range = Category 3.

Note: – = 0

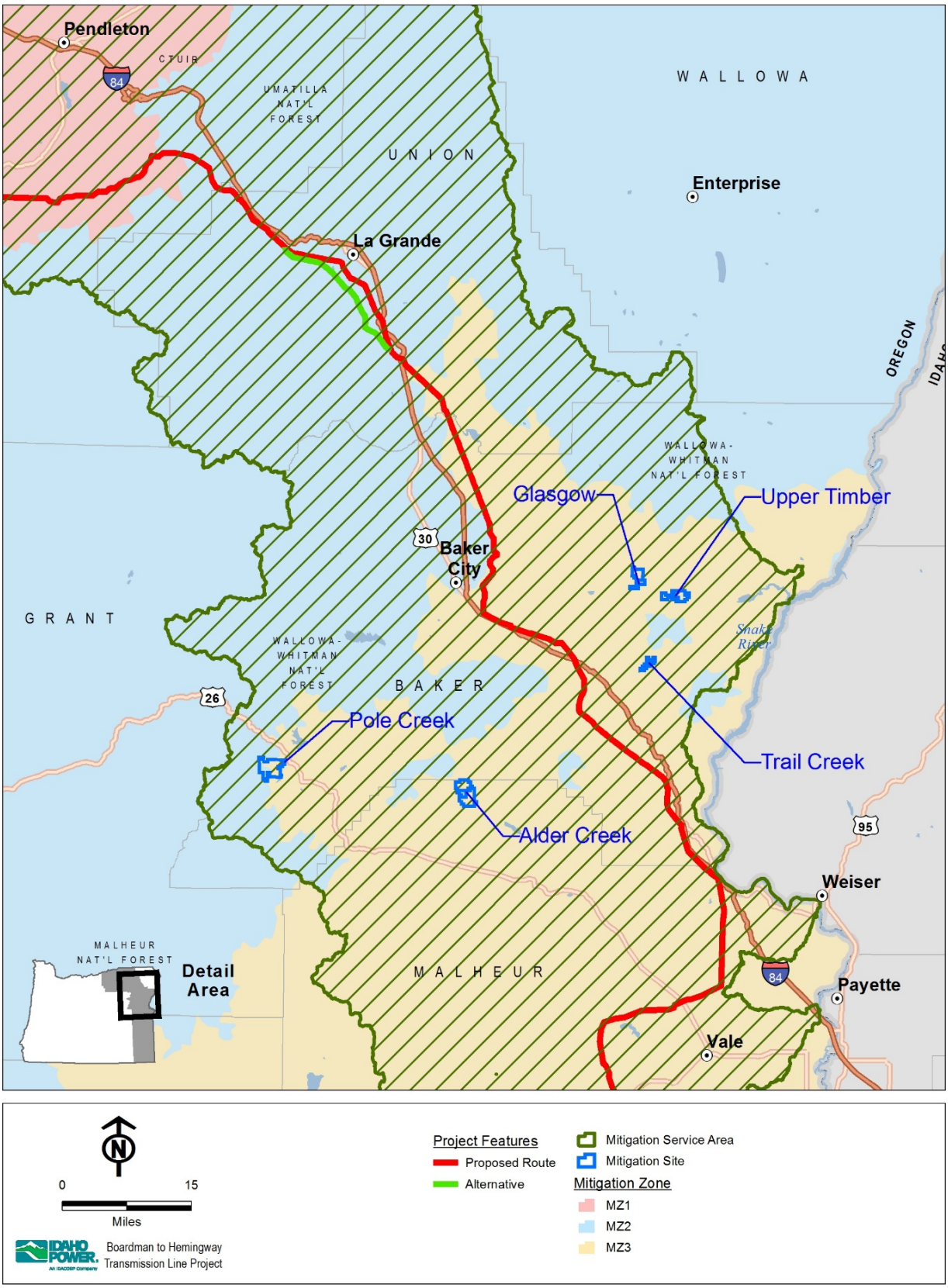

Figure 5. Mitigation Sites within MZ3

4.3 Debit and Credit Accounting for Draft Assessment

4.3.1 MZ1 Accounting

IPC has identified a mitigation debit of approximately 732 to 765 acres that will be accrued for impacts from the Proposed Route within MZ1. Mitigation sites identified within MZ1 account for approximately 6,279 available credits. Table 19 displays the debits and available credits by ODFW habitat category.

Table 19. Mitigation Accounting by Habitat Category in MZ1

ODFW Habitat Category	Impact	Acres	Mitigation Debit	Debit Subtotal by Habitat Category	Subtotal of Available Credits within MZ1 Mitigation Sites from Table 13
1	Temp	–	–	–	418.6
	Perm	–	–		
2	Temp	614.1	>614.1	>724	5,446.8
	Perm	109.9	>109.9		
3	Temp	21.5	<21.5	4.1 to 25.6	413.5
	Perm	4.1	4.1		
4	Temp	15.8	<15.8	>3.5 to 19.2	–
	Perm	3.5	3.5		
5	Temp	98.8	–	<15.0	–
	Perm	15.0	<15.0		
6	Temp	410.2	–	–	187.6
	Perm	60.0	–		
			Total	**>731.6 to 764.6**	**6,278.9**

Note: – = 0

Impacts from the Proposed Route within MZ1 will also accrue species-specific mitigation debits. Table 20 identifies the debits and available credits by wildlife habitat layer. These debits are not in addition to those identified in Table 19. For instance, of the 724 acres of Category 2 debits identified, 22.4 acres originate from impacts to Category 2 WAGS habitat.

Table 20. Mitigation Accounting by Wildlife Habitat Layer in MZ1

Wildlife Habitat Layer	Impact	Acres	Mitigation Debit	Debit Subtotal by Wildlife Habitat[1]	Subtotal of Available Credits within MZ1 Mitigation Sites from Table 14
WAGS	Temp	19.7	>19.7	>22.4	1,406.4[2]
	Perm	2.7	>2.7		
Elk winter range	Temp	54.6	>54.6	>63.2	3,038.3
	Perm	8.5	>8.5		
Elk summer range	Temp	20.4	<20.4	>2.8 to 23.2	2,774.3
	Perm	2.8	2.8		
Mule deer winter range	Temp	593.8	>593.8	>700.2	2,906.1
	Perm	106.4	>106.4		
Mule deer summer range	Temp	–	–	–	1,822.2
	Perm	–	–		

[1] These subtotals should not be added together as the resulting total would be double-counting acres where wildlife habitat layers overlap. Overlap is abundant between seasonal ranges of both elk and mule deer.
[2] IPC is aware that not all this habitat is available for mitigation. The exact amount is currently unknown.
Note: – = 0

IPC will look at the general vegetation type (sometimes habitat type), habitat category, and wildlife habitat layer together when performing the mitigation accounting for MZ1. This accounting will be performed during final selection of habitat mitigation sites and after issuance of the site certificate and prior to construction.

4.3.2 MZ2 Accounting

IPC has identified a mitigation debit of 1,078 to 1,268 acres that will be accrued for impacts from the Proposed Route within MZ2. Mitigation sites identified within MZ2 account for approximately 32,863 available credits. Table 21 identifies the debits and available credits by ODFW habitat category.

Table 21. Mitigation Accounting by Habitat Category in MZ2

ODFW Habitat Category	Impact	Acres	Mitigation Debit	Debit Subtotal by Habitat Category	Subtotal of Available Credits within MZ2 Mitigation Sites from Table 15
2	Temp	198.5	>198.5	>602.4	21,536
	Perm	403.9[1]	>403.9		
3	Temp	176.4	<176.4	>473.0 to 649.4	11,315
	Perm	473.0	473.0		
4	Temp	12.5	<12.5	2.9 to 15.4	–
	Perm	2.9	2.9		
5	Temp	11.6	–	<1.1	–
	Perm	1.1	<1.1		
6	Temp	59.2	–	–	12.0
	Perm	41.4	–		
			Total	**>1,078.3 to 1,268.3**	**32,863**

[1] Includes 0 acres of indirect impacts on elk winter range within MZ2 (Table 6).
[2] Includes 6.3 acres of indirect impacts on elk summer range within MZ2
Note: – = 0

Table 22 identifies the debits and available credits by wildlife habitat layer within MZ2. These debits are not in addition to those identified in Table 21. For instance, of the 602 acres of Category 2 debits identified in Table 21, approximately 573 acres originate from impacts to Category 2 mule deer winter range habitat (Table 22).

Table 22. Mitigation Accounting by Wildlife Habitat Layer in MZ2

Wildlife Habitat Layer	Impact	Acres	Mitigation Debit	Debit Subtotal by Wildlife Habitat[1]	Subtotal of Available Credits within MZ2 Mitigation Sites from Table 16
Elk winter range	Temp	83.2	>219.1	>221.1	21,547.9
	Perm	137.9[2]	>500.4		
Elk summer range	Temp	23.0	<23.0	>92.5 to 115.6	28,179.8
	Perm	92.5[3]	92.5		
Mule deer winter range	Temp	169.8	>169.8	>573.0	10,687.4
	Perm	403.1	>403.2		
Mule deer summer range	Temp	180	<180.0	>503.4 to 683.4	30,883.4
	Perm	503.4	503.4		

[1] These subtotals will not correspond to the mitigation debits calculated by habitat category in Table 21. For instance, some elk summer range Category 3 habitat overlaps with elk winter range Category 2 habitat, these areas default to Category 2. For this reason, these subtotals should not be added together.
[2] Includes 0 acres of indirect impacts on elk winter range within MZ2 (Table 6).
[3] Includes 6.3 acres of indirect impacts on elk summer range within MZ2 (Table 6).
Note: – = 0

IPC will look at the general vegetation type (sometimes habitat type), habitat category, and wildlife habitat layer together when performing the mitigation accounting for MZ2. This accounting will be performed during final selection of habitat mitigation sites and after issuance of the site certificate and prior to construction.

4.3.3 MZ3 Accounting

IPC has identified a mitigation debit of approximately 2,145 to 2,456 acres that will be accrued for impacts from the Proposed Route within MZ3. Mitigation sites identified within MZ3 account for approximately 9,605 available credits. Table 23 identifies the debits and available credits by ODFW habitat category.

Table 23. Mitigation Accounting by Habitat Category in MZ3

ODFW Habitat Category	Impact	Acres	Mitigation Debit	Debit Subtotal by Habitat Category	Subtotal of Available Credits within MZ3 Mitigation Sites from Table 17
2	Temp	1,310.5	>1,310.5	>2,106.7	9,605.3
	Perm	796.2[1]	>796.2		
3	Temp	146.7	<146.7	>18.3 to <165.0	–
	Perm	18.3	18.3		
4	Temp	137.1	<137.1	>19.7 to 156.8	–
	Perm	19.7	19.7		
5	Temp	219.0	–	<27.2	–
	Perm	27.2	<27.2		
6	Temp	55.7	–	–	-
	Perm	123.4	–		
			Total	**>2,144.7 to 2,455.7**	**9,605.3**

[1] Includes 427.3 acres of indirect impacts on elk winter range within MZ3 (Table 8).
Note: – = 0

Table 24 identifies the mitigation debits and available credits by wildlife habitat layer within MZ3. These debits are not in addition to those identified in Table 23. For instance, of the more than 2,106 acres of Category 2 debits identified in Table 23, approximately 1,678 acres originate from impacts to Category 2 mule deer winter range habitat.

Table 24. Mitigation Accounting by Wildlife Habitat Layer in MZ3

Wildlife Habitat Layer	Impact	Acres	Mitigation Debit	Debit Subtotal by Wildlife Habitat[1]	Subtotal of Available Credits within MZ3 Mitigation Sites from Table 18
Elk winter range	Temp	100.8	>100.8	>566	4,337.1
	Perm	459.6[2]	>459.6		
Mule deer winter range	Temp	1,309.9	>1,309.9	>1,678.6	10,408.5
	Perm	368.7	>368.7		
Mule deer summer range	Temp	108.7	<106.9	101.7 to <208.6	7,196.7
	Perm	102.5	101.7		
California Bighorn Sheep Herd Range	Temp	1.6	>1.6	>15.8	–
	Perm	14.2	>14.2		

[1] These subtotals will not correspond to the mitigation debits calculated by habitat category in Table 23 due to overlap among wildlife habitat layers. For this reason, these subtotals should not be added together.
[2] Includes 427.3 acres of indirect impacts to elk winter range within MZ3 (Table 8).

5.0 MITIGATION SCHEDULE

Coordination continues between IPC and the applicable land and wildlife management agencies regarding mitigation projects and options. IPC has identified preliminary scheduling milestones for mitigation that track with the EFSC process (Table 25).

Table 25. Mitigation Schedule

Date Range	EFSC Stage	Mitigation Planning
Present to July 2017	Submittal of 2017 Amended Preliminary Application for Site Certificate (ASC)	Respond to ODOE comments on the HMP included in the amended preliminary ASC.
July 2017 to July 2019	Final Order and Site Certificate	Develop and finalize mitigation sites and associated Mitigation Management Plans. Land acquisition will begin following issuance of the Site Certificate and prior to construction.
July 2019 to start of construction, 2022 or later	Monitoring Project compliance with conditions of approval as described in the Final Order.	All mitigation land acquisitions will be completed. Baseline data acquisition will occur at mitigation sites according to the Mitigation Management Plan. Initial mitigation actions will begin if timing is appropriate. Finalize HMP and submit to ODOE for its approval.

Date Range	EFSC Stage	Mitigation Planning
Start of construction in 2022 or later	Monitoring Project compliance with conditions of approval as described in the Final Order.	Initial mitigation actions (e.g., juniper removal, native seeding) will be completed or continued, and mitigation monitoring will track success.
In Service to Project decommissioning	Monitoring Project compliance with conditions of approval as described in the Final Order.	Any adaptive management techniques will be implemented if mitigation success criteria are not being met. Long-term monitoring and reporting will be performed as needed.

6.0 REFERENCES

EPA (U.S. Environmental Protection Agency). 2011. Level III and IV ecoregions of the continental United States. U.S. EPA, National Health and Environmental Effects Research Laboratory, Corvallis, Oregon, Map scale 1:3,000,000. Available online at: http://www.epa.gov/wed/pages/ecoregions/level_iii_iv.htm.

FWS (U.S. Fish and Wildlife Service). 2014. Greater Sage-grouse Rangewide Mitigation Framework. Version 1.0. September 3, 2014.

NRCS (Natural Resources Conservation Service). 2011. Soil Survey Staff, Natural Resources Conservation Service, United States Department of Agriculture. Soil Survey Geographic (SSURGO) Database. Available online at http://sdmdataaccess.nrcs.usda.gov/. Accessed 2011.

ODFW. 2015. Mitigation Framework for Indirect Road Impacts to Rocky Mountain Elk Habitat. April 14, 2015. Salem, OR.

Oregon Natural Heritage Information Center & The Wetlands Conservancy. 2009. Oregon Wetland Cover, Dated 20091030. ESRI file geodatabase. Oregon Natural Heritage Information Center, Oregon State University.

USGS (U.S. Geological Survey). 2010. National Hydrography Dataset Flowline. Available online at online at: http://nhd.usgs.gov/ (Accessed 2010).

USGS. 2011. Gap Analysis Program. National Land Cover, Version 2. GIS dataset. May 2011.

APPENDIX A
HABITAT MITIGATION SITES

Habitat Mitigation Areas with Mitigation Zone 1

- Government Mountain
- Ione
- Olex
- Eightmile

Boardman to Hemingway Transmission Line Project

Desktop Habitat Mitigation Site Assessment Worksheet

Parcel Name: Government Mountain (**Figure 1**)
Landowner:
Parcel Size in Acres: 3,453
Date of Assessment: 9/15/2014
Parcel Elevation (ft): 2,400 – 4,400
Within Mitigation Service Area?: No

Location Description
(County, miles and direction from known location, TRS, UTM, other):

Umatilla County, 20 miles southeast of Walla Walla, WA. Near the OR/WA border.
T5N R38E Sections 17, 18, 19, 20
T5N R37E Sections 13, 14, 15, 22, 23, 24

Vegetation Cover Classes (GAP[1], **Figure 2**)

HMP Habitat Category[2] and Type	HMP General Vegetation Type	Acres	% of Parcel	Wildlife Habitat[3]
Category 1		**0**	**0**	
Category 2		**2,976.8**	**85.7**	-
Mixed Grand Fir/Douglas Fir	Forest/Woodland	670.4	19.3	RMEWR, RMESR, MDSR
Mixed Grand Fir/Douglas Fir	Forest/Woodland	334.8	9.6	RMEWR, MDWR, RMESR
Mixed Grand Fir/Douglas Fir	Forest/Woodland	87.5	2.5	RMEWR, MDWR
Mixed Grand Fir/Douglas Fir	Forest/Woodland	13.5	0.4	RMEWR, MDSR
Native Grasslands	Shrub/Grass	428.9	12.3	RMEWR, RMESR, MDSR
Native Grasslands	Shrub/Grass	411.0	11.8	RMEWR, MDWR, RMESR
Native Grasslands	Shrub/Grass	244.8	7.0	RMEWR, MDWR
Native Grasslands	Shrub/Grass	38.9	1.1	RMEWR, MDSR
Subalpine/Montane Forest	Forest/Woodland	25.3	0.7	RMEWR, RMESR, MDSR
Subalpine/Montane Forest	Forest/Woodland	18.8	0.5	RMEWR, MDWR, RMESR
Subalpine/Montane Forest	Forest/Woodland	10.3	0.3	RMEWR, MDWR
Shrub-Steppe with Big Sage	Shrub/Grass	38.9	1.1	RMEWR, RMESR, MDSR
Shrub-Steppe with Big Sage	Shrub/Grass	72.0	2.1	RMEWR, MDWR, RMESR
Shrub-Steppe with Big Sage	Shrub/Grass	75.4	2.2	RMEWR, MDWR
Shrub-Steppe with Big Sage	Shrub/Grass	20.6	0.6	RMEWR, MDSR
Introduced Upland Vegetation	Shrub/Grass	33.3	1.0	RMEWR, RMESR, MDSR
Introduced Upland Vegetation	Shrub/Grass	62.1	1.8	RMEWR, MDWR, RMESR
Introduced Upland Vegetation	Shrub/Grass	41.8	1.2	RMEWR, MDWR

[1]USGS Gap Analysis Project (GAP) GIS data. Ecological systems were cross-walked to HMP Habitat Type as shown in the Habitat Categorization Matrix (Attachment P1-1 of Exhibit P1).
[2]Represents the habitat category based on overlap with wildlife habitat layers. Agriculture and Developed habitat types' categories are not modified by overlap with wildlife habitat.
[3]MDWR = Category 2 habitat for ODFW mule deer winter range; RMEWR = Category 2 habitat for ODFW Rocky Mountain elk winter range; RMESR = Category 3 habitat for Rocky Mountain Elk Foundation Rocky Mountain elk summer range; MDSR = Category 3 habitat for WAFWA mule deer summer range.
[4]Total acres of habitat type may not match actual parcel size due to resolution of the GAP raster dataset. Pixels of the raster dataset were not simplified or smoothed to match the exact shape of the parcel boundary.

Vegetation

HMP Habitat Category[2]	HMP General	Acres	% of	Wildlife Habitat[3]

Cover Classes cont. (GAP[1])	**and Type**	**Vegetation Type**		**Parcel**	
	Category 2 cont.				-
	Forested Wetland	Wetland	43.1	1.2	RMEWR, RMESR, MDSR
	Forested Wetland	Wetland	79.5	2.3	RMEWR, MDWR, RMESR
	Forested Wetland	Wetland	18.6	0.5	RMEWR, MDWR
	Shrub-Steppe without Big Sage	Shrub/Grass	49.1	1.4	RMEWR, RMESR, MDSR
	Shrub-Steppe without Big Sage	Shrub/Grass	31.2	0.9	RMEWR, MDWR, RMESR
	Shrub-Steppe without Big Sage	Shrub/Grass	24.0	0.7	RMEWR, MDWR
	Forested-Other	Forest/Woodland	30.9	0.9	RMEWR, RMESR, MDSR
	Forested-Other	Forest/Woodland	19.8	0.6	RMEWR, MDWR, RMESR
	Forested-Other	Forest/Woodland	5.4	0.2	RMEWR, MDWR
	Ponderosa Pine	Forest/Woodland	11.1	0.3	RMEWR, MDWR, RMESR
	Ponderosa Pine	Forest/Woodland	15.2	0.4	RMEWR, RMESR, MDSR
	Remaining	-	20.2	0.6	-
	Category 3		**414.1**	**11.9**	-
	Mixed Grand Fir / Douglas Fir	Forest/Woodland	181.8	5.2	RMESR, MDSR
	Subalpine/Montane Forest	Forest/Woodland	169.6	4.9	RMESR, MDSR
	Forested-Other	Forest/Woodland	44.9	1.3	RMESR, MDSR
	Native Grasslands	Shrub/Grass	10.6	0.3	RMESR, MDSR
	Shrub-Steppe without Big Sage	Shrub/Grass	2.9	0.1	RMESR, MDSR
	Ponderosa Pine	Forest/Woodland	1.8	0.1	RMESR, MDSR
	Mixed Tamarack	Forest/Woodland	1.6	0.0	RMESR, MDSR
	Shrub-Steppe with Big Sage	Shrub/Grass	0.3	0.0	RMESR, MDSR
	Introduced Upland Vegetation	Shrub/Grass	0.0	0.0	RMESR, MDSR
	Category 4		**0**	**0**	-
	Category 5		**0**	**0**	-
	Category 6		**82.7**	**2.4**	-
	Agriculture	Ag/ Developed	51.1	1.5	RMEWR, MDWR
	Agriculture	Ag/ Developed	17.2	0.5	RMEWR
	Agriculture	Ag/ Developed	0.2	0.0	RMESR, MDSR
	Developed	Ag/ Developed	12.0	0.3	RMEWR, MDWR
	Developed	Ag/ Developed	1.8	0.1	RMEWR
	Developed	Ag/ Developed	0.4	0.0	RMESR, MDSR
	Total				**-**

[1]USGS Gap Analysis Project (GAP) GIS data. Ecological systems were cross-walked to HMP Habitat Type as shown in the Habitat Categorization Matrix (Attachment P1-1 of Exhibit P1).

[2]Represents the habitat category based on overlap with wildlife habitat layers. Agriculture and Developed habitat types' categories are not modified by overlap with wildlife habitat.

[3]MDWR = Category 2 habitat for ODFW mule deer winter range; RMEWR = Category 2 habitat for ODFW Rocky Mountain elk winter range; RMESR = Category 3 habitat for Rocky Mountain Elk Foundation Rocky Mountain elk summer range; MDSR = Category 3 habitat for WAFWA mule deer summer range.

[4]Total acres of habitat type may not match actual parcel size due to resolution of the GAP raster dataset. Pixels of the raster dataset were not simplified or smoothed to match the exact shape of the parcel boundary.

Soil types	The NRCS Soil Survey Geographic Database (SSURGO) data was reviewed and the following soils were identified on the property (**Figure 3**): *Buckcreek-Gwin association* (**706 acres**). Buckcreek soils consist of moderately deep, well drained soils found on uplands at elevations of 2,000 to 4,500 feet. Buckcreek soils are used for range and wildlife habitat. Native vegetation is Idaho fescue, ninebark and snowberry. Gwin soils consist of shallow, well drained soils found on mountain slopes, basalt plateaus, ridgetops, foothills, structural benches, hill shoulders, summits, backslopes, and footslopes and canyon walls at elevations of 800 to 6,210 feet in Oregon and Idaho. Gwin soils are used for grazing and as wildlife habitat. Native vegetation is mainly bluebunch wheatgrass, Idaho fescue, and Sandberg bluegrass. *Cowsly* (**39 acres**) and *Cowsly silt loam* (**51 acres**). Cowsly soils consist of deep or very deep, moderately well drained soils found on plateaus at elevations from 2800 to 5000 feet. Cowsly soils are used primarily for timber production. Other uses are dryland small grain, pasture, wildlife habitat and water supply. Native vegetation is ponderosa pine and Douglas fir with an understory of spirea, ocean spray, snowberry, Idaho fescue, pinegrass and elksedge. *Gwin-Rock outcrop complex* (**704 acres**). Gwin soils consist of shallow, well drained soils found on mountain slopes, basalt plateaus, ridgetops, foothills, structural benches, hill shoulders, summits, backslopes, and footslopes and canyon walls at elevations of 800 to 6,210 feet in Oregon and Idaho. Gwin soils are used for grazing and as wildlife habitat. Native vegetation is mainly bluebunch wheatgrass, Idaho fescue, and Sandberg bluegrass. *Tolo silt loam* (**400 acres**). Tolo soils consist of deep and very deep, well drained soils found on nearly level upland plateaus and steep north and east-facing mountain side slopes at elevations of 2,800 to 5,400 feet. Tolo soils are used for timber production and livestock grazing with small areas at lower elevations cleared for cultivation. Principal trees include Douglas fir, grand fir, larch, ponderosa pine, and lodgepole pine. *Umatilla-Kahler-Gwin association* (**1,546 acres**). Umatilla soils consist of very deep, well drained soils found on uplands at elevations of 2,000 to 5,000 feet. Umatilla soils are used for timber production, livestock grazing and wildlife habitat. Native vegetation is Douglas-fir, grand fir and ponderosa pine. Kahler soils consist of deep and very deep, well drained soils found on back slopes of plateaus, canyons, hills, and mountains at elevations ranging from 2,000 to 6,000 feet. Kahler soils are used for timber production, limited cropland, livestock grazing, watershed, recreation, and wildlife habitat. Many areas with slopes of less than 15 percent have been cleared and produce dryland hay and grain, or irrigated crops. The native vegetation is mainly ponderosa pine, Douglas fir, pinegrass and elk sedge. Gwin soils consist of shallow, well drained soils found on mountain slopes, basalt plateaus, ridgetops, foothills, structural benches, hill shoulders, summits, backslopes, and footslopes and canyon walls at elevations of 800 to 6,210 feet in Oregon and Idaho. Gwin soils are used for grazing and as wildlife habitat. Native vegetation is mainly bluebunch wheatgrass, Idaho fescue, and Sandberg bluegrass. *Xerofluvents* (**0.1 acre**). A fluvent soil with a xeric moisture regime.
Hydrologic Features Present (SteamNet, NWI, NHD)	Four perennial and three intermittent streams are within the property (NHD), including the North Fork of the Walla Walla River (three miles of river frontage per the real estate listing). Other than an impoundment, all wetland areas (NWI) appear to be associated with riparian corridors of streams identified in NHD.
Adjacent land ownership, use, and condition	Most of the adjacent lands are private; however, the eastern border of the property connects to a large tract of USFS lands. Land use is likely rangeland and timber with agricultural land use in the valley approximately 5 miles to the west.

Infrastructure Density within or Near the Parcel (Qualitative Description)	Ranch includes a historic 1920 cabin, a bunkhouse, a barn, machine shop, fencing, cross fencing, and an old miner cabin (per real estate listing). Several maintained roads access the property.

Summary	The property is outside of the mitigation service area. Property is approximately 2.7 miles north of the South Fork Walla Walla River BLM ACEC, designated to protect and enhance riparian ecosystems, fisheries habitat, and scenic values and recreational use. Borders a large tract of USFS lands including areas with old growth forest and is within elk and mule deer winter range. North Fork of the Walla Walla River is bull trout and steelhead critical habitat, Little Meadow Creek and Big Meadow Creek are steelhead critical habitat. Property is within 2 different ODFW COAs, the Umatilla – Walla Walla area of the Blue Mountains ecoregion and the Walla Walla River area of the Columbia Plateau ecoregion. Conservation actions identified for both areas include maintenance and enhancement of in-channel watershed function, connection to riparian habitat, flow and hydrology; and maintenance or restoration of riparian habitat and ecological function and to ensure sufficient habitat complexity for wildlife. In addition, the Umatilla – Walla Walla COA adds initiation or continuation of wet meadow conservation and restoration; and promotion of early detection and suppression of invasive weeds.

Pass/Fail Desktop Assessment?	Pass

Boardman to Hemingway Transmission Line Project

Consideration of Property as a Potential Mitigation Site

Mitigation Function	This mitigation site has been identified as in-kind and in-proximity mitigation for impacts on Category 2 elk and mule deer winter habitat within the forest/woodland general vegetation type. This mitigation site could help meet the Project need for elk and mule deer summer habitat as well. It contains important habitat features with opportunities to provide durable ecological uplift through implementation of standard mitigation actions. Opportunities to improve the watershed would benefit bull trout and steelhead critical habitat. The mitigation actions listed below, upon successful implementation, will increase the quality of habitat available to elk and mule deer (among other species) within the mitigation site and result in an ecological uplift to the mitigation site above what is provided under the current management.
Mitigation Site Manager	Fee title acquisition with transfer of ownership to State of Oregon, Federal Land Management Agency, approved NPO or Land Trust
Mitigation Actions	The following are mitigation actions that may be implemented at this mitigation site in order to satisfy the mitigation policies/guidelines of the permitting agencies. All mitigation actions will follow reliable methods. The mitigation actions presented here are not comprehensive. Implementation will likely be some combination of one or more of the following: • *Livestock grazing restrictions* – historic grazing practices at this property are unknown. However, the objective would be to avoid grazing practices that would compete with native wildlife life history needs. Targeted grazing may be considered for habitat enhancement/treatment actions. • *Weed treatment* – the extent of noxious weed invasion on the mitigation site is unknown at this time but it is anticipated that opportunities exist to implement this mitigation action. • *Native revegetation/restoration* – the focus would be planting forage shrubs and implementing forest management practices that would create structural diversity and enhance desirable habitat conditions. • *Fire readiness* – efforts made to make the property more resistant to catastrophic fire and a fire response plan could be developed. • *Fence removal/fence upgrade* – opportunities are unknown at this time, but it is anticipated that some unnecessary fencing may be removed or necessary fencing can be upgraded to more wildlife friendly fencing.
Monitoring	A specific plan for monitoring will be developed, but in general, mitigation progress will be monitored through vegetation plot monitoring and establishment of photo locations. Monitoring will occur annually for the first 3-5 years and an annual report will be produced. During the annual monitoring phase, a longer-term monitoring plan will be developed using similar protocols and methods to monitor the mitigation actions at larger time intervals (i.e., 5 years, 10 years).

Success Criteria

Specific success criteria will be developed once baseline conditions have been determined and potential mitigation actions have been confirmed for the site. Success criteria may include but are not limited to:

- Vegetation plots show an increase in native vegetation cover and general trend toward increased habitat quality representing an ecological uplift.
- Successful weed control through documentation of a reduction in weeds and non-native invasive plant species.
- Mitigation success will not be dependent on documentation of increased use of the mitigation site by WAGS or any other wildlife species.

Financial Outline

Estimated Budget for the Government Mountain Mitigation Site

Action	Cost per Unit	Units	Years	Expense
One-time Costs				
Acquisition (from 4/10/2013 listing)	$3,250,000	1	-	$3,250,000
Recurring Costs (Annually)				
O&M[1]	$53.75	3,453	50	$9,279,938
Total	-			$12,529,938 ($3,628/acre)[2]

[1] This O&M cost is an estimate of the cost per acre per year (not including acquisition/easement costs) based on the research presented in the Independent Economic Analysis Board's 2007 *Investigation of Wildlife O&M Costs*. The cost per acre identified in that study for the Elkhorn Wildlife Management Area (which this mitigation site will be modeled after) was $43 in 2004 dollars, this has been adjusted to reflect 2015 dollars.

[2] Cost per acre here includes cost of acquisition/easement and long-term O&M for 50 years.

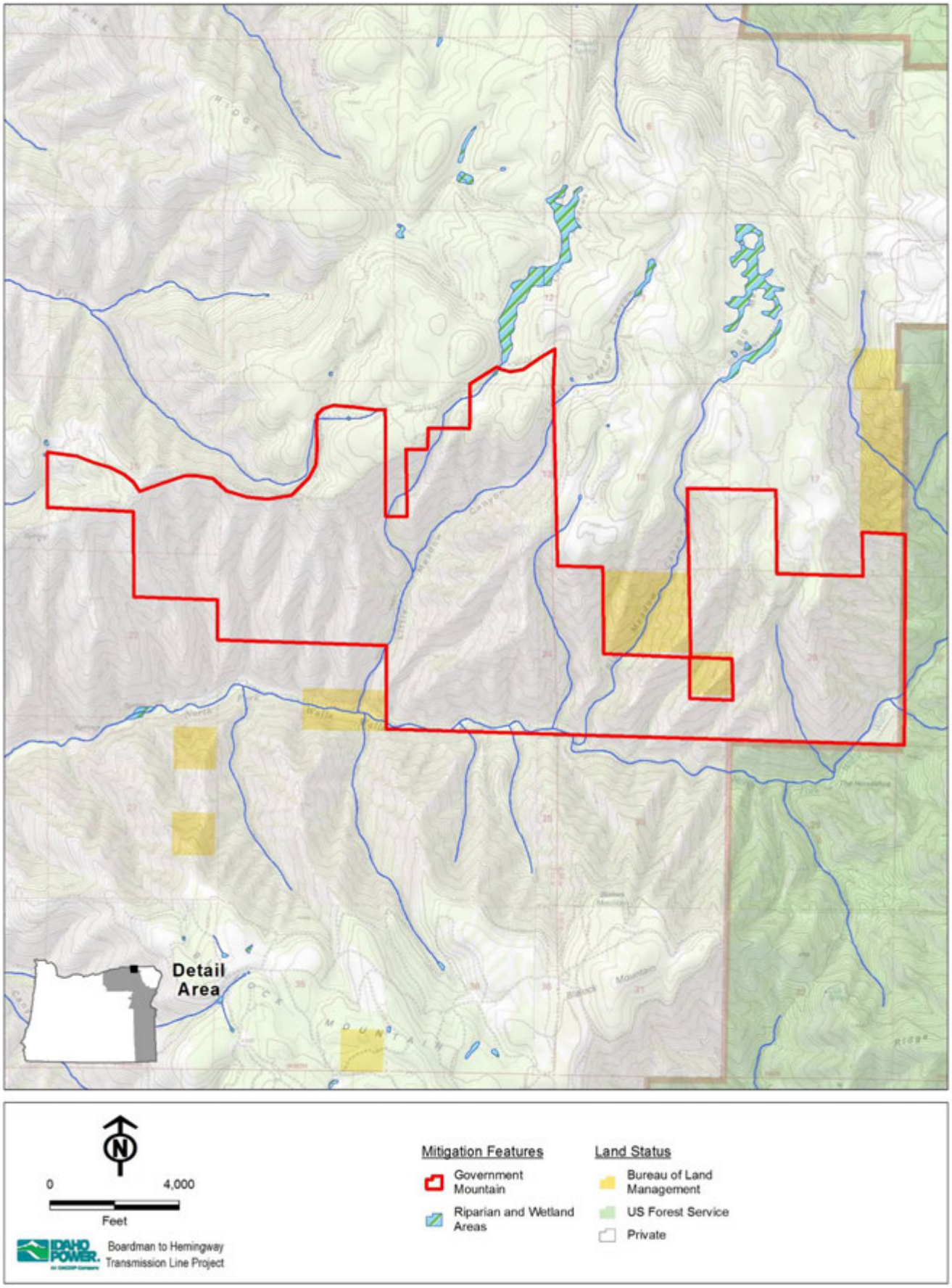

Figure 1. Government Mountain Ownership and Water

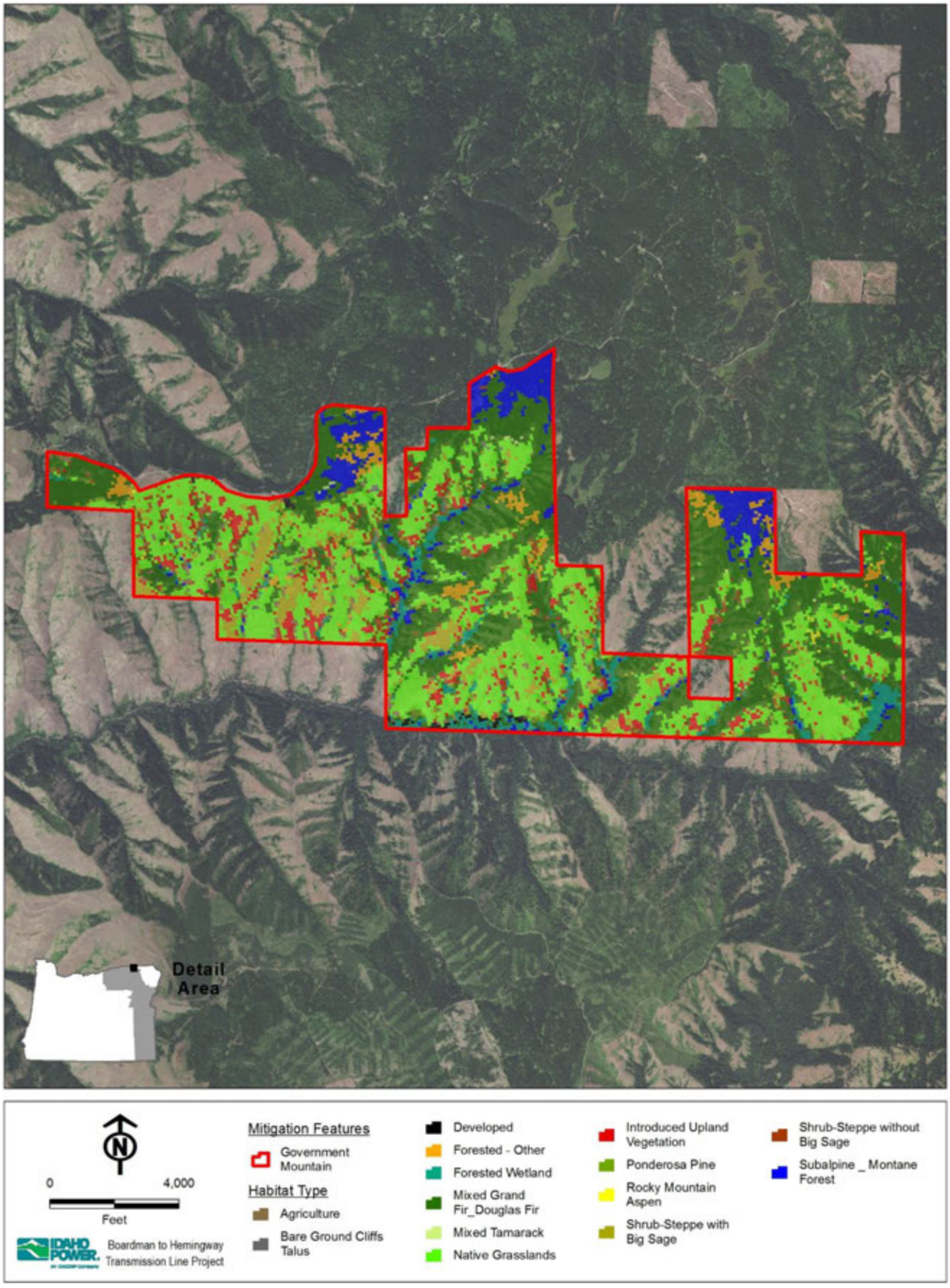

Figure 2. Government Mountain Habitat Types

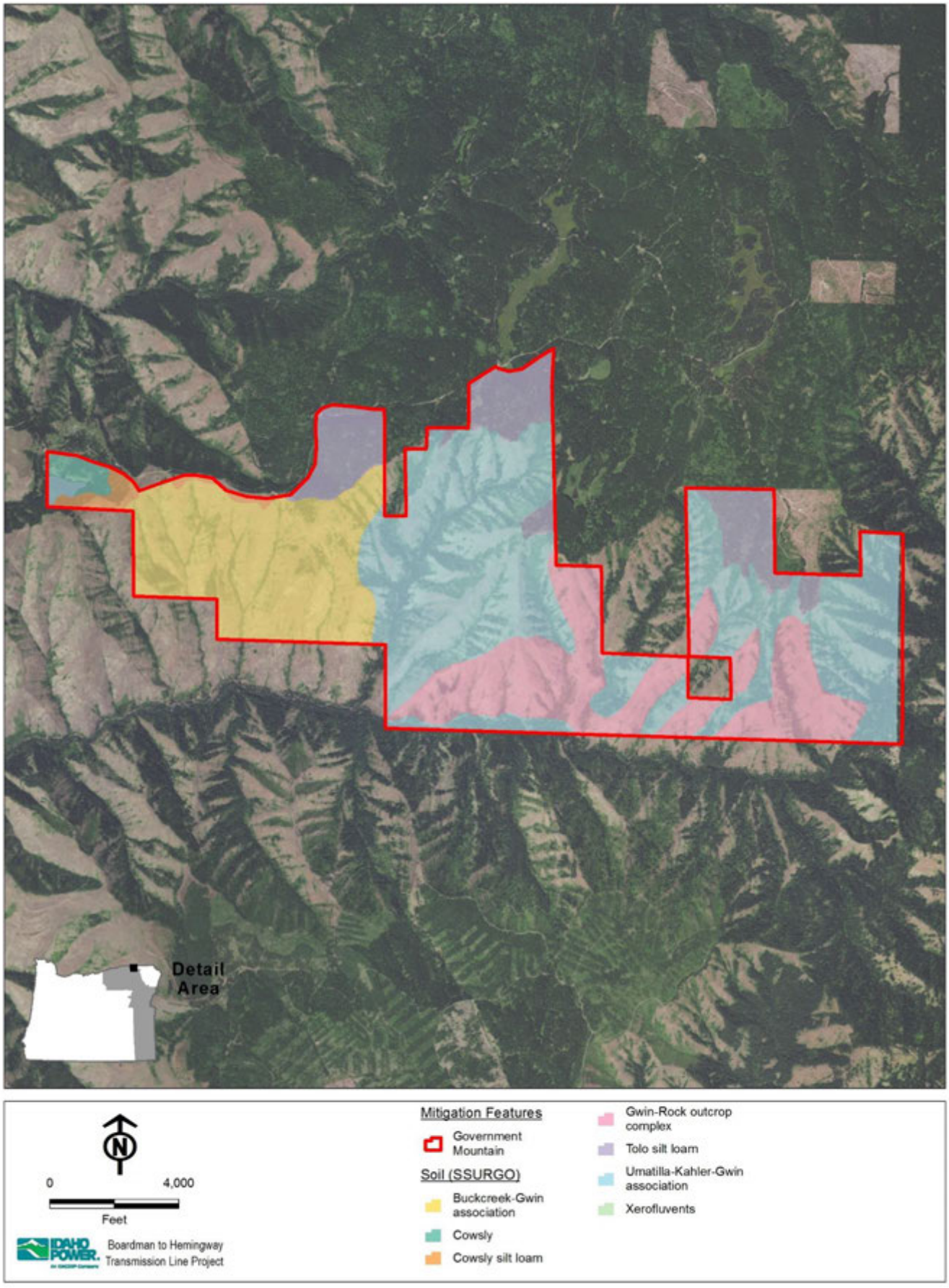

Figure 3. Government Mountain Soil Types

Boardman to Hemingway Transmission Line Project

Desktop Habitat Mitigation Site Assessment Worksheet

Parcel Name: Ione (**Figure 1**)
Landowner:
Parcel Size in Acres: 433 (108 acres available)
Date of Assessment: 10/15/2014
Parcel Elevation (ft): 1,500 – 1,850
Within Mitigation Service Area?: No

Location Description
(County, miles and direction from known location, TRS, UTM, other):

Morrow County, 8 miles southwest of Ione.
T2S R23E Sections 8, 9.

Vegetation Cover Classes (GAP[1], **Figure 2**)

HMP Habitat Category[2] and Type	HMP General Vegetation Type	Acres	% of Parcel	Wildlife Habitat[3]
Category 1		**0**	**0**	
Category 2		**425.6**	**98.3**	
Shrub-Steppe with Big Sage	Shrub / Grass	423.9	97.9	
Native Grasslands	Shrub / Grass	1.3	0.3	
Shrub-Steppe without Big Sage	Shrub / Grass	0.4	0.1	
Category 3		**5.8**	**1.3**	-
Agriculture	Agriculture / Developed	5.8	1.3	
Category 4		**0**	**0**	-
Category 5		**1.3**	**0.3**	-
Introduced Upland Vegetation	Shrub / Grass	1.3	0.3	
Category 6		**0**	**0**	-
Total		**432.8**	**100**	**-**
Total Available for Easement		**108[4]**		

[1] USGS Gap Analysis Project (GAP) GIS data using ecological systems. Ecological systems were cross-walked to HMP Habitat Type as shown in the Habitat Categorization Matrix (Attachment P-2 of Exhibit P).
[2] Represents the highest category that the habitat type can be attributed based only on vegetation metrics. Field review of this site would likely warrant modification of categorization.
[3] No wildlife habitat layers used in the Project's habitat categorization model overlap this property.
[4] All 108 acres are identified as shrub-steppe with big sage by GAP. Site visit showed that the 108 acres was made up of native grassland and non-native grasslands with remnant sagebrush stands and shrublands without a sagebrush component.

Soil types	The NRCS Soil Survey Geographic Database (SSURGO) data was reviewed and the following soils were identified on the property (**Figure 3**): *Endersby fine sandy loam* (**1 acre**). Endersby soils consist of deep, somewhat excessively drained soils found on nearly level bottomlands at elevations of 200 to 1,500 feet. Endersby soils are used primarily for forage crops. Other uses are dry and irrigated small grain, range, pasture, wildlife, and water supply. Vegetation consists of bunchgrasses and forbs. *Lickskillet-Rock outcrop complex* (**42 acres**). Lickskillet soils consist of shallow, well drained soils typically found on south-facing canyon and mountain side slopes at elevations of 200 to 4,500 feet. Lickskillet soils are dominantly used for livestock grazing. Other uses include watershed, recreation, and wildlife habitat. Vegetation is bluebunch wheatgrass, Sandberg bluegrass, Thurber needlegrass, western yarrow, and Wyoming big sagebrush. *Lickskillet very stony loam* (**353 acres**). Lickskillet soils consist of shallow, well drained soils typically found on south-facing canyon and mountain side slopes at elevations of 200 to 4,500 feet. Lickskillet soils are dominantly used for livestock grazing. Other uses include watershed, recreation, and wildlife habitat. Vegetation is bluebunch wheatgrass, Sandberg bluegrass, Thurber needlegrass, western yarrow, and Wyoming big sagebrush. *Mikkalo silt loam* (**34 acres**). Mikkalo soils consist of moderately deep, well drained soils found on canyons, hills, plateaus, and ridges at elevations of 300 to 2,800 feet. Mikkalo soils are used for production of small grains and for rangeland. The native vegetation is bluebunch wheatgrass, green rabbitbrush, big sagebrush, balsamroot and yarrow. *Ritzville silt loam* (**2 acres**). Ritzville soils consist of very deep and deep to duripan, well drained soils found on uplands including plateaus, benches, and canyon side slopes at elevations ranging between 700 to 3,000 feet. Ritzville soils are used for dryland wheat production and some livestock grazing. Native vegetation is bluebunch wheatgrass, Sandberg bluegrass, Wyoming big sagebrush, and yarrow.
Hydrologic Features Present (SteamNet, NWI, NHD)	NHD does not show any water within the property. NWI identifies a temporarily flooded streambed.
Adjacent land ownership, use, and condition	All adjacent land is privately held. A majority of adjacent land use is dry land agriculture with some open rangeland.
Infrastructure Density within or Near the Parcel (Qualitative Description)	There does not appear to be any infrastructure within this property, other than boundary fencing. Infrastructure within the adjacent private lands also appears very low; other than dirt farm roads there does not appear to be any significant infrastructure. TOPO maps show a pipeline north of the property.
Summary	The property is outside of the mitigation service area. None of the wildlife habitat layers considered for this assessment overlap the property. It provides non-agriculture and native habitat adjacent to a water source in Eightmile Canyon, so likely provides undisturbed nesting and hiding cover for numerous species.
Pass/Fail Desktop Assessment?	Pass

Boardman to Hemingway Transmission Line Project

Consideration of Property as a Potential Mitigation Site

Mitigation Function	This potential mitigation site could provide mitigation for impacts on the shrub/grass general vegetation type within the Columbia Basin. The mitigation site is outside of Washington ground squirrel modeled habitat (habitat concentration areas [WWHCWG 2012]) and only historical records of squirrel activity occur within 5 miles of the property. This mitigation site provides native habitat features within an agricultural-dominated landscape. Wildlife species, especially migratory birds, that utilize shrub-steppe and grassland habitats would benefit from implementation of mitigation actions that result in ecological uplift.
Mitigation Site Manager	The mitigation site would be established through a conservation easement held and managed by the current landowners.
Mitigation Actions	The following are mitigation actions that may be implemented at this mitigation site in order to satisfy the mitigation policies/guidelines of the permitting agencies. All mitigation actions will follow reliable methods. The mitigation actions presented here are not comprehensive. Implementation will likely be some combination of one or more of the following: • *Livestock grazing restrictions* – the current level of grazing on this property is unknown. Mitigation action could avoid grazing practices that would compete with native wildlife life history needs. Targeted grazing may be considered for habitat enhancement/treatment actions. • *Weed treatment* – the extent of noxious weed invasion on the mitigation site is unknown at this time but it is anticipated that opportunities exist to implement this mitigation action. • *Native revegetation/restoration* – the focus would be sagebrush and bunchgrasses on this mitigation site. • *Fire readiness* – efforts made to make the property more resistant to catastrophic fire and a fire response plan could be developed. • *Fence removal/fence upgrade* – opportunities are unknown at this time, but it is anticipated that some unnecessary fencing may be removed or necessary fencing can be upgraded to more wildlife friendly fencing.
Monitoring	A specific plan for monitoring will be developed, but in general, mitigation progress will be monitored through vegetation plot monitoring and establishment of photo locations. Monitoring will occur annually for the first 3-5 years and an annual report will be produced. During the annual monitoring phase, a longer-term monitoring plan will be developed using similar protocols and methods to monitor the mitigation actions at larger time intervals (i.e., 5 years, 10 years).
Success Criteria	Specific success criteria will be developed once baseline conditions have been determined and potential mitigation actions have been confirmed for the site. Success criteria may include but are not limited to: • Vegetation plots show an increase in native vegetation cover and general trend toward increased habitat quality representing an ecological uplift. • Successful weed control through documentation of a reduction in weeds and non-native invasive plant species. • Mitigation success will not be dependent on documentation of increased use of the mitigation site by wildlife species.

Financial Outline

This financial outline provides estimated figures and data for informational purposes only. These estimates are meant to provide an overview of the potential and reasonable costs of preparing an easement and implementing mitigation on this mitigation site. The financial outline does not guarantee the final easement value and costs for the easement. This desktop assessment cannot be used to infer value (monetary or ecological) of other properties or easements in the region. Unless otherwise stated, cost assumptions come from NRCS EQIP Practice Payment Rate schedules.

- Weed treatment: $20 - $200 per acre
- Native Seeding:
  - Site preparation (mowing/discing) $500 per acre
  - Broadcast/Drill seed: $100 - $250 per acre
- Hydroseeding: $792 per acre

Estimated Budget for the Lone Mitigation Site

Action	Cost per Unit	Units	Years	Expense
One-time Costs				
Easement Value	Unknown	1	-	?
Easement Transaction Costs[1]	$20,000	1		$20,000
Recurring Costs (Annually)				
O&M[2]	$30	433	50	649,500
Total	**-**			**$?** ($?/acre)[3]

[1] Easement transaction cost is on the high end of the average presented in the 2009 report by Defenders of Wildlife and Trust for Public, titled *Land Conservation Spending in Oregon in Relation to the State Wildlife Conservation Strategy*.

[2] This O&M cost is an estimate of the cost per acre per year (not including acquisition/easement costs) based on the research presented in the Independent Economic Analysis Board's 2007 *Investigation of Wildlife O&M Costs*. The average cost per acre presented in that document was $24 in 2004 dollars, this has been adjusted to reflect 2015 dollars.

[3] Cost per acre here includes cost of acquisition/easement and initial mitigation actions and long-term O&M for 50 years.

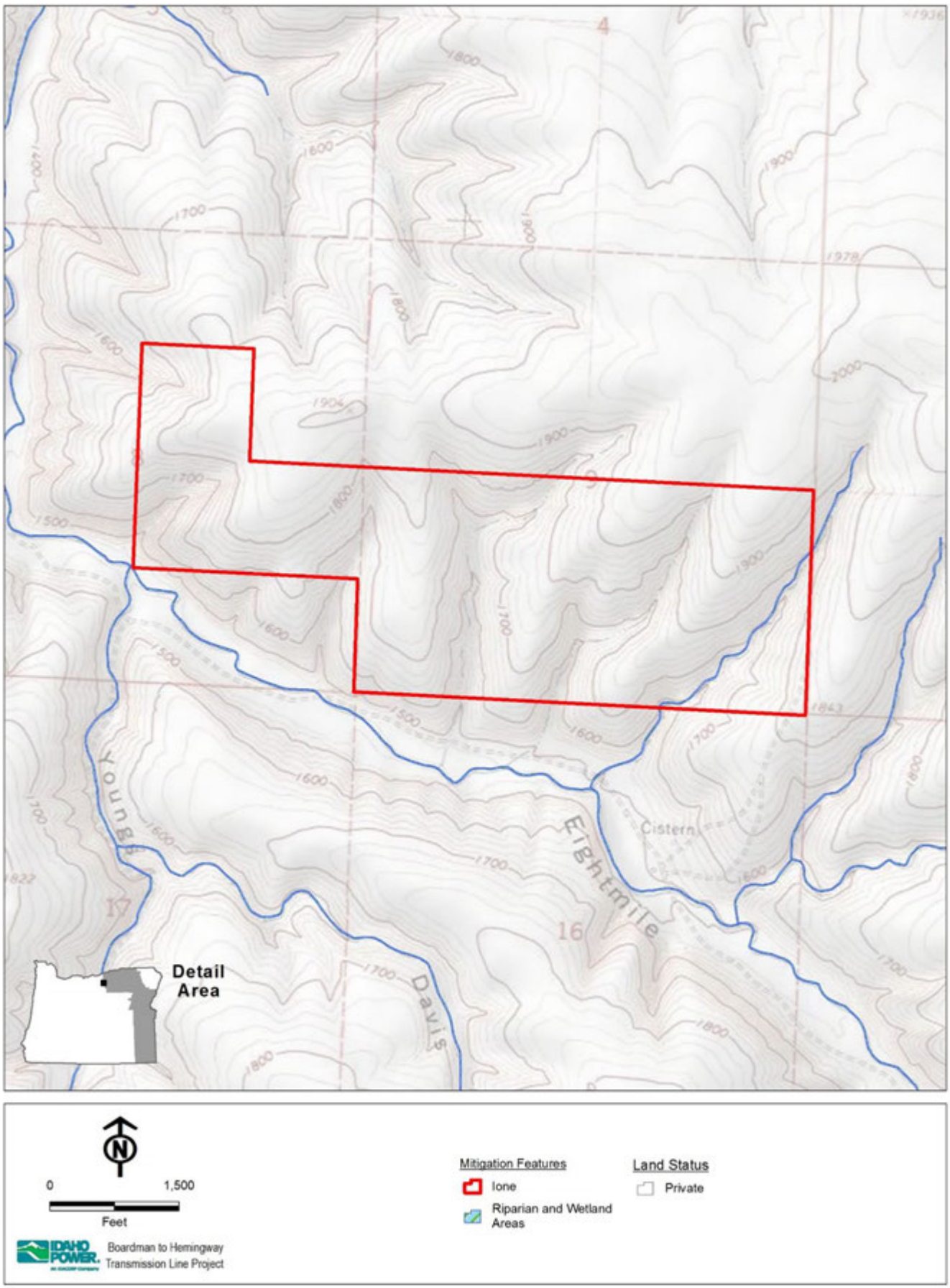

Figure 1. Ione Ownership and Water

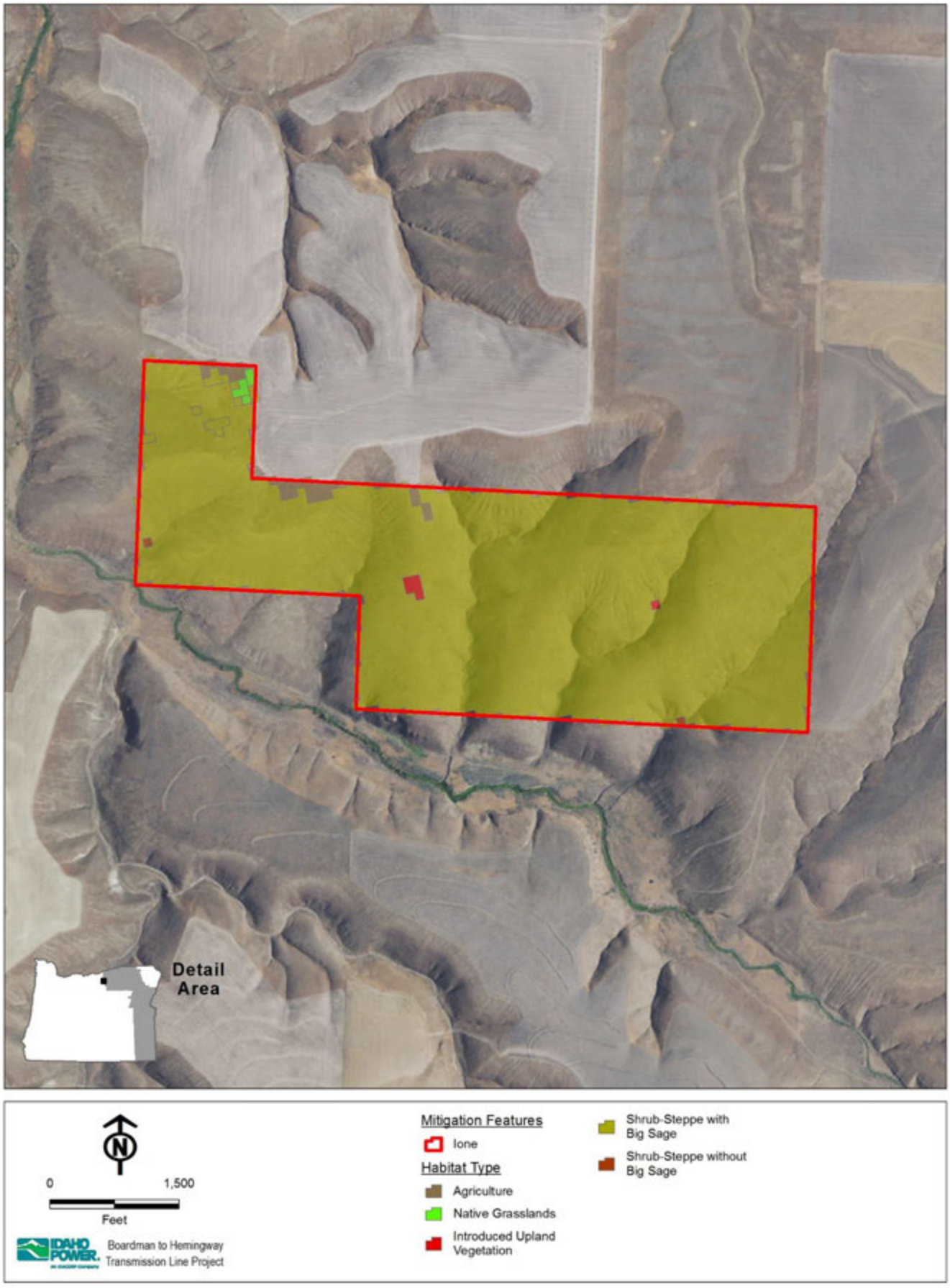

Figure 2. Ione Habitat Types

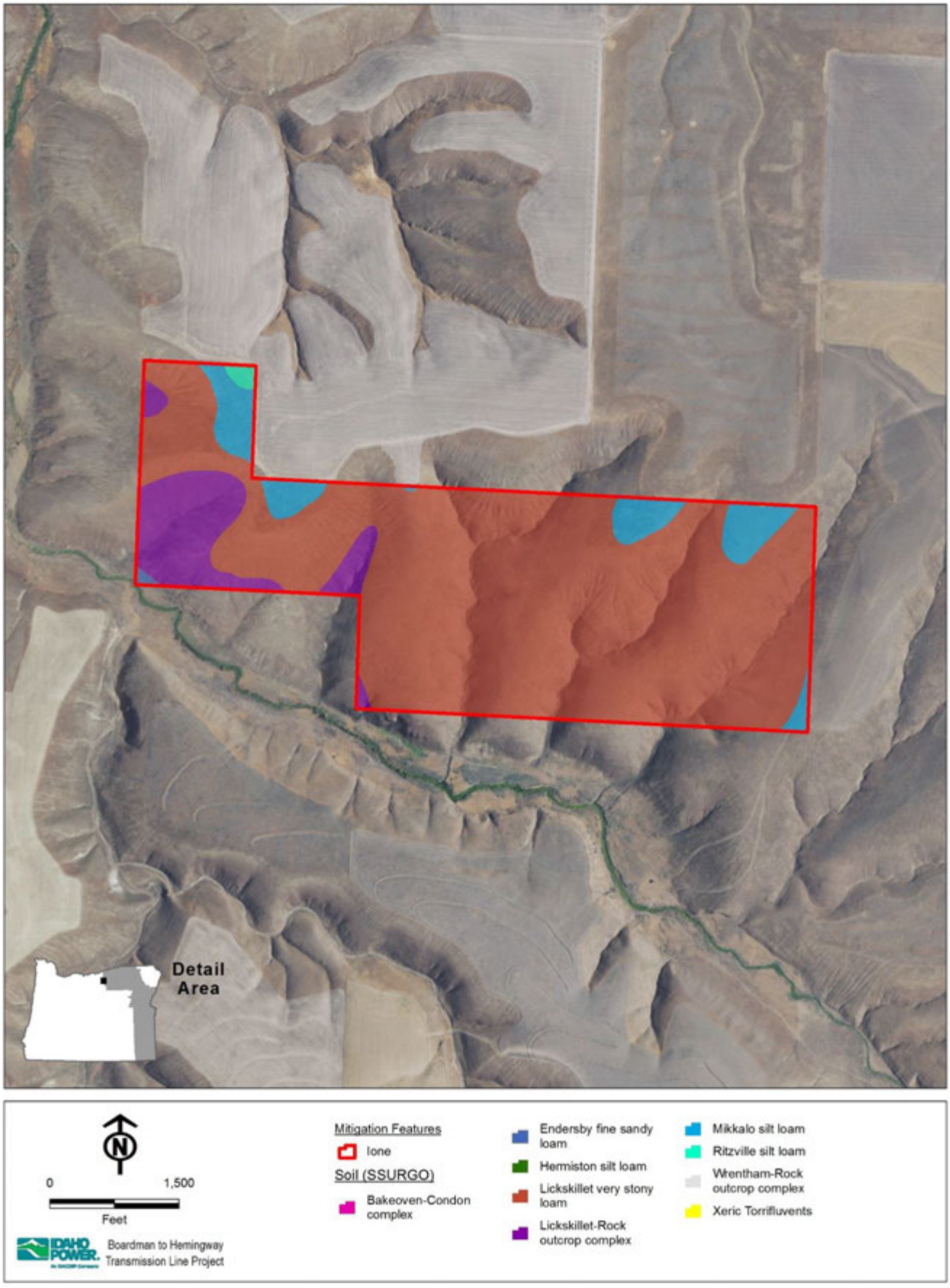

Figure 3. Ione Soil Types

Boardman to Hemingway Transmission Line Project

Desktop Habitat Mitigation Site Assessment Worksheet

Parcel Name: Olex (**Figure 1**)
Landowner:
Parcel Size in Acres: 2,067 (1,563 available for easement)
Date of Assessment: 9/8/2015
Parcel Elevation (ft): 1,000 – 1,800
Within Mitigation Service Area?: No

Location Description
(County, miles and direction from known location, TRS, UTM, other):

Gilliam County, 16 miles west of Ione.
T1S R21E Sections 1, 11, 14, 15, 22, 23, 24, 25, 26

Vegetation Cover Classes (**Figure 2**)

Habitat Category[1] and Habitat Type[2]	HMP General Vegetation Type	Acres	% of Parcel	Wildlife Habitat[3]
Category 1		**418.6**	**20.2**	
Native Grassland	Shrub/Grass	346.0	16.7	WAGS1, MDWR
Perennial Grassland	Shrub/Grass	72.6	3.5	WAGS1, MDWR
Category 2		**1,583.2**	**76.5**	-
Perennial Grassland	Shrub/Grass	556.2	26.9	WAGS2, MDWR
Native Grassland	Shrub/Grass	429.5	20.7	WAGS2, MDWR
Old Field	Shrub/Grass	2.1	0.1	WAGS2, MDWR
Perennial Grassland	Shrub/Grass	198.0	9.6	MDWR
Native Grassland	Shrub/Grass	348.0	16.8	MDWR
Old Field	Shrub/Grass	49.4	2.4	MDWR
Category 3		**0**	**0**	-
Category 4		**0**	**0**	-
Category 5		**0**	**0**	-
Category 6		**68.2**	**3.3**	-
Agriculture	Agriculture/ Developed	61.1	3.3	MDWR
Developed	Agriculture/ Developed	6.3	0.3	MDWR
Cemetery	Agriculture/ Developed	0.8		MDWR
Total	**NA**	**2,069.9**	**100**	**-**

[1] Represents the habitat category based on overlap with wildlife habitat layers. Agriculture and Developed habitat types' categories are not modified by overlap with wildlife habitat.
[2] The Habitat Type for this property was provided by the property owner, and does not exactly follow the Habitat Types defined for the Project and presented in the Habitat Categorization Matrix (see Exhibit P1, Attachment P1-1).
[3] WAGS1 = Category 1 habitat consisting of the active ground squirrel colony which is defined as single or cluster of holes as well as the required habitat for squirrel survival (785 feet from the edge of the extent of active holes). WAGS2 = Category 2 habitat consisting of the area of potential Washington ground squirrel use (1.5km from the edge of the WAGS1 area in similar habitat type and quality). MDWR = Category 2 habitat for ODFW mule deer winter range.
[4] Total acres of habitat type will not match actual parcel size due to resolution of the Gap Analysis Project raster dataset. Pixels of the raster dataset were not simplified or smoothed to match the exact shape of the parcel boundary.

Soil types

The NRCS Soil Survey Geographic Database (SSURGO) data was reviewed and the following soils were identified on the property (**Figure 3**):

Bakeoven-Condon complex, 2 to 20 percent slopes (**4 acres**). Bakeoven soils consist of very shallow, well drained soils found on mountains, ridgetops, hillslopes, mesas, and benches at elevations of 300 to 4,800 feet. Bakeoven soils are used for livestock grazing and wildlife habitat. Native vegetation is Sandberg bluegrass and stiff sagebrush. Condon soils are moderately deep, well drained soils found in uplands at elevations of 1,100 to 4,000 feet. Typical use is grain crops. Native plants are bluebunch wheatgrass, Idaho fescue, Sandberg bluegrass, and forbs such as yarrow, phlox, and buckwheat.

Hermiston Silt Loam (**57.5 acres**). Hermiston soils consist of deep, well drained soils found on stream bottomlands (along Rock Creek here) and low terraces. Typical use is production of dry farmed wheat or irrigated small grains, alfalfa, sugar beets, pasture and hay crops. Native vegetation was mainly giant wildrye and bluebunch wheatgrass.

Lickskillet-Rock outcop complex, 40 to 70 percent slopes (**11 acres**) and *Lickskillet very stony loam*, 7 to 40 percent slopes (**645 acres**). The lickskillet soils consist of shallow, well drained soils typical of south-facing canyon and mountain side slopes from 200 to 4,500 feet. On this property, the rock outcrop complex makes up the south facing canyon wall along Rock Creek just north of Rock Creek Road; the very stony loam occurs along the side slopes of the drainages (Pat's Canyon and others) within the property. Typical use is livestock grazing. Native vegetation is bluebunch wheatgrass, Sandberg bluegrass, Thurber needlegrass, western yarrow, and Wyoming big sagebrush.

Mikkalo silt loam, 2 to 70 percent slopes (**463 acres**). Mikkalo soils consist of moderately deep, well drained soils on canyons, hills, plateaus, and ridges from 300 to 2,800 feet. These soils are found within the hilltops/plateaus that dominate the property south of Rock Creek. They make up some of the potential WAGS habitat on the property. Typical use is production of small grains and rangeland. The native vegetation is bluebunch wheatgrass, green rabbitbrush, big sagebrush, balsamroot, and yarrow.

Ritzville silt loam, 2 to 40 percent slopes (**687 acres**). Ritzville soils consist of very deep and deep to duripan, well drained soils typically found on upland plateaus and benches from 700 to 3,000 feet. They make up the majority of the hilltops/plateaus found on the property south of Rock Creek. These soils make up some of the potential WAGS habitat on the property. Typical use is dryland wheat production and livestock grazing. Native vegetation is bluebunch wheatgrass, Sandberg bluegrass, Wyoming big sagebrush, and yarrow.

Wtrentham-Rock outcrop complex, 35 to 70 percent slopes (**190 acres**). The Wrentham soils consist of moderately deep, well drained soils found on north-facing canyon slopes from 900 to 3,600 feet elevation. They occur on the property along the north facing slopes just south of Rock Creek, including bands of rock outcrops. Typical use is range; native vegetation is Idaho fescue, bluebunch wheatgrass, Sandberg bluegrass, forbs and shrubs.

Xeric torrifluvents, nearly level (**10 acres**). This is an alluvial fan type of soil and is found along a small portion of Rock Creek.

Hydrologic Features Present (SteamNet, NWI, NHD)

Property contains four intermittent streams per NHD. Rock Creek supports redband trout and ESA listed summer steelhead. Rock Creek supports migrating and spawning steelhead and provides rearing areas for fry and juveniles. NWI did not identify any wetland features outside those associated with riparian areas of NHD streams.

Adjacent land ownership, use, and condition	Adjacent land ownership is private; however, a small BLM parcel is just east of the property on the opposite side of Rock Creek. Majority of adjacent land use is dry land agriculture.
Infrastructure Density within or Near the Parcel (Qualitative Description)	Upper Rock Creek Rd. runs through the property and a couple of residential structures appear along the road in the northern portion of the property. Otherwise, a majority of the property is open habitat. Property is just east of State Route 19 (John Day Highway), Union Pacific RR has a line within 3 miles, and TOPO maps show a transmission line coming into a substation at OLEX.
Summary	Identified as a WAGS habitat concentration area by the Washington Wildlife Habitat Connectivity Working Group (**Figure 1**). Active WAGS colonies are present; therefore the property contains Category 1 and Category 2 WAGS habitat (**Figure 4**). The property is outside of the mitigation service area and is in a county not directly impacted by the project. However, the property was nominated by ODFW and would likely be acceptable mitigation. In addition to WAGS, the property contains Rock Creek which supports an ESA listed steelhead population and the entire property is within ODFW designated mule deer winter range.
Pass/Fail Desktop Assessment?	Pass

Boardman to Hemingway Transmission Line Project

Consideration of Property as a Potential Mitigation Site

Mitigation Function	The property owner has stated that 1,563 acres of the property are available for mitigation through an easement. Most of the potential easement area (1,515 acres) is upland habitat identified as Native Grassland and Perennial Grassland (**Figure 2**). These upland habitats consist of planted perennial, annual, and native bunchgrass grasslands; and patches of shrub-steppe habitat consisting of basin big sagebrush and other shrub species. The remaining 48 acres has recently been planted to native grassland (Seeded/Planted Revegetation; **Figure 2**) and contains approximately 1.25 miles of riparian corridor consisting of alder and willow along Rock Creek. This mitigation site would meet the entire Project need for WAGS habitat mitigation. It contains habitat features important to the species with ample opportunities to provide ecological uplift through implementation of standard mitigation actions. This mitigation site would provide mitigation credit for Project impacts on Category 1 & 2 WAGS habitat within the shrub/grass general vegetation type of the Columbia Basin. Mitigation actions and use restrictions will be consistent with the goal of no net loss of habitat and a net benefit in the quantity and quality of Category 2 habitat. In addition to Category 2 mitigation within the Columbia Basin, this mitigation site provides additional mitigation credit towards impacts on Category 3 and Category 4 shrub/grass habitats occurring within the Columbia Basin. The mitigation actions listed below, upon effective implementation, will provide a net benefit in quantity and quality of habitat available to WAGS (among other species) within the mitigation site and result in an ecological uplift (additionality) on the mitigation site.
Mitigation Site Manager	The mitigation site would be established through a conservation easement held by a non-profit group such as a land trust and would be managed by the current landowners.
Mitigation Actions	The following are mitigation actions that may be implemented at this mitigation site in order to satisfy the mitigation policies/guidelines of the permitting agencies. All mitigation actions will follow reliable methods. The mitigation actions presented here are not comprehensive. Implementation will likely be some combination of one or more of the following: • *Modification of Livestock Grazing* – avoid grazing practices that would compete with native wildlife life history needs. Targeted grazing may be considered for habitat enhancement/treatment actions. • *Weed treatment* – the extent of noxious weed invasion on the mitigation site is unknown at this time but it is anticipated that opportunities exist to implement this mitigation action. Financial outline below assumes an initial effort to treat 75 acres. • *Native revegetation/restoration* – focus of efforts would be to promote establishment of sagebrush and bunchgrasses; opportunities exist but have not been specifically identified at this time. • *Fire readiness* – efforts made to make the property more resistant to catastrophic fire and a fire response plan could be developed. • *Fence removal/fence upgrade* – opportunities are unknown at this time, but it is anticipated that some unnecessary fencing may be removed or necessary fencing can be upgraded to more wildlife friendly fencing.
Monitoring	A specific plan for monitoring will be developed in coordination with ODFW during preparation of the conservation easement.

Success Criteria

Specific success criteria will be developed once baseline conditions have been determined and potential mitigation actions have been confirmed for the site. Success criteria may include but are not limited to:

- Vegetation plots show an increase in native vegetation cover and general trend toward increased habitat quality representing an ecological uplift.
- Successful weed control through documentation of a reduction in weeds and non-native invasive plant species.
- Mitigation success will not be dependent on documentation of increased use of the mitigation site by WAGS or any other wildlife species.

Financial Outline

This financial outline provides estimated figures and data for informational purposes only. These estimates are meant to provide an overview of the potential and reasonable costs of preparing an easement and implementing mitigation on this mitigation site. The financial outline does not guarantee the final easement value and costs for the easement. This desktop assessment cannot be used to infer value (monetary or ecological) of other properties or easements in the region. Unless otherwise stated, cost assumptions come from NRCS EQIP Practice Payment Rate schedules.

- Weed treatment: $20 - $200 per acre
- Native Seeding:
  - Site preparation (mowing/discing) $500 per acre
  - Broadcast/Drill seed: $100 - $250 per acre
- Hydroseeding: $792 per acre
- Wetland/Spring/Riparian Improvement
  - Complex Restoration: $2,400 per acre
  - Riparian Herbacous Cover
    - Broadcast Seeding: $687 per acre
    - Pollinator Cover: $1,303 per acre
    - Plug Planting: $13,730 per acre
    - Combo Seeding and Plug Planting: $6,947 per acre
  - Riparian Forest Buffer
    - Hand Plant, bare root: $768 per acre
    - Cuttings, small to medium: $867 per acre
    - Seeding: $106 per acre

Estimated Budget for the Olex Mitigation Site

Action	Cost per Unit	Units	Years	Expense
One-time Costs				
Easement Value	Unknown	1		Unknown
Easement Transaction Costs[1]	$20,000	1	-	$20,000
Weed Treatment	$200	75	-	$15,000
Native Seeding	$750	300	-	$225,000
Recurring Costs (Annually)				
O&M[3]	$30	1,563	50	$2,344,500
Total		**-**		**$?** ($?/acre)[4]

[1] Easement transaction cost is on the high end of the average presented in the 2009 report by Defenders of Wildlife and Trust for Public, titled *Land Conservation Spending in Oregon in Relation to the State Wildlife Conservation Strategy*.

[2] This O&M cost is an estimate of the cost per acre per year (not including acquisition/easement costs) based on the research presented in the Independent Economic Analysis Board's 2007 *Investigation of Wildlife O&M Costs*. The average cost per acre presented in that document was $24 in 2004 dollars, this has been adjusted to reflect 2015 dollars.

[3] Cost per acre here includes cost of acquisition/easement and initial mitigation actions and long-term O&M for 50 years.

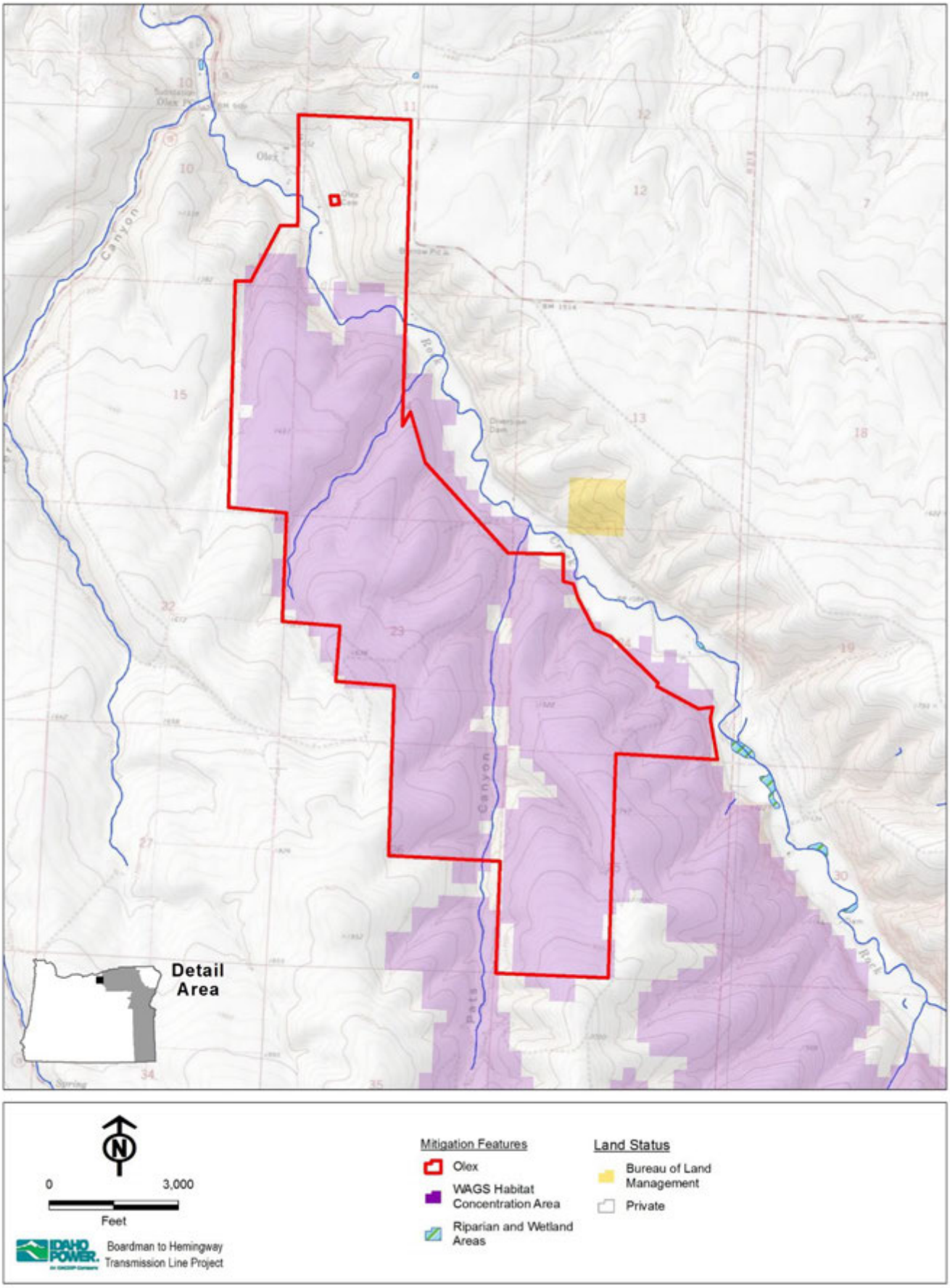

Figure 1. Olex WAGS Habitat Concentration Area, Ownership, and Water

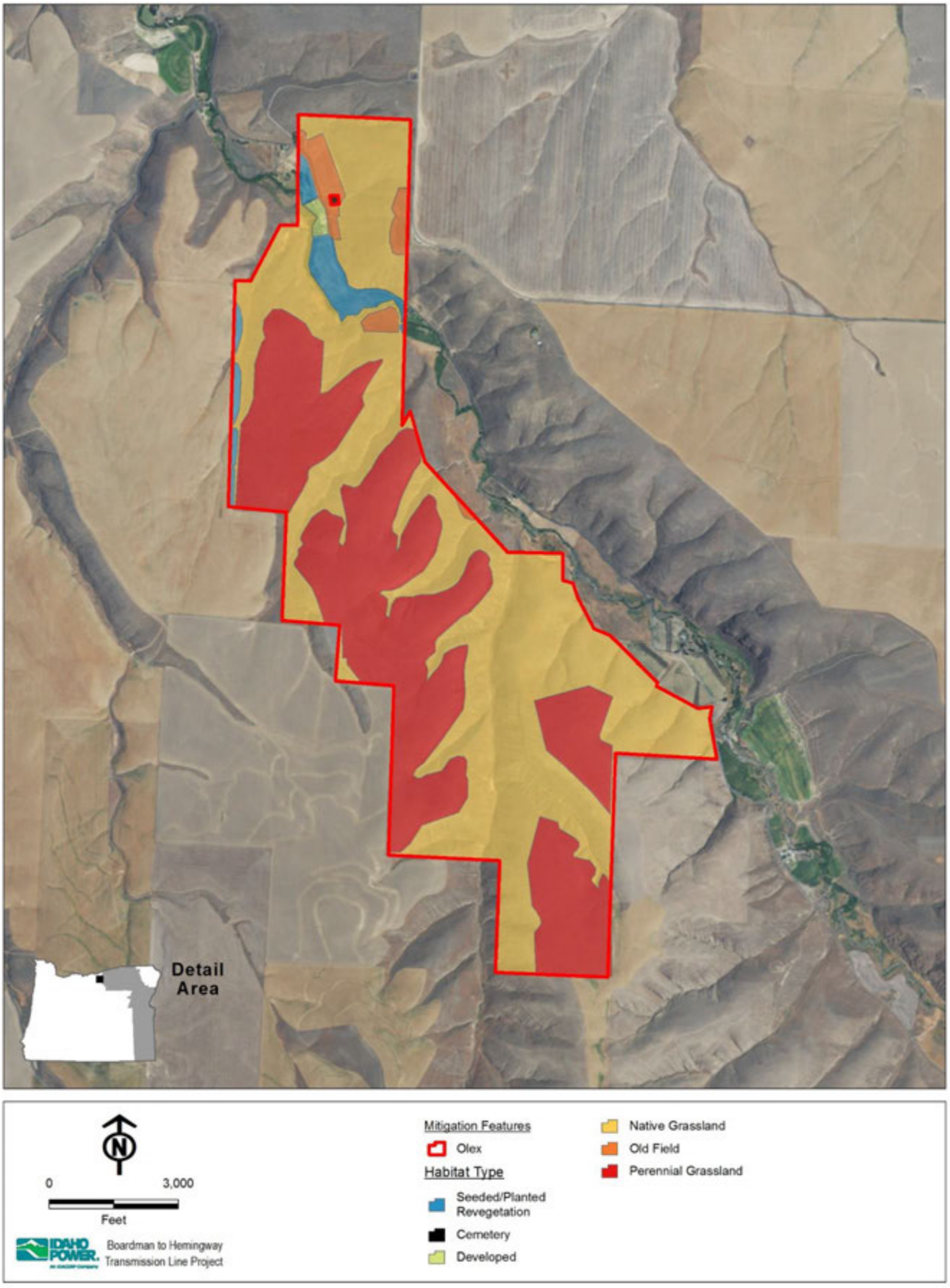

Figure 2. Olex Habitat Types

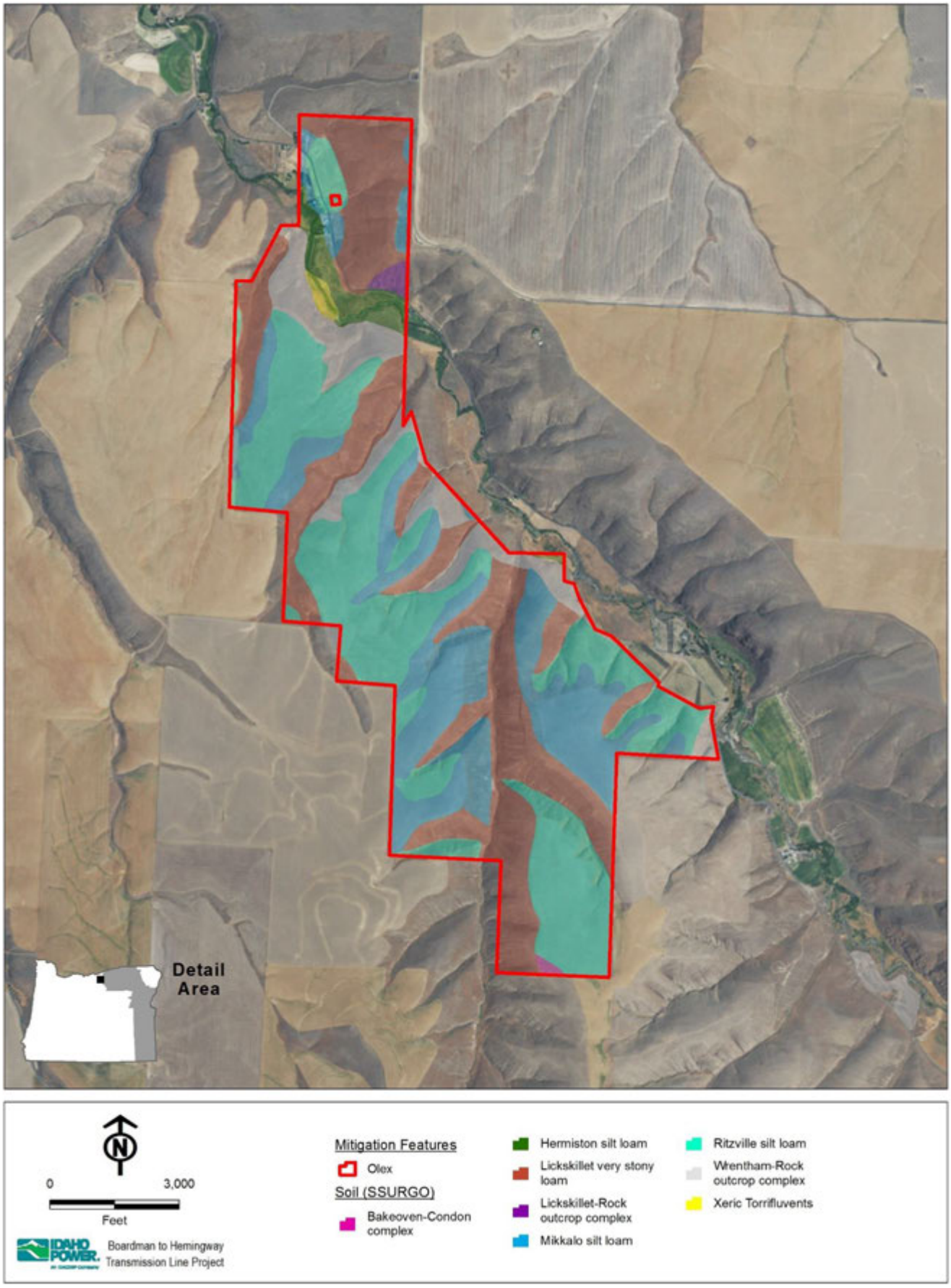

Figure 3. Olex Soil Types

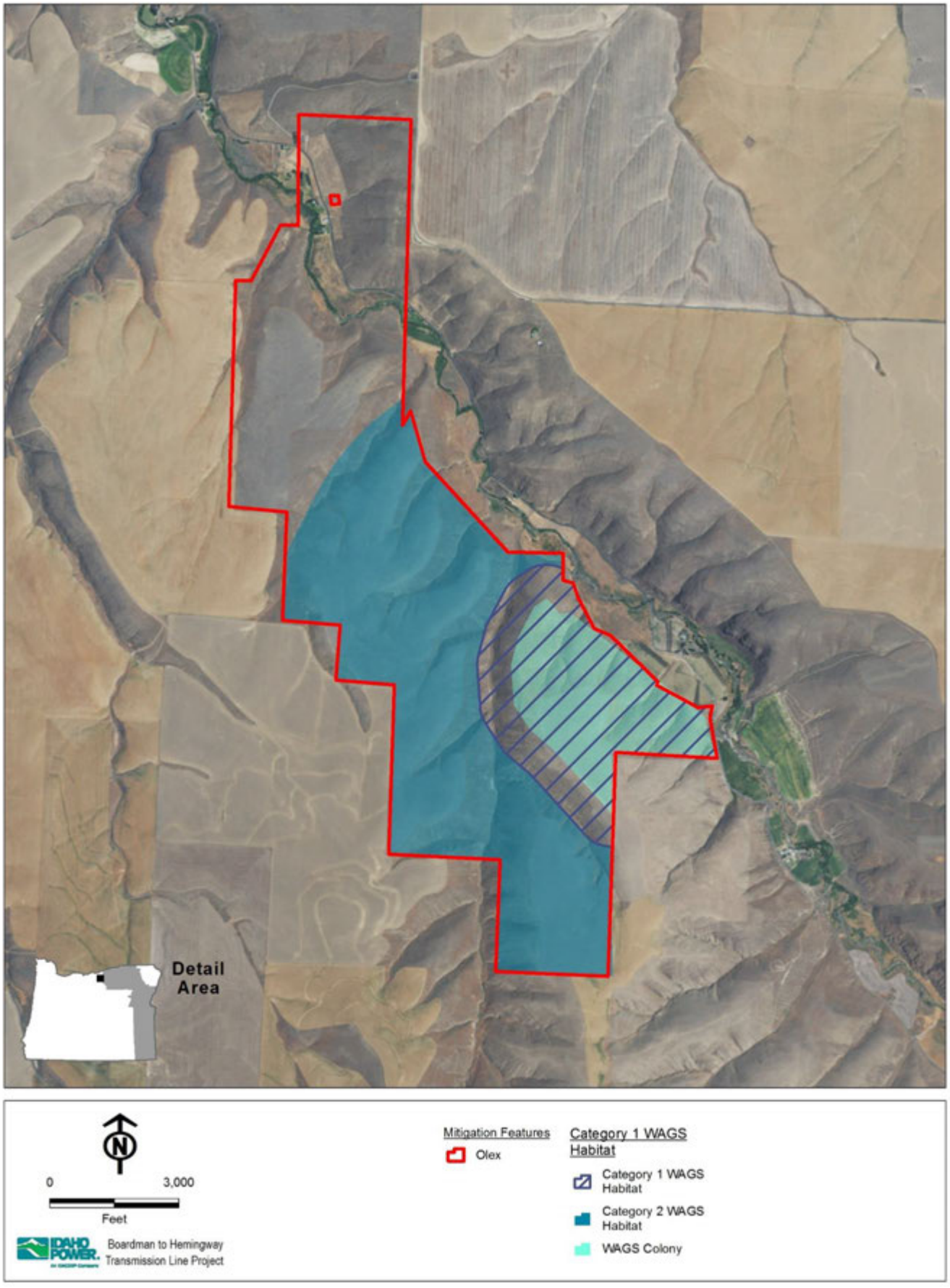

Figure 4. Olex Ground Squirrel Habitat

Boardman to Hemingway Transmission Line Project

Desktop Habitat Mitigation Site Assessment Worksheet

Parcel Name: Eightmile (**Figure 1**) **Date of Assessment:** 2/12/2016
Landowner: **Parcel Elevation (ft):** 1,600 – 2,100
Within Mitigation
Parcel Size in Acres: 838 **Service Area?:** No

Location Description
(County, miles and direction from known location, TRS, UTM, other):

Morrow County, 10 miles south of Ione.
T2S R23E Sections 25, 26, 36. T2S R24E Section 31.

Vegetation Cover Classes (GAP[1], **Figure 2**)

HMP Habitat Category[2] and Type	HMP General Vegetation Type	Acres	% of Parcel	Wildlife Habitat[3]
Category 1				
Category 2		**799.4**	**95.6**	
CRP	Agriculture / Developed	429.9	51.4	MDWR
Shrub-Steppe with Big Sage	Shrub / Grass	357.8	42.8	MDWR
Native Grasslands	Shrub / Grass	6.2	0.7	MDWR
Shrub-Steppe without Big Sage	Shrub / Grass	3.3	0.4	MDWR
Introduced Upland Vegetation	Shrub / Grass	2.2	0.3	MDWR
Category 3				-
Category 4				-
Category 5				-
Category 6		**36.7**	**4.4**	-
Developed	Agriculture / Developed	4.2	0.5	MDWR
Agriculture	Agriculture / Developed	32.5	3.9	MDWR
Total		**836.1**	**100**	**-**

[1]USGS Gap Analysis Project (GAP) GIS data using ecological systems. Ecological systems were cross-walked to HMP Habitat Type as shown in the Habitat Categorization Matrix (Attachment P-2 of Exhibit P).
[2]Represents the highest category that the habitat type can be attributed based only on vegetation metrics. Field review of this site would likely warrant modification of categorization.
[3]MDWR = Category 2 ODFW mule deer winter range.

Soil types	The NRCS Soil Survey Geographic Database (SSURGO) data was reviewed and the following soils were identified on the property (**Figure 3**): *Lickskillet very stony loam* (**219 acres**). Lickskillet soils consist of shallow, well drained soils typically found on south-facing canyon and mountain side slopes at elevations of 200 to 4,500 feet. Lickskillet soils are dominantely used for livestock grazing. Other uses include watershed, recreation, and wildlife habitat. Vegetation is bluebunch wheatgrass, Sandberg bluegrass, Thurber needlegrass, western yarrow, and Wyoming big sagebrush. *Rhea silt loam* (**22 acres**). Rhea soils consist of deep, well drained soils found on upland slopes at elevations of 1,600 to 3,200 feet. Rhea soils are cultivated or used as rangeland. Small grains, hay and pasture are the principal crops. Native vegetation is mainly bluebunch wheatgrass, Idaho fescue, Sandberg bluegrass and forbs such as yarrow, phlox and buckwheat. *Ritzville silt loam* (**6.6 acres**). Ritzville soils consist of very deep and deep to duripan, well drained soils found on uplands including plateaus, benches, and canyon side slopes at elevations ranging between 700 to 3,000 feet. Ritzville soils are used for dryland wheat production and some livestock grazing. Native vegetation is bluebunch wheatgrass, Sandberg bluegrass, Wyoming big sagebrush, and yarrow. *Valby silt loam* (**590 acres**). Valby soils consist of moderately deep, well drained soils on upland slopes at elevations of 1,600 to 3,000 feet. Valby soils are used for dryfarm small grains, hay, pasture and range. Native vegetation is mainly bluebunch wheatgrass, Idaho fescue, Sandberg bluegrass and forbs such as yarrow, phlox and buckwheat.
Hydrologic Features Present (SteamNet, NWI, NHD)	One intermittent water feature crosses the property, in Lundell Canyon. The property borders Eightmile Canyon for approximately 0.75 mile, which contains an intermittent water feature. The property also borders an intermittent water feature associated with Gooseberry and Lundell Canyon for 1 mile. Wetland features are along the intermittent water features; otherwise the property is dry.
Adjacent land ownership, use, and condition	All adjacent land is privately held. A majority of adjacent land use is dry land agriculture with some open rangeland.
Infrastructure Density within or Near the Parcel (Qualitative Description)	The property contains a 2,400 square foot residence, a feeder barn, shop, additional barn, and four metal grain bins. The Ione-Gooseberry Road borders the northern portion of the property. Rural area is relatively devoid of major infrastructure.
Summary	The property is outside of the mitigation service area. Mule deer winter range completely overlaps the property. It provides non-agriculture and native habitat adjacent to a couple of canyon features, so likely provides relatively undisturbed nesting and hiding cover for numerous species. Aerial photo review shows livestock trailing and congregation areas on the property. The CRP contract expires in September of 2017 (per real estate listing). The property overlaps with a historic WAGS occurrence from ORBIC. The property is outside of modeled habitat, but is within 2.5 miles of a habitat concentration area.
Pass/Fail Desktop Assessment?	Pass

Boardman to Hemingway Transmission Line Project

Consideration of Property as a Potential Mitigation Site

Mitigation Function	This potential mitigation site could provide mitigation for impacts on Category 2 mule deer winter range within the shrub/grass general vegetation type of the Columbia Basin. The mitigation site is outside of Washington ground squirrel modeled habitat (habitat concentration areas [WWHCWG 2012]) and only historical records of squirrel activity occur within the property. This mitigation site provides CRP and native habitat features within an agricultural-dominated landscape. Wildlife species including mule deer and especially migratory birds that utilize shrub-steppe and grassland habitats would benefit from implementation of mitigation actions that result in ecological uplift.
Mitigation Site Manager	Fee title acquisition with transfer of ownership to, State of Oregon, Federal Land Management Agency, approved NPO or Land Trust.
Mitigation Actions	The following are mitigation actions that may be implemented at this mitigation site in order to satisfy the mitigation policies/guidelines of the permitting agencies. All mitigation actions will follow reliable methods. The mitigation actions presented here are not comprehensive. Implementation will likely be some combination of one or more of the following: • *Livestock grazing restrictions* – the current level of grazing on this property is unknown. Mitigation action could avoid grazing practices that would compete with native wildlife life history needs. Targeted grazing may be considered for habitat enhancement/treatment actions. • *Weed treatment* – the extent of noxious weed invasion on the mitigation site is unknown at this time but it is anticipated that opportunities exist to implement this mitigation action. • *Native revegetation/restoration* – the focus would be sagebrush and bunchgrasses on this mitigation site. • *Fire readiness* – efforts made to make the property more resistant to catastrophic fire and a fire response plan could be developed. • *Fence removal/fence upgrade* – opportunities are unknown at this time, but it is anticipated that some unnecessary fencing may be removed or necessary fencing can be upgraded to more wildlife friendly fencing.
Monitoring	A specific plan for monitoring will be developed, but in general, mitigation progress will be monitored through vegetation plot monitoring and establishment of photo locations. Monitoring will occur annually for the first 3-5 years and an annual report will be produced. During the annual monitoring phase, a longer-term monitoring plan will be developed using similar protocols and methods to monitor the mitigation actions at larger time intervals (i.e., 5 years, 10 years).
Success Criteria	Specific success criteria will be developed once baseline conditions have been determined and potential mitigation actions have been confirmed for the site. Success criteria may include but are not limited to: • Vegetation plots show an increase in native vegetation cover and general trend toward increased habitat quality representing an ecological uplift. • Successful weed control through documentation of a reduction in weeds and non-native invasive plant species. • Mitigation success will not be dependent on documentation of increased use of the mitigation site by wildlife species.

Financial Outline

Estimated Budget for the Eightmile Mitigation Site

Action	Cost per Unit	Units	Years	Expense
One-time Costs				
Acquisition	700,000	1		700,000
Recurring Costs (Annually)				
O&M[1]	30	838	50	1,257,000
Total	**-**			**$1,957,000** ($2,335/acre)[2]

[1] This O&M cost is an estimate of the cost per acre per year (not including acquisition/easement costs) based on the research presented in the Independent Economic Analysis Board's 2007 *Investigation of Wildlife O&M Costs*. The average cost per acre presented in that document was $24 in 2004 dollars, this has been adjusted to reflect 2015 dollars.

[2] Cost per acre here includes cost of acquisition/easement and initial mitigation actions and long-term O&M for 50 years.

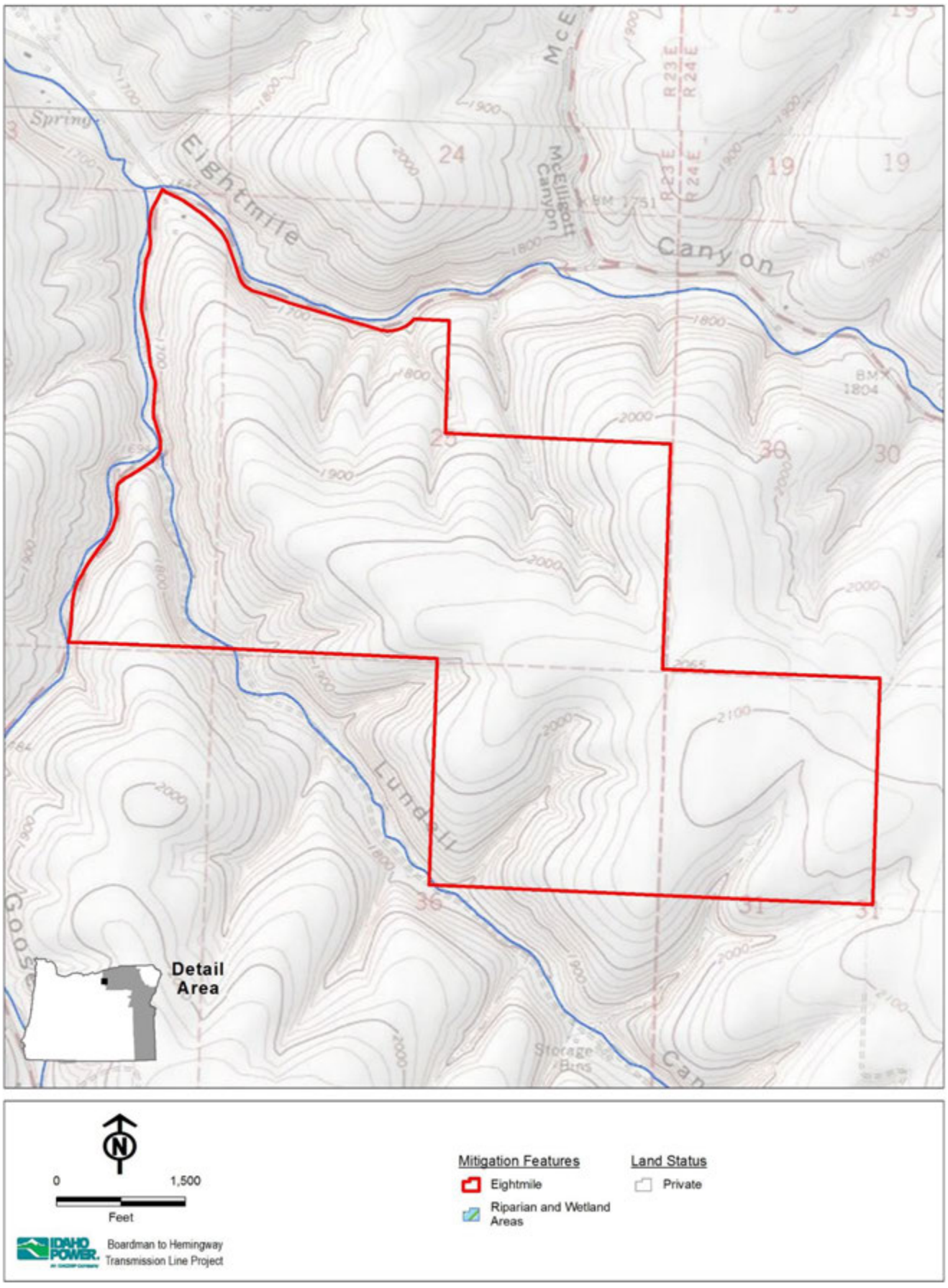

Figure 1. Eightmile Ownership and Water

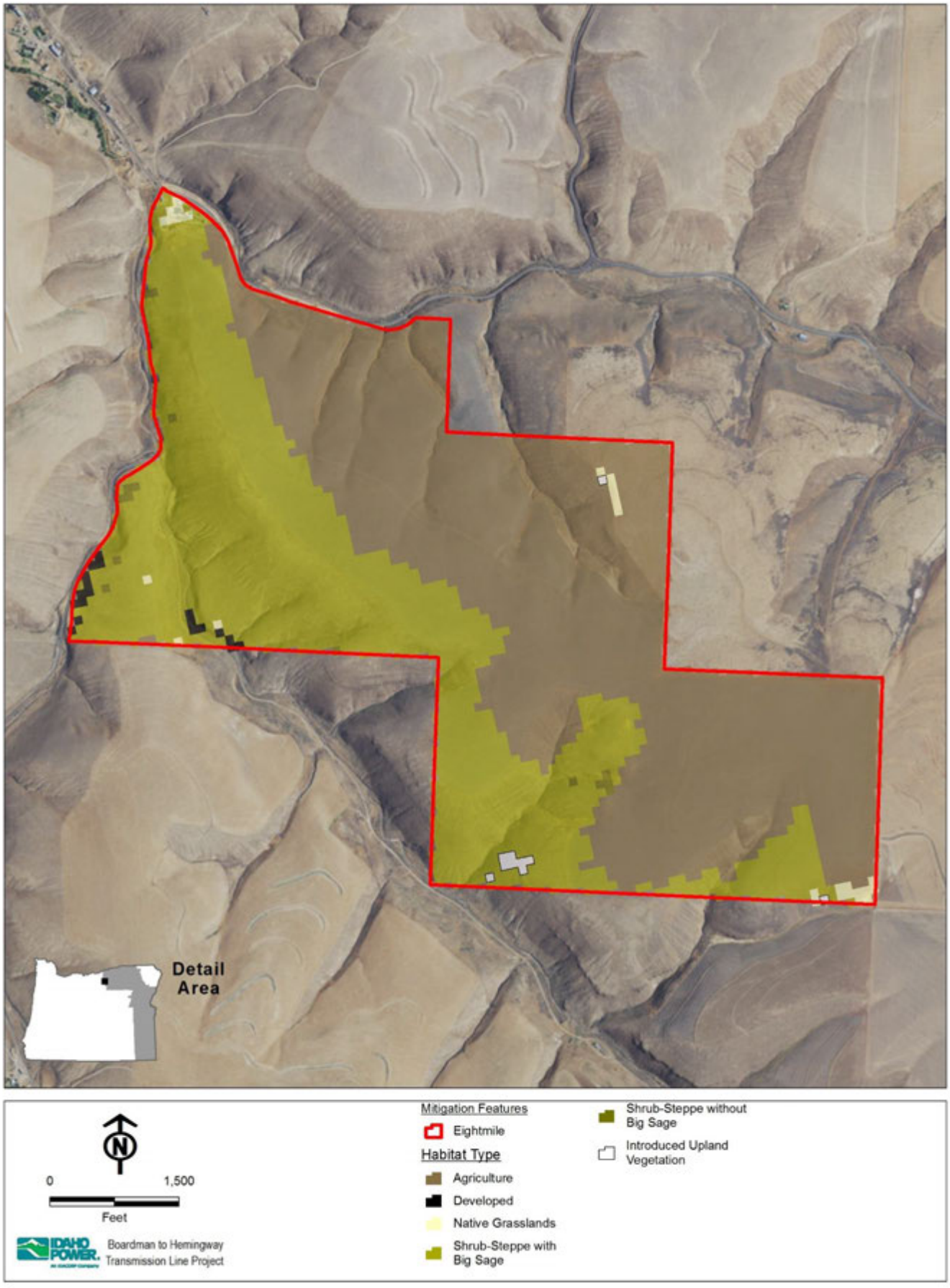

Figure 2. Eightmile Habitat Types

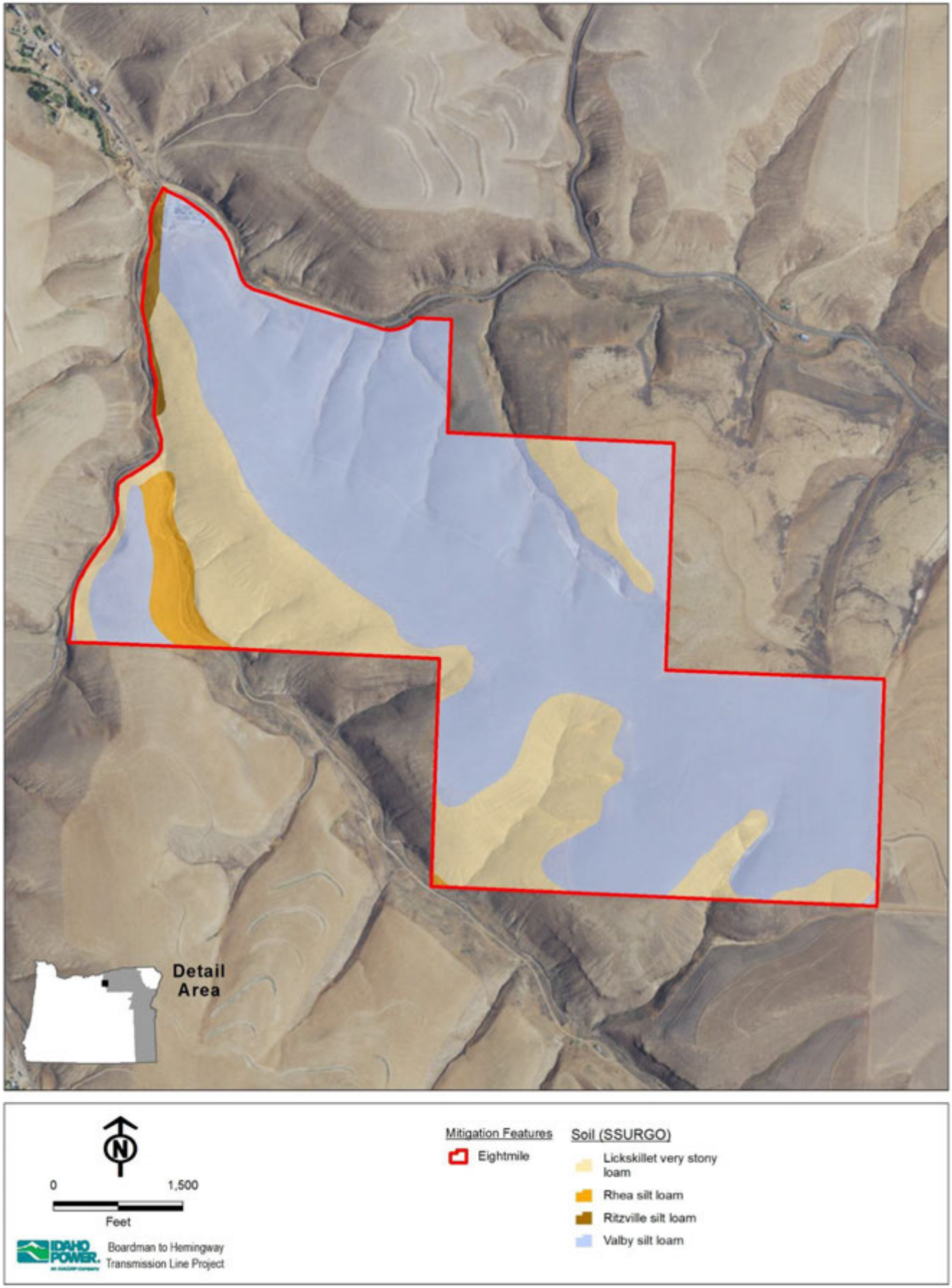

Figure 3. Eightmile Soil Types

Habitat Mitigation Areas with Mitigation Zone 2

- Antelope Mountain
- County Line
- Glass Hill
- High Valley

Boardman to Hemingway Transmission Line Project

Desktop Habitat Mitigation Site Assessment Worksheet

Parcel Name: Antelope Mountain (**Figure 1**)
Landowner:
Parcel Size in Acres: 1,623
Date of Assessment: 8/11/2014
Parcel Elevation (ft): 3,690 – 5,128
Within Mitigation Service Area?: Yes

Location Description
(County, miles and direction from known location, TRS, UTM, other):

Baker County, T7S R38E S4, 7 miles southwest of North Powder, OR.
T7S R38E Sections 3, 4, 5, 8, 9, 16, 17

Vegetation Cover Classes (GAP[1], **Figure 2**)

HMP Habitat Category[2] and Type	HMP General Vegetation Type	Acres	% of Parcel	Wildlife Habitat[3]
Category 1, 3, 4, 5, & 6		**0**	**0**	
Category 2[4]		**1,623.4**	**100**	-
Ponderosa Pine	Forest/Woodland	448.3	27.6	RMEWR, MDWR, RMESR
Ponderosa Pine	Forest/Woodland	57.5	3.5	RMEWR, MDWR
Mixed Grand Fir / Douglas Fir	Forest/Woodland	388.7	23.9	RMEWR, MDWR, RMESR
Mixed Grand Fir / Douglas Fir	Forest/Woodland	183.8	11.3	RMEWR, MDWR
Shrub-Steppe without Big Sage	Shrub/Grassland	70.7	4.4	RMEWR, MDWR, RMESR
Shrub-Steppe without Big Sage	Shrub/Grassland	144.6	8.9	RMEWR, MDWR
Rocky Mountain Aspen	Forest/Woodland	58.6	3.6	RMEWR, MDWR, RMESR
Rocky Mountain Aspen	Forest/Woodland	5.1	0.3	RMEWR, MDWR
Western Juniper / Mountain Mahogany Woodland	Forest/Woodland	46.6	2.9	RMEWR, MDWR, RMESR
Western Juniper / Mountain Mahogany Woodland	Forest/Woodland	12.3	0.8	RMEWR, MDWR
Forested Wetland	Open Water/ Wetland	28.7	1.8	RMEWR, MDWR, RMESR
Forested Wetland	Open Water/ Wetland	4.4	0.3	RMEWR, MDWR
Subalpine/Montane Forest	Forest/Woodland	22.2	1.4	RMEWR, MDWR
Shrub-Steppe with Big Sage	Shrub/Grassland	19.9	1.2	RMEWR, MDWR, RMESR
Shrub-Steppe with Big Sage	Shrub/Grassland	90.2	5.6	RMEWR, MDWR
Lodgepole Pine	Forest/Woodland	7.6	0.5	RMEWR, MDWR, RMESR
Lodgepole Pine	Forest/Woodland	2.9	2.9	RMEWR, MDWR
Mixed Tamarack	Forest/Woodland	6.2	0.4	RMEWR, MDWR, RMESR
Scrub-Shrub Wetland	Open Water/ Wetland	4.2	0.3	RMEWR, MDWR, RMESR
Remaining	-			

[1] USGS Gap Analysis Project (GAP) GIS data. Ecological systems were cross-walked to HMP Habitat Type as shown in the Habitat Categorization Matrix (Attachment P1-1 of Exhibit P1).
[2] Represents the habitat category based on overlap with wildlife habitat layers.
[3] MDWR = ODFW mule deer winter range; RMEWR = ODFW Rocky Mountain elk winter range; RMESR = Rocky Mountain Elk Foundation Rocky Mountain elk summer range.
[4] Total acres of habitat type will not match actual parcel size due to resolution of the GAP raster dataset.

Soil types The NRCS Soil Survey Geographic Database (SSURGO) data was reviewed and the

following soils were identified on the property (**Figure 3**):

Bouldrock-Kilmerque complex (**25 acres**). Bouldrock soils consist of moderately deep, well drained soils found on south-facing side slopes of mountainous areas at elevations ranging from 4,000 to 6,200 feet. Bouldrock soils are used for rangeland. The native vegetation is bluebunch wheatgrass, mountain big sagebrush, arrowleaf balsamroot and gray rabbitbrush. Kilmerque soils consist of moderately deep, well drained soils on gently rolling bench tops to moderately steep south aspect side slopes in forested mountains at elevations ranging from 3,500 to 6,000 feet. Kilmerque soils are used for woodland. The native vegetation is ponderosa pine, Douglas fir and pinegrass.

Brownlee-Shangland loams (**0.2**). Brownlee soils consist of deep and very deep, well drained soils that are found on nearly level to steep inclines on hill summits, backslopes and footslopes, and fan remnants at elevations of 2,500 to 5,800 feet. Brownlee soils are used mainly for rangeland and wildlife habitat. Native vegetation is bluebunch wheatgrass, Idaho fescue, xeric big sagebrush and antelope bitterbrush. Some areas are used for irrigated or nonirrigated cropland (small grains) and hayland/pasture. Shangland soils consist of moderately deep, well drained soils on hills with slopes of 2 to 35 percent and elevation ranging from 3,600 to 4,000 feet. Shangland soils are used mainly for rangeland. Some small areas are used for nonirrigated small grain, hay and pasture. The native vegetation is mainly mountain big sagebrush, Idaho fescue, bluebunch wheatgrass, needlegrass, buckwheat, antelope bitterbrush, and squaw apple.

Crackler-Rouen gravelly silt loams (**275**). Crackler soils consist of deep, well drained soils found on north-facing side slopes of forested mountains at elevations ranging from 3,800 to 6,200 feet. Crackler soils are used for woodland, watershed and wildlife habitat. The native vegetation is Douglas fir, ponderosa pine, grand fir and western larch with an understory of pinegrass, elk sedge, huckleberry and snowberry. Rouen soils consist of moderately deep, well drained soils on north side slopes of forested areas at elevations of 3,800 to 6,200 feet. Rouen soils are used mainly for timber production. The vegetation is mainly Douglas fir, grand fir, western larch, minor amounts of ponderosa pine and lodgepole pine, common snowberry, princes pine, low Oregon grape, myrtle pachystima, elk sedge, pinegrass, big huckleberry, western rattlesnake plantain, twinflower, and heartleaf arnica.

Dogtown complex (**340**). Dogtown soils consist of deep and very deep, well drained soils on moderately steep and steep metastable and active north-facing side slopes of forested mountains at elevations ranging from 3,800 to 6,200 feet. Dogtown soils are used for woodland, watershed and wildlife habitat. The native vegetation is Douglas fir, grand fir, ponderosa pine and western larch with an understory of pinegrass, elk sedge, huckleberry and snowberry.

Greenscombe loam (**129**). Greenscombe soils consist of moderately deep, well drained soils on low hills at elevations 3,200 to 3,800 feet. Greenscombe soils are Rangeland. The native vegetation is Idaho fescue, bluebunch wheatgrass, Sandberg bluegrass, Thurber needlegrass, and big sagebrush.

Hibbard silt loam (**117**). Hibbard soils consist of moderately deep to a duripan, well drained soils found on fan terraces at elevations of 3,000 to 3,700 feet. Hibbard soils are used for rangeland. The native vegetation is bluebunch wheatgrass, Idaho fescue and big sagebrush.

Soil types (cont.)

Highhorn-Huntrock very gravelly silt loams (**282**). Highhorn soils consist of deep, well drained soils on moderately steep to steep south-facing side slopes of mountains at elevations from 3,800 to 7,200 feet. Highhorn soils are used for timber production, watershed and wildlife habitat. The native vegetation is ponderosa pine, Douglas fir

	and grand fir with an understory of pinegrass and elk sedge. Huntrock soils consist of moderately deep, well drained soils on moderately steep to steep south side slopes of mountains at elevations from 3,800 to 7,200 feet. Huntrock soils are used for woodland, watershed and wildlife habitat. The native vegetation is ponderosa pine, Douglas fir and grand fir with an understory of pinegrass and elk sedge. *Kilmerque loam* (**272**). Kilmerque soils consist of moderately deep, well drained soils on gently rolling bench tops to moderately steep south aspect side slopes in forested mountains at elevations ranging from 3,500 to 6,000 feet. Kilmerque soils are used for woodland. The native vegetation is ponderosa pine, Douglas fir and pinegrass. *Ladd loam* (**24**). Ladd soils consist of deep, well drained soils on alluvial fans, terraces, and colluvial footslopes at elevations ranging from 2,700 to 5,050 feet. Ladd soils are mostly used in irrigated crops of alfalfa, grass and small grain or dryland pasture and hay or range. Vegetation is mainly Idaho fescue, associated forbs, a few ponderosa pine or western juniper, big sagebrush, rabbitbrush, bluebunch wheatgrass, and cheatgrass. *Tolo-Dogtown complex* (**159**). Tolo soils consist of deep and very deep, well drained soils found on nearly level upland plateaus and steep north and east-facing mountain side slopes at elevations of 2,800 to 5,400 feet. Tolo soils used for timber production and livestock grazing with small areas at lower elevations cleared for cultivation. Principal trees include Douglas fir, grand fir, larch, ponderosa pine, and lodgepole pine. Dogtown soils consist of deep and very deep, well drained soils on moderately steep and steep metastable and active north-facing side slopes of forested mountains at elevations ranging from 3,800 to 6,200 feet. Dogtown soils are used for woodland, watershed and wildlife habitat. The native vegetation is Douglas fir, grand fir, ponderosa pine and western larch with an understory of pinegrass, elk sedge, huckleberry and snowberry.
Hydrologic Features Present (SteamNet, NWI, NHD)	A couple of intermittent drainages are identified through NHD, as well as a couple of canal/ditch features. According to the real estate listing, numerous springs occur on site. The North Powder River runs within 0.10 mile along the western border of the parcel.
Adjacent land ownership, use, and condition	One small BLM parcel borders the property; otherwise the entire property is bordered by private landowners. Immediate adjacent land use includes some pasture/ag lands, otherwise a majority appears to be rangeland and wildlife. Large tracts of USFS occur approximately 1.5 miles to the west and the ODFW North Powder Elkhorn Wildlife Management Area is within 0.5 mile, located to the northwest of the parcel. The Rocky Ford campground is located along the North Powder River within 0.25 mile to the west of the parcel.
Infrastructure Density within or Near the Parcel (Qualitative Description)	I-84 is 6.5 miles to the east of the property. Anthony Lakes Hwy is just outside of the parcel to the east, and a few rural homes and rural access roads border the parcel. The parcel itself contains a couple of dirt/gravel access roads. Infrastructure is nearly absent within the parcel and is at minimal densities in the immediate vicinity.
Summary	Parcel is dominated by conifer forest type habitat with secondary habitat of shrub-steppe habitat both with and without big sage species. USFS land and an ODFW WMA are in close proximity; however, there are no shared borders with those lands. The parcel overlaps with the Elkhorn Mountains area of the TNC Portfolio. The parcel

	also overlaps an ODFW Conservation Opportunity Area within the Blue Mountains ecoregion, the Baker Valley. Most of the recommended conservation actions in this area include watershed, riparian, and wetland improvements, along with the protection or enhancement of habitat for ESA listed plants (Howell's spectacular thelopody, Oregon semaphore grass). The parcel is completely with ODFW elk and mule deer winter range and is also identified as summer elk range. The parcel is within an ODFW linkage buffer for elk, which were identified to show areas important to animal movement that cross paved roads.

Pass/Fail Desktop Assessment?	Pass

Boardman to Hemingway Transmission Line Project

Consideration of Property as a Potential Mitigation Site

Mitigation Function	This mitigation site has been identified as in-kind and in-proximity mitigation for impacts on Category 2 elk and mule deer winter habitat within the forest/woodland general vegetation group. This mitigation site could also help meet the Project need for elk summer habitat. It contains important habitat features with opportunities to provide durable ecological uplift through implementation of standard mitigation actions. Opportunities to improve the watershed would be in line with the recommendations of the Oregon Conservation Strategy for the Baker Valley Conservation Opportunity Area. The mitigation actions listed below, upon successful implementation, will increase the quality of habitat available to elk and mule deer (among other species) within the mitigation site and result in an ecological uplift to the mitigation site above what is provided under the current management.
Mitigation Site Manager	Fee title acquisition with transfer of ownership to State of Oregon, Federal Land Management Agency, approved NPO or Land Trust
Mitigation Actions	The following are mitigation actions that may be implemented at this mitigation site in order to satisfy the mitigation policies/guidelines of the permitting agencies. All mitigation actions will follow reliable methods. The mitigation actions presented here are not comprehensive. Implementation will likely be some combination of one or more of the following: • *Livestock grazing restrictions* – avoid grazing practices that would compete with native wildlife life history needs. Targeted grazing may be considered for habitat enhancement/treatment actions. • *Weed treatment* – the extent of noxious weed invasion on the mitigation site is unknown at this time but it is anticipated that opportunities exist to implement this mitigation action. • *Native revegetation/restoration* – the focus would be planting forage shrubs and implementing forest management practices that would create structural diversity and enhance desirable habitat conditions. • *Fire readiness* – efforts made to make the property more resistant to catastrophic fire and a fire response plan could be developed. • *Fence removal/fence upgrade* – opportunities are unknown at this time, but it is anticipated that some unnecessary fencing may be removed or necessary fencing can be upgraded to more wildlife friendly fencing.
Monitoring	A specific plan for monitoring will be developed, but in general, mitigation progress will be monitored through vegetation plot monitoring and establishment of photo locations. Monitoring will occur annually for the first 3-5 years and an annual report will be produced. During the annual monitoring phase, a longer-term monitoring plan will be developed using similar protocols and methods to monitor the mitigation actions at larger time intervals (i.e., 5 years, 10 years).

Success Criteria

Specific success criteria will be developed once baseline conditions have been determined and potential mitigation actions have been confirmed for the site. Success criteria may include but are not limited to:

- Vegetation plots show an increase in native vegetation cover and general trend toward increased habitat quality representing an ecological uplift.
- Successful weed control through documentation of a reduction in weeds and non-native invasive plant species.
- Mitigation success will not be dependent on documentation of increased use of the mitigation site by WAGS or any other wildlife species.

Financial Outline

Estimated Budget for the Antelope Mountain Mitigation Site

Action	Cost per Unit	Units	Years	Expense
One-time Costs				
Acquisition (from listing)	$3,000,000	1	-	$3,000,000
Recurring Costs (Annually)				
O&M[1]	$53.75	1,623	50	$4,361,813
Total	-			$7,361,813 ($4,536/acre)[2]

[1] This O&M cost is an estimate of the cost per acre per year (not including acquisition/easement costs) based on the research presented in the Independent Economic Analysis Board's 2007 *Investigation of Wildlife O&M Costs*. The cost per acre identified in that study for the Elkhorn Wildlife Management Area (which this mitigation site will be modeled after) was $43 in 2004 dollars, this has been adjusted to reflect 2015 dollars.

[2] Cost per acre here includes cost of acquisition/easement and long-term O&M for 50 years.

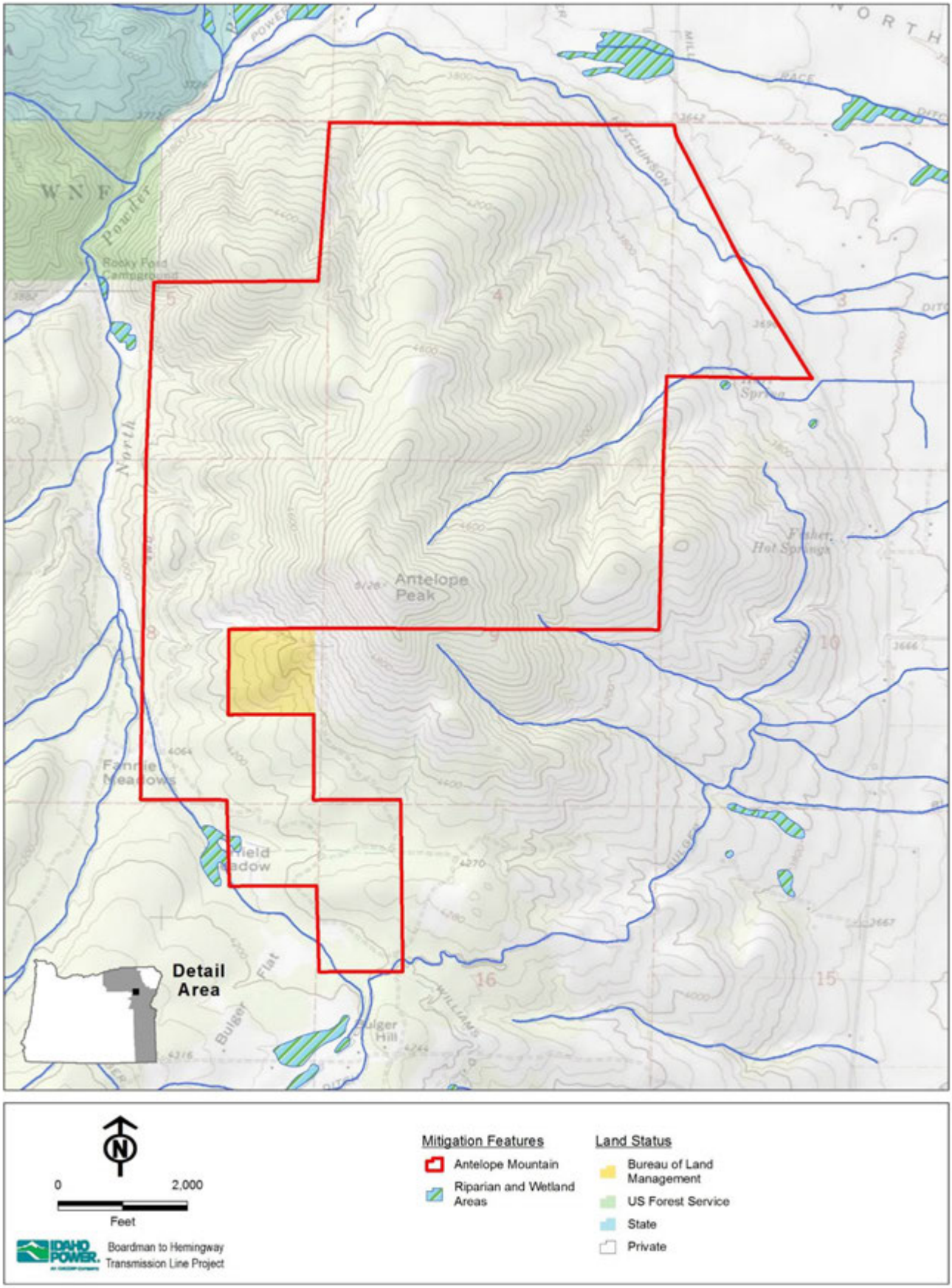

Figure 1. Antelope Mountain Ownership and Water

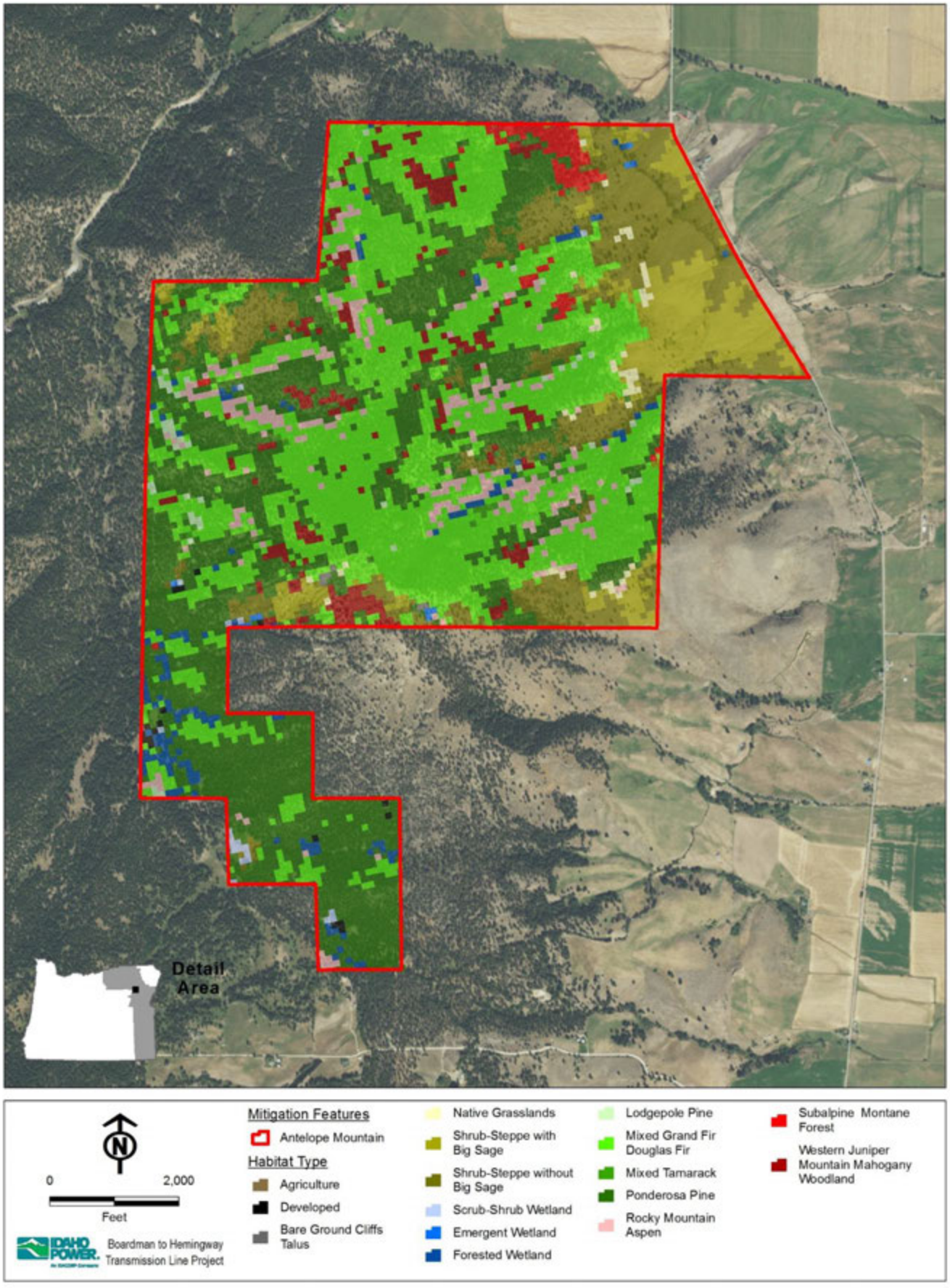

Figure 2. Antelope Mountain Habitat Types

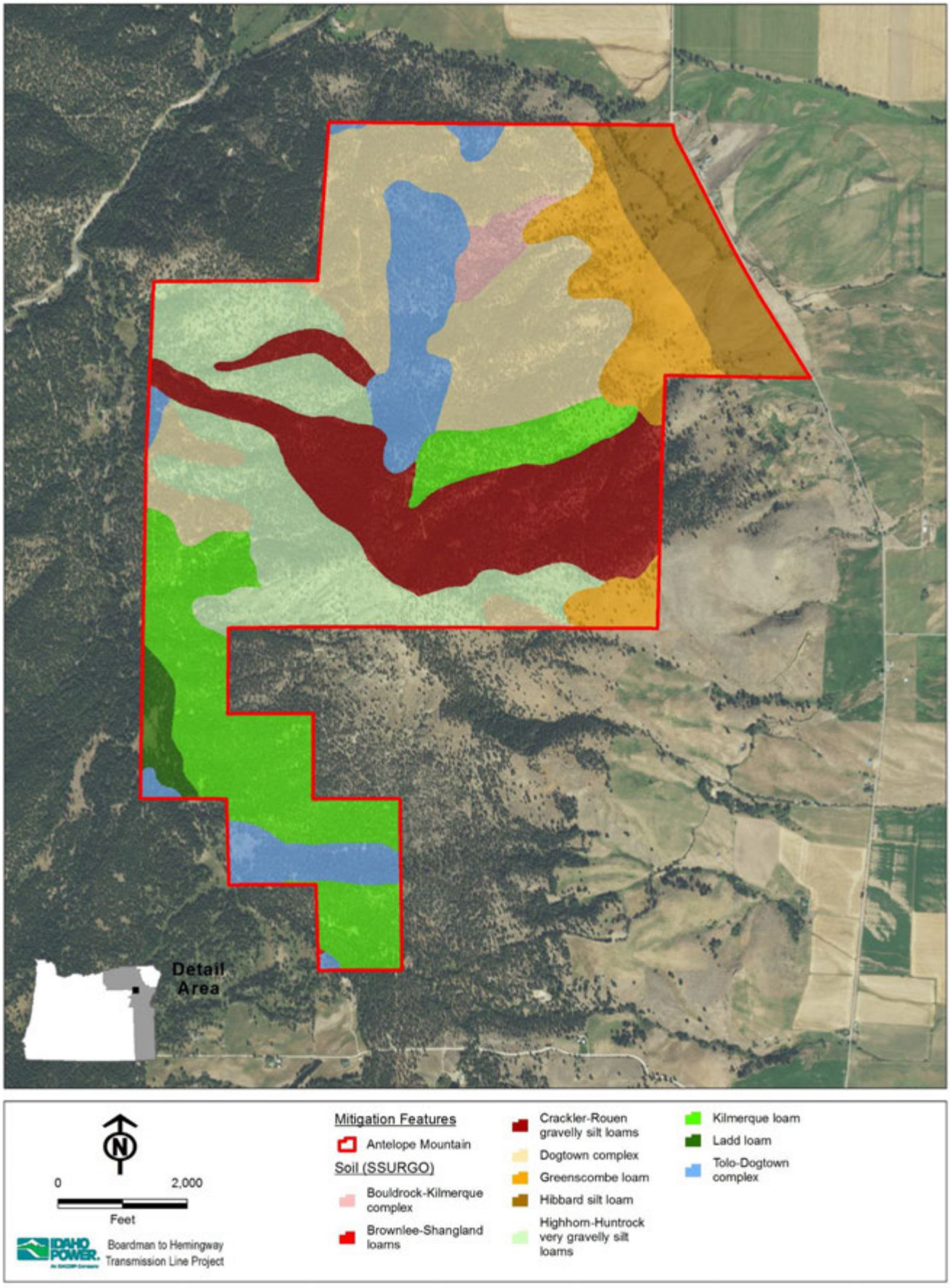

Figure 3. Antelope Mountain Soil Types

Boardman to Hemingway Transmission Line Project

Desktop Habitat Mitigation Site Assessment Worksheet

Parcel Name: County Line (**Figure 1**) **Date of Assessment:** 10/15/2014
Landowner: **Parcel Elevation (ft):** 4,000 – 4,800
Parcel Size in Acres: 792 **Within Mitigation Service Area?:** Yes

Location Description
(County, miles and direction from known location, TRS, UTM, other):

Baker and Union County, 9 miles west of North Powder.
T6S R38E Sections 7, 18, 19.

Vegetation Cover Classes (GAP[1], **Figure 2**)

HMP Habitat Category[2] and Type	HMP General Vegetation Type	Acres	% of Parcel	Wildlife Habitat[3]
Category 1		**-**	**-**	-
Category 2		**775.5**	**100**	-
Mixed Grand Fir / Douglas Fir	Forest/Woodland	305.4	39.4	RMEWR, RMESR, MDWR, MDSR
Ponderosa Pine	Forest/Woodland	244.7	31.6	
Rocky Mountain Aspen	Forest/Woodland	97.8	12.6	
Shrub-Steppe without Big Sage	Shrub/Grass	31.3	4.0	
Lodgepole Pine	Forest/Woodland	30.7	4.0	
Forested Wetland	Wetland	24.9	3.2	
Mixed Tamarack	Forest/Woodland	13.1	1.7	
Western Juniper / Mountain Mahogany Woodland	Forest/Woodland	11.3	1.5	
Shrub-Steppe with Big Sage	Shrub/Grass	6.0	0.8	
Subalpine / Montane Forest	Forest/Woodland	4.0	0.5	
Native Grasslands	Shrub/Grass	2.7	0.3	
Remaining (**Figure 2**)	-	3.6	0.5	
Category 3		**-**	**-**	-
Category 4		**-**	**-**	-
Category 5		**-**	**-**	-
Category 6		**-**	**-**	-
Total		**775.5**	**100**	**-**

[1] USGS Gap Analysis Project (GAP) GIS data using ecological systems. Ecological systems were cross-walked to HMP Habitat Type as shown in the Habitat Categorization Matrix (Attachment P1-1 of Exhibit P1).
[2] Represents the habitat category based on overlap with wildlife habitat layers. Agriculture and Developed habitat types' categories are not modified by overlap with wildlife habitat.
[3] MDWR = Category 2 habitat for ODFW mule deer winter range; RMEWR = Category 2 habitat for ODFW Rocky Mountain elk winter range; RMESR = Category 3 habitat for Rocky Mountain Elk Foundation Rocky Mountain elk summer range; MDSR = Category 3 habitat for WAFWA mule deer summer range.
[4] Total acres of habitat type may not match actual parcel size due to resolution of the GAP raster dataset. Pixels of the raster dataset were not simplified or smoothed to match the exact shape of the parcel boundary.

Soil types The NRCS Soil Survey Geographic Database (SSURGO) data was reviewed and the

following soils were identified on the property (**Figure 3**):

Hudspeth very stony clay loam (**9 acres**). Hudspeth soils consist of moderately deep, well drained soils found on side slopes of forested areas at elevations ranging from 4,000 to 5,700 feet. Hudspeth soils are used mainly for rangeland and wildlife habitat. The vegetation is mainly curlleaf mountainmahogany, western juniper, scattered ponderosa pine, mountain big sagebrush, bitterbrush, squaw apple, wax currant, bluebunch wheatgrass, Sandberg bluegrass, along with minor amounts of elk sedge, pinegrass, Idaho fescue and arrowleaf balsamroot.

Klicker-Anatone complex (**45 acres**). Klicker soils consist of moderately deep, well drained soils on mountains, plateaus, and benches at elevations from 2,500 to 6,200 feet. Klicker soils are used mainly for timber production and wildlife habitat. Native vegetation is an open stand of ponderosa pine and Douglas-fir with an understory of bluebunch wheatgrass, slender wheatgrass, brome grass, elk sedge, Oregon-grape, common snowberry, Saskatoon serviceberry, creambush oceanspray, mallow ninebark and wild rose. Anatone soils consist of shallow, well drained soils found on mountain side slopes, ridgetops, hills, and plateaus at elevations of 2,000 to 6,200 feet. Anatone soils are mostly used for livestock grazing, wildlife habitat, and recreation. Native vegetation is mainly bluebunch wheatgrass, Idaho fescue, Sandberg bluegrass, mossy stonecrop, curlleaf mountain mahogany and stiff sagebrush.

Klicker stony silt loam (**269 acres**). Klicker soils consist of moderately deep, well drained soils on mountains, plateaus, and benches at elevations from 2,500 to 6,200 feet. Klicker soils are used mainly for timber production and wildlife habitat. Native vegetation is an open stand of ponderosa pine and Douglas-fir with an understory of bluebunch wheatgrass, slender wheatgrass, brome grass, elk sedge, Oregon-grape, common snowberry, Saskatoon serviceberry, creambush oceanspray, mallow ninebark and wild rose.

Lookingglass silt loam (**4 acres**) and *Lookingglass very stony silt loam* (**2 acres**). Lookingglass soils consist of very deep, moderately well drained soils found on uplands at elevations of 1,800 to 4,000 feet. Lookingglass soils are used mainly for timber production. Cleared areas are cropped to small grains, hay, pasture, and peas. The native vegetation is ponderosa pine and Douglas fir with an understory of spirea, oceanspray, Idaho fescue, pinegrass and elksedge.

Tolo silt loam (**47 acres**). Top soils consist of deep and very deep, well drained soils found on mountains at elevations ranging from 3,000 to 5,400 feet. Top soils are used mainly for timber production and cropland. Most areas with slopes of less than 15 percent have been cleared and are used for production for dryland grain and hay. Native vegetation is ponderosa pine, Douglas fir, white fir, pinegrass and elksedge. This series is in what is called the Douglas-fir forest plant community.

Top-McGarr complex (**238 acres**). Top soils consist of deep and very deep, well drained soils found on mountains at elevations ranging from 3,000 to 5,400 feet. Top soils are used mainly for timber production and cropland. Most areas with slopes of less than 15 percent have been cleared and are used for production for dryland grain and hay. Native vegetation is ponderosa pine, Douglas fir, white fir, pinegrass and elksedge. This series is in what is called the Douglas-fir forest plant community. McGarr soils consist of moderately deep, well drained soils found on mountains and hills at elevations of 3,000 to 5,800 feet. McGarr soils are used for timber production with some grazing. Vegetation is mainly Douglas fir and ponderosa pine with an understory of pinegrass and elk sedge.

Top silt loam (**160 acres**). Top soils consist of deep and very deep, well drained soils found on mountains at elevations ranging from 3,000 to 5,400 feet. Top soils are used mainly for timber production and cropland. Most areas with slopes of less than 15 percent have been cleared and are used for production for dryland grain and hay. Native vegetation is ponderosa pine, Douglas fir, white fir, pinegrass and elksedge. This series is in what is called the Douglas-fir forest plant community.

Hydrologic Features Present (SteamNet, NWI, NHD)	Property contains one intermittent stream, one perennial stream, and two canals/ditches (NHD). The perennial stream is Anthony Creek, which is designated critical habitat for bull trout. NWI identifies an emergent wetland not associated with the NHD streams.
Adjacent land ownership, use, and condition	Property is located between USFS land and the ODFW Elkhorn WMA. Some private parcels are located around the northern portion of the property. The property has been logged recently, as well as adjacent private parcels. Land use in the area is timber production, wildlife conservation, and rangelands.
Infrastructure Density within or Near the Parcel (Qualitative Description)	Property contains canals/ditches, logging roads throughout, and a small shack, otherwise devoid of development. Some WMA buildings, a gravel pit, Pilcher Creek reservoir, and well-maintained Tucker Flat Rd are within 0.5 mile of the property.
Summary	This property borders another property considered during desktop assessments (Cantrell). Property is within The Nature Conservancy's Elkhorn Mountains priority conservation area. It is immediately adjacent to ODFW's Elkhorn WMA. Contains critical habitat for bull trout and is completely within Rocky Mountain elk winter and summer range and mule deer winter and summer range. Property was recommended by ODFW.
Pass/Fail Desktop Assessment?	Pass

Boardman to Hemingway Transmission Line Project

Consideration of Property as a Potential Mitigation Site

Mitigation Function	This mitigation site has been identified as in-kind and in-proximity mitigation for impacts on Category 2 elk and mule deer winter range within the forest/woodland general vegetation type. This mitigation site could help meet the Project need for elk and mule deer summer habitat as well. It contains important habitat features with opportunities to provide durable ecological uplift through implementation of standard mitigation actions. Opportunities to improve the watershed would benefit bull trout and their designated critical habitat. The mitigation actions listed below, upon successful implementation, will increase the quality of habitat available to elk and mule deer (among other species) within the mitigation site and result in an ecological uplift to the mitigation site above what is provided under the current management.
Mitigation Site Manager	Fee title acquisition with transfer of ownership to State of Oregon, Federal Land Management Agency, approved NPO or Land Trust
Mitigation Actions	The following are mitigation actions that may be implemented at this mitigation site in order to satisfy the mitigation policies/guidelines of the permitting agencies. All mitigation actions will follow reliable methods. The mitigation actions presented here are not comprehensive. Implementation will likely be some combination of one or more of the following: • *Livestock grazing restrictions* – historic grazing practices at this property are unknown. However, the objective would be to avoid grazing practices that would compete with native wildlife life history needs. Targeted grazing may be considered for habitat enhancement/treatment actions. • *Weed treatment* – the extent of noxious weed invasion on the mitigation site is unknown at this time but it is anticipated that opportunities exist to implement this mitigation action. • *Native revegetation/restoration* – forest management practices would be implemented to create structural diversity and enhance desirable habitat conditions. • *Road closure* – restrict motor vehicle use to just those roads that are necessary; seasonally close access based on use by elk and mule deer. • *Fire readiness* – efforts made to make the property more resistant to catastrophic fire and a fire response plan could be developed. • *Fence removal/fence upgrade* – opportunities are unknown at this time, but it is anticipated that some unnecessary fencing may be removed or necessary fencing can be upgraded to more wildlife friendly fencing.
Monitoring	A specific plan for monitoring will be developed, but in general, mitigation progress will be monitored through vegetation plot monitoring and establishment of photo locations. Monitoring will occur annually for the first 3-5 years and an annual report will be produced. During the annual monitoring phase, a longer-term monitoring plan will be developed using similar protocols and methods to monitor the mitigation actions at larger time intervals (i.e., 5 years, 10 years).

Success Criteria

Specific success criteria will be developed once baseline conditions have been determined and potential mitigation actions have been confirmed for the site. Success criteria may include but are not limited to:

- Vegetation plots show an increase in native vegetation cover and general trend toward increased habitat quality representing an ecological uplift.
- Successful weed control through documentation of a reduction in weeds and non-native invasive plant species.
- Mitigation success will not be dependent on documentation of increased use of the mitigation site by wildlife species.

Financial Outline

Estimated Budget for the County Line Mitigation Site

Action	Cost per Unit	Units	Years	Expense
One-time Costs				
Acquisition (from 2009 listing attached to ODFW nomination form)	$1,200,000	1		$1,200,000
50-year Operation and Management Costs				
O&M[1]	$53.75	792	50	$2,128,500
Total	**-**			**$3,328,500** ($4,202/acre)[2]

[1] This O&M cost is an estimate of the cost per acre per year (not including acquisition/easement costs) based on the research presented in the Independent Economic Analysis Board's 2007 *Investigation of Wildlife O&M Costs*. The cost per acre identified in that study for the Elkhorn Wildlife Management Area (which this mitigation site will be modeled after) was $43 in 2004 dollars, this has been adjusted to reflect 2015 dollars.

[2] Cost per acre here includes cost of acquisition/easement and long-term O&M for 50 years.

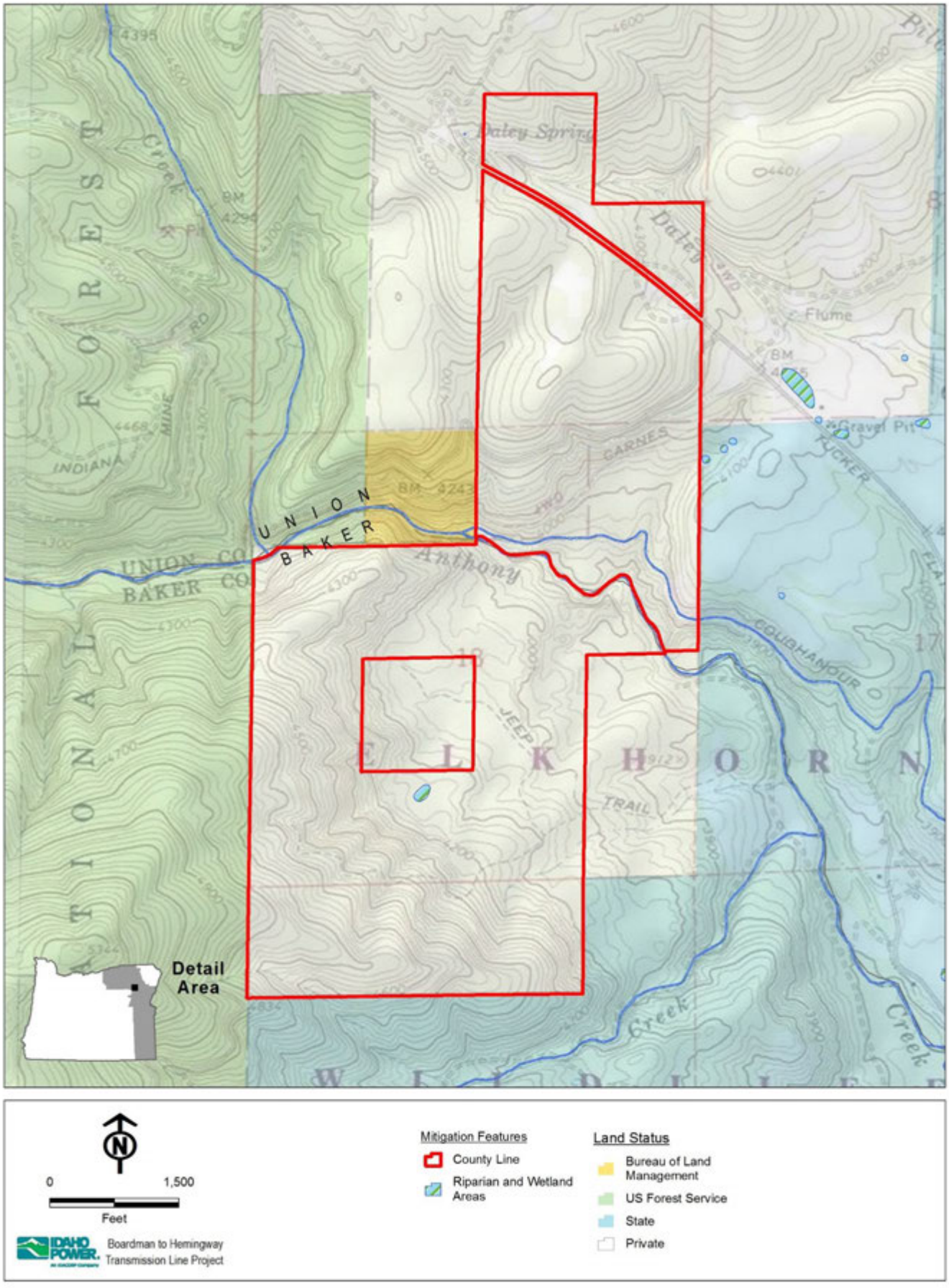

Figure 1. County Line Ownership and Water

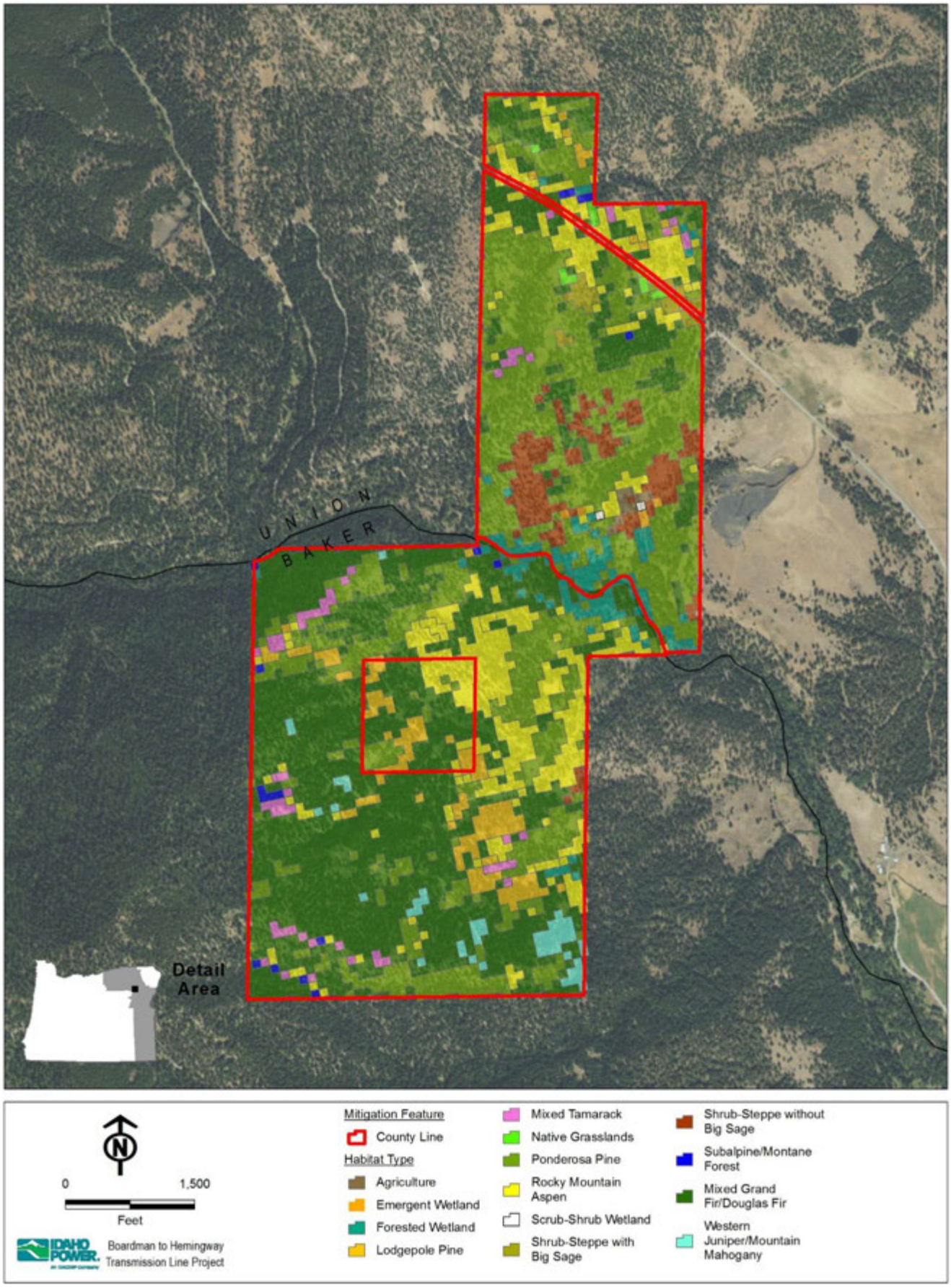

Figure 2. County Line Habitat Types

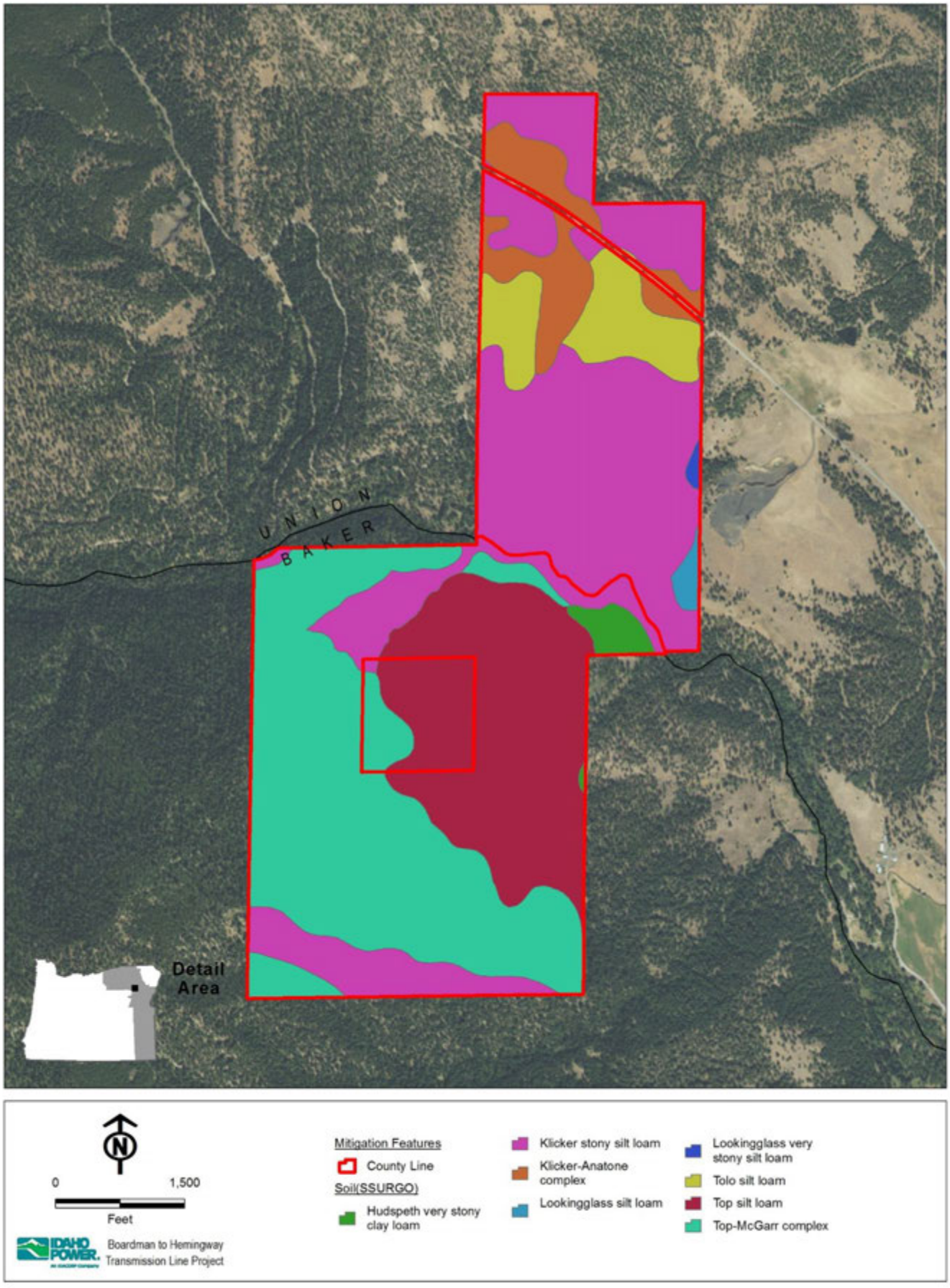

Figure 3. County Line Soil Types

Boardman to Hemingway Transmission Line Project

Desktop Habitat Mitigation Site Assessment Worksheet

Parcel Name: High Valley (**Figure 1**) **Date of Assessment:** 10/21/2015

Landowner: **Parcel Elevation (ft):**

Parcel Size in Acres: Approx. 14,886 acres **Within Mitigation Service Area?:** Yes

Location Description

(County, miles and direction from known location, TRS, UTM, other):

Union County, just west of I-84 at Ladd Canyon.
T4S R38E Sections 4, 5, 8, 9, 10, 14, 15, 16, 17, 19, 20, 21, 22, 23, 26, 27, 28, 29, 30, 32, 33, 34, 35, 36
T5S R38E Sections 1, 2, 3, 4, 10, 11, 12, 13, 14, 15, 18, 19, 21, 22, 23, 24, 25, 26, 27, 28, 30, 34, 35

Vegetation Cover Classes (GAP[1], **Figure 2**)

HMP Habitat Category[2] and Type	HMP General Vegetation Type	Acres	% of Total	Wildlife Habitat[3]
Category 1		**0**	**0**	-
Category 2		**7,455**	**50.1**	-
Mixed Grand Fir/Douglas Fir	Forest/Woodland	3,158	21.2	RMEWR, RMESR, MDSR
Mixed Grand Fir/Douglas Fir	Forest/Woodland	58	0.4	RMEWR, MDWR, MDSR
Mixed Grand Fir/Douglas Fir	Forest/Woodland	111	0.7	RMEWR, MDWR
Mixed Grand Fir/Douglas Fir	Forest/Woodland	474	3.2	RMEWR, MDSR
Ponderosa Pine	Forest/Woodland	671	4.5	RMEWR, RMESR, MDSR
Ponderosa Pine	Forest/Woodland	256	1.7	RMEWR, MDWR, MDSR
Ponderosa Pine	Forest/Woodland	119	0.8	RMEWR, MDWR
Ponderosa Pine	Forest/Woodland	823	5.5	RMEWR, MDSR
Subalpine/Montane Forest	Forest/Woodland	445	3.0	RMEWR, RMESR, MDSR
Subalpine/Montane Forest	Forest/Woodland	14	0.1	RMEWR, MDSR
Mixed Tamarack	Forest/Woodland	424	2.9	RMEWR, RMESR, MDSR
Mixed Tamarack	Forest/Woodland	8	0.1	RMEWR, MDWR
Mixed Tamarack	Forest/Woodland	60	0.4	RMEWR, MDSR
Forested Wetland	Wetland	151	1.0	RMEWR, RMESR, MDSR
Forested Wetland	Wetland	21	0.1	RMEWR, MDWR, MDSR
Forested Wetland	Wetland	9	0.1	RMEWR, MDWR
Forested Wetland	Wetland	87	0.6	RMEWR, MDSR
Lodgepole Pine	Forest/Woodland	175	1.2	RMEWR, RMESR, MDSR
Lodgepole Pine	Forest/Woodland	10	0.1	RMEWR, MDSR
Native Grasslands	Shrub/Grass	34	0.2	RMEWR, RMESR, MDSR
Native Grasslands	Shrub/Grass	45	0.3	RMEWR, MDWR
Native Grasslands	Shrub/Grass	9	0.1	RMEWR, MDSR
Rocky Mountain Aspen	Forest/Woodland	47	0.3	RMEWR, RMESR, MDSR
Rocky Mountain Aspen	Forest/Woodland	68	0.5	RMEWR, MDWR, MDSR
Rocky Mountain Aspen	Forest/Woodland	13	0.1	RMEWR, MDSR

[1] USGS Gap Analysis Project (GAP) GIS data using ecological systems. Ecological systems were cross-walked to HMP Habitat Type as shown in the Habitat Categorization Matrix (Attachment P1--1 of Exhibit P1).

[2] Represents the habitat category based on overlap with wildlife habitat layers. Agriculture and Developed habitat types' categories are not modified by overlap with wildlife habitat.

[3] MDWR = Category 2 habitat for ODFW mule deer winter range; RMEWR = Category 2 habitat for ODFW Rocky Mountain elk winter range; RMESR = Category 3 habitat for Rocky Mountain Elk Foundation Rocky Mountain elk summer range; MDSR = Category 3 habitat for WAFWA mule deer summer range.

[4] Total acres of habitat type will not match actual parcel size due to resolution of the GAP raster dataset. Pixels of the dataset were not simplified or smoothed to match the exact shape of the parcel boundary.

Boardman to Hemingway Transmission Line Project

Desktop Habitat Mitigation Site Assessment Worksheet

Parcel Name: Glass Hill (**Figure 1**)
Landowner:
Parcel Size in Acres: Appx. 14,000 acres
Date of Assessment: 10/21/2015
Parcel Elevation (ft): 3,200 – 5,300
Within Mitigation Service Area?: Yes

Location Description
(County, miles and direction from known location, TRS, UTM, other):

Union County, just west of I-84 at Ladd Canyon.
T4S R38E Sections 4, 5, 8, 9, 10, 14, 15, 16, 17, 19, 20, 21, 22, 23, 26, 27, 28, 29, 30, 32, 33, 34, 35, 36
T5S R38E Sections 1, 2, 3, 4, 10, 11, 12, 13, 14, 15, 18, 19, 21, 22, 23, 24, 25, 26, 27, 28, 30, 34, 35

Vegetation Cover Classes (GAP[1], **Figure 2**)

HMP Habitat Category[2] and Type	HMP General Vegetation Type	Acres	% of Parcel	Wildlife Habitat[3]
Category 1, 4, 5, & 6		**0**	**0**	-
Category 2		**10,038**	**72**	-
Mixed Grand Fir/Douglas Fir	Forest/Woodland	2,551	18.3	RMEWR, RMESR, MDSR
Mixed Grand Fir/Douglas Fir	Forest/Woodland	2,446	17.5	RMEWR, RMESR, MDWR, MDSR
Mixed Grand Fir/Douglas Fir	Forest/Woodland	226	1.6	RMEWR, MDWR, MDSR
Mixed Grand Fir/Douglas Fir	Forest/Woodland	30	0.2	RMEWR, MDWR
Ponderosa Pine	Forest/Woodland	334	2.4	RMEWR, RMESR, MDSR
Ponderosa Pine	Forest/Woodland	751	5.4	RMEWR, RMESR, MDWR, MDSR
Ponderosa Pine	Forest/Woodland	147	1.1	RMEWR, MDWR, MDSR
Ponderosa Pine	Forest/Woodland	8	0.1	RMEWR, MDWR
Shrub-Steppe without Big Sage	Shrub/Grass	109	0.8	RMEWR, RMESR, MDSR
Shrub-Steppe without Big Sage	Shrub/Grass	433	3.1	RMEWR, RMESR, MDWR, MDSR
Shrub-Steppe without Big Sage	Shrub/Grass	147	1.1	RMEWR, MDWR, MDSR
Shrub-Steppe without Big Sage	Shrub/Grass	20	0.1	RMEWR, MDWR
Shrub-Steppe with Big Sage	Shrub/Grass	153	1.1	RMEWR, RMESR, MDSR
Shrub-Steppe with Big Sage	Shrub/Grass	269	1.9	RMEWR, RMESR, MDWR, MDSR
Shrub-Steppe with Big Sage	Shrub/Grass	82	0.6	RMEWR, MDWR, MDSR
Shrub-Steppe with Big Sage	Shrub/Grass	7	0.0	RMEWR, MDWR

[1]USGS Gap Analysis Project (GAP) GIS data. Ecological systems were cross-walked to HMP Habitat Type as shown in the Habitat Categorization Matrix (Attachment P1--1 of Exhibit P1).
[2]Represents the habitat category based on overlap with wildlife habitat layers. Agriculture and Developed habitat types' categories are not modified by overlap with wildlife habitat.
[3]MDWR = Category 2 habitat for ODFW mule deer winter range; RMEWR = Category 2 habitat for ODFW Rocky Mountain elk winter range; RMESR = Category 3 habitat for Rocky Mountain Elk Foundation Rocky Mountain elk summer range; MDSR = Category 3 habitat for WAFWA mule deer summer range.
[4]Total acres of habitat type will not match actual parcel size due to resolution of the GAP raster dataset. Pixels of the dataset were not simplified or smoothed to match the exact shape of the parcel boundary.

Vegetation Cover Classes cont.

HMP Habitat Category[2] and Type	HMP General Vegetation Type	Acres	% of Total	Wildlife Habitat[3]
Category 2 cont				
Mixed Tamarack	Forest/Woodland	338	2.4	RMEWR, RMESR, MDSR
Mixed Tamarack	Forest/Woodland	233	1.7	RMEWR, RMESR, MDWR, MDSR
Mixed Tamarack	Forest/Woodland	12	0.1	RMEWR, MDWR, MDSR
Subalpine/Montane Forest	Forest/Woodland	502	3.6	RMEWR, RMESR, MDSR
Subalpine/Montane Forest	Forest/Woodland	240	1.7	RMEWR, RMESR, MDWR, MDSR
Western Juniper/Mountain Mahogany Woodland	Forest/Woodland	207	1.5	RMEWR, RMESR, MDSR
Western Juniper/Mountain Mahogany Woodland	Forest/Woodland	175	1.3	RMEWR, RMESR, MDWR, MDSR
Forested Wetland	Wetland	81	0.6	RMEWR, RMESR, MDSR
Forested Wetland	Wetland	125	0.9	RMEWR, RMESR, MDWR, MDSR
Native Grasslands	Shrub/Grass	17	0.1	RMEWR, RMESR, MDSR
Native Grasslands	Shrub/Grass	63	0.5	RMEWR, RMESR, MDWR, MDSR
Native Grasslands	Shrub/Grass	6	0.0	RMEWR, MDWR, MDSR
Lodgepole Pine	Forest/Woodland	151	1.1	RMEWR, RMESR, MDSR
Lodgepole Pine	Forest/Woodland	59	0.4	RMEWR, RMESR, MDWR, MDSR
Rocky Mountain Aspen	Forest/Woodland	22	0.2	RMEWR, RMESR, MDSR
Rocky Mountain Aspen	Forest/Woodland	26	0.2	RMEWR, RMESR, MDWR, MDSR
Emergent Wetland	Wetland	5	0.0	RMEWR, RMESR, MDWR, MDSR
Remaining	-	63	0.5	-
Category 3		**3,913**	**28**	-
Mixed Grand Fir/Douglas Fir	Forest/Woodland	1,826	13.1	RMESR, MDSR
Subalpine/Montane Forest	Forest/Woodland	658	4.7	RMESR, MDSR
Ponderosa Pine	Forest/Woodland	467	3.3	RMESR, MDSR
Mixed Tamarack	Forest/Woodland	364	2.6	RMESR, MDSR
Lodgepole Pine	Forest/Woodland	266	1.9	RMESR, MDSR
Western Juniper/Mountain Mahogany Woodland	Forest/Woodland	119	**0.9**	RMESR, MDSR
Forested Wetland	Wetland	70	**0.5**	RMESR, MDSR
Shrub-Steppe without Big Sage	Shrub/Grass	51	**0.4**	RMESR, MDSR
Rocky Mountain Aspen	Forest/Woodland	34	**0.2**	RMESR, MDSR
Shrub-Steppe with Big Sage	Shrub/Grass	27	**0.2**	RMESR, MDSR
Native Grasslands	Shrub/Grass	18	**0.1**	RMESR, MDSR
Emergent Wetland	Wetland	10	**0.1**	RMESR, MDSR
Remaining	-	3	**0.0**	-
Total		**13,952**	**100**	**-**

[1]USGS Regional Gap Analysis Project (GAP) GIS data. Ecological systems were cross-walked to HMP Habitat Type as shown in the Habitat Categorization Matrix (Attachment P1--1 of Exhibit P1).
[2]Represents the habitat category based on overlap with wildlife habitat layers. Agriculture and Developed habitat types' categories are not modified by overlap with wildlife habitat.
[3]MDWR = Category 2 habitat for ODFW mule deer winter range; RMEWR = Category 2 habitat for ODFW Rocky Mountain elk winter range; RMESR = Category 3 habitat for Rocky Mountain Elk Foundation Rocky Mountain elk summer range; MDSR = Category 3 habitat for WAFWA mule deer summer range.
[4]Total acres of habitat type will not match actual parcel size due to resolution of the GAP raster dataset. Pixels of the dataset were not simplified or smoothed to match the exact shape of the parcel boundary.

Soil Types	The NRCS Soil Survey Geographic Database (SSURGO) data was reviewed and the following soils were identified on the property (**Figure 3**): *Anatone-Bocker complex* (**34 acres**). Anatone soils consist of shallow, well drained soils found on mountain side slopes, ridgetops, hills, and plateaus at elevations of 2,000 to 6,200 feet. Anatone soils are mostly used for livestock grazing, wildlife habitat, and recreation. Native vegetation is mainly bluebunch wheatgrass, Idaho fescue, Sandberg bluegrass, mossy stonecrop, curlleaf mountain mahogany and stiff sagebrush. Bocker soils consist of very shallow, well drained soils found on hills, plateaus and mountains at elevations of 2,800 to 6,600 feet. Bocker soils are used for livestock grazing and recreation. The native vegetation is buckwheat, Sandberg bluegrass, Idaho fescue, bluebunch wheatgrass, bottlebrush squirreltail, stiff sagebrush and low sagebrush. *Anatone-Klicker complex* (**991 acres**). Anatone soils consist of shallow, well drained soils found on mountain side slopes, ridgetops, hills, and plateaus at elevations of 2,000 to 6,200 feet. Anatone soils are mostly used for livestock grazing, wildlife habitat, and recreation. Native vegetation is mainly bluebunch wheatgrass, Idaho fescue, Sandberg bluegrass, mossy stonecrop, curlleaf mountain mahogany and stiff sagebrush. Klicker soils consist of moderately deep, well drained soils on mountains, plateaus, and benches at elevations from 2,500 to 6,200 feet. Klicker soils are used mainly for timber production and wildlife habitat. Native vegetation is an open stand of ponderosa pine and Douglas-fir with an understory of bluebunch wheatgrass, slender wheatgrass, brome grass, elk sedge, Oregon-grape, common snowberry, Saskatoon serviceberry, creambush oceanspray, mallow ninebark and wild rose. *Anatone extremely stony loam* (**665 acres**). Anatone soils consist of shallow, well drained soils found on mountain side slopes, ridgetops, hills, and plateaus at elevations of 2,000 to 6,200 feet. Anatone soils are mostly used for livestock grazing, wildlife habitat, and recreation. Native vegetation is mainly bluebunch wheatgrass, Idaho fescue, Sandberg bluegrass, mossy stonecrop, curlleaf mountain mahogany and stiff sagebrush. *Cowsly silt loam* (**81 acres**) and *Cowsly very stony silt loam* (**164 acres**). Cowsly soils consist of deep or very deep, moderately well drained soils found on plateaus at elevations from 2800 to 5000 feet. Cowsly soils are used primarily for timber production. Other uses are dryland small grain, pasture, wildlife habitat and water supply. Native vegetation is ponderosa pine and Douglas fir with an understory of spirea, ocean spray, snowberry, Idaho fescue, pinegrass and elksedge. *Gwinly-Rockly* (**429 acres**). The Gwinly soils consist of shallow, well drained soils found on hills, plateaus, structural benches, mountains, and canyons at elevations from 1,400 to 4,600 feet. Used for livestock grazing and wildlife habitat. Potential native vegetation is dominantly bluebunch wheatgrass, Idaho fescue, Sandberg bluegrass and low sagebrush. Rockly soils consist of shallow and very shallow, well drained soils found on mesas, ridges, plateaus, structural benches, canyon walls, and nearly level to very steep south and west slopes on uplands at elevations of 300 to 5,000 feet. Rockly soils are used for livestock grazing, wildlife habitat, and water supply purposes. Native vegetation is mostly stiff sagebrush, lomatium, bluebunch wheatgrass, and Sandberg bluegrass. *Gwinly very cobbly silt loam* (**202 acres**). The Gwinly soils consist of shallow, well drained soils found on hills, plateaus, structural benches, mountains, and canyons at elevations from 1,400 to 4,600 feet. Used for livestock grazing and wildlife habitat. Potential native vegetation is dominantly bluebunch wheatgrass, Idaho fescue, Sandberg bluegrass and low sagebrush. *Kamela very stony silt loam* (**2,379 acres**). Kamela soils consist of moderately deep, well drained soils found on ridgetops and side slopes of mountains at elevations of 3,000 to 6,200 feet. Kamela soils are used primarily for timber production. They are used also for wildlife habitat. Native vegetation dominantly is grand fir, Douglas fir,

	ponderosa pine and some western larch. Understory vegetation is willow, oceanspray, rocky mountain maple, ninebark, false Solomons seal, snowberry, elk sedge, pinegrass, heartleaf arnica and princes pine. *Klicker-Anatone complex* (**1,447 acres**). Klicker soils consist of moderately deep, well drained soils on mountains, plateaus, and benches at elevations from 2,500 to 6,200 feet. Klicker soils are used mainly for timber production and wildlife habitat. Native vegetation is an open stand of ponderosa pine and Douglas-fir with an understory of bluebunch wheatgrass, slender wheatgrass, brome grass, elk sedge, Oregon-grape, common snowberry, Saskatoon serviceberry, creambush oceanspray, mallow ninebark and wild rose. Anatone soils consist of shallow, well drained soils found on mountain side slopes, ridgetops, hills, and plateaus at elevations of 2,000 to 6,200 feet. Anatone soils are mostly used for livestock grazing, wildlife habitat, and recreation. Native vegetation is mainly bluebunch wheatgrass, Idaho fescue, Sandberg bluegrass, mossy stonecrop, curlleaf mountain mahogany and stiff sagebrush. *Klicker stony silt loam* (**3,213 acres**). Klicker soils consist of moderately deep, well drained soils on mountains, plateaus, and benches at elevations from 2,500 to 6,200 feet. Klicker soils are used mainly for timber production and wildlife habitat. Native vegetation is an open stand of ponderosa pine and Douglas-fir with an understory of bluebunch wheatgrass, slender wheatgrass, brome grass, elk sedge, Oregon-grape, common snowberry, Saskatoon serviceberry, creambush oceanspray, mallow ninebark and wild rose. *Loneridge stony silt loam* (**337 acres**). Loneridge soils consist of very deep, well drained soils found on mountain side slopes, plateaus and benches at elevations of 2,400 to 5,400 feet. Loneridge soils are used for timber production, livestock grazing, recreation, wildlife habitat, and watershed. Native vegetation is mainly Douglas-fir, ponderosa pine, grand fir, and western larch, with an understory of pinegrass, elk sedge, Oregon-grape, ceanothus, creambush oceanspray, lupine, common snowberry and pinemat manzanita. *Lookingglass silt loam* (**108 acres**) and *Lookingglass very stony silt loam* (**0.1 acres**). Lookingglass soils consist of very deep, moderately well drained soils found on uplands at elevations of 1,800 to 4,000 feet. Lookingglass soils are used mainly for timber production. Cleared areas are cropped to small grains, hay, pasture, and peas. The native vegetation is ponderosa pine and Douglas fir with an understory of spirea, oceanspray, Idaho fescue, pinegrass and elksedge. *Olot silt loam* (**200 acres**) and *Olot stony silt loam* (**2,001 acres**). Olot soils consist of moderately deep, well drained soils found on plateaus, canyons, mountains and structural benches at elevations typically between 2,800 to 5,000 feet. Olot soils are used mainly for timber production. Also used for wildlife habitat. Vegetation is western larch, Douglas fir, willow, mountain alder, common snowberry, elk sedge, and pinegrass. *Pits, gravel* (**7 acres**). *Ramo very stony silty clay loam* (**34 acres**). Ramo soils consist of very deep, well drained soils found on concave foot slopes at elevations of 2,800 to 3,800 feet. Ramo soils are used for hay, pasture, small grain and livestock grazing. Potential native vegetation is mainly Idaho fescue and bluebunch wheatgrass.
Hydrologic Features Present (SteamNet, NWI, NHD)	Four perennial streams flow through the property. This includes Ladd Creek and three of its tributaries. Seven intermittent streams also cross the project, all but one are tributaries to Ladd Creek. Wetland features include several emergent wetlands, springs, and at least two impoundments.

Adjacent land ownership, use, and condition	Most of adjacent landowners are private; however the property does border a large tract of USFS lands and smaller BLM holdings. The northern tip of the property borders the ODFW Ladd Marsh WMA.
Infrastructure Density within or Near the Parcel (Qualitative Description)	The property borders I84 through Ladd Canyon. The Quartz to La Grande 230kV transmission line is within 1 mile of a portion of the eastern border of the property. Access roads occur throughout the property. A different landowner maintains an inholding of approximately 1.7 acres that includes a residential structure/cabin and a couple of out buildings.
Summary	The property is currently used for timber production. The property is within elk and mule deer winter range and borders some USFS and BLM lands as well as ODFW Ladd Marsh WMA. The recent (2015) removal and replacement of an impassable culvert at I84 in Ladd Canyon opens several miles of spawning and rearing habitat within the property to listed runs of Chinook salmon and steelhead. The proposed B2H Project (winter 2015) would cross the northern portion of the property (**Figure 1**).
Pass/Fail Desktop Assessment?	Pass

Boardman to Hemingway Transmission Line Project

Consideration of Property as a Potential Mitigation Site

Mitigation Function	This mitigation site has been identified as in-kind and in-proximity mitigation for impacts on Category 2 elk and mule deer winter range within the forest/woodland general vegetation type. This mitigation site could help meet the Project need for elk and mule deer summer habitat as well. The property has some shrub/grass general vegetation communities that could be considered for mitigation for impacts to Category 3 & 4 shrub-steppe and grassland habitat types. It contains important habitat features with opportunities to provide durable ecological uplift through implementation of standard mitigation actions. Opportunities to improve the watershed would benefit Chinook salmon and steelhead (no critical habitat on the property). The mitigation actions listed below, upon successful implementation, will increase the quality of habitat available to elk and mule deer (among other species) within the mitigation site and result in an ecological uplift to the mitigation site above what is provided under the current management.
Mitigation Site Manager	Fee title acquisition with transfer of ownership to State of Oregon, Federal Land Management Agency, approved NPO or Land Trust
Mitigation Actions	The following are mitigation actions that may be implemented at this mitigation site in order to satisfy the mitigation policies/guidelines of the permitting agencies. All mitigation actions will follow reliable methods. The mitigation actions presented here are not comprehensive. Implementation will likely be some combination of one or more of the following: • *Livestock grazing restrictions* – historic grazing practices at this property are unknown. However, the objective would be to avoid grazing practices that would compete with native wildlife life history needs. Targeted grazing may be considered for habitat enhancement/treatment actions. • *Weed treatment* – the extent of noxious weed invasion on the mitigation site is unknown at this time but it is anticipated that opportunities exist to implement this mitigation action. • *Native revegetation/restoration* – the focus would be planting forage shrubs and bunchgrasses; forest management practices would be implemented to create structural diversity and enhance desirable habitat conditions. • *Fire readiness* – efforts made to make the property more resistant to catastrophic fire and a fire response plan could be developed. • *Fence removal/fence upgrade* – opportunities are unknown at this time, but it is anticipated that some unnecessary fencing may be removed or necessary fencing can be upgraded to more wildlife friendly fencing, such as lay down fencing.
Monitoring	A specific plan for monitoring will be developed, but in general, mitigation progress will be monitored through vegetation plot monitoring and establishment of photo locations. Monitoring will occur annually for the first 3-5 years and an annual report will be produced. During the annual monitoring phase, a longer-term monitoring plan will be developed using similar protocols and methods to monitor the mitigation actions at larger time intervals (i.e., 5 years, 10 years).

Success Criteria

Specific success criteria will be developed once baseline conditions have been determined and potential mitigation actions have been confirmed for the site. Success criteria may include but are not limited to:

- Vegetation plots show an increase in native vegetation cover and general trend toward increased habitat quality representing an ecological uplift.
- Successful weed control through documentation of a reduction in weeds and non-native invasive plant species.
- Mitigation success will not be dependent on documentation of increased use of the mitigation site by any wildlife species.

Financial Outline

Estimated Budget for the Glass Hill Mitigation Site

Action	Cost per Unit	Units	Years	Expense
One-time Costs				
Acquisition	?			?
Recurring Costs (Annually)				
O&M[1]	$53.75	13,868	50	
Total	**-**			**$37,270,250** ($?/acre)[2]

[1] This O&M cost is an estimate of the cost per acre per year (not including acquisition/easement costs) based on the research presented in the Independent Economic Analysis Board's 2007 *Investigation of Wildlife O&M Costs*. The cost per acre identified in that study for the Elkhorn Wildlife Management Area (which this mitigation site will be modeled after) was $43 in 2004 dollars, this has been adjusted to reflect 2015 dollars.

[2] Cost per acre here includes cost of acquisition/easement and initial mitigation actions and long-term O&M for 50 years.

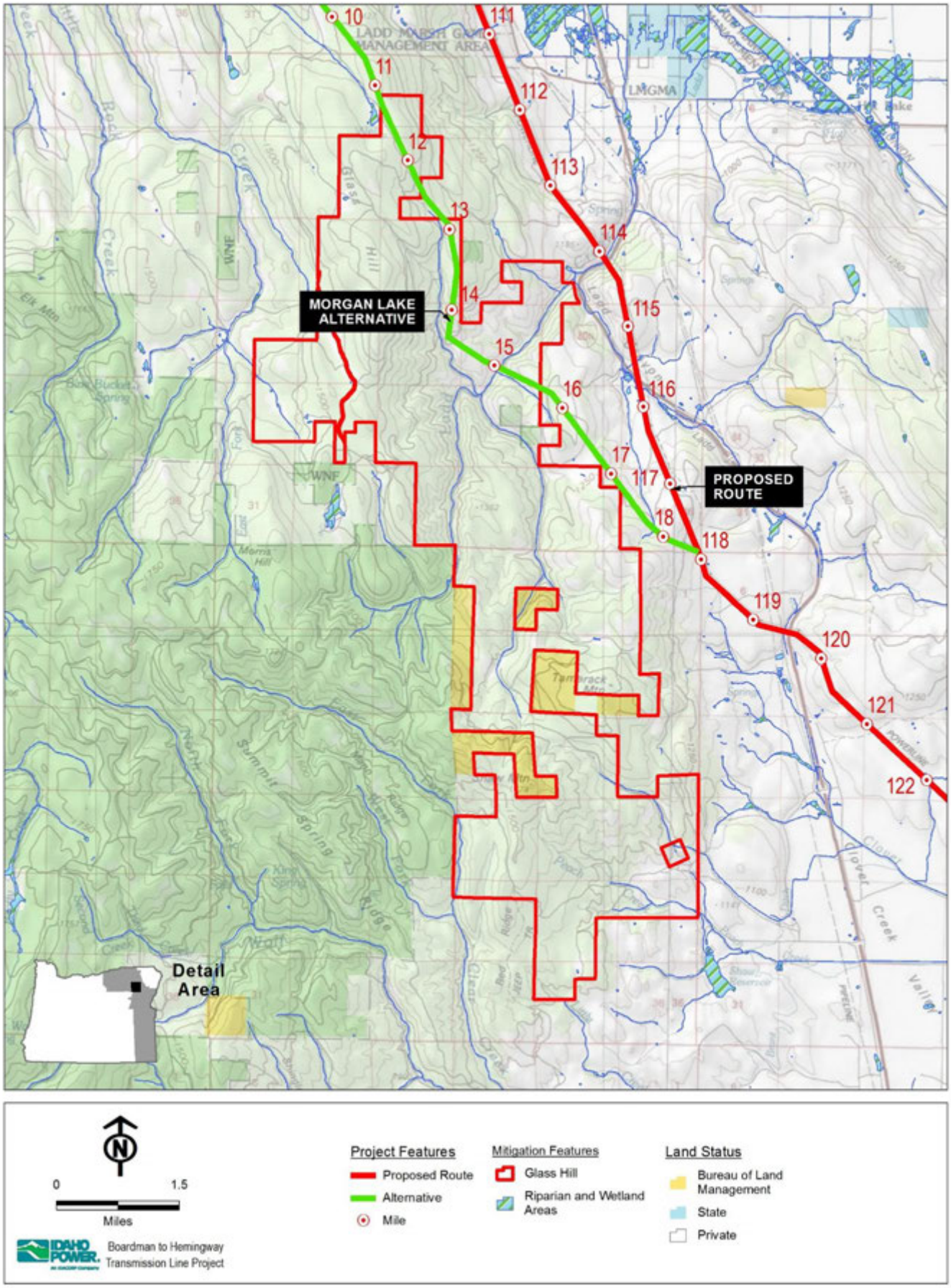

Figure 1. Glass Hill Ownership and Water

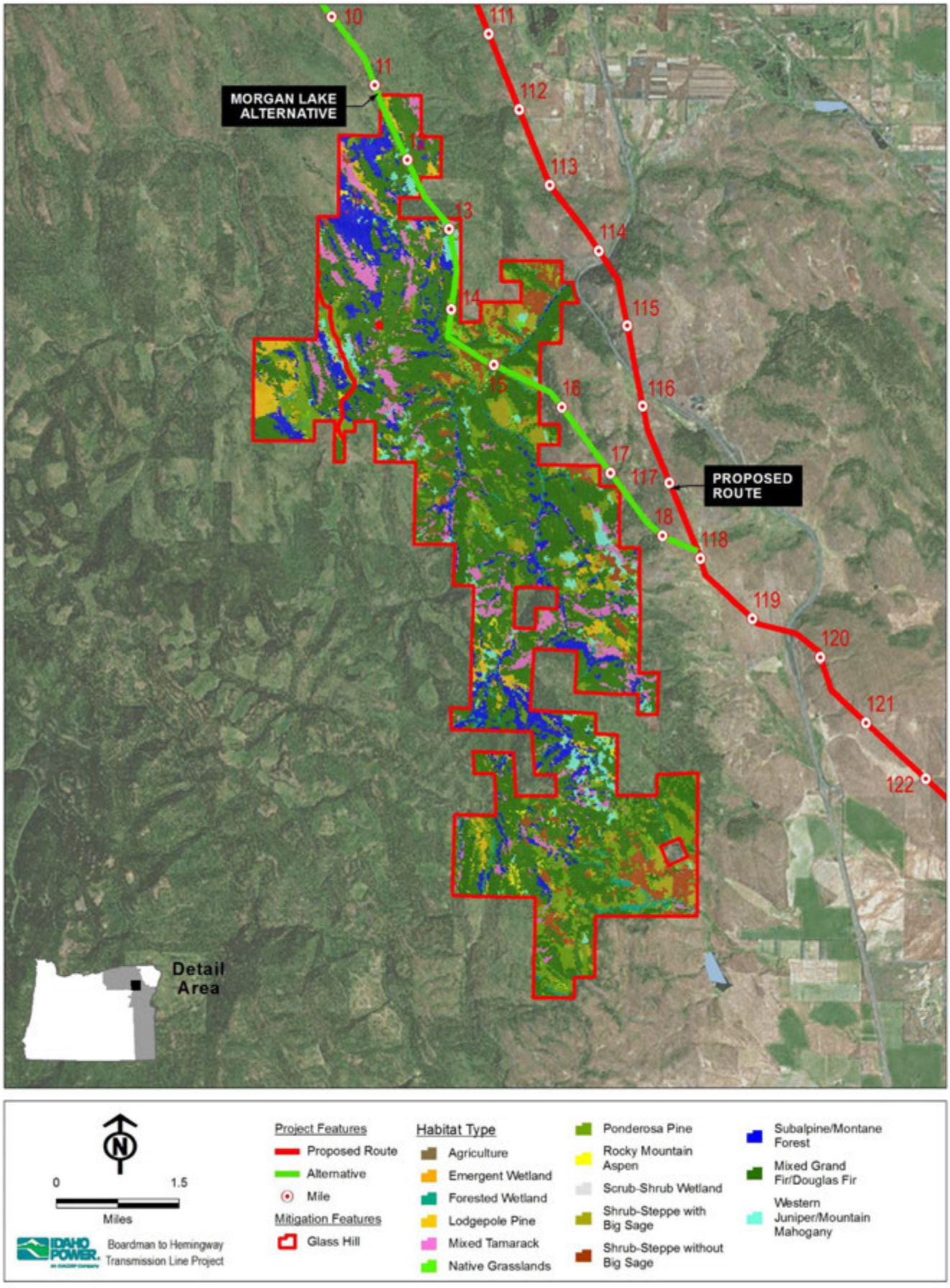

Figure 2. Glass Hill Habitat Types

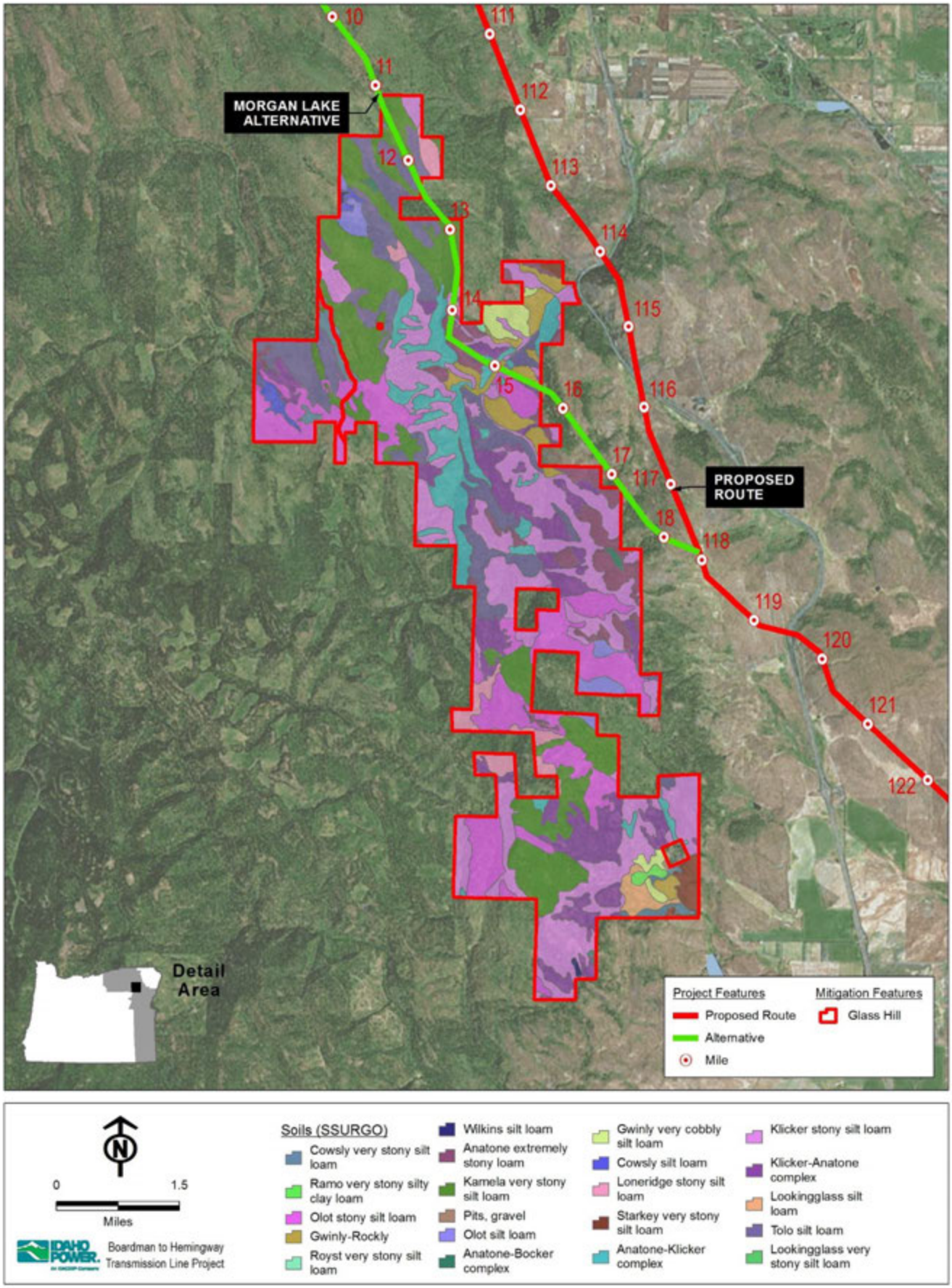

Figure 3. Glass Hill Soil Types

Vegetation Cover Classes cont. (GAP[1])

HMP Habitat Category[2] and Type	HMP General Vegetation Type	Acres	% of Total	Wildlife Habitat[3]
Category 2 cont.				
Shrub-Steppe without Big Sage	Shrub/Grass	28	0.2	RMEWR, MDWR, MDSR
Shrub-Steppe without Big Sage	Shrub/Grass	52	0.3	RMEWR, MDSR
Shrub-Steppe with Big Sage	Shrub/Grass	13	0.1	RMEWR, RMESR, MDSR
Shrub-Steppe with Big Sage	Shrub/Grass	11	0.1	RMEWR, MDWR
Shrub-Steppe with Big Sage	Shrub/Grass	20	0.1	RMEWR, MDSR
Remaining	-	44	0.3	-
Category 3		**7,411**	**49.8**	-
Mixed Grand Fir / Douglas Fir	Forest/Woodland	3,757	25.2	RMESR, MDSR
Mixed Grand Fir / Douglas Fir	Forest/Woodland	520	3.5	MDSR
Subalpine / Montane Forest	Forest/Woodland	1,519	10.2	RMESR, MDSR
Subalpine / Montane Forest	Forest/Woodland	16	0.1	MDSR
Mixed Tamarack	Forest/Woodland	431	2.9	RMESR, MDSR
Mixed Tamarack	Forest/Woodland	3	0.0	MDSR
Ponderosa Pine	Forest/Woodland	397	2.7	RMESR, MDSR
Ponderosa Pine	Forest/Woodland	126	0.8	MDSR
Lodgepole Pine	Forest/Woodland	252	1.7	RMESR, MDSR
Forested Wetland	Wetland	185	1.2	RMESR, MDSR
Forested Wetland	Wetland	6	0.0	MDSR
Native Grasslands	Shrub/Grass	100	0.7	RMESR, MDSR
Native Grasslands	Shrub/Grass	1	0.0	MDSR
Rocky Mountain Aspen	Forest/Woodland	38	0.3	RMESR, MDSR
Western Juniper / Mountain Mahogany Woodland	Forest/Woodland	24	0.2	RMESR, MDSR
Shrub-Steppe without Big Sage	Shrub/Grass	21	0.1	RMESR, MDSR
Emergent Wetland	Wetland	4	0.0	RMESR, MDSR
Emergent Wetland	Wetland	1	0.0	MDSR
Shrub-Steppe with Big Sage	Shrub/Grass	4	0.0	RMESR, MDSR
Remaining	-	6	0.0	RMESR, MDSR
Category 4				-
Category 5				-
Category 6				-
Developed	Agriculture / Developed	1	0.0	RMEWR
Developed	Agriculture / Developed	11	0.1	RMEWR, MDWR
Total		**14,879**	**100**	**-**

[1] USGS Gap Analysis Project (GAP) GIS data using ecological systems. Ecological systems were cross-walked to HMP Habitat Type as shown in the Habitat Categorization Matrix (Attachment P1--1 of Exhibit P1).

[2] Represents the habitat category based on overlap with wildlife habitat layers. Agriculture and Developed habitat types' categories are not modified by overlap with wildlife habitat.

[3] MDWR = Category 2 habitat for ODFW mule deer winter range; RMEWR = Category 2 habitat for ODFW Rocky Mountain elk winter range; RMESR = Category 3 habitat for Rocky Mountain Elk Foundation Rocky Mountain elk summer range; MDSR = Category 3 habitat for WAFWA mule deer summer range.

[4] Total acres of habitat type will not match actual parcel size due to resolution of the GAP raster dataset. Pixels of the dataset were not simplified or smoothed to match the exact shape of the parcel boundary.

Soil types	The NRCS Soil Survey Geographic Database (SSURGO) data was reviewed and the following soils were identified on the property (**Figure 3**): *Anatone-Bocker complex* (**122 acres**). Anatone soils consist of shallow, well drained soils found on mountain side slopes, ridgetops, hills, and plateaus at elevations of 2,000 to 6,200 feet. Anatone soils are mostly used for livestock grazing, wildlife habitat, and recreation. Native vegetation is mainly bluebunch wheatgrass, Idaho fescue, Sandberg bluegrass, mossy stonecrop, curlleaf mountain mahogany and stiff sagebrush. Bocker soils consist of very shallow, well drained soils found on hills, plateaus and mountains at elevations of 2,800 to 6,600 feet. Bocker soils are used for livestock grazing and recreation. The native vegetation is buckwheat, Sandberg bluegrass, Idaho fescue, bluebunch wheatgrass, bottlebrush squirreltail, stiff sagebrush and low sagebrush. *Anatone-Klicker-McCartycreek complex* (**3 acres**). Anatone soils consist of shallow, well drained soils found on mountain side slopes, ridgetops, hills, and plateaus at elevations of 2,000 to 6,200 feet. Anatone soils are mostly used for livestock grazing, wildlife habitat, and recreation. Native vegetation is mainly bluebunch wheatgrass, Idaho fescue, Sandberg bluegrass, mossy stonecrop, curlleaf mountain mahogany and stiff sagebrush. Klicker soils consist of moderately deep, well drained soils on mountains, plateaus, and benches at elevations from 2,500 to 6,200 feet. Klicker soils are used mainly for timber production and wildlife habitat. Native vegetation is an open stand of ponderosa pine and Douglas-fir with an understory of bluebunch wheatgrass, slender wheatgrass, brome grass, elk sedge, Oregon-grape, common snowberry, Saskatoon serviceberry, creambush oceanspray, mallow ninebark and wild rose. McCartycreek soils consist of moderately deep, well-drained soils found on mountain backslopes and footslopes at elevations from 3,000 to 5,500 feet. McCartycreek soils are used for watershed, wildlife habitat, livestock grazing and recreation. Native vegetation is mountain big sagebrush, western serviceberry, bitter cherry, chokecherry, creamy buckwheat, low Oregon grape, mountain snowberry, scouler's willow, common yarrow, arrowleaf balsamroot, Gray's desert parsley, mint, Brown's peony, showy aster, bluebunch wheatgrass, and mountain brome. *Anatone-Klicker complex* (**203 acres**). Anatone soils consist of shallow, well drained soils found on mountain side slopes, ridgetops, hills, and plateaus at elevations of 2,000 to 6,200 feet. Anatone soils are mostly used for livestock grazing, wildlife habitat, and recreation. Native vegetation is mainly bluebunch wheatgrass, Idaho fescue, Sandberg bluegrass, mossy stonecrop, curlleaf mountain mahogany and stiff sagebrush. Klicker soils consist of moderately deep, well drained soils on mountains, plateaus, and benches at elevations from 2,500 to 6,200 feet. Klicker soils are used mainly for timber production and wildlife habitat. Native vegetation is an open stand of ponderosa pine and Douglas-fir with an understory of bluebunch wheatgrass, slender wheatgrass, brome grass, elk sedge, Oregon-grape, common snowberry, Saskatoon serviceberry, creambush oceanspray, mallow ninebark and wild rose. *Anatone extremely stony loam* (**117 acres**). Anatone soils consist of shallow, well drained soils found on mountain side slopes, ridgetops, hills, and plateaus at elevations of 2,000 to 6,200 feet. Anatone soils are mostly used for livestock grazing, wildlife habitat, and recreation. Native vegetation is mainly bluebunch wheatgrass, Idaho fescue, Sandberg bluegrass, mossy stonecrop, curlleaf mountain mahogany and stiff sagebrush. *Cowsly silt loam* (**58 acres**) *and Cowsly very stony silt loam* (**0.1 acre**). Cowsly soils consist of deep or very deep, moderately well drained soils found on plateaus at elevations from 2800 to 5000 feet. Cowsly soils are used primarily for timber production. Other uses are dryland small grain, pasture, wildlife habitat and water supply. Native vegetation is ponderosa pine and Douglas fir with an understory of spirea, ocean spray, snowberry, Idaho fescue, pinegrass and elksedge. *Gwinly very cobbly silt loam* (**174**). The Gwinly soils consist of shallow, well drained soils found on hills, plateaus, structural benches, mountains, and canyons at elevations from 1,400 to 4,600 feet. Used for livestock grazing and wildlife habitat. Potential native vegetation is dominantly bluebunch wheatgrass, Idaho fescue, Sandberg bluegrass and

low sagebrush.

Hall Ranch stony loam (**6,836**). Hall Ranch soils consist of moderately deep, well drained soils found on mountainous areas at elevations of 3,000 to 5,400 feet. Hall Ranch soils are used for timber production and rangeland. Native vegetation is ponderosa pine and Douglas fir with an understory of pinegrass and elk sedge.

Limberjim-Getaway-Rock Outcrop complex (**7**). Limberjim soils consist of deep, well drained soils on stable slopes of mountains, plateaus, canyons, and structural benches at elevations from 2,800 to 5,800 feet. Limberjim soils are used for timber production, watershed, recreation and wildlife habitat. Native vegetation is grand fir, western larch, lodgepole pine, Douglas fir, Rocky Mountain maple, twinflower, princes pine, big huckleberry, round-leaved violet, meadowrue, fragrant bedstraw, and fairybells. Getaway soils consist of deep, well drained soils found on mountain side slopes and canyon walls at elevations from 2,800 to 5,000 feet.

Olot-Crackercreek-Lowerbluff complex (**4**). Olot soils consist of moderately deep, well drained soils found on plateaus, canyons, mountains and structural benches at elevations typically between 2,800 to 5,000 feet. Olot soils are used mainly for timber production. Also used for wildlife habitat. Vegetation is western larch, Douglas fir, willow, mountain alder, common snowberry, elk sedge, and pinegrass. Crackercreek soils consist of deep, well drained soils on north- facing mountainsides and canyon walls at elevations from 3,200 to 4,800 feet. Crackercreek soils are used for woodland, watershed and wildlife habitat. The native vegetation is Douglas-fir, ponderosa pine, grand fir and western larch with an understory of pine grass, elk sedge, huckleberry and common snowberry. Lowerbluff soils consist of shallow, well drained soils usually found on summits of plateaus or structural benches at elevations of 2,800 to 5,700 feet. Lowerbuff soils are used for timber production, watershed, recreation, livestock grazing, and wildlife habitat. The native vegetation is Douglas fir, ponderosa pine, grand fir, common snowberry, spiraea, pinegrass, elk sedge, heartleaf arnica, strawberry, yarrow, and lupine.

Olot silt loam (**350**) and *Olot stony silt loam* (**3297**). Olot soils consist of moderately deep, well drained soils found on plateaus, canyons, mountains and structural benches at elevations typically between 2,800 to 5,000 feet. Olot soils are used mainly for timber production. Also used for wildlife habitat. Vegetation is western larch, Douglas fir, willow, mountain alder, common snowberry, elk sedge, and pinegrass.

Tolo silt loam (**1555**). Top soils consist of deep and very deep, well drained soils found on mountains at elevations ranging from 3,000 to 5,400 feet. Top soils are used mainly for timber production and cropland. Most areas with slopes of less than 15 percent have been cleared and are used for production for dryland grain and hay. Native vegetation is ponderosa pine, Douglas fir, white fir, pinegrass and elksedge. This series is in what is called the Douglas-fir forest plant community.

Veazie-Voats complex (**1**). Veazie soils consist of very deep, well drained soils found on flood plains broken by old stream channels at elevations of 750 to 4,000 feet. Veazie soils are used mainly for irrigated hay and pasture. Other uses are livestock grazing and wildlife. Native vegetation is bluebunch wheatgrass, basin wildrye, sedges, rushes and willows. Voats soils consist of very deep, well drained soils found on flood plains broken by old stream channels and occur at elevations of 1,600 to 4,000 feet. Voats soils are used mainly for pasture. Other uses are livestock grazing and wildlife habitat. Potential native vegetation is bluebunch wheatgrass, basin wildrye, timothy, Kentucky bluegrass, sedges, rushes, and scattered willow, alder, hawthorne, and rose.

Ramo silty clay loam (**3**). Ramo soils consist of very deep, well drained soils found on concave foot slopes at elevations of 2,800 to 3,800 feet. Ramo soils are used for hay, pasture, small grain and livestock grazing. Potential native vegetation is mainly Idaho fescue and bluebunch wheatgrass.

Hydrologic Features Present (SteamNet, NWI, NHD)	Property contains four intermittent streams per NHD. Rock Creek supports redband trout and ESA listed summer steelhead. Rock Creek supports migrating and spawning steelhead and provides rearing areas for fry and juveniles. NWI did not identify any wetland features outside those associated with riparian areas of NHD streams.
Adjacent land ownership, use, and condition	The entire eastern boundary of the property borders USFS lands and ranges from 1-3 miles from the Eagle Cap Wilderness. To the west are foothills dominated by dryland farming and open rangeland. The towns of Union and Cove are approximately 2 to 5 miles west of the property.
Infrastructure Density within or Near the Parcel (Qualitative Description)	The property contains roads that provide access throughout. The towns of Union and Cove are nearby to the west, with rural infrastructure development. The property and most lands to the north, south, and east are forested with no development other than access roads.
Summary	The property contains winter range for both elk and mule deer, as well as summer range for both species. The property is immediately north of Catherine Creek State Park. Little Catherine Creek crosses the property and is identified as critical habitat for Chinook salmon. Little Creek (critical habitat for steelhead downstream from the property) and its tributaries originate on or cross through the property. Timber harvest is the main use of the property today.
Pass/Fail Desktop Assessment?	Pass

Boardman to Hemingway Transmission Line Project

Consideration of Property as a Potential Mitigation Site

Mitigation Function	Given the size of the property, mitigation opportunities would likely be considered for smaller portions of the property. This mitigation site has been identified as in-kind and in-proximity mitigation for impacts on Category 2 elk and mule deer winter range within the forest/woodland general vegetation type. This mitigation site could help meet the Project need for elk and mule deer summer habitat as well. It contains important habitat features with opportunities to provide durable ecological uplift through implementation of standard mitigation actions. Opportunities to improve the watershed would benefit Chinook salmon and steelhead (Chinook salmon critical habitat occurs on the property). The mitigation actions listed below, upon successful implementation, will increase the quality of habitat available to elk and mule deer (among other species) within the mitigation site and result in an ecological uplift to the mitigation site above what is provided under the current management.
Mitigation Site Manager	Fee title acquisition with transfer of ownership to State of Oregon, Federal Land Management Agency, approved NPO or Land Trust
Mitigation Actions	The following are mitigation actions that may be implemented at this mitigation site in order to satisfy the mitigation policies/guidelines of the permitting agencies. All mitigation actions will follow reliable methods. The mitigation actions presented here are not comprehensive. Implementation will likely be some combination of one or more of the following: • *Livestock grazing restrictions* – historic grazing practices at this property are unknown. However, the objective would be to avoid grazing practices that would compete with native wildlife life history needs. Targeted grazing may be considered for habitat enhancement/treatment actions. • *Weed treatment* – the extent of noxious weed invasion on the mitigation site is unknown at this time but it is anticipated that opportunities exist to implement this mitigation action. • *Native revegetation/restoration* – the focus would be planting forage shrubs and bunchgrasses; forest management practices would be implemented to create structural diversity and enhance desirable habitat conditions. • *Road closure* – restrict motor vehicle use to just those roads that are necessary; seasonally close access based on use by elk and mule deer. • *Fire readiness* – efforts made to make the property more resistant to catastrophic fire and a fire response plan could be developed. • *Fence removal/fence upgrade* – opportunities are unknown at this time, but it is anticipated that some unnecessary fencing may be removed or necessary fencing can be upgraded to more wildlife friendly fencing, such as lay down fencing.
Monitoring	A specific plan for monitoring will be developed, but in general, mitigation progress will be monitored through vegetation plot monitoring and establishment of photo locations. Monitoring will occur annually for the first 3-5 years and an annual report will be produced. During the annual monitoring phase, a longer-term monitoring plan will be developed using similar protocols and methods to monitor the mitigation.

Success Criteria

Specific success criteria will be developed once baseline conditions have been determined and potential mitigation actions have been confirmed for the site. Success criteria may include but are not limited to:

- Vegetation plots show an increase in native vegetation cover and general trend toward increased habitat quality representing an ecological uplift.
- Successful weed control through documentation of a reduction in weeds and non-native invasive plant species.
- Mitigation success will not be dependent on documentation of increased use of the mitigation site by any wildlife species.

Financial Outline

Estimated Budget for the Mitigation Site

Action	Cost per Unit	Units	Years	Expense
One-time Costs				
Acquisition	?	1		?
50-year Operation and Management Costs				
O&M[1]	$53.75	14,886	50	$40,006,125
Total	**-**			**$?** (?/acre)[2]

[1] This O&M cost is an estimate of the cost per acre per year (not including acquisition/easement costs) based on the research presented in the Independent Economic Analysis Board's 2007 *Investigation of Wildlife O&M Costs*. The cost per acre identified in that study for the Elkhorn Wildlife Management Area (which this mitigation site will be modeled after) was $43 in 2004 dollars, this has been adjusted to reflect 2015 dollars.

[2] Cost per acre here includes cost of acquisition/easement and initial mitigation actions and long-term O&M for 50 years.

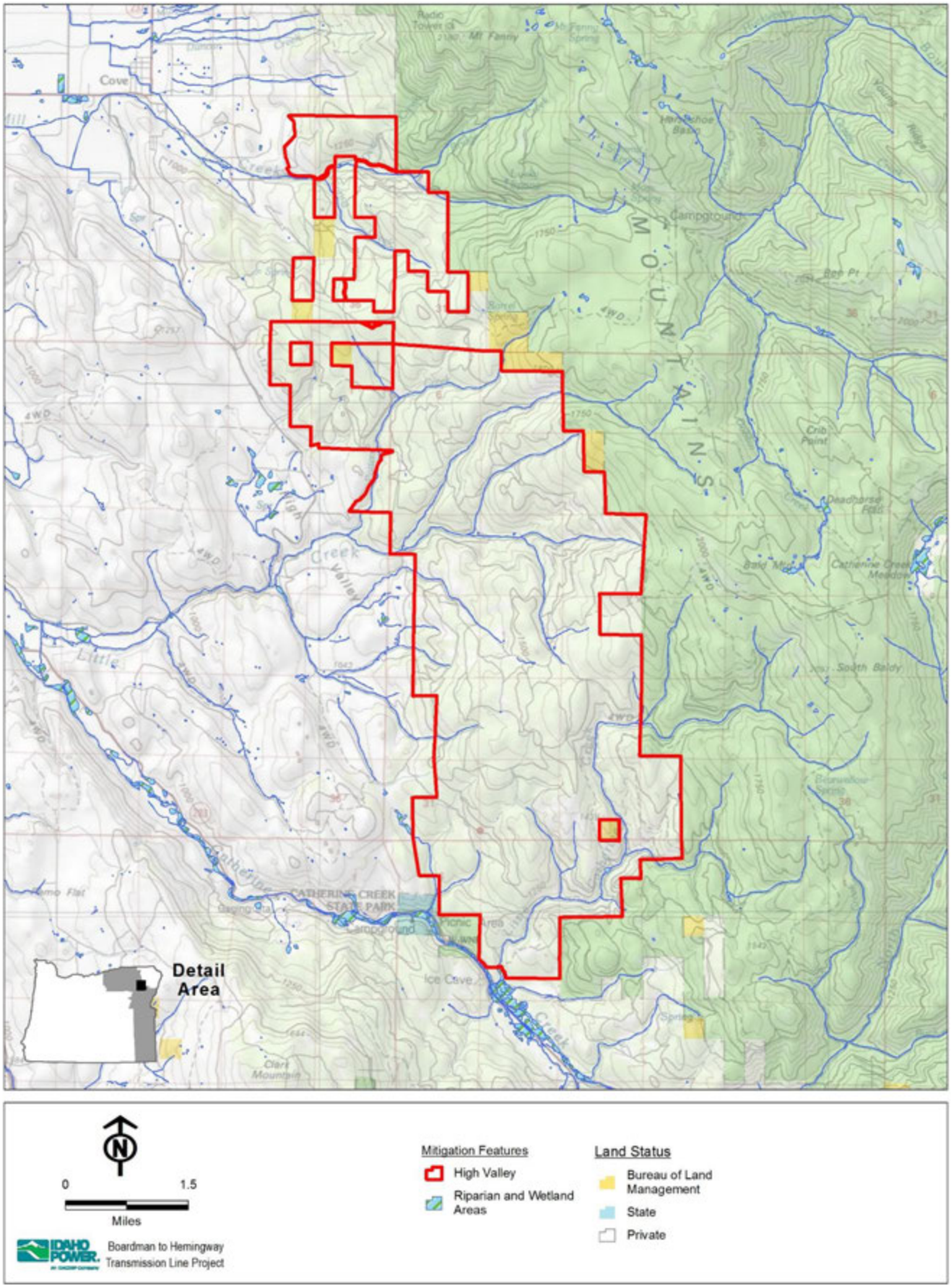

Figure 1. High Valley Ownership and Water

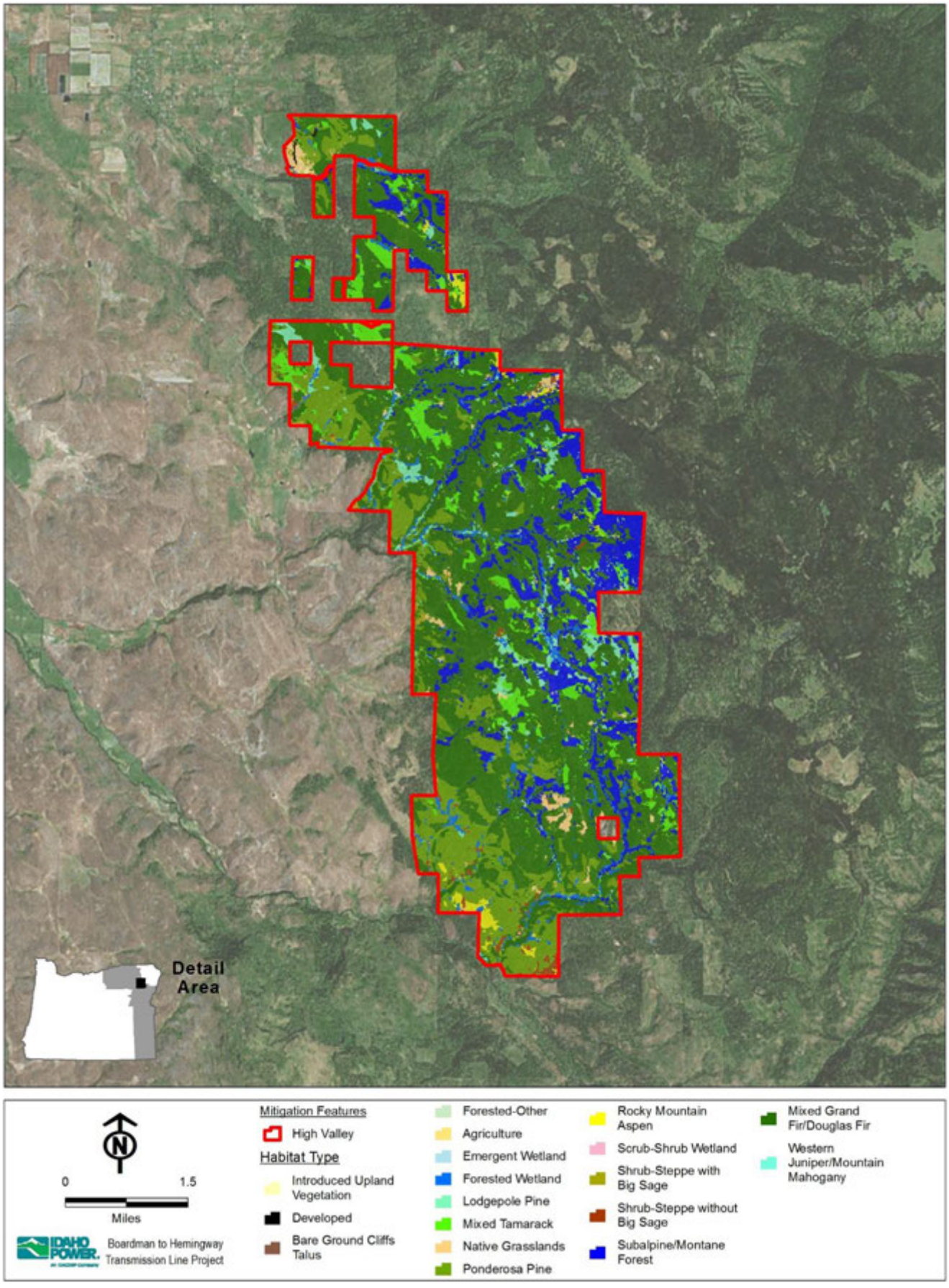

Figure 2. High Valley Habitat Types

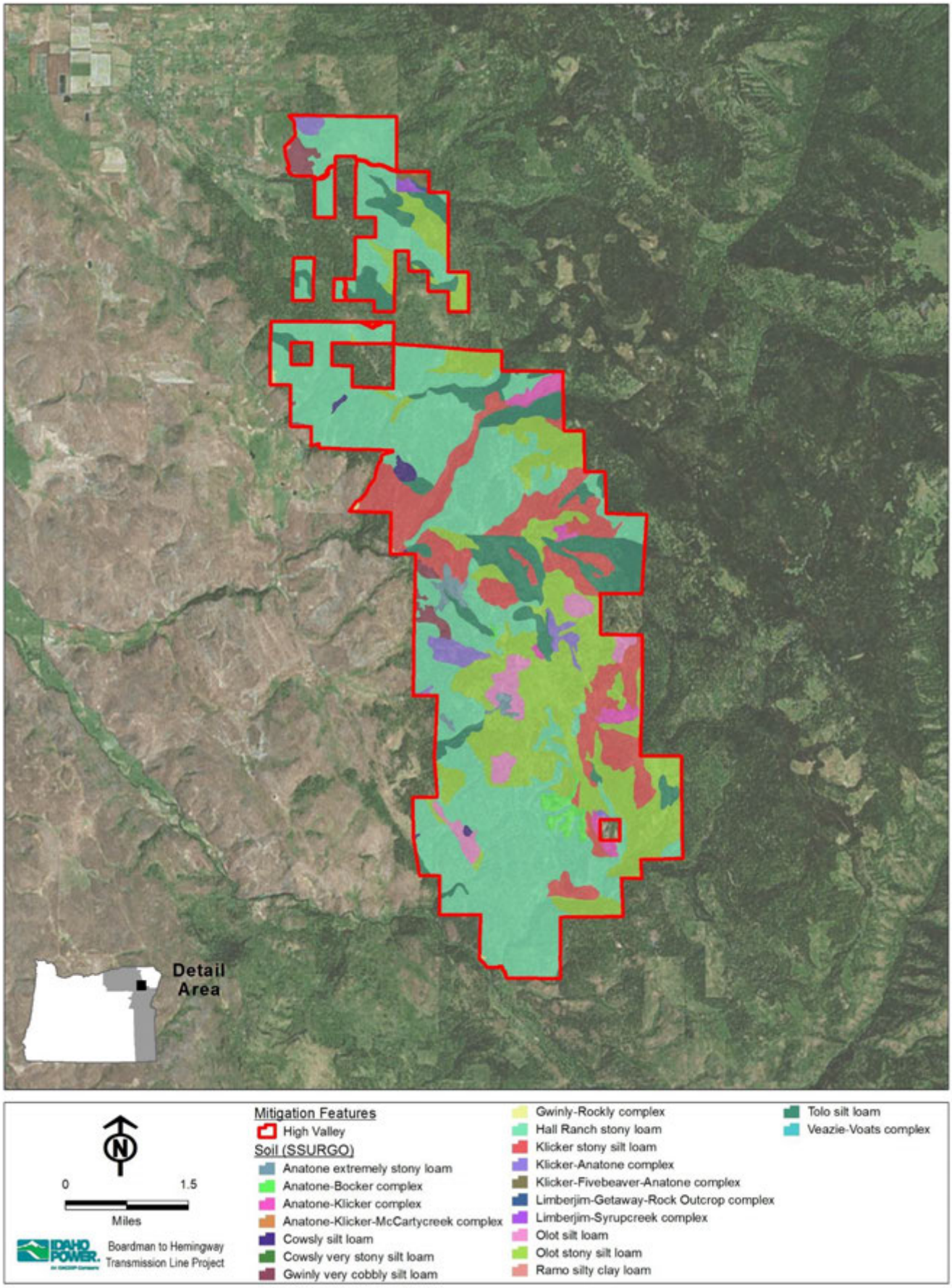

Figure 3. High Valley Soil Types

Habitat Mitigation Areas with Mitigation Zone 3

- Pole Creek
- Alder Creek
- Glasgow
- Trail Creek
- Upper Timber

Boardman to Hemingway Transmission Line Project

Desktop Habitat Mitigation Site Assessment Worksheet

Parcel Name: Pole Creek (**Figure 1**) **Date of Assessment:** 2/10/2016
Landowner: **Parcel Elevation (ft):** 4,100 – 5,100
Within Mitigation
Parcel Size in Acres: 3,233 **Service Area?:** Yes

Location Description
(County, miles and direction from known location, TRS, UTM, other):

Baker County, 3 miles west of Unity, OR.
T12S R36E Section 34, T13S R36E Sections 1, 2, 3, 10, 11, 12, & 15.

Vegetation Cover Classes (GAP[1], **Figure 2**)

HMP Habitat Category[2] and Type	HMP General Vegetation Type	Acres	% of Parcel	Wildlife Habitat[3]
Category 1				
Category 2		**3,233.2**	**100**	-
Shrub-Steppe with Big Sage	Shrub/Grassland	644.4	19.9	MDWR, MDSR, RMESR
Shrub-Steppe with Big Sage	Shrub/Grassland	685.7	21.2	MDWR, MDSR
Shrub-Steppe with Big Sage	Shrub/Grassland	43.3	1.3	MDWR
Mixed Grand Fir/Douglas Fir	Forest/Woodland	488.8	15.1	MDWR, MDSR, RMESR
Western Juniper/Mountain Mahogany Woodland	Forest/Woodland	432.0	13.4	MDWR, MDSR, RMESR
Western Juniper/Mountain Mahogany Woodland	Forest/Woodland	117.9	3.6	MDWR, MDSR
Ponderosa Pine	Forest/Woodland	380.7	11.8	MDWR, MDSR, RMESR
Ponderosa Pine	Forest/Woodland	3.4	0.1	MDWR, MDSR
Shrub-Steppe without Big Sage	Shrub/Grassland	172.8	5.3	MDWR, MDSR, RMESR
Shrub-Steppe without Big Sage	Shrub/Grassland	15.2	0.5	MDWR, MDSR
Shrub-Steppe without Big Sage	Shrub/Grassland	5.6	0.2	MDWR
Rocky Mountain Aspen	Forest/Woodland	89.8	2.8	MDWR, MDSR, RMESR
Rocky Mountain Aspen	Forest/Woodland	3.6	0.1	MDWR, MDSR
Forested Wetland	Open Water/Wetland	27.6	0.9	MDWR, MDSR, RMESR
Introduced Upland Vegetation	Shrub/Grassland	10.2	0.3	MDWR, MDSR, RMESR
Introduced Upland Vegetation	Shrub/Grassland	20.4	0.6	MDWR, MDSR

[1] USGS Gap Analysis Project (GAP) GIS data using ecological systems. Ecological systems were cross-walked to HMP Habitat Type as shown in the Habitat Categorization Matrix (Attachment P-2 of Exhibit P).

[2] Represents the habitat category based on overlap with wildlife habitat layers. Agriculture and Developed habitat types' categories are not modified by overlap with wildlife habitat.

[3] WAGS1 = Category 1 habitat consisting of the active ground squirrel colony which is defined as single or cluster of holes as well as the required habitat for squirrel survival (785 feet from the edge of the extent of active holes). WAGS2 = Category 2 habitat consisting of the area of potential Washington ground squirrel use (1.5km from the edge of the WAGS1 area in similar habitat type and quality). MDWR = Category 2 habitat for ODFW mule deer winter range.

[4] Total acres of habitat type will not match actual parcel size due to resolution of the GAP raster dataset.

Vegetation Cover Classes cont. (GAP[1])

HMP Habitat Category[2] and Type	HMP General Vegetation Type	Acres	% of Parcel	Wildlife Habitat[3]
Category 2 cont.				
Emergent Wetland	Open Water/Wetland	10.0	0.3	MDWR, MDSR, RMESR
Native Grasslands	Shrub/Grassland	9.9	0.3	MDWR, MDSR, RMESR
Native Grasslands	Shrub/Grassland	44.6	1.4	MDWR, MDSR
Scrub-Shrub Wetland	Open Water/Wetland	9.8	0.3	MDWR, MDSR, RMESR
Lodgepole Pine	Forest/Woodland	7.3	0.2	MDWR, MDSR, RMESR
Subalpine/Montane Forest	Forest/Woodland	4.4	0.1	MDWR, MDSR, RMESR
Remaining	-	5.8	0.2	-
Category 3				-
Category 4				-
Category 5				-
Category 6				-
Total		**3,233.2**	**100**	**-**

[1] USGS Gap Analysis Project (GAP) GIS data using ecological systems. Ecological systems were cross-walked to HMP Habitat Type as shown in the Habitat Categorization Matrix (Attachment P-2 of Exhibit P).

[2] Represents the habitat category based on overlap with wildlife habitat layers. Agriculture and Developed habitat types' categories are not modified by overlap with wildlife habitat.

[3] MDWR = Category 2 habitat for ODFW mule deer winter range; RMESR = Category 3 habitat for Rocky Mountain Elk Foundation Rocky Mountain elk summer range; MDSR = Category 3 habitat for WAFWA mule deer summer range.

Soil types

The NRCS Soil Survey Geographic Database (SSURGO) data was reviewed and the following soils were identified on the property (**Figure 3**):

Ateron-Roostercomb extremely gravelly clay loams (**718 acres**). Ateron soils consist of shallow, well drained soils found on ridge tops and side slopes of hills and mountains at elevations of 3,600 to 5,800 feet. Ateron soils are used for livestock grazing. The native vegetation is mountain big sagebrush, Idaho fescue, bluebunch wheatgrass, and Sandberg bluegrass. Roostercomb soils consist of moderately deep, well drained soils found on stable to meta-stable side slopes of hills with elevations ranging from 3,800 to 5,700 feet. Roostercomb soils are used for rangeland and wildlife habitat. The native vegetation is mainly mountain big sagebrush, threetip sagebrush, squaw apple, antelope bitterbrush, Idaho fescue, bluebunch wheatgrass and Sandberg bluegrass.

Ateron very stony loam (**505 acres**). Ateron soils consist of shallow, well drained soils found on ridge tops and side slopes of hills and mountains at elevations of 3,600 to 5,800 feet. Ateron soils are used for livestock grazing. The native vegetation is mountain big sagebrush, Idaho fescue, bluebunch wheatgrass, and Sandberg bluegrass.

Damore-Silvies silt loams (**0.1 acre**). Damore soils consist of deep, somewhat poorly drained soils found on flood plains with elevations ranging from 3,700 to 5,000 feet. Damore soils are mostly used for meadow hay production and pasture. The native vegetation is mainly tufted hairgrass, sedge, and Baltic rush. Silvies soils consist of very deep, poorly drained soils found on flood plains and in basins at elevations of 3,300 to 5,000 feet. Silvies soils are mostly used for meadow hay production and pasture. The native vegetation is sedges and rushes.

Soil types (cont.)

Hall Ranch stony loam (**151 acres**). Hall Ranch soils consist of moderately deep, well drained soils found in mountainous areas at elevations of 3,000 to 5,400 feet. Hall

Ranch soils are used as timber production and rangeland. Native vegetation is ponderosa pine and Douglas fir with an understory of pinegrass and elk sedge.

Klicker-Fivebit complex (**473 acres**). Klicker soils consist of moderately deep, well drained soils on mountains, plateaus, and benches at elevations from 2,500 to 6,200 feet. Klicker soils are used mainly for timber production and wildlife habitat. Native vegetation is an open stand of ponderosa pine and Douglas-fir with an understory of bluebunch wheatgrass, slender wheatgrass, brome grass, elk sedge, Oregon-grape, common snowberry, Saskatoon serviceberry, creambush oceanspray, mallow ninebark and wild rose. Fivebit soils consist of shallow, well drained soils found on ridgetops and side slopes of mountains, plateaus, canyons, and structural benches at elevations from 2,800 to 6,200 feet. Fivebit soils are used for livestock grazing, recreation, water supply, and wildlife habitat. The vegetation is mainly curlleaf mountain mahogany, western juniper, scattered ponderosa pine, mountain big sagebrush, bitterbrush, squaw apple, wax currant, bluebunch wheatgrass, Idaho fescue, Sandberg bluegrass, some elk sedge and pinegrass, and arrowleaf balsamroot.

Marack-Badland complex (**58 acres**). Marack soils consist of deep, well drained soils found on old terraces at elevations ranging from 3,800 to 4,400 feet. Marack soils are used for rangeland. The native vegetation is Idaho fescue, bluebunch wheatgrass, Mountain big sagebrush, basin big sagebrush, and prairie junegrass. Badlands are a type of dry terrain where softer sedimentary rocks and clay-rich soils have been extensively eroded by wind and water. They are characterized by steep slopes, minimal vegetation, lack of a substantial regolith, and high drainage density. They can resemble malpaís, a terrain of volcanic rock. Canyons, ravines, gullies, buttes, mesas, hoodoos and other such geological forms are common in badlands.

Marack gravelly silty clay loam (**186 acres**). Marack soils consist of deep, well drained soils found on old terraces at elevations ranging from 3,800 to 4,400 feet. Marack soils are used for rangeland. The native vegetation is Idaho fescue, bluebunch wheatgrass, Mountain big sagebrush, basin big sagebrush, and prairie junegrass.

Marack silt loam (**51 acres**). Marack soils consist of deep, well drained soils found on old terraces at elevations ranging from 3,800 to 4,400 feet. Marack soils are used for rangeland. The native vegetation is Idaho fescue, bluebunch wheatgrass, Mountain big sagebrush, basin big sagebrush, and prairie junegrass.

Marack very gravelly silty clay loam (**25 acres**). Marack soils consist of deep, well drained soils found on old terraces at elevations ranging from 3,800 to 4,400 feet. Marack soils are used for rangeland. The native vegetation is Idaho fescue, bluebunch wheatgrass, Mountain big sagebrush, basin big sagebrush, and prairie junegrass.

McGarr-Kahler complex (**497 acres**). Marack soils consist of deep, well drained soils found on old terraces at elevations ranging from 3,800 to 4,400 feet. Marack soils are used for rangeland. The native vegetation is Idaho fescue, bluebunch wheatgrass, Mountain big sagebrush, basin big sagebrush, and prairie junegrass. Kahler soils consist of deep and very deep, well drained soils found on back slopes of plateaus, canyons, hills, and mountains at elevations ranging from 2,000 to 6,000 feet. Kahler soils are used for timber production, limited cropland, livestock grazing, watershed, recreation, and wildlife habitat. Many areas with slopes of less than 15 percent have been cleared and produce dryland hay and grain, or irrigated crops. The native vegetation is mainly ponderosa pine, Douglas fir, pinegrass and elk sedge.

Soil types (cont.)	*Roostercomb-Longbranch complex* (**492 acres**). Roostercomb soils consist of moderately deep, well drained soils found on stable to meta-stable side slopes of hills with elevations ranging from 3,800 to 5,700 feet. Roostercomb soils are used for rangeland and wildlife habitat. The native vegetation is mainly mountain big sagebrush, threetip sagebrush, squaw apple, antelope bitterbrush, Idaho fescue, bluebunch wheatgrass and Sandberg bluegrass. Longbranch soils consist of deep, well drained soils found on stable to meta-stable north-facing side slopes of hills with elevations ranging from 3,800 to 5,700 feet. Longbranch soils are used for rangeland and wildlife habitat. The native vegetation is mainly mountain big sagebrush, wax currant, Idaho fescue and basin wildrye with minor amounts of prairie junegrass and green rabbitbrush. *Snell-Ateron complex* (**74 acres**). Snell soils consists of moderately deep, well drained soils on hills, plateaus, mountains and on canyon walls at elevations of 2,000 to 6,800 feet, mainly on north and east exposures and on south exposures at higher elevations. Snell soils are used for livestock grazing and wildlife habitat. Potential native vegetation is bluebunch wheatgrass, Idaho fescue, and Sandberg bluegrass. Ateron soils consist of shallow, well drained soils found on ridge tops and side slopes of hills and mountains at elevations of 3,600 to 5,800 feet. Ateron soils are used for livestock grazing. The native vegetation is mountain big sagebrush, Idaho fescue, bluebunch wheatgrass, and Sandberg bluegrass. *Xeric Torriorthents* (**2 acres**). Torriorthents are the dry Orthents of cool to hot, arid regions. They have an aridic (or torric) moisture regime. Orthents are primarily Entisols on recent erosional surfaces. The erosion may be geologic or may have been induced by cultivation, mining, or other factors. Any former soil that was on the landscape has been completely removed or so truncated that the diagnostic horizons for all other orders do not occur.
Hydrologic Features Present (SteamNet, NWI, NHD)	Property contains a perennial stream, Pole Creek, and an unnamed intermittent tributary. Powell Gulch also contains an intermittent stream feature. The southeast corner of the property crosses over the South Fork Burnt River just below Whited Reservoir. Wetland features exist along the streams, including some man made impoundments.
Adjacent land ownership, use, and condition	The property borders USFS lands to the west, with a small BLM in holding also sharing a boundary. The remainder of the property borders private lands, which appear to be mostly open rangeland in the foothills west of Unity, OR. Agriculture and pastures also occur west of the property around Unity.
Infrastructure Density within or Near the Parcel (Qualitative Description)	Property has a 4,000 square foot log home and a large 5,000 square foot shop. A transmission line is located just west of the property and a substation is less than 2 miles west of the property. A well maintained county road, Cemetery Road, runs along the western border and HWY 26 is within 1 mile of the property.
Summary	Property is within The Nature Conservancy Ecoregional Assessment (Monument Rock Area). An ODFW Conservation Opportunity Area (North Fork Malheur-Monument Rock area) overlaps a very small portion of the property near Buck Mountain. This conservation actions listed in the Oregon Conservation Strategy for this area include: 1) Initiate or continue wet meadow conservation and restoration efforts; 2) Maintain and enhance aspen stands; 3) Maintain or restore riparian habitat and ecological function; 4) Ensure sufficient habitat complexity for wildlife; 5) Restore and maintain complex, continuous sage habitat; 6) Restore and maintain grassland habitat; and 7) Restore and maintain ponderosa pine habitats. Property contains mule deer winter and summer range and elk summer range.
Pass/Fail Desktop Assessment?	Pass

Boardman to Hemingway Transmission Line Project

Consideration of Property as a Potential Mitigation Site

Mitigation Function	This mitigation site has been identified as in-kind and in-proximity mitigation for impacts on Category 2 mule deer winter range within the shrub/grass general vegetation type. It also provides opportunity for shrub/grass and forest/woodland mitigation of Category 3, 4, & 5 habitats. It contains important habitat features that could be preserved and has some uplift opportunities that could be achieved through implementation of standard mitigation actions. The mitigation actions listed below, upon successful implementation, will increase the quality of habitat available to sage-grouse, elk, and deer (among other species) within the mitigation site and result in an ecological uplift to the mitigation site above what is provided under the current management.
Mitigation Site Manager	Fee title acquisition with transfer of ownership to, State of Oregon, Federal Land Management Agency, approved NPO or Land Trust.
Mitigation Actions	The following are mitigation actions that may be implemented at this mitigation site in order to satisfy the mitigation policies/guidelines of the permitting agencies. All mitigation actions will follow reliable methods. The mitigation actions presented here are not comprehensive. Implementation will likely be some combination of one or more of the following: • *Livestock grazing restrictions* – avoid grazing practices that would compete with native wildlife life history needs. Targeted grazing may be considered for habitat enhancement/treatment actions. • *Fence Removal/Marking* – opportunities are unknown at this time, but it is anticipated that some unnecessary fencing may be removed or necessary fencing can be upgraded to more wildlife friendly fencing. • *Weed treatment* – the extent of noxious weed invasion on the mitigation site is unknown at this time but it is anticipated that opportunities exist to implement this mitigation action. • *Native revegetation/restoration* – focus of efforts would be to promote establishment of forage shrubs and bunchgrasses; opportunities exist but have not been specifically identified at this time. • *Fire readiness* – efforts made to make the property more resistant to catastrophic fire and a fire response plan could be developed. • *Juniper removal* – review of aerial photography shows juniper/conifer encroachment into sagebrush habitat, some opportunity may exists for long-term maintenance of encroachment.
Monitoring	A specific plan for monitoring will be developed, but in general, mitigation progress will be monitored through vegetation plot monitoring and establishment of photo locations. Monitoring will occur annually for the first 3-5 years and an annual report will be produced. During the annual monitoring phase, a longer-term monitoring plan will be developed using similar protocols and methods to monitor the mitigation actions at larger time intervals (i.e., 5 years, 10 years).

Success Criteria

Specific success criteria will be developed once baseline conditions have been determined and potential mitigation actions have been confirmed for the site. Success criteria may include but are not limited to:

- Vegetation plots show an increase in native vegetation cover and general trend toward increased habitat quality representing an ecological uplift.
- Successful weed control through documentation of a reduction in weeds and non-native invasive plant species.
- Mitigation success will not be dependent on documentation of increased use of the mitigation site by WAGS or any other wildlife species.

Financial Outline

Estimated Budget for the Pole Creek Mitigation Site

Action	Cost per Unit	Units	Years	Expense
One-time Costs				
Acquisition	1,400,000	1		1,400,000
Recurring Costs (Annually)				
O&M[1]	30	3,233	50	4,849,500
Total	**-**			**$6,249,500** ($1,933/acre)[2]

[1] This O&M cost is an estimate of the cost per acre per year (not including acquisition/easement costs) based on the research presented in the Independent Economic Analysis Board's 2007 *Investigation of Wildlife O&M Costs*. The average cost per acre presented in that document was $24 in 2004 dollars, this has been adjusted to reflect 2015 dollars.

[2] Cost per acre here includes cost of acquisition/easement and initial mitigation actions and long-term O&M for 50 years.

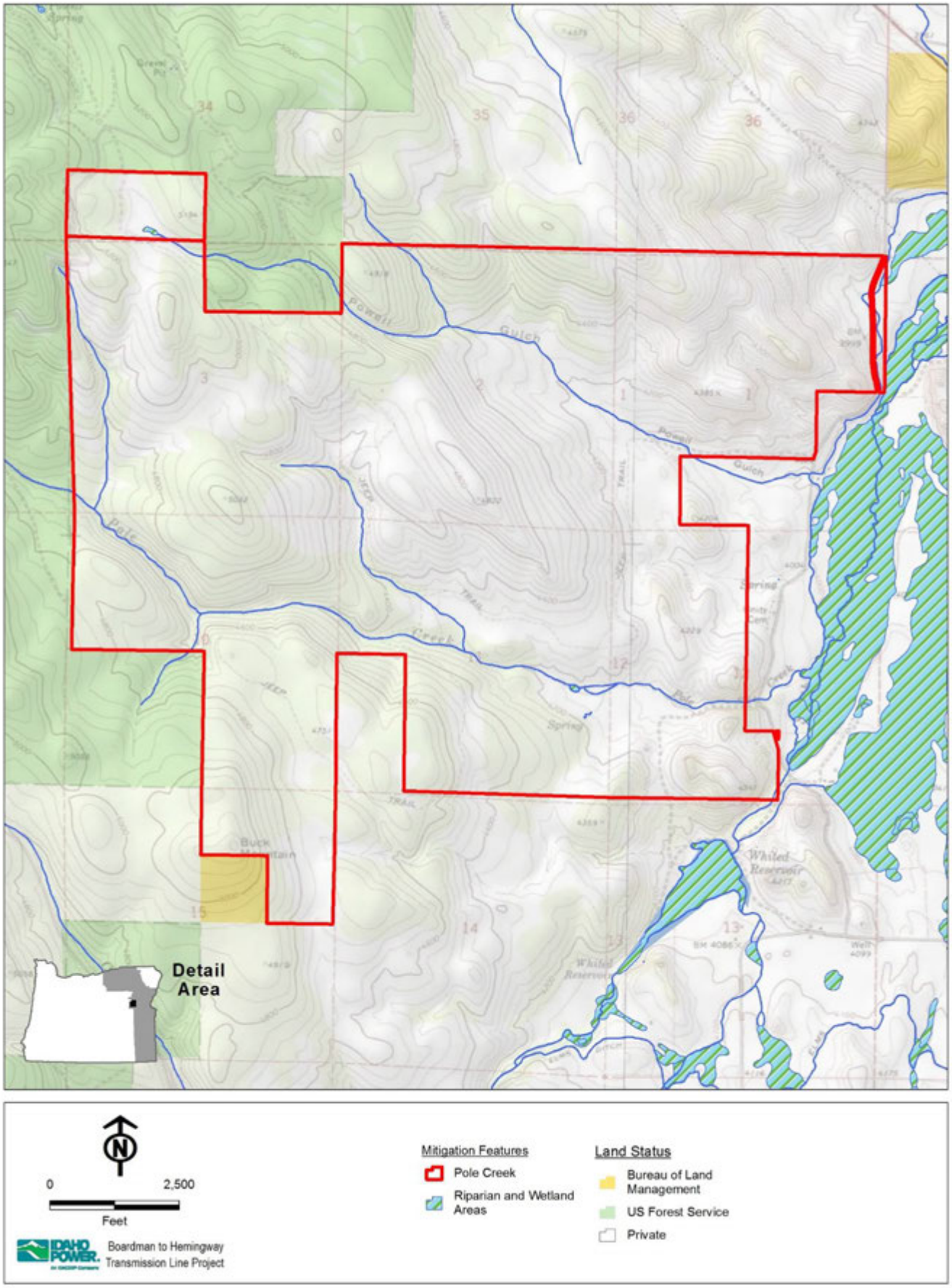

Figure 1. Pole Creek Ownership and Water

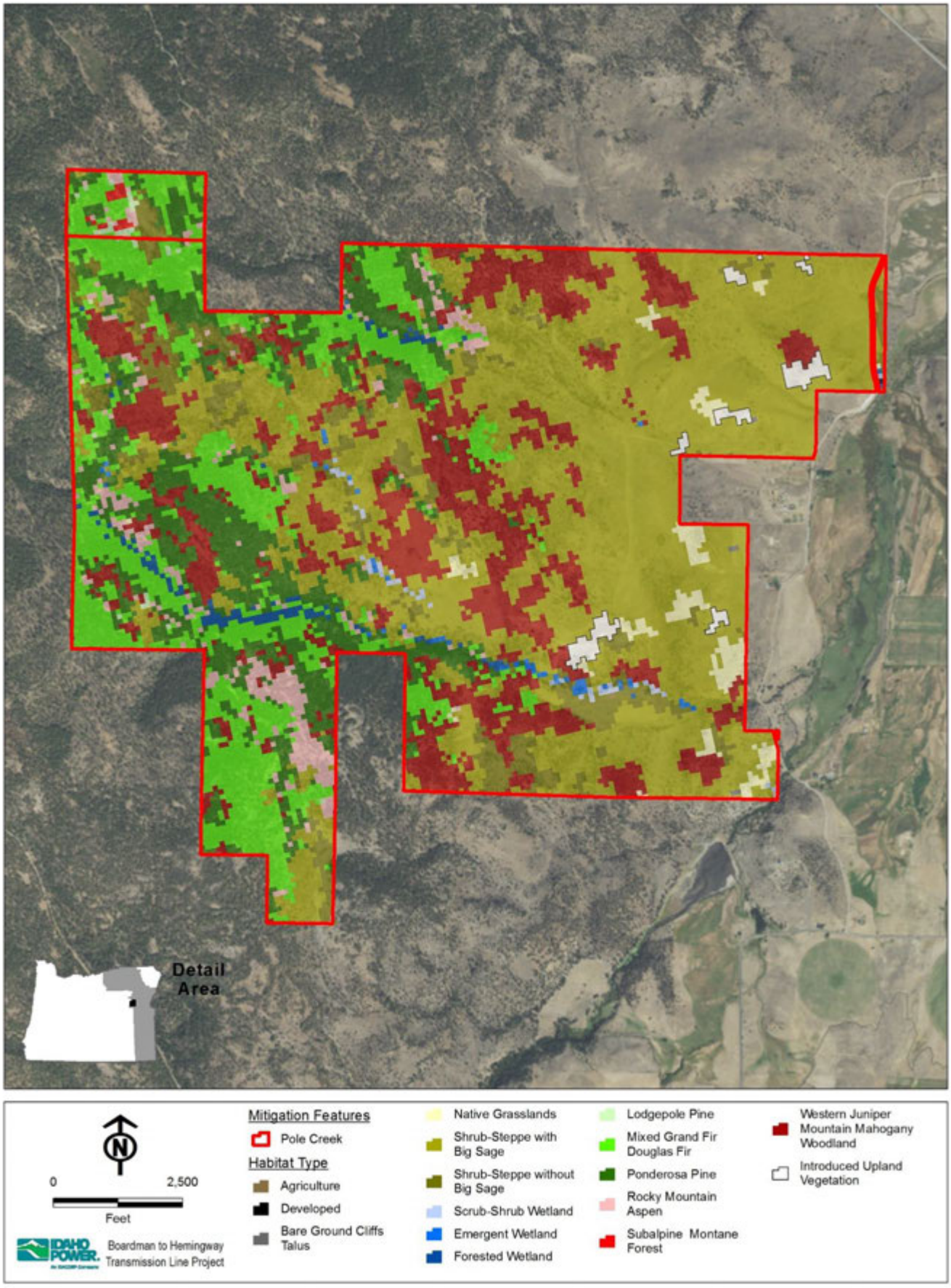

Figure 2. Pole Creek Habitat Types

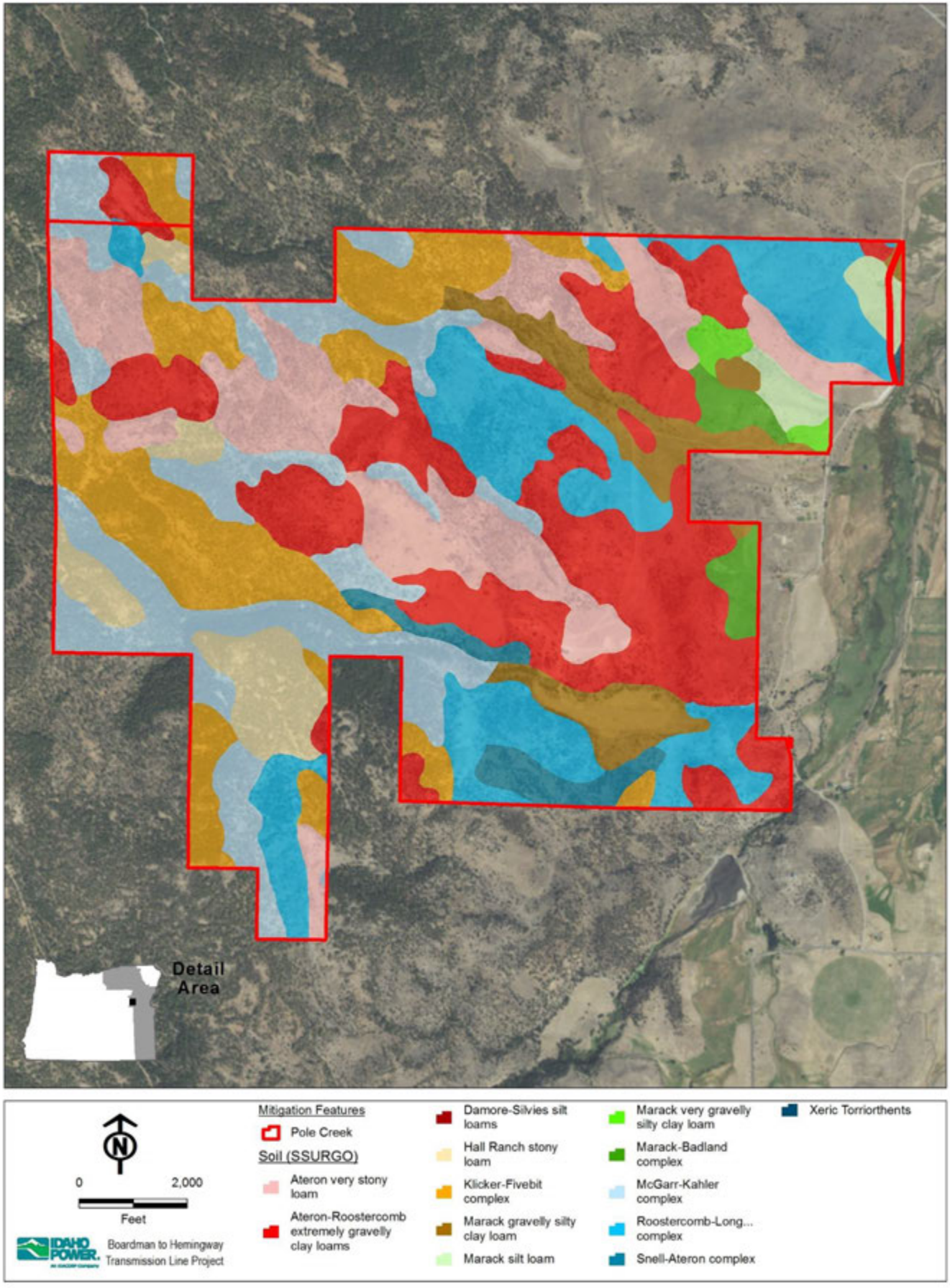

Figure 3. Pole Creek Soil Types

Boardman to Hemingway Transmission Line Project

Desktop Habitat Mitigation Site Assessment Worksheet

Parcel Name: Alder Creek
Landowner:
Parcel Size in Acres: 3,081
Date of Assessment: 9/11/2014
Parcel Elevation (ft): 3,700 – 4,450
Within Mitigation Service Area?: Yes

Location Description
(County, miles and direction from known location, TRS, UTM, other):

Baker County, approximately 20 miles northwest of Brogan, 20 miles southwest of Durkee.
T13S R40E Sections 14, 15, 16, 21, 22, 23, 26, 27, 28 (**Figure 1**)

Vegetation Cover Classes (GAP[1], **Figure 2**)

HMP Habitat Category[2] and Type	HMP General Vegetation Type	Acres	% of Parcel	Wildlife Habitat[3]
Category 1		**0**	**0**	
Category 2		**0**	**0**	-
Shrub-Steppe with Big Sage	Shrub/Grass	1,452.3	49.3	RMEWR
Shrub-Steppe with Big Sage	Shrub/Grass	294.1	10.0	RMEWR, MDWR
Introduced Upland Vegetation	Shrub/Grass	258.1	8.8	RMEWR
Introduced Upland Vegetation	Shrub/Grass	233.7	7.9	RMEWR, MDWR
Shrub-Steppe without Big Sage	Shrub/Grass	213.7	7.3	RMEWR
Shrub-Steppe without Big Sage	Shrub/Grass	171.6	5.8	RMEWR, MDWR
Native Grasslands	Shrub/Grass	41.2	1.4	RMEWR
Native Grasslands	Shrub/Grass	27.0	0.9	RMEWR, MDWR
Bare Ground Cliffs Talus	Bare Ground	5.6	0.2	RMEWR
Bare Ground Cliffs Talus	Bare Ground	1.3	0.0	RMEWR, MDWR
Emergent Wetland	Wetland	3.4	0.1	RMEWR
Emergent Wetland	Wetland	13.5	0.5	RMEWR, MDWR
Desert Shrub	Shrub/Grass	0.4	0.0	RMEWR
Desert Shrub	Shrub/Grass	12.2	0.4	RMEWR, MDWR
Forested Wetland	Wetland	0.2	0.0	RMEWR
Forested Wetland	Wetland	0.7	0.0	RMEWR, MDWR
Western Juniper	Forest/Woodland	13.8	0.5	RMEWR, MDWR
Ponderosa Pine	Forest/Woodland	4.4	0.2	RMEWR, MDWR
Scrub-Shrub Wetland	Wetland	1.1	0.0	RMEWR, MDWR
Rocky Mountain Aspen	Forest/Woodland	0.2	0.0	RMEWR, MDWR
Mixed Grand Fir / Douglas Fir	Forest/Woodland	0.2	0.0	RMEWR, MDWR
Category 3		**0**	**0**	-
Category 4		**0**	**0**	-
Category 5		**0**	**0**	-
Category 6		**198.3**	**6.7**	
Agriculture	Agriculture/ Developed	194.5	6.6	RMEWR
Developed	Agriculture/ Developed	3.8	0.1	RMEWR
Total[4]	**NA**	**2,947.1**	**100**	**-**

[1] USGS Gap Analysis Project (GAP) GIS data for ecological systems. Ecological systems were cross-walked to HMP Habitat Type as shown in Exhibit P1, Attachment P1-1 Habitat Categorization Matrix.
[2] Represents the habitat category based on overlap with wildlife habitat layers. Agriculture and Developed habitat types' categories are not modified by overlap with wildlife habitat.
[3] RMEWR = Category 2 habitat for ODFW Rocky Mountain elk winter range. MDWR = Category 2 habitat for ODFW mule deer winter range.
[4] Total acres of habitat type may not match actual parcel size due to resolution of the GAP raster dataset. Pixels of the raster dataset were not simplified or smoothed to match the exact shape of the parcel boundary.

Hydrologic Features Present (SteamNet, NWI, NHD)	One perennial (Alder Creek) and four intermittent streams (NHD). Some spring and emergent wetlands not associated with the NHD streams are identified in the NWI dataset.
Adjacent land ownership, use, and condition	Property is bordered by both BLM and private lands. Land use is mostly rangeland with some agricultural developments. A majority of the adjacent landscape is classified as intermountain basins big sagebrush-steppe by GAP.
Infrastructure Density within or Near the Parcel (Qualitative Description)	Per the real estate listing, the property contains dwellings, shop, multiple large hay sheds, center pivot irrigation, and a livestock processing facility. HWY 26 and an existing transmission line are 5 miles to the south; state route 245 is approximately 4 miles to the north. Otherwise, the landscape is open rangeland.
Soil type, soil temperature and moisture regime (NRCS 2014)	Detailed SSURGO data is not available for this portion of Malheur County. STATSGO2 identifies the property is within the Ruclick-Ruckles-Lookout mapunit. Ruckles soils are shallow. They have a surface layer of very dark grayish brown very stony clay loam and a subsoil of dark brown very stony clay. These soils are on south- and west-facing slopes of 2 to 70 percent. Ruclick soils are moderately deep. They have a surface layer of very dark grayish brown very cobbly silt loam and a subsoil of dark brown very cobbly and extremely cobbly clay. These soils are on all aspects of the terrain at a slope of 2 to 70 percent. Lookout soils are moderately deep to a duripan. They have a surface layer mainly of very dark grayish brown very cobbly silt loam and a subsoil of dark yellowish brown clay over a duripan. In some areas the surface layer is silt loam. These soils are on hilltops and benches with slopes of 2 to 12 percent. The soils in this unit are used mainly for livestock grazing. The unit also provides habitat for many kinds of wildlife. In the areas used for livestock grazing, the main limitations are the very cobbly or very stony surface layer and the slope of the Ruckles and Rucklick soils. The temperature regime is Mesic and the moisture regime is Aridic bordering on Xeric (Warm/Dry bordering on Moist). This area is identified as having low relative resilience and resistance to disturbances (drought, fire, invasive species).

NRCS. 2014. Sage Grouse Management Zones Soil Taxonomic Temperature and Moisture Regimes. GIS Dataset.

Summary	The property is in sage-grouse core area within the Cow Valley PAC. According to Alternative D of the Oregon Sub-Region SAGR FEIS (Chapter 2, Figure 2-4), this property is located within or immediately adjacent to three proposed Sage-Grouse Strategic Areas: Climate Change Consideration Area – identified as higher elevation areas of high quality habitat likely to provide habitat over the long-term; Restoration Opportunity Area – within existing habitat where restoration would increase habitat quality and connectivity; and High-density Breeding Area – high quality habitat with a high density of active lek sites. The property is also completely within elk winter range and elk summer range and the northern 1/3 of the property is within mule deer winter range. Year-round springs, perennial stream (Alder Creek), and emergent wetlands increase the value of the property to wildlife in the arid landscape as well as provide potential for watershed improvement projects. GAP data indicates that introduced upland vegetation is present on site and could provide upland habitat restoration opportunities. Weed treatment and revegetation opportunities are available across the entire property but are abundant in areas currently in agricultural production and where livestock congregate. Opportunity areas generally coincide with habitat identified as Agriculture and/or Introduced Upland Vegetation by the GAP dataset (**Figure 2**). Western juniper woodlands are encroaching into sagebrush habitats on the parcel.
Pass/Fail Assessment?	Pass

Boardman to Hemingway Transmission Line Project

Consideration of Property as a Potential Mitigation Site

Mitigation Function	This mitigation site has been identified as in-kind and in-proximity mitigation for impacts on both Category 1 and category 2 sage-grouse core area habitat and Category 2 elk and mule deer winter range within the shrub/grass general vegetation type. Areas where sage-grouse habitat and big game winter range overlap are typically shrub-steppe and native grassland types with a continuous or mosaic big sagebrush component. The mitigation site contains important habitat features with ample opportunities to provide durable ecological uplift through implementation of standard mitigation actions. The mitigation actions listed below, upon successful implementation, will increase the quality of habitat available to sage-grouse and big game (among other species) within the mitigation site and result in an ecological uplift to the mitigation site above what is provided under the current management.
Mitigation Site Manager	Fee title acquisition with transfer of ownership to State of Oregon, Federal Land Management Agency, approved NPO or Land Trust
Mitigation Actions	The following are mitigation actions that IPC may consider implementing at this mitigation site in order to satisfy the mitigation policies/guidelines of the permitting agencies. All mitigation actions will follow reliable methods and be conducted as necessary to maintain desired habitat conditions throughout the life of the Project impacts. The mitigation actions presented here are not comprehensive. Implementation will likely be some combination of one or more of the following: • *Juniper/Conifer Removal* – There are approximately 300-450 acres of shrub-steppe and introduced upland vegetation where juniper encroachment is occurring (**Figure 3**). The juniper stands appear to be Phase I consisting of early successional young trees at very low density. Opportunity for spot-treating single trees occurs throughout the property. • *Modification of Livestock Grazing* – this would benefit a majority of the mitigation site as grazing has reduced native plant cover and has likely been a contributor to dispersal of non-native/invasive plant species across the site. In addition, livestock grazing may be incompatible with the short-term success of some of the mitigation actions identified, such as seeding of native plant species. Long-term maintenance of the mitigation site may consider domestic livestock grazing as a management tool. • *Fence Removal/Marking/Upgrade* – the mitigation site has approximately 60,000 feet of cross fencing (**Figure 3**) that can be removed. Fence removal would reduce the potential for wildlife injuries/mortalities from collisions. Fencing acts as a source of weed establishment through accumulation of windblown weeds. Fences provide perching opportunity for raptors and corvids. Marking of perimeter fencing in areas of concern would allow sage-grouse and other wildlife to more effectively visualize the fence and avoid collisions. Fences maintained on the mitigation site can be upgraded to a more wildlife friendly design that reduces the likelihood of significant injury during crossing events. • *Weed treatment* – the extent of noxious weed invasion on the mitigation site is unknown at this time but it is anticipated that opportunities exist to implement this mitigation action. Opportunities likely exist in areas identified for native seeding (**Figure 3**), along fence lines, within livestock handling facilities, near the residence, and other outbuildings/haysheds etc.

Mitigation Actions (cont.)	• *Native seeding/revegetation* – opportunity exists to seed native plant species in areas currently in agriculture and lowland areas adjacent to drainages where cattle have congregated. These areas cover approximately 300 acres of the mitigation site (**Figure 3**). Other seeding opportunities are available throughout the mitigation site. • *Wetland/Spring/Riparian Improvement* – drainages and riparian/wetland areas on the mitigation site are currently lacking native vegetation components. Opportunities exist to modify/improve water resources (channel modification, erosion control, vegetation treatment/plantings) on the mitigation site to reflect a more natural state and to provide water to mitigation action areas as needed to ensure success. There is approximately 3-8 miles of riparian corridor within the mitigation site and several acres of wetlands.
Monitoring	A specific plan for monitoring will be developed, but in general, mitigation progress will be monitored through vegetation plot monitoring and establishment of photo locations. Monitoring will occur annually for the first 3-5 years and an annual report will be produced. During the annual monitoring phase, a longer-term monitoring plan will be developed using similar protocols and methods to monitor the mitigation actions at larger time intervals (i.e., 5 years, 10 years).
Success Criteria	Specific success criteria will be developed once baseline conditions have been determined and potential mitigation actions have been confirmed for the site. Success criteria may include but are not limited to: • Vegetation plots show an increase in native vegetation cover and general trend toward increased habitat quality representing an ecological uplift. • Successful weed control through documentation of weed reduction. • Natural recruitment of sagebrush into areas currently in Agriculture or Introduced Upland Vegetation that were seeded to native plant species. • Successful juniper removal and continued control of encroachment onto the mitigation site for the life of the project. • Mitigation success will not be dependent on documentation of increased use of the mitigation site by sage-grouse or any other wildlife species.

Financial Outline	This financial outline provides estimated figures and data for informational purposes only. These estimates are meant to provide an overview of the potential and commercially reasonable costs of acquiring and implementing mitigation on this mitigation site. The financial outline does not guarantee the final sales price and costs for the acquisition, and the price offering is subject to prior sale, price change, correction, amendment or withdrawal.
	• Initial purchase of the mitigation site: $2,750,000
	• Juniper removal: $80 - $200 per acre
	• Fence removal: $1.88 per foot
	• Fence marking: $0.11 per foot of fence ($581 per mile)
	• Weed treatment: $20 - $200 per acre
	• Native Seeding:
	  ○ Site preparation (mowing/discing) $500 per acre
	  ○ Broadcast/Drill seed: $100 - $250 per acre
	• Hydroseeding: $792 per acre

Financial Outline (cont.)

- Wetland/Spring/Riparian Improvement
  - Complex Restoration: $2,400 per acre
  - Riparian Herbacous Cover
    - Broadcast Seeding: $687 per acre
    - Pollinator Cover: $1,303 per acre
    - Plug Planting: $13,730 per acre
    - Combo Seeding and Plug Planting: $6,947 per acre
  - Riparian Forest Buffer
    - Hand Plant, bare root: $768 per acre
    - Cuttings, small to medium: $867 per acre
    - Seeding: $106 per acre

Estimated Budget for the Alder Creek Mitigation Site

Action	Cost per Unit	Units	Years	Expense
One-time Costs				
Acquisition of mitigation site	$2,750,000	1	-	$2,750,000
Juniper Removal	$100	450	-	$45,000
Grazing Modification	-	-	-	-
Removal of cross fencing	$2	60,000	-	$120,000
Marking of perimeter fence	-	-	-	-
Weed Treatment	$20-$200	75	-	$15,000
Native Seeding	$750	300	-	$225,000
50-year Operation and Management Costs				
O&M[1]	$30	3,081	50	$4,621,500
Total	**-**			**$7,776,500** ($2,524/acre)[2]

[1] This O&M cost is an estimate of the cost per acre per year (not including acquisition/easement costs) based on the research presented in the Independent Economic Analysis Board's 2007 *Investigation of Wildlife O&M Costs*. The average cost per acre presented in that document was $24 in 2004 dollars, this has been adjusted to reflect 2015 dollars. In addition, one of the projects presented in the document was the 10,000 acre Sagebrush Flat Wildlife Mitigation area in Washington state which is within a similar habitat type and has a FY2015 budget of approximately $300,000 (or $30/acre).

[2] Cost per acre here includes cost of acquisition and initial mitigation actions and long-term O&M for 50 years.

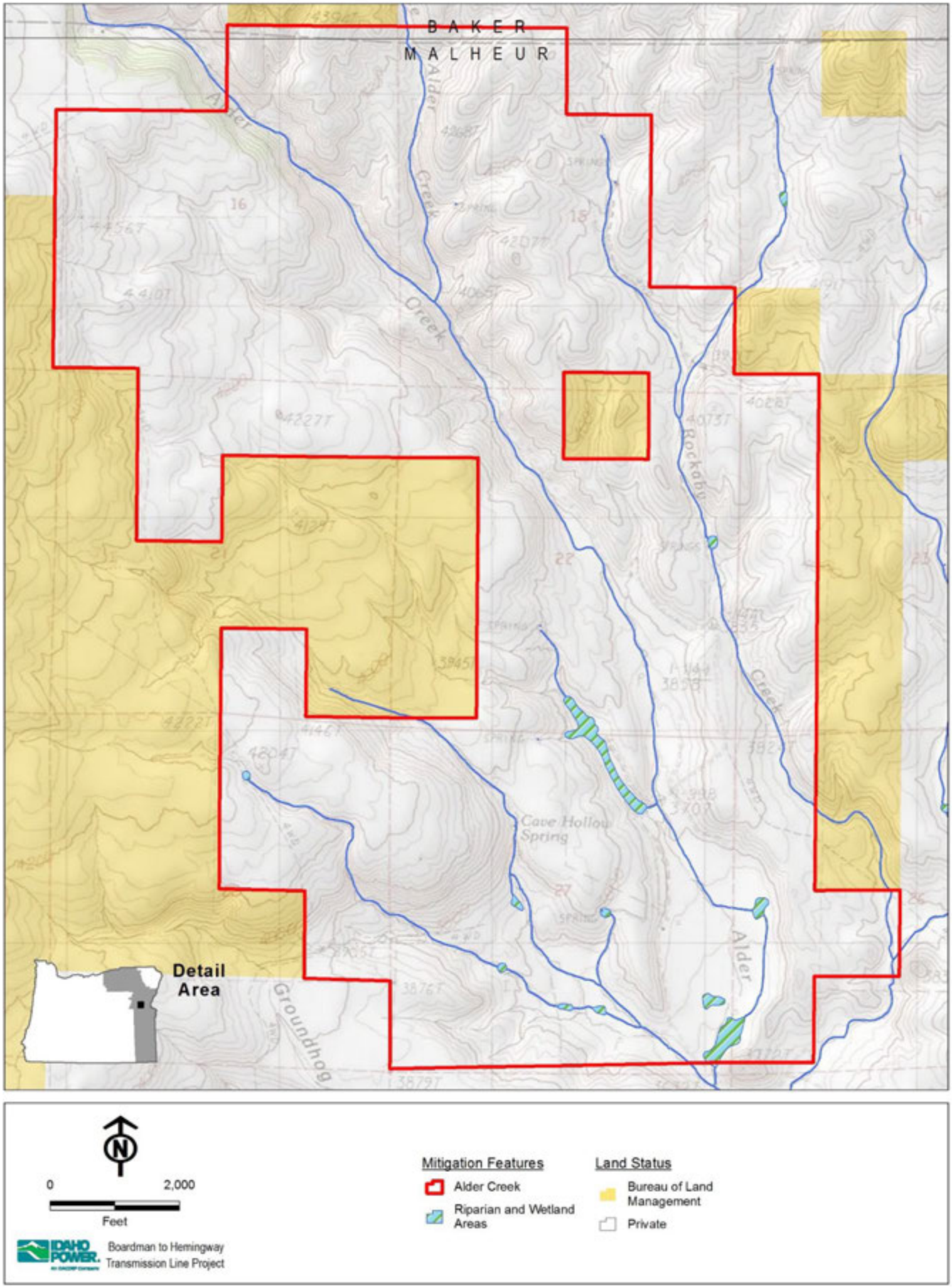

Figure 1. Alder Creek Ownership and Water

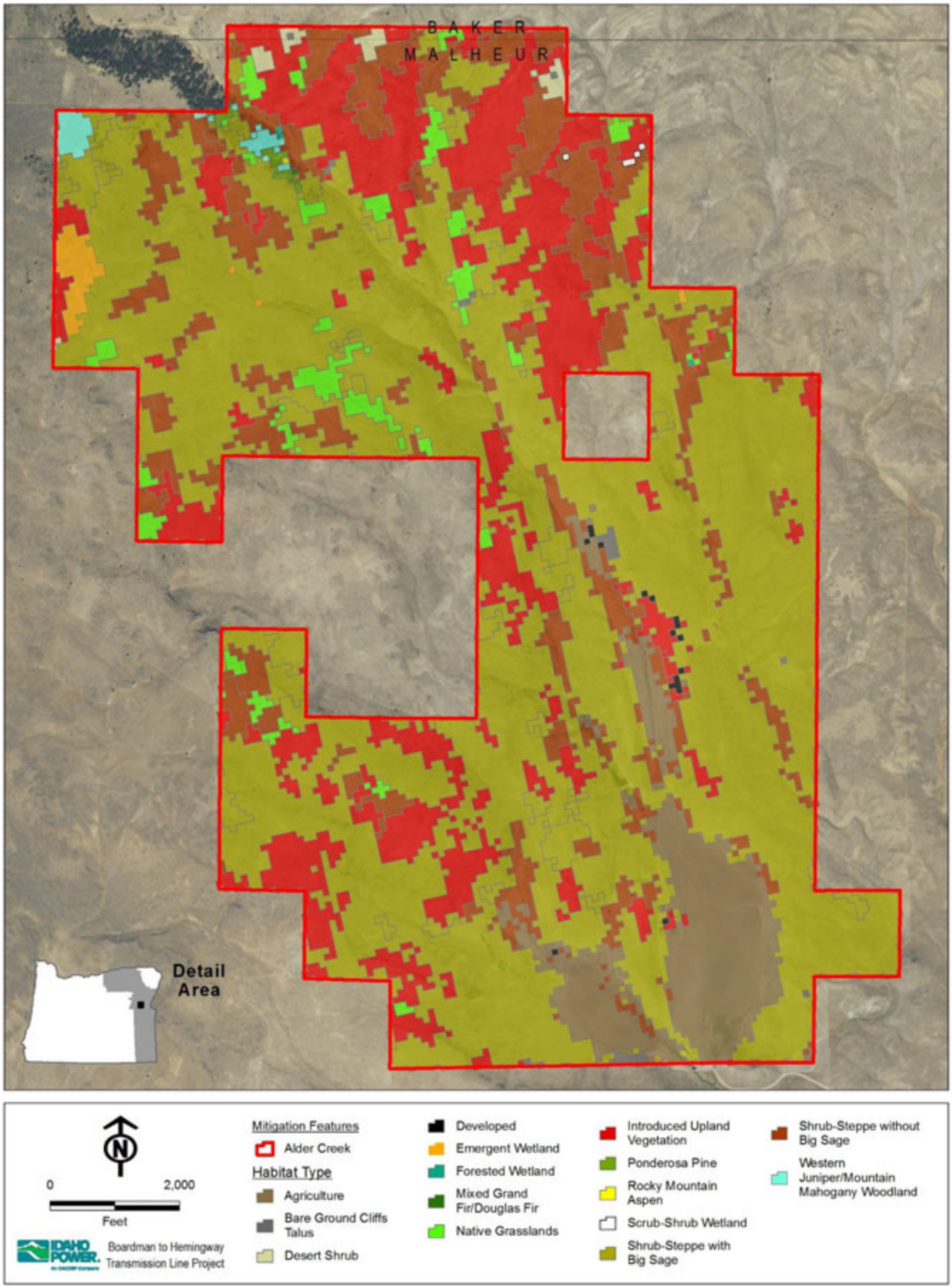

Figure 2. Alder Creek Ranch Habitat Types

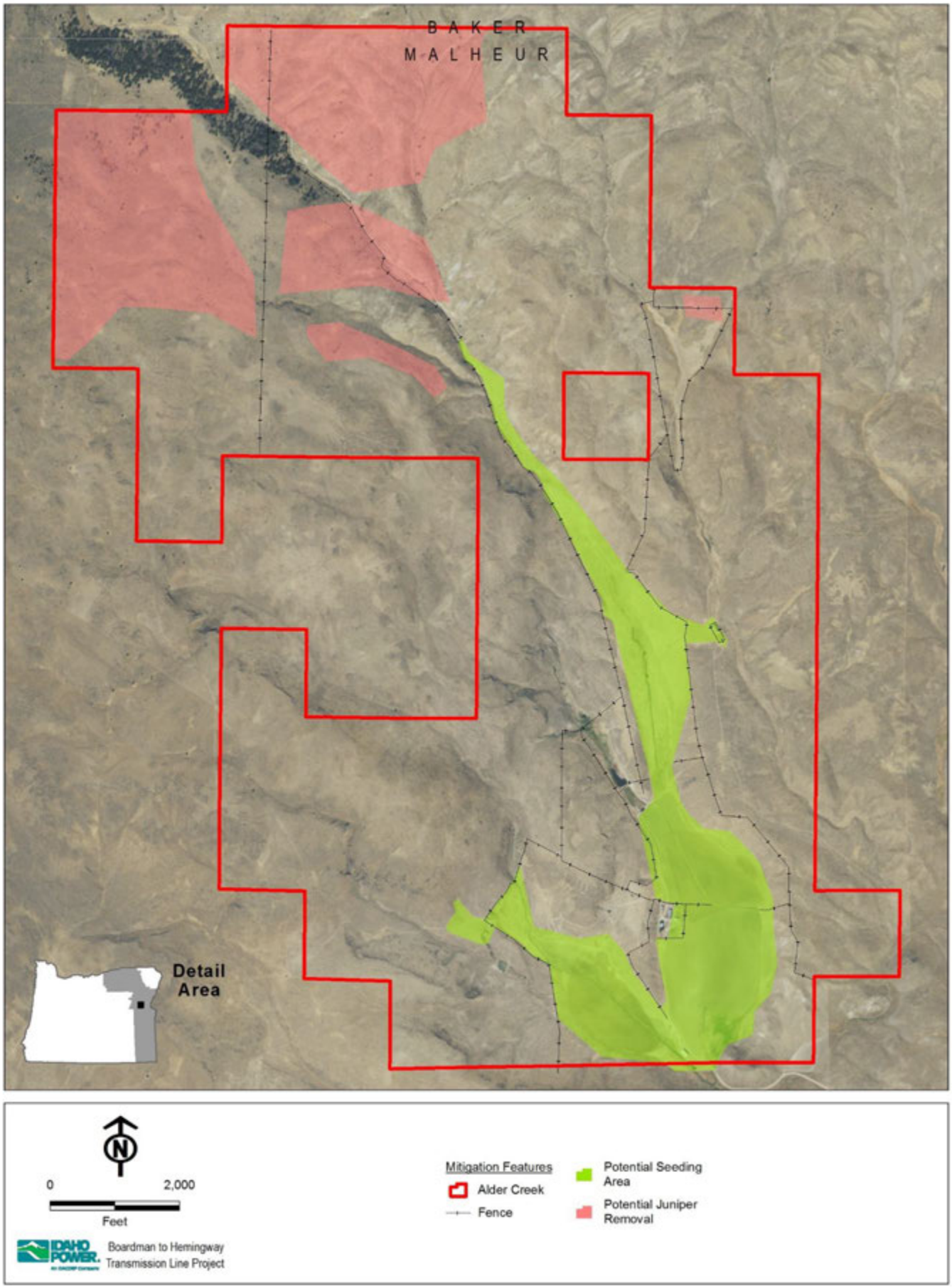

Figure 3. Alder Creek Potential Mitigation Action Areas

Boardman to Hemingway Transmission Line Project

Desktop Habitat Mitigation Site Assessment Worksheet

Parcel Name: Glasgow (**Figure 1**)
Landowner:
Parcel Size in Acres: 1,438

Date of Assessment: 10/13/2014
Parcel Elevation (ft): 3,000 – 4,600
Within Mitigation Service Area?: Yes

Location Description
(County, miles and direction from known location, TRS, UTM, other):

Baker County, 10 miles southeast of Keating.
T9S R43E Sections 11, 12, 13, 14, 23, 24

Vegetation Cover Classes (GAP[1], **Figure 2**)

HMP Habitat Category[2] and Type	HMP General Vegetation Type	Acres	% of Total	Wildlife Habitat[3]
Category 1		**0**	**0**	
Category 2				-
Shrub-Steppe with Big Sage	Shrub/Grass	675.9	47.0	MDWR
Shrub-Steppe with Big Sage	Shrub/Grass	364.9	25.4	MDWR, RMEWR, RMESR
Shrub-Steppe with Big Sage	Shrub/Grass	25.9	1.8	MDWR, RMESR
Shrub-Steppe with Big Sage	Shrub/Grass	6.2	0.4	RMEWR, MDWR
Shrub-Steppe without Big Sage	Shrub/Grass	76.0	5.3	MDWR
Shrub-Steppe without Big Sage	Shrub/Grass	159.9	11.1	MDWR, RMEWR, RMESR
Shrub-Steppe without Big Sage	Shrub/Grass	10.5	0.7	MDWR, RMEWR
Native Grasslands	Shrub/Grass	39.6	2.7	MDWR, RMEWR, RMESR
Native Grasslands	Shrub/Grass	35.6	2.5	MDWR
Native Grasslands	Shrub/Grass	1.7	0.1	MDWR, RMESR
Mixed Grand Fir/Douglas Fir	Forest/Woodland	23.8	1.7	MDWR, RMEWR, RMESR
Western Juniper/Mountain Mahogany Woodland	Forest/Woodland	4.4	0.3	MDWR, RMEWR, RMESR
Rocky Mountain Aspen	Forest/Woodland	1.6	0.1	MDWR, RMEWR, RMESR
Introduced Upland Vegetation	Shrub/Grass	8.0	0.6	MDWR
Ponderosa Pine	Forest/Woodland	0.9	0.1	MDWR, RMEWR, RMESR
Forested Wetland	Wetland	1.1	0.1	MDWR
Emergent Wetland	Wetland	0.7	0.0	MDWR
Remaining	-	2.2	0.2	-
Category 3		**0**	**0**	-
Category 4		**0**	**0**	-
Category 5		**0**	**0**	-
Category 6		**0**	**0**	-
Total		**1,438.9**	**100**	**-**

[1] USGS Gap Analysis Project (GAP) GIS data using ecological systems. Ecological systems were cross-walked to HMP Habitat Type as shown in the Habitat Categorization Matrix (Attachment P1-1 of Exhibit P1).
[2] Represents the habitat category based on overlap with wildlife habitat layers. Agriculture and Developed habitat types' categories are not modified by overlap with wildlife habitat.
[3] RMEWR = Category 2 habitat for ODFW Rocky Mountain elk winter range. MDWR = Category 2 habitat for ODFW mule deer winter range.
[4] Total acres of habitat type may not match actual parcel size due to the resolution of the GAP raster dataset. Pixels of the raster dataset were not simplified or smoothed to match the exact shape of the parcel boundary.

Soil types	The NRCS Soil Survey Geographic Database (SSURGO) data was reviewed and the following soils were identified on the property (**Figure 3**): *Ateron very stony loam* (**84 acres**). Ateron soils consist of shallow, well drained soils found on ridge tops and side slopes of hills and mountains at elevations from 3,600 to 5,800 feet. Ateron soils are used for livestock grazing. The native vegetation is mountain big sagebrush, Idaho fescue, bluebunch wheatgrass, and Sandberg bluegrass. *Brownscombe silt loam* (**389 acres**). Brownscombe soils consist of moderately deep, well drained soils found on hills at elevations of 2,400 to 3,600 feet. Brownscombe soils are used for range, dryland winter wheat, and wildlife habitat. Native vegetation is bluebunch wheatgrass, Sandberg bluegrass and arrowleaf balsamroot. *Hibbard gravelly silty clay loam* (**143 acres**). Hibbard soils consist of moderately deep to a duripan, well drained soils found on fan terraces at elevations of 3,000 to 3,700 feet. Hibbard soils are used for rangeland. The native vegetation is bluebunch wheatgrass, Idaho fescue and big sagebrush. *Lookout very cobbly silt loam* (**85 acres**). Lookout soils consist of moderately deep to a duripan, well drained soils found on hills at elevations of 2,800 to 3,600 feet. Lookout soils are mainly rangeland. Small acreage is irrigated for alfalfa, hay, pasture and small grain. Native vegetation dominantly is bluebunch wheatgrass, Idaho fescue, Sandberg bluegrass, buckwheat, and big sagebrush. *Ruckles-Ruclick complex* (**20 acres**). Ruckles soils consist of shallow, well drained soils found on hill and canyon side slopes at elevations ranging from 1,200 to 3,800 feet in Oregon. Ruckles soils are used for livestock grazing. Native vegetation dominantly is bluebunch wheatgrass, Idaho fescue on north slopes, Sandberg bluegrass and Wyoming big sagebrush. Ruclick soils consist of moderately deep, well drained soils found on summits, dipslopes, and sideslopes of foothills and tablelands at elevations of 4,000 to 6,500 feet in Idaho, and as low as 1,200 feet in Oregon. Ruclick soils are used mainly for rangeland and wildlife habitat. The dominant natural vegetation is Wyoming big sagebrush, bluebunch wheatgrass, and Sandberg bluegrass. *Skullgulch silty clay loam* (**196 acres**). Skullgulch soils consist of very deep, well drained soils in concave positions on north-facing side slopes on terraces and on fans with elevations ranging from 4,000 to 5,400 feet. Skullgulch soils are used for rangeland. The native vegetation in MLRA 10 is Idaho fescue, bluebunch wheatgrass, prairie junegrass, mountain big sagebrush, and green rabbitbrush. The native vegetation in MLRA 9 is Idaho fescue, bluebunch wheatgrass and prairie junegrass. *Snell-Ateron complex* (**468 acres**). Snell series consists of moderately deep, well drained soils found on hills, plateaus, mountains and on canyon walls at elevations of 2,000 to 6,800 feet. Snell soils are used for livestock grazing and wildlife habitat. Potential native vegetation is bluebunch wheatgrass, Idaho fescue, and Sandberg bluegrass. Ateron soils consist of shallow, well drained soils found on ridge tops and side slopes of hills and mountains at elevations from 3,600 to 5,800 feet. Ateron soils are used for livestock grazing. The native vegetation is mountain big sagebrush, Idaho fescue, bluebunch wheatgrass, and Sandberg bluegrass. *Virtue very gravelly silt loam* (**53 acres**). Virtue soils consist of moderately deep to a duripan well drained soils found on fans and terraces at elevations of 2,300 to 4,000 feet. Virtue soils are used for rangeland, irrigated small grain, hay and pasture. The native vegetation is bluebunch wheatgrass, Idaho fescue, Sandberg bluegrass, Thurber needlegrass and Wyoming big sagebrush.

Hydrologic Features Present	Two perennial streams and one intermittent stream within the property boundary (NHD). NWI identifies a couple of emergent wetlands, a scrub-shrub wetland, and three cold water springs in addition to riparian areas associated with NHD data.

(SteamNet, NWI, NHD)	
Adjacent land ownership, use, and condition	The northern boundary of the property connects to a very large tract of BLM land that connects many of the uplands above the Lower Powder Valley; including Spring Creek and Goose Creek areas to the north of State Route 86; Love Creek, Ritter Creek and Ruckles Creek south of State Route 86; and areas extending into the upper Lower Powder Valley including Crews Creek and portions of the Powder River north of State Route 203 to the Union/Baker County line. However, a majority of the property is immediately adjacent to private properties. Adjacent land use is rangeland that appears to be heavily grazed.
Infrastructure Density within or Near the Parcel (Qualitative Description)	Property is approximately 1 mile south of State Route 86 and contains some fencing and two-track trails; otherwise, the property is open rangeland absent of development.
Summary	The entire property is within a sage-grouse Core Area that is well-studied by ODFW. Nesting sage-grouse have been documented on the property. The property contains both elk and mule deer winter ranges and is heavily utilized by pronghorn in the spring. The property is grazed every other year, and has been managed in this manner for the last 10 years. Landowner explained that since this grazing rotation was implemented, he has seen an upward trend in desirable vegetation (Idaho fescue especially). The property is mostly Wyoming big sagebrush with islands of invasive species (Japanese brome was mentioned) that would need treatment. Landowner believes that ten years of rest from grazing and some treatments would get the property to a state where, barring fire or some other unexpected event, habitat would contain enough native desirable vegetation that few management actions would be needed to maintain the quality of habitat.
Pass/Fail Desktop Assessment?	Pass

Boardman to Hemingway Transmission Line Project

Consideration of Property as a Potential Mitigation Site

Mitigation Function	This mitigation site has been identified as in-kind and in-proximity mitigation for impacts on Category 2 Rocky Mountain elk winter range and mule deer winter range within the shrub/grass general vegetation type. This mitigation site could also help meet the Project need for sage-grouse habitat mitigation. It also provides opportunity for shrub/grass mitigation of Category 3, 4, & 5 habitats. It contains important habitat features that could be preserved and has some uplift opportunities that could be achieved through implementation of standard mitigation actions. The mitigation actions listed below, upon successful implementation, will increase the quality of habitat available to sage-grouse, elk, and deer (among other species) within the mitigation site and result in an ecological uplift to the mitigation site above what is provided under the current management.
Mitigation Site Manager	Fee title acquisition with transfer of ownership to State of Oregon, Federal Land Management Agency, approved NPO or Land Trust.
Mitigation Actions	The following are mitigation actions that may be implemented at this mitigation site in order to satisfy the mitigation policies/guidelines of the permitting agencies. All mitigation actions will follow reliable methods. The mitigation actions presented here are not comprehensive. Implementation will likely be some combination of one or more of the following: • *Modification of Livestock Grazing* – this property has been grazed every other year for the past ten years, allowing for re-establishment of native vegetation. Future management would focus primarily on grazing practices that would not compete with native wildlife life history needs. Targeted grazing may be considered for habitat enhancement/treatment actions. • *Fence Removal/Marking* – opportunities are unknown at this time, but it is anticipated that some unnecessary fencing may be removed or necessary fencing can be upgraded to more wildlife friendly fencing. • *Weed treatment* – the extent of noxious weed invasion on the mitigation site is unknown at this time but it is anticipated that opportunities exist to implement this mitigation action. Some areas of introduced upland vegetation (specifically Japanese brome) were noted on the property in cattle congregation areas. • *Native revegetation/restoration* – focus of efforts would be to promote establishment of sagebrush and bunchgrasses; opportunities exist but have not been specifically identified at this time. • *Fire readiness* – efforts made to make the property more resistant to catastrophic fire and a fire response plan could be developed.
Monitoring	A specific plan for monitoring will be developed, but in general, mitigation progress will be monitored through vegetation plot monitoring and establishment of photo locations. Monitoring will occur annually for the first 3-5 years and an annual report will be produced. During the annual monitoring phase, a longer-term monitoring plan will be developed using similar protocols and methods to monitor the mitigation actions at larger time intervals (i.e., 5 years, 10 years).
Success Criteria	Specific success criteria will be developed once baseline conditions have been determined and potential mitigation actions have been confirmed for the site. Success

criteria may include but are not limited to:

- Vegetation plots show an increase in native vegetation cover and general trend toward increased habitat quality representing an ecological uplift.
- Successful weed control through documentation of a reduction in weeds and non-native invasive plant species.
- Mitigation success will not be dependent on documentation of increased use of the mitigation site by sage-grouse or any other wildlife species.

Financial Outline

Estimated Budget for the Glasgow Mitigation Site

Action	Cost per Unit	Units	Years	Expense
One-time Costs				
Acquisition	?	1		?
50-year Operation and Management Costs				
O&M[1]	$30.00	1,438	50	$2,157,000
Total	**-**			**$?** ($?)[2]

[1] This O&M cost is an estimate of the cost per acre per year (not including acquisition/easement costs) based on the research presented in the Independent Economic Analysis Board's 2007 *Investigation of Wildlife O&M Costs*. The average cost per acre presented in that document was $24 in 2004 dollars, this has been adjusted to reflect 2015 dollars. In addition, one of the projects presented in the document was the 10,000 acre Sagebrush Flat Wildlife Mitigation area in Washington state which is within a similar habitat type and has a FY2015 budget of approximately $300,000 (or $30/acre).

[2] Cost per acre here includes cost of acquisition/easement and initial mitigation actions and long-term O&M for 50 years.

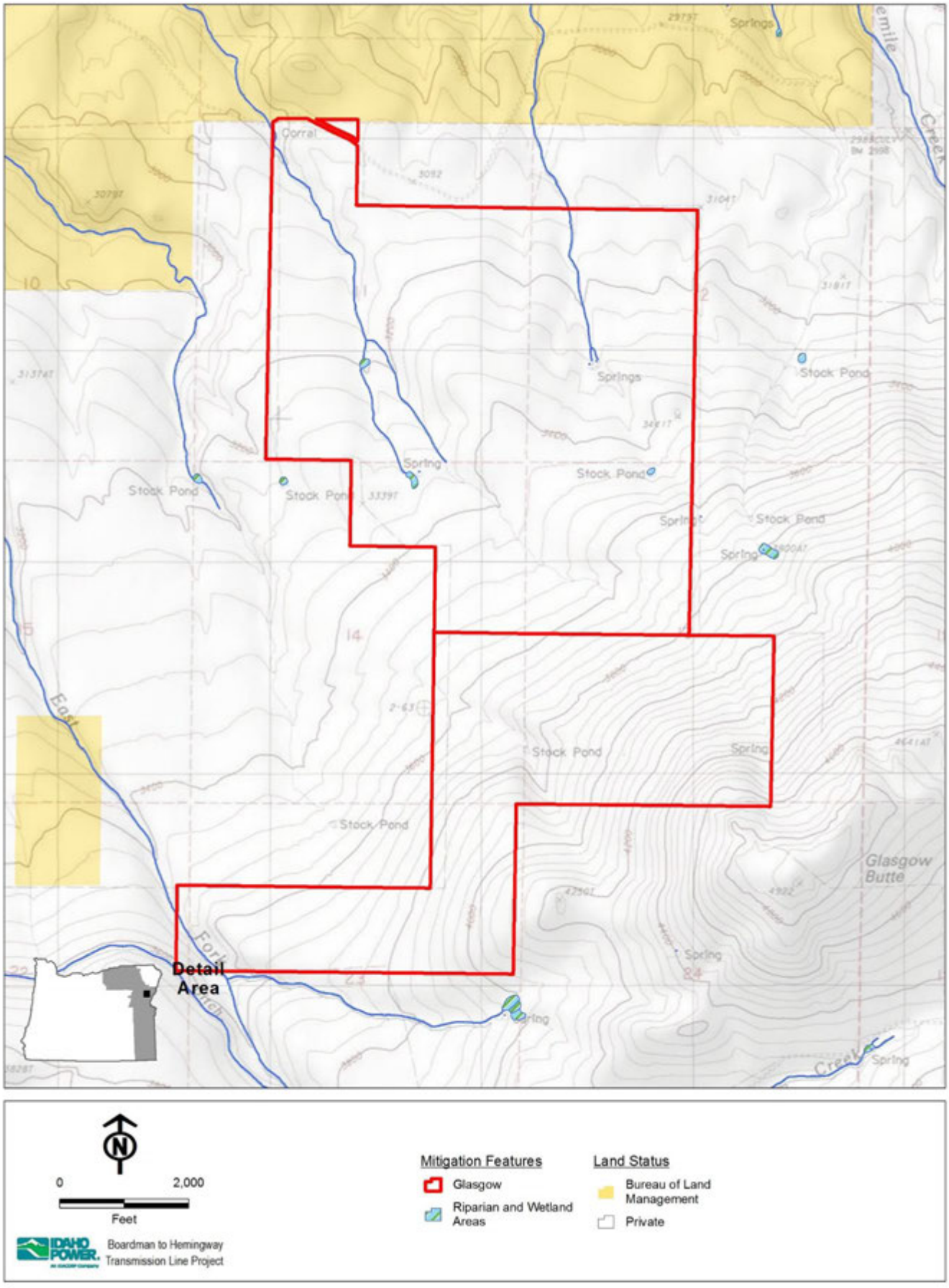

Figure 1. Glasgow Ownership and Water

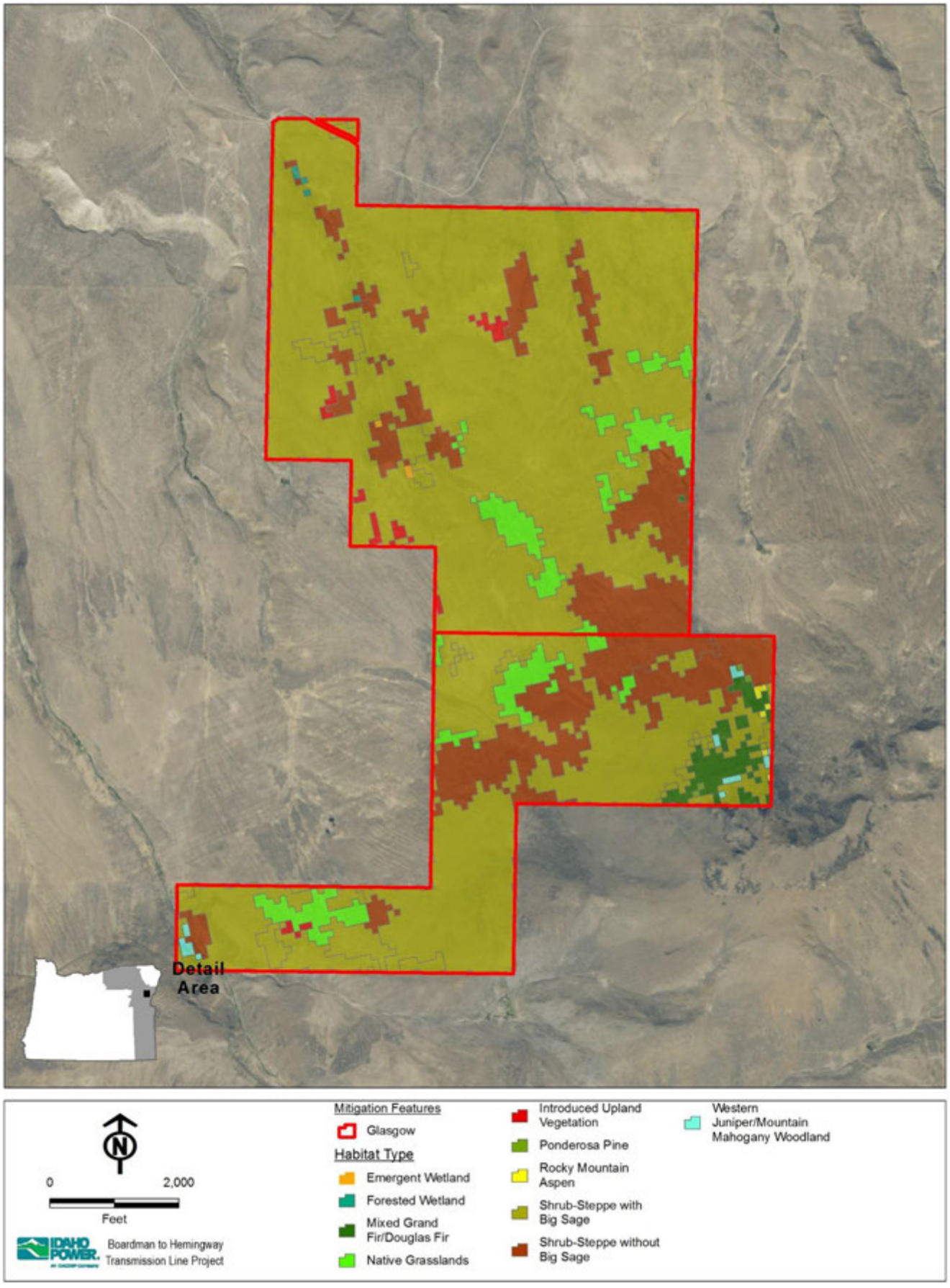

Figure 2. Glasgow Habitat Types

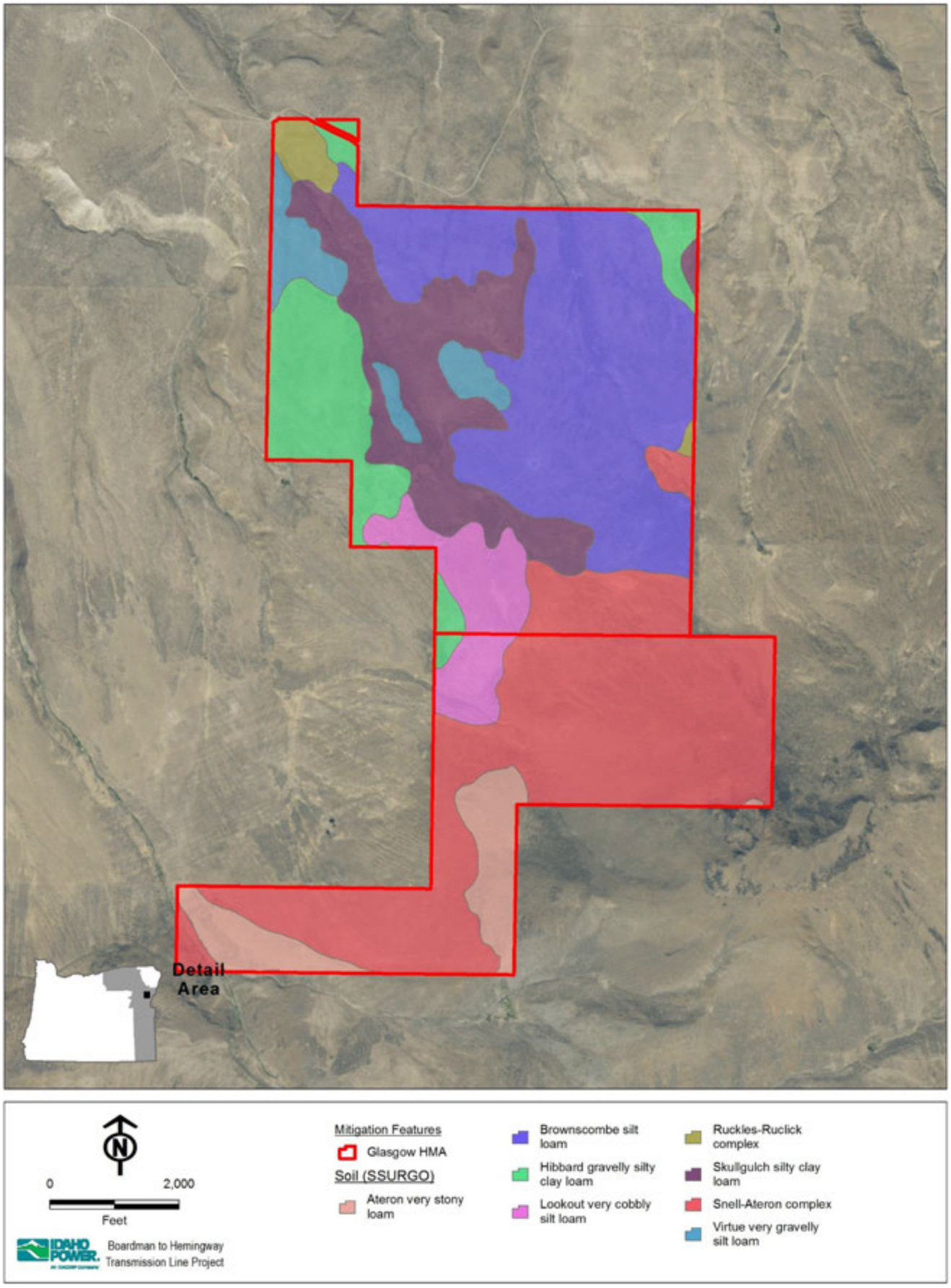

Figure 3. Glasgow Soil Types

Boardman to Hemingway Transmission Line Project

Desktop Habitat Mitigation Site Assessment Worksheet

Parcel Name: Trail Creek
Landowner:
Parcel Size in Acres: 624
Date of Assessment: 10/13/2014
Parcel Elevation (ft): 3,600 – 4,580
Within Mitigation Service Area?: Yes

Location Description
(County, miles and direction from known location, TRS, UTM, other):

Baker County, approximately 5 miles northeast of Durkee.
T10S R43E Section 36, T10S R44E Section 31, T11S R43E Section 1, T11S R44E Section 6 (**Figure 1**)

Vegetation Cover Classes (GAP[1], **Figure 2**)

HMP Habitat Category[2] and Type	HMP General Vegetation Type	Acres	% of Parcel	Wildlife Habitat[3]
Category 1		**0**	**0**	-
Category 2		**624.5**	**100**	-
Shrub-Steppe with Big Sage	Shrub/Grass	490.0	78.5	RMEWR, RMESR, MDSR
Shrub-Steppe without Big Sage	Shrub/Grass	75.6	12.1	RMEWR, RMESR, MDSR
Native Grasslands	Shrub/Grass	27.1	4.3	RMEWR, RMESR, MDSR
Introduced Upland Vegetation	Shrub/Grass	8.2	1.3	RMEWR, RMESR, MDSR
Western Juniper /Mountain Mahogany Woodland	Forest/Woodland	7.6	1.2	RMEWR, RMESR, MDSR
Ponderosa Pine	Forest/Woodland	7.1	1.1	RMEWR, RMESR, MDSR
Mixed Grand Fir / Douglas Fir	Forest/Woodland	3.1	0.5	RMEWR, RMESR, MDSR
Rocky Mountain Aspen	Forest/Woodland	3.1	0.5	RMEWR, RMESR, MDSR
Bare Ground Cliffs Talus	Bare Ground	2.0	0.3	RMEWR, RMESR, MDSR
Emergent Wetland	Wetland	0.7	0.1	RMEWR, RMESR, MDSR
Category 3		**0**	**0**	-
Category 4		**0**	**0**	-
Category 5		**0**	**0**	-
Category 6		**0**	**0**	-
Total	**NA**	**624.5[4]**	**100**	**-**

[1] USGS Gap Analysis Project (GAP) GIS data using ecological systems. Ecological systems were cross-walked to HMP Habitat Type as shown in Exhibit P1, Attachment P1-1 Habitat Categorization Matrix.
[2] Represents the habitat category based on overlap with wildlife habitat layers. Agriculture and Developed habitat types' categories are not modified by overlap with wildlife habitat.
[3] RMEWR = Rocky Mountain Elk Winter Range.
[4] Total acres of habitat type may not match actual parcel size due to resolution of the GAP raster dataset. Pixels of the raster dataset were not simplified or smoothed to match the exact shape of the parcel boundary. This is apparent in **Figure 2**.

Soil type

The NRCS Soil Survey Geographic Database (SSURGO) data was reviewed and the following soil was identified on the property (**Figure 3**):

Durkee gravelly silt loam (**623**). Durkee soils consist of moderately deep, well drained soils on smooth rolling hills at elevation ranges from 3,600 to 6,100 feet.

Hydrologic Features Present (SteamNet, NWI, NHD)	Two intermittent streams are on the property (NHD). NWI does not indicate any additional wetland features beyond those associated with the streams identified by NHD.
Adjacent land ownership, use, and condition (if possible)	A majority of this property shares a border with a BLM parcel that is approximately 4,000 acres in size. Also adjacent to private land ownership. Dominant land use in the area is rangeland. Adjacent private lands appear to be more degraded as a result of heavier grazing practices (per 2013 site visit).
Infrastructure Density within or Near the Parcel (Qualitative Description)	The property contains some fencing and gates and some two track roads; otherwise open rangeland.
Summary	The property is completely within a sage-grouse Core Area and the Lookout Mountain Rocky Mountain elk herd's winter range. The property is completely within elk summer range and mule deer summer range as well. The property is close to the Nodine sage-grouse lek. The property provides sage-grouse breeding habitat, adequate sagebrush cover and height ensures adequate winter forage, and an abundance of forbs in the understory and a source of water in Trail Creek provides quality brood-rearing habitat. The property is able to support sage-grouse year-round and therefore provides habitat for many other sagebrush obligate species.
Pass/Fail Desktop Assessment?	Pass

Boardman to Hemingway Transmission Line Project

Consideration of Property as a Potential Mitigation Site

Mitigation Function	This mitigation site has been identified as in-kind and in-proximity mitigation for impacts on Category 2 Rocky Mountain elk winter range within the shrub/grass general vegetation type. This mitigation site could also help meet the Project need for sage-grouse habitat mitigation. It also provides opportunity for shrub/grass mitigation of Category 3, 4, & 5 habitats. It contains important habitat features that could be preserved and has some uplift opportunities that could be achieved through implementation of standard mitigation actions. The mitigation actions listed below, upon successful implementation, will increase the quality of habitat available to sage-grouse and elk (among other species) within the mitigation site and result in an ecological uplift to the mitigation site above what is provided under the current management.
Mitigation Site Manager	Fee title acquisition with transfer of ownership to State of Oregon, Federal Land Management Agency, approved NPO or Land Trust.
Mitigation Actions	The following are mitigation actions that IPC may consider implementing at this mitigation site in order to satisfy the mitigation policies/guidelines of the permitting agencies. All mitigation actions will follow reliable methods. The mitigation actions presented here are not comprehensive. Implementation will likely be some combination of one or more of the following: • *Juniper/Conifer Removal* –Opportunity for spot-treating single trees occurs throughout the property to prevent future encroachment. • *Modification of Livestock Grazing* –grazing on this property appears to have been managed in a manner that allows native vegetation to remain established and provide cover and forage for wildlife species. Future management would focus primarily on grazing practices that would not compete with native wildlife life history needs. Targeted grazing may be considered for habitat enhancement/treatment actions. • *Fence Removal/Marking* – opportunities are unknown at this time, but it is anticipated that some unnecessary fencing may be removed or necessary fencing can be upgraded to more wildlife friendly fencing. • *Weed treatment* – the extent of noxious weed invasion on the mitigation site is unknown at this time but it is anticipated that opportunities exist to implement this mitigation action. Some areas of introduced upland vegetation were noted along Trail Creek where cattle congregate. • *Native revegetation/restoration* – focus of efforts would be to promote establishment of sagebrush and bunchgrasses; opportunities exist but have not been specifically identified at this time. • *Fire readiness* – efforts made to make the property more resistant to catastrophic fire and a fire response plan could be developed. • *Wetland/Spring/Riparian Improvement* – opportunity exists along Trail Creek to perform riparian/watershed improvements.
Monitoring	A specific plan for monitoring will be developed, but in general, mitigation progress will be monitored through vegetation plot monitoring and establishment of photo locations. Monitoring will occur annually for the first 3-5 years and an annual report will be produced. During the annual monitoring phase, a longer-term monitoring plan will be developed using similar protocols and methods to monitor the mitigation actions at larger time intervals (i.e., 5 years, 10 years).

Success Criteria

Specific success criteria will be developed once mitigation actions have been confirmed for the site. Success criteria may include but are not limited to:

- Vegetation plots show an increase in native vegetation cover and general trend toward increased habitat quality representing an ecological uplift.
- Successful weed control through documentation of weed reduction.
- Successful juniper removal and continued control of encroachment onto the mitigation site for the life of the project.
- Mitigation success will not be dependent on documentation of increased use of the mitigation site by sage-grouse or any other wildlife species.

Financial Outline

Estimated Budget for the Trail Creek Mitigation Site

Action	Cost per Unit	Units	Years	Expense
One-time Costs				
Acquisition	?	1		?
50-year Operation and Management Costs				
O&M[1]	$30.00	624	50	$936,000
Total	**-**			**$?** ($?)[2]

[1] This O&M cost is an estimate of the cost per acre per year (not including acquisition/easement costs) based on the research presented in the Independent Economic Analysis Board's 2007 *Investigation of Wildlife O&M Costs*. The average cost per acre presented in that document was $24 in 2004 dollars, this has been adjusted to reflect 2015 dollars. In addition, one of the projects presented in the document was the 10,000 acre Sagebrush Flat Wildlife Mitigation area in Washington state which is within a similar habitat type and has a FY2015 budget of approximately $300,000 (or $30/acre).

[2] Cost per acre here includes cost of acquisition/easement and initial mitigation actions and long-term O&M for 50 years.

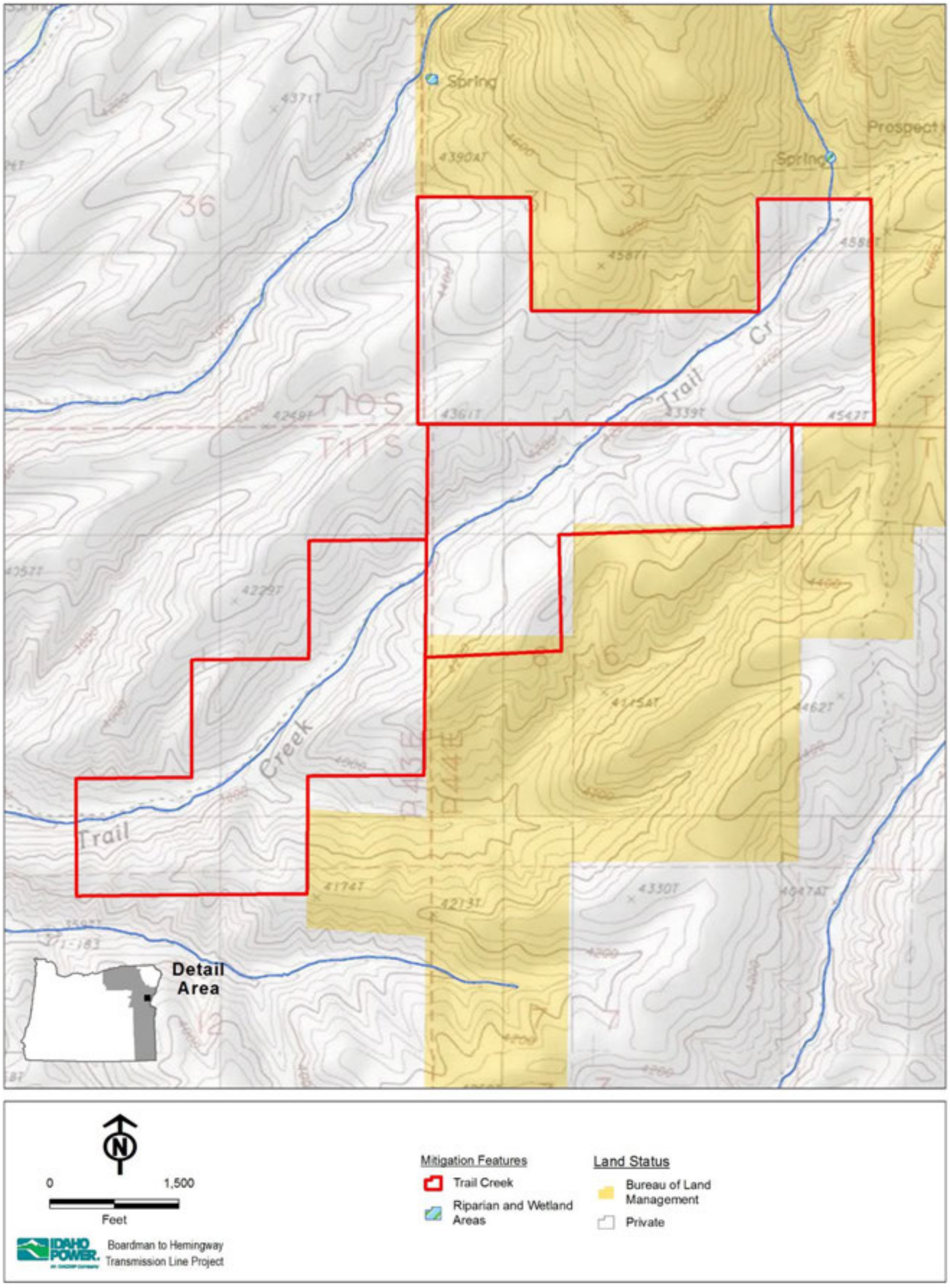

Figure 1. Trail Creek Ownership and Water

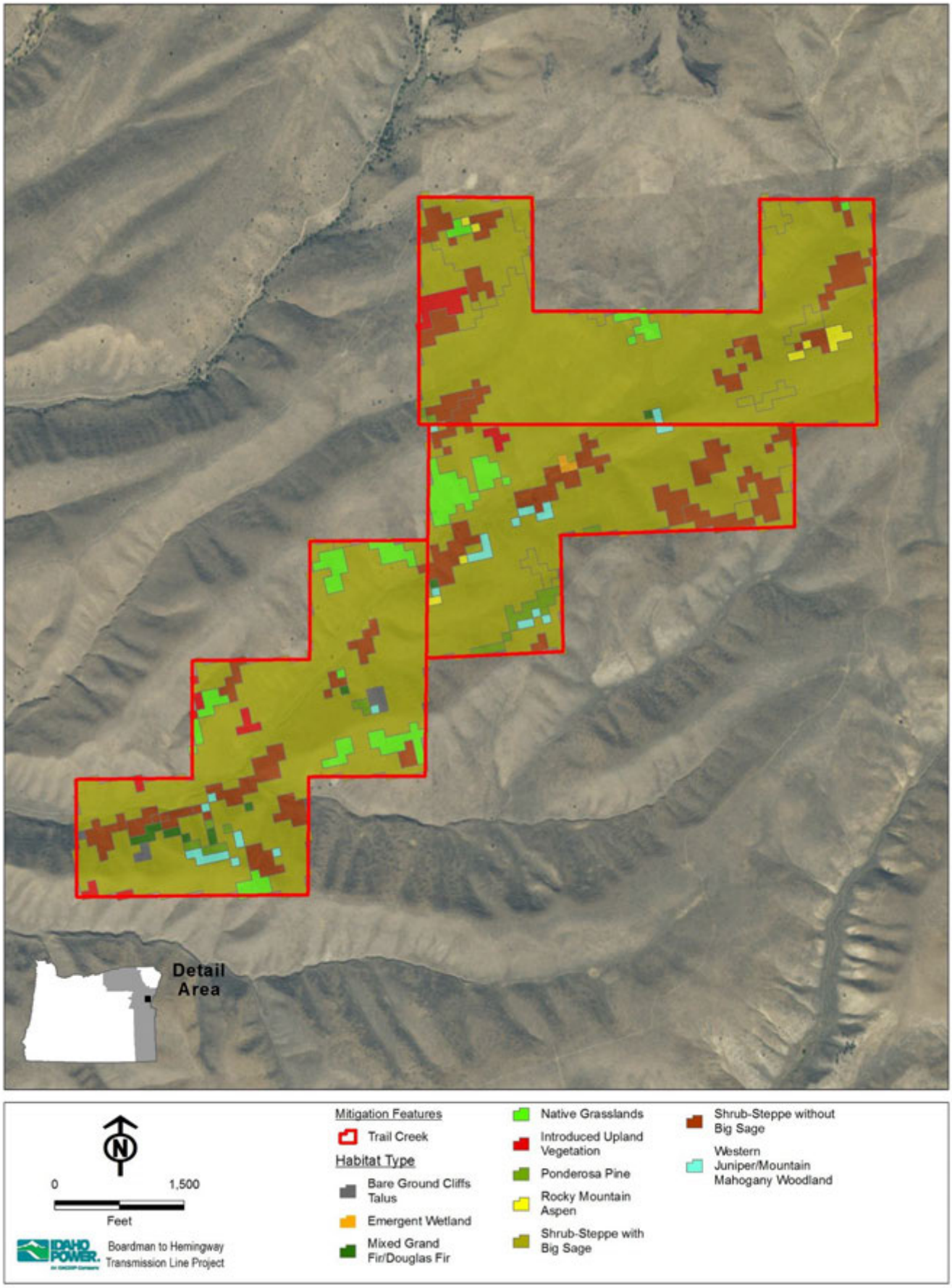

Figure 2. Trail Creek Habitat Types

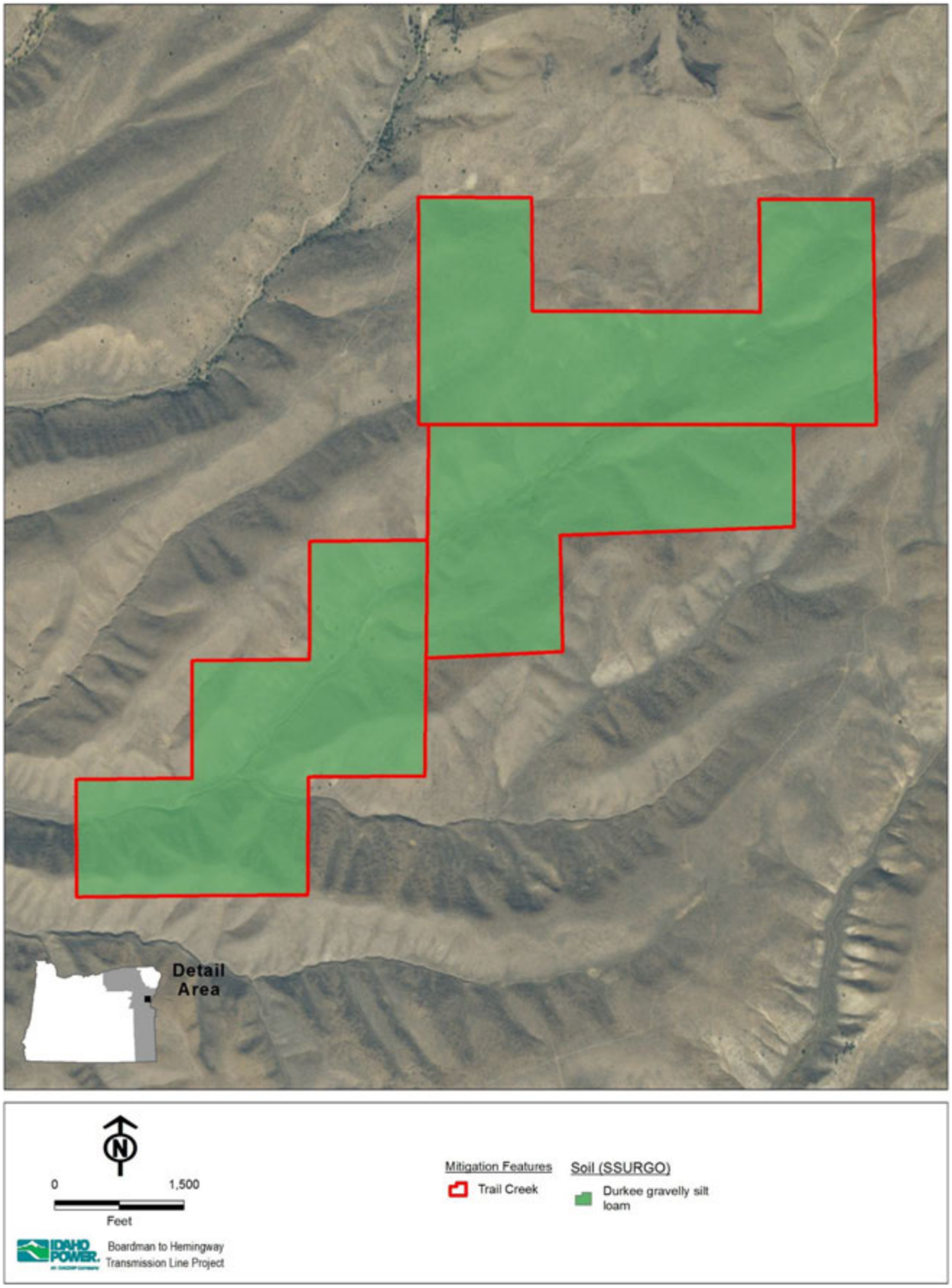

Figure 3. Trail Creek Soil Types

Boardman to Hemingway Transmission Line Project

Desktop Habitat Mitigation Site Assessment Worksheet

Parcel Name: Upper Timber (**Figure 1**)
Landowner:
Parcel Size in Acres: 1,577
Date of Assessment: 10/13/2014
Parcel Elevation (ft): 3,000 – 4,800
Within Mitigation Service Area?: Yes

Location Description
(County, miles and direction from known location, TRS, UTM, other):

Baker County, 5 miles west of Richland.
T9S R44E Sections 22, 23, 26, 27, 28, 29

Vegetation Cover Classes (GAP[1], **Figure 2**)

HMP Habitat Category[2] and Type	HMP General Vegetation Type	Acres	% of Total	Wildlife Habitat[3]
Category 1		**0**	**0**	
Category 2				-
Shrub-Steppe with Big Sage	Shrub/Grass	538.1	34.2	MDWR
Shrub-Steppe with Big Sage	Shrub/Grass	407.6	25.8	MDWR, RMESR
Shrub-Steppe with Big Sage	Shrub/Grass	104.1	6.6	RMEWR, RMESR, MDWR
Shrub-Steppe without Big Sage	Shrub/Grass	79.3	5.1	MDWR
Shrub-Steppe without Big Sage	Shrub/Grass	189.7	12.0	MDWR, RMESR
Shrub-Steppe without Big Sage	Shrub/Grass	32.1	2.0	RMEWR, RMESR, MDWR
Native Grasslands	Shrub/Grass	19.5	1.2	MDWR
Native Grasslands	Shrub/Grass	80.0	5.1	MDWR, RMESR
Native Grasslands	Shrub/Grass	11.2	0.7	RMEWR, RMESR, MDWR
Introduced Upland Vegetation	Shrub/Grass	36.2	2.3	MDWR
Introduced Upland Vegetation	Shrub/Grass	52.2	3.3	MDWR, RMESR
Introduced Upland Vegetation	Shrub/Grass	6.4	0.4	RMEWR, RMESR, MDWR
Forested Wetland	Wetland	7.4	0.5	MDWR
Forested Wetland	Wetland	1.5	0.1	MDWR, RMESR
Agriculture[4]	Ag/Developed	3.3	0.3	MDWR
Agriculture[4]	Ag/Developed	3.8	0.2	MDWR, RMESR
Mixed Grand Fir/Douglas Fir	Forest/Woodland	1.8	0.1	MDWR
Ponderosa Pine	Forest/Woodland	1.6	0.1	MDWR
Rocky Mountain Aspen	Forest/Woodland	1.1	0.1	MDWR
Category 3		**0**	**0**	-
Category 4		**0**	**0**	-
Category 5		**0**	**0**	-
Category 6		**0**	**0**	-
Total[5]		**1,576.9**	**100**	**-**

[1] USGS Gap Analysis Project (GAP) GIS data using ecological systems. Ecological systems were cross-walked to HMP Habitat Type as shown in the Habitat Categorization Matrix (Attachment P1-1 of Exhibit P1).
[2] Represents the habitat category based on overlap with wildlife habitat layers. Agriculture and Developed habitat types' categories are not modified by overlap with wildlife habitat.
[3] RMEWR = Category 2 habitat for ODFW Rocky Mountain elk winter range. MDWR = Category 2 habitat for ODFW mule deer winter range.
[4] A brief review of aerial imagery indicated that ReGAP is misclassifying areas as Agriculture. In this instance, the Agriculture appears likely to be wetlands. Therefore, Agriculture is remaining as a Category 2 habitat in this case. Reviewing of ReGAP data via aerial photo interpretation is not performed for the vast majority of habitat classifications on potential mitigation properties. On the ground knowledge of this property prompted a review of the Agriculture habitat classification.
[5] Total acres of habitat type may not match actual parcel size due to the resolution of the GAP raster dataset. Pixels of the raster dataset were not simplified or smoothed to match the exact shape of the parcel boundary.

Soil types	The NRCS Soil Survey Geographic Database (SSURGO) data was reviewed and the following soils were identified on the property (**Figure 3**): *Ateron very stony loam* (**123 acres**). Ateron soils consist of shallow, well drained soils found on ridge tops and side slopes of hills and mountains at elevations from 3,600 to 5,800 feet. Ateron soils are used for livestock grazing. The native vegetation is mountain big sagebrush, Idaho fescue, bluebunch wheatgrass, and Sandberg bluegrass. *Bakeoven-Ruckles complex* (**101 acres**). Bakeoven soils consist of very shallow, well drained soils found on mountains, ridgetops, hillslopes, mesas, and benches at elevations of 300 to 4,800 feet. Bakeoven soils are used for livestock grazing and wildlife habitat. Native vegetation is Sandberg bluegrass and stiff sagebrush. Ruckles soils consist of shallow, well drained soils found on hill and canyon side slopes at elevations ranging from 1,200 to 3,800 feet in Oregon. Ruckles soils are used for livestock grazing. Native vegetation dominantly is bluebunch wheatgrass, Idaho fescue on north slopes, Sandberg bluegrass and Wyoming big sagebrush. *Bouldrock complex* (**129 acres**) and *Bouldrock loam* (**118 acres**). Bouldrock soils consist of moderately deep, well drained soils found on south-facing side slopes of mountainous areas at elevations ranging from 4,000 to 6,200 feet. Bouldrock soils are used for rangeland. The native vegetation is bluebunch wheatgrass, mountain big sagebrush, arrowleaf balsamroot and gray rabbitbrush. *Greenscombe loam* (**280 acres**). Greenscombe soils consist of moderately deep, well drained soils on low hills at elevations 3,200 to 3,800 feet. Greenscombe soils are Rangeland. The native vegetation is Idaho fescue, bluebunch wheatgrass, Sandberg bluegrass, Thurber needlegrass, and big sagebrush. *Hyall-Simas association* (**91 acres**). Hyall soils consist of moderately deep to consolidated old alluvium (densic material), well drained soils on side slopes of dissected terraces at elevations of 2,700 to 3,500 feet. Hyall soils are used for range, watershed and wildlife habitat. Native vegetation is bluebunch wheatgrass, Idaho fescue and arrowleaf balsamroot. Simas soils consist of very deep, well drained soils found on hills at elevations of 1,200 to 4,000 feet. Simas soils are used for livestock grazing. Native plants are bluebunch wheatgrass, Idaho fescue, Sandberg bluegrass, and Wyoming and basin big sagebrush. *Kilmerque loam* (**25 acres**). Kilmerque soils consist of moderately deep, well drained soils on gently rolling bench tops to moderately steep south aspect side slopes in forested mountains at elevations ranging from 3,500 to 6,000 feet. Kilmerque soils are used for woodland. The native vegetation is ponderosa pine, Douglas fir and pinegrass. *Ruckles-Ruclick-Snellby complex* (**50 acres**). Ruckles soils consist of shallow, well drained soils found on hill and canyon side slopes at elevations ranging from 1,200 to 3,800 feet in Oregon. Ruckles soils are used for livestock grazing. Native vegetation dominantly is bluebunch wheatgrass, Idaho fescue on north slopes, Sandberg bluegrass and Wyoming big sagebrush. Ruclick soils consist of moderately deep, well drained soils found on summits, dipslopes, and sideslopes of foothills and tablelands at elevations of 4,000 to 6,500 feet in Idaho, and as low as 1,200 feet in Oregon. Ruclick soils are used mainly for rangeland and wildlife habitat. The dominant natural vegetation is Wyoming big sagebrush, bluebunch wheatgrass, and Sandberg bluegrass. Snellby soils consist of moderately deep, well drained soils on hills at elevations of 3,400 to 3,800 feet. Snellby soils are used for rangeland. The native vegetation is Idaho fescue, bluebunch wheatgrass, and big sagebrush.

Soil types (cont.)	*Ruckles-Ruclick complex* (**336 acres**). Ruckles soils consist of shallow, well drained soils found on hill and canyon side slopes at elevations ranging from 1,200 to 3,800 feet in Oregon. Ruckles soils are used for livestock grazing. Native vegetation dominantly is bluebunch wheatgrass, Idaho fescue on north slopes, Sandberg bluegrass and Wyoming big sagebrush. Ruclick soils consist of moderately deep, well drained soils found on summits, dipslopes, and sideslopes of foothills and tablelands at elevations of 4,000 to 6,500 feet in Idaho, and as low as 1,200 feet in Oregon. Ruclick soils are used mainly for rangeland and wildlife habitat. The dominant natural vegetation is Wyoming big sagebrush, bluebunch wheatgrass, and Sandberg bluegrass. *Ruclick very cobbly silt loam* (**135 acres**). Ruclick soils consist of moderately deep, well drained soils found on summits, dipslopes, and sideslopes of foothills and tablelands at elevations of 4,000 to 6,500 feet in Idaho, and as low as 1,200 feet in Oregon. Ruclick soils are used mainly for rangeland and wildlife habitat. The dominant natural vegetation is Wyoming big sagebrush, bluebunch wheatgrass, and Sandberg bluegrass. *Snell-Ateron complex* (**32 acres**). Snell series consists of moderately deep, well drained soils found on hills, plateaus, mountains and on canyon walls at elevations of 2,000 to 6,800 feet. Snell soils are used for livestock grazing and wildlife habitat. Potential native vegetation is bluebunch wheatgrass, Idaho fescue, and Sandberg bluegrass. Ateron soils consist of shallow, well drained soils found on ridge tops and side slopes of hills and mountains at elevations from 3,600 to 5,800 feet. Ateron soils are used for livestock grazing. The native vegetation is mountain big sagebrush, Idaho fescue, bluebunch wheatgrass, and Sandberg bluegrass. *Snellby stony silt loam* (**79 acres**). Snellby soils consist of moderately deep, well drained soils on hills at elevations of 3,400 to 3,800 feet. Snellby soils are used for rangeland. The native vegetation is Idaho fescue, bluebunch wheatgrass, and big sagebrush. *Taterpa loam* (**77 acres**). Taterpa soils consist of deep, well drained soils on north-facing side slopes of mountains at elevations ranging from 4,000 to 6,200 feet. Taterpa soils are used for rangeland. The native vegetation is Idaho fescue, bluebunch wheatgrass, mountain big sagebrush and green rabbitbrush.
Hydrologic Features Present (SteamNet, NWI, NHD)	The property contains four perennial streams. NWI identifies several (14) emergent wetlands, a couple of impounded ponds, and three cold springs.
Adjacent land ownership, use, and condition	A majority of the immediately adjacent lands are private ownership; however, a few small BLM parcels border the property and larger tracts of BLM land are within 1 mile of the property. Livestock rangeland is the primary land use in the area, with irrigated agriculture in the valley surrounding Richland, approximately 2 miles to the east of the property.
Infrastructure Density within or Near the Parcel (Qualitative Description)	State Route 86 is 1 mile north of the property. The property itself contains some fencing and two track trails; otherwise, the property is open range.

Summary	The property contains some high quality shrub-steppe and native grassland habitat, but is interspersed with invasive vegetation such as medusahead wildrye. The property contains numerous water sources and riparian habitat. The property is completely within a sage-grouse Core Area and mule deer winter range and also contains some elk winter range. The highest density of wintering mule deer in Baker County occurs just north of the property. Pronghorn are common in the area. The property is adjacent to multiple sage-grouse leks and is situated between known lek sites and Sheep Mountain where radio-collared birds have been located, indicating the property is likely used during seasonal migrations and/or for nesting and brood rearing. The Pevine Flat area to the east is important for both sage-grouse and wintering big game.

Pass/Fail Desktop Assessment?	Pass

Boardman to Hemingway Transmission Line Project

Consideration of Property as a Potential Mitigation Site

Mitigation Function	This mitigation site has been identified as in-kind and in-proximity mitigation for impacts on Category 2 mule deer winter range and Rocky Mountain elk winter range within the shrub/grass general vegetation type. This mitigation site could also help meet the Project need for sage-grouse habitat mitigation. It also provides opportunity for shrub/grass mitigation of Category 3, 4, & 5 habitats. It contains important habitat features that could be preserved and has some uplift opportunities that could be achieved through implementation of standard mitigation actions. The mitigation actions listed below, upon successful implementation, will increase the quality of habitat available to sage-grouse, elk, and deer (among other species) within the mitigation site and result in an ecological uplift to the mitigation site above what is provided under the current management.
Mitigation Site Manager	Fee title acquisition with transfer of ownership to State of Oregon, Federal Land Management Agency, approved NPO or Land Trust.
Mitigation Actions	The following are mitigation actions that may be implemented at this mitigation site in order to satisfy the mitigation policies/guidelines of the permitting agencies. All mitigation actions will follow reliable methods. The mitigation actions presented here are not comprehensive. Implementation will likely be some combination of one or more of the following: • *Modification of Livestock Grazing* –. Future management would focus primarily on grazing practices that would not compete with native wildlife life history needs. Targeted grazing may be considered for habitat enhancement/treatment actions. • *Fence Removal/Marking* – opportunities are unknown at this time, but it is anticipated that some unnecessary fencing may be removed or necessary fencing can be upgraded to more wildlife friendly fencing. • *Weed treatment* – the extent of noxious weed invasion on the mitigation site is unknown at this time but it is anticipated that opportunities exist to implement this mitigation action. Some areas of introduced upland vegetation (specifically medusahead wildrye) were noted on the property. • *Native revegetation/restoration* – focus of efforts would be to promote establishment of sagebrush and bunchgrasses; opportunities exist but have not been specifically identified at this time. • *Fire readiness* – efforts made to make the property more resistant to catastrophic fire and a fire response plan could be developed. • *Wetland/Spring/Riparian Improvement* – opportunity exists along Canyon Creek, Upper Timber Gulch, and other areas to perform riparian/watershed improvements.
Monitoring	A specific plan for monitoring will be developed, but in general, mitigation progress will be monitored through vegetation plot monitoring and establishment of photo locations. Monitoring will occur annually for the first 3-5 years and an annual report will be produced. During the annual monitoring phase, a longer-term monitoring plan will be developed using similar protocols and methods to monitor the mitigation actions at larger time intervals (i.e., 5 years, 10 years).

Success Criteria

Specific success criteria will be developed once baseline conditions have been determined and potential mitigation actions have been confirmed for the site. Success criteria may include but are not limited to:

- Vegetation plots show an increase in native vegetation cover and general trend toward increased habitat quality representing an ecological uplift.
- Successful weed control through documentation of a reduction in weeds and non-native invasive plant species.
- Mitigation success will not be dependent on documentation of increased use of the mitigation site by sage-grouse or any other wildlife species.

Financial Outline

Estimated Budget for the Upper Timber Mitigation Site

Action	Cost per Unit	Units	Years	Expense
One-time Costs				
Acquisition	?	1		?
50-year Operation and Management Costs				
O&M[1]	$30.00	1,577	50	$2,365,500
Total	**-**			**$?** ($?)[2]

[1] This O&M cost is an estimate of the cost per acre per year (not including acquisition/easement costs) based on the research presented in the Independent Economic Analysis Board's 2007 *Investigation of Wildlife O&M Costs*. The average cost per acre presented in that document was $24 in 2004 dollars, this has been adjusted to reflect 2015 dollars. In addition, one of the projects presented in the document was the 10,000 acre Sagebrush Flat Wildlife Mitigation area in Washington state which is within a similar habitat type and has a FY2015 budget of approximately $300,000 (or $30/acre).

[2] Cost per acre here includes cost of acquisition/easement and initial mitigation actions and long-term O&M for 50 years.

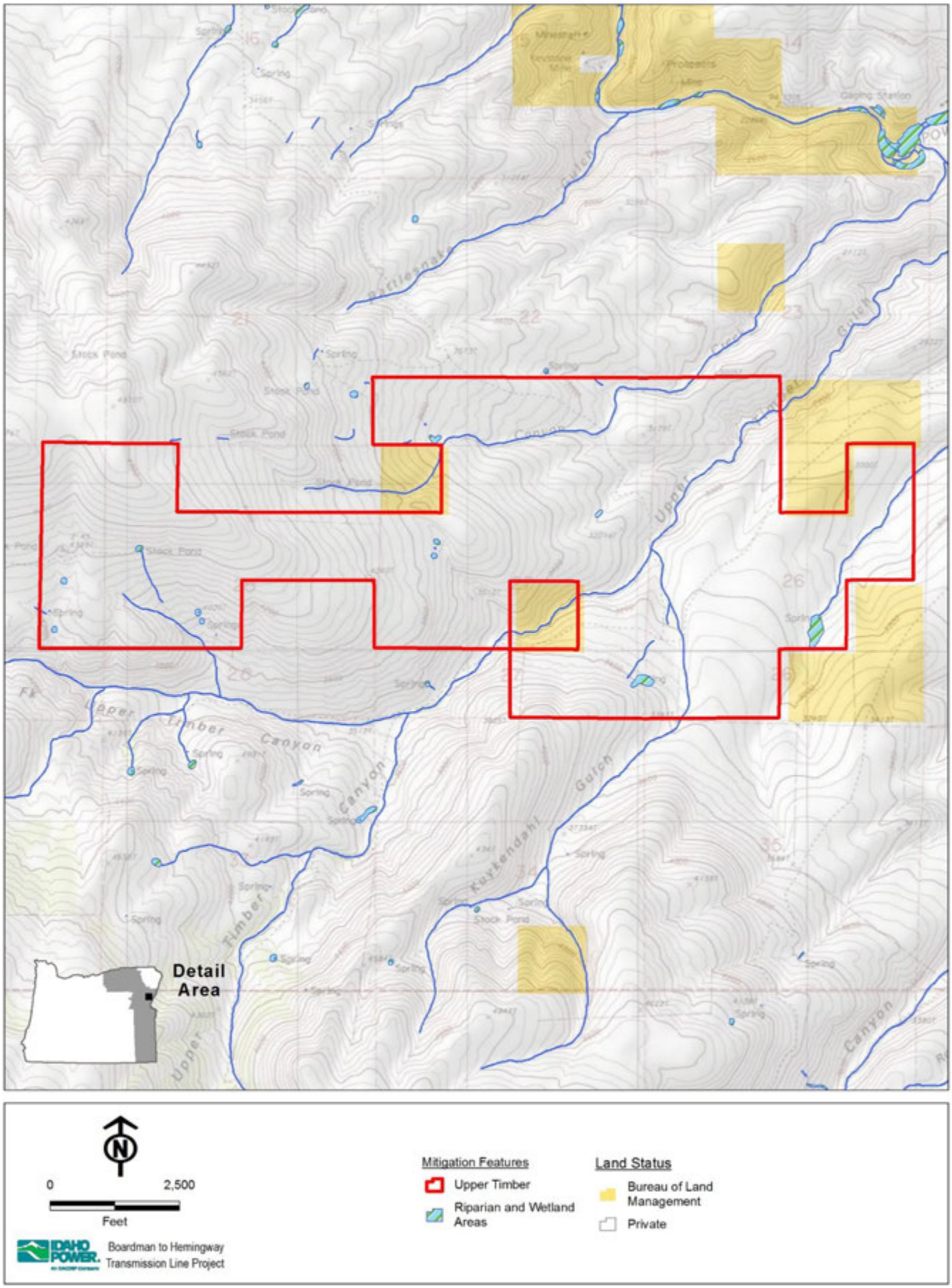

Figure 1. Upper Timber Ownership and Water

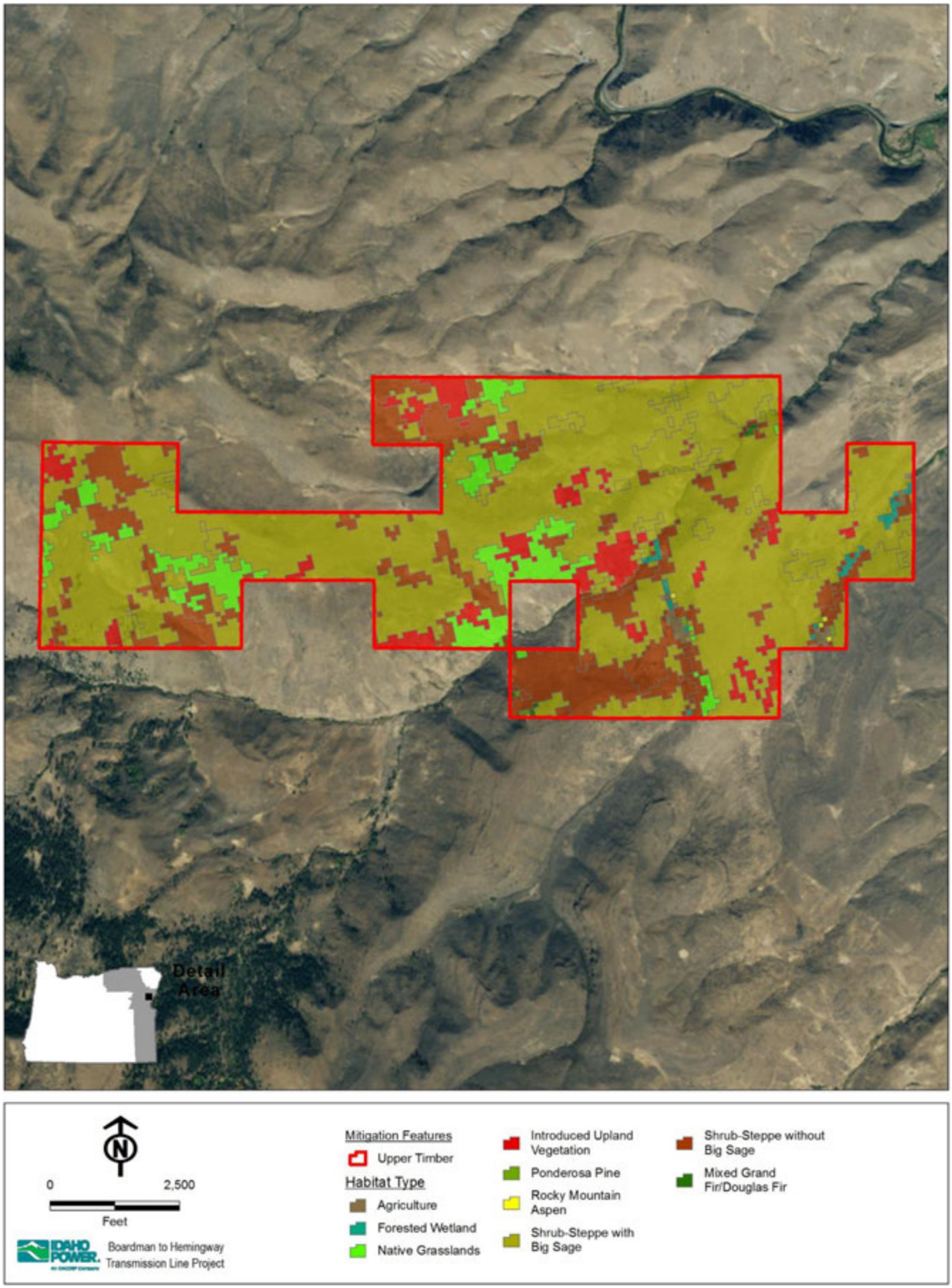

Figure 2. Upper Timber Habitat Types

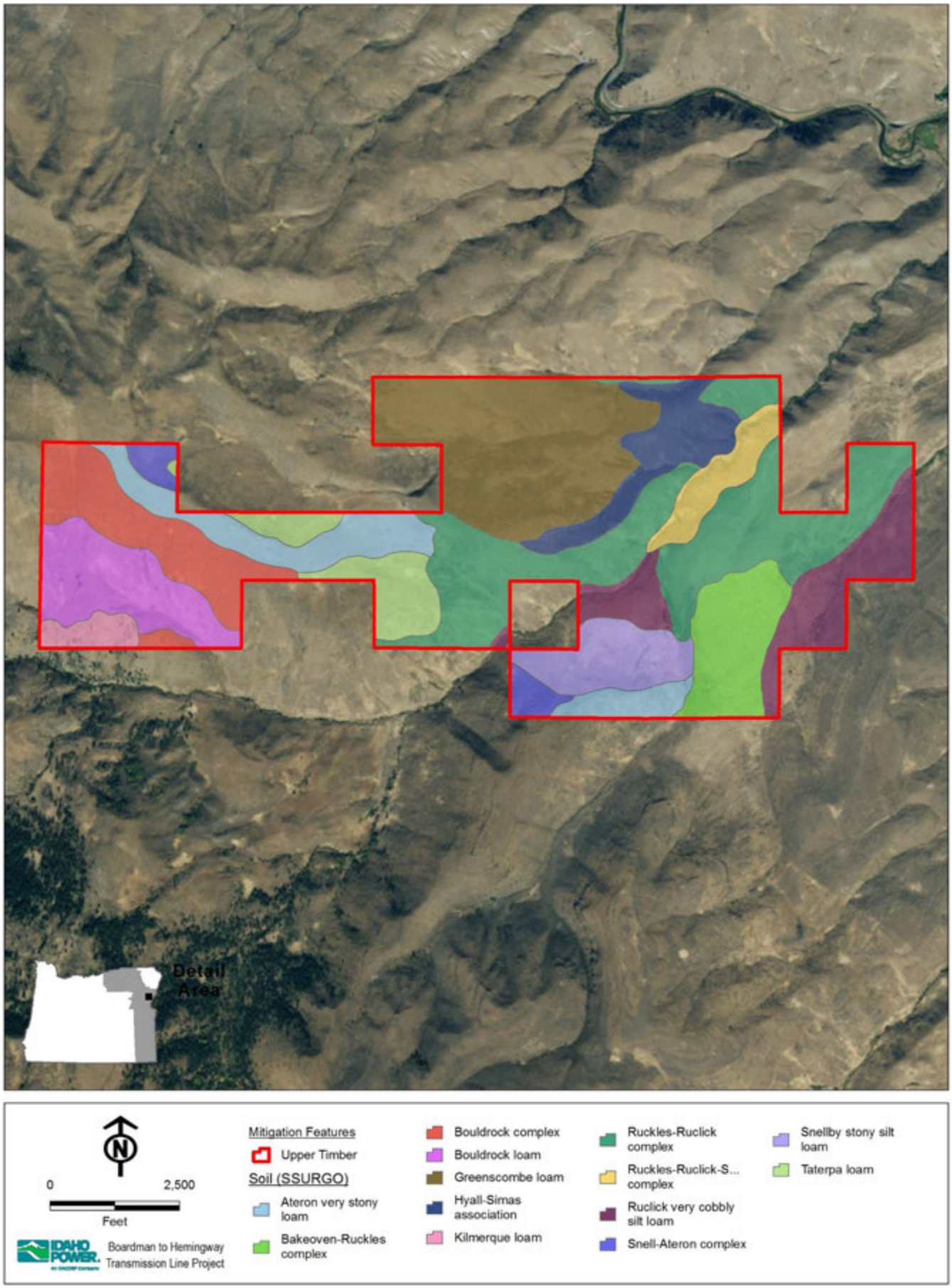

Figure 3. Upper Timber Soil Types

APPENDIX B
WOLF CREEK MITIGATION SITE EXPANDED ASSESSMENT

Boardman to Hemingway Transmission Line Project

Wolf Creek Mitigation Site

Mitigation Site Name: Wolf Creek (**Figure 1**)
Mitigation Credit: 1,775.8 acres
Parcel Elevation (ft): 3,750 – 4,650
Within Mitigation Service Area: Yes

Summary

Background

Idaho Power's Boardman to Hemingway Transmission Line Project will impact fish and wildlife habitat in Oregon. Idaho Power assigned a habitat category to each area impacted by the Project (Habitat Category 1 through 6) and identified the vegetation types within each habitat category area. Idaho Power also quantified the acres of the following species-specific habitats affected by the Project: Washington ground squirrel habitat, raptor nests, elk winter and summer range, mule deer winter and summer range, and sage-grouse habitat.

Idaho Power is required to secure compensatory mitigation sites to offset impacts to Habitat Category 1 through 5, and to offset impacts to the relevant species-specific habitats. Compensatory mitigation credits may be "stacked." That is, to the extent habitat within a mitigation site comprises Habitat Category 1 through 5 and provides relevant species-specific habitat, the relevant portion of the habitat site will be credited against both the habitat-category and species-specific mitigation requirements. For example, a mitigation site with 20 acres of Habitat Category 2 forest/woodland habitat, all of which occurs within elk winter range and half of which occurs within mule deer winter range, may be used to offset impacts to 20 acres of Habitat Category 2 forest/woodland habitat, 20 acres of elk winter range, and 10 acres of mule deer winter range.

Mitigation Site Description

The Wolf Creek Mitigation Site comprises approximately 1,781 acres and is located adjacent to Wolf Creek Reservoir and Forest Service-administered lands. The site is mostly timberland, providing winter and summer range for elk and mule deer. Wolf Creek runs through the site and is considered bull trout designated critical habitat. The site is very close to Oregon Department of Wildlife's (ODFW) Elkhorn–North Powder Wildlife Management Area. The site is partially within the Baker Valley Conservation Opportunity Area identified in the Oregon Conservation Strategy.

Mitigation Actions

Idaho Power would secure control over this mitigation site by obtaining a conservation easement or through acquisition for the life of the Project. Idaho Power would conduct the following mitigation actions on the site, which would benefit the entirety of the mitigation site and the fish and wildlife that use the mitigation site:

- Install or repair wildlife-friendly fence along the entirety of mitigation site boundary.
- Redistribute, burn, or otherwise dispose of approximately 200 slash piles, and revegetate and provide weed control at the slash pile sites.
- Decommission up to 12 miles of unnecessary roads, and close or limit access to other roads as directed by ODFW.

Mitigation Site Credits

This mitigation site has been identified by Idaho Power as a potential site for in-kind compensatory mitigation to offset the following Habitat Category and species-specific habitat impacts related to the Project:

Habitat Category and Vegetation Types	Mitigation Credit Acres
Category 2	**1,775.8**
Forest/Woodland	1,361.3
Shrub/Grass	344.3
Open Water/Wetlands	70.2

Species-Specific Habitat	Mitigation Credit Acres
Elk Winter Range	1,775.8
Mule Deer Winter Range	1,266.0
Elk Summer Range	1,775.8
Mule Deer Summer Range	1,775.8

Location Description (County, miles and direction from known location, TRS)

Union County, 5 miles northwest of North Powder.
T5S R38E Sections 27, 33, 34; T6S R38E Sections 3, 4, 10, 11.

Hydrologic Features Present (StreamNet, NWI, NHD)

Property contains two intermittent streams and two perennial streams (Clear Creek and Wolf Creek) per the NHD. Wetland features outside of those associated with the riparian corridors of the NHD streams includes an emergent wetland and an impoundment. The property borders the west side of Wolf Creek Reservoir.

Adjacent Ownership and Land Use	Majority of adjacent land ownership is private; however, the property does border a large tract of USFS lands and is within 0.5 mile of ODFW's Elkhorn WMA. Adjacent land use is open range, timbered range, timber harvest, and agricultural development.

Infrastructure Density within or Near the Parcel	Parcel has some residential buildings/shops in the southeast corner and some dirt/gravel roads; otherwise, the property is open timber/recently harvested timber. Wolf Creek Reservoir is adjacent to the property; the valley floor 1 mile to the east contains developed agricultural areas and associated infrastructure. I84 is over 4 miles away.

Table 1. Mitigation Credits by ODFW Habitat Category and General Vegetation Type[1]

Habitat Category and General Vegetation Type	Mitigation Credits
Category 2	**1,775.8**
Forest/Woodland	1,361.3
Shrub/Grass	344.3
Open Water/Wetlands	70.2

[1] USGS Gap Analysis Project (GAP) GIS data using ecological systems. Ecological systems were cross-walked to HMP General Vegetation Type (**Figure 2**) as shown in the Habitat Categorization Matrix (Attachment P1-1 of Exhibit P1).

Table 2. Mitigation Credits by Wildlife Habitat Layers[1]

Species-Specific Habitat	Mitigation Credits
Category 2 Elk Winter Range[2]	1,775.8
Category 3 Elk Summer Range[3]	1,266.0
Category 2 Mule Deer Winter Range[2]	1,775.8
Category 3 Mule Deer Summer Range[4]	1,775.8

[1] Wildlife habitat layers are not spatially discreet; there is abundant spatial overlap between the layers. In this mitigation site, the entire property is within elk winter range, mule deer summer range, and mule deer winter range. Elk summer range covers over half of the property.
[2] ODFW. 2013. ODFW Winter Range for Eastern Oregon. GIS data files (2). Available online at: https://nrimp.dfw.state.or.us/DataClearinghouse/default.aspx?p=202&XMLname=885.xml
[3] Rocky Mountain Elk Foundation. 1999. M.A.P. Elk Habitat Project. GIS data.
[4] WAFWA (Western Association of Fish and Wildlife Agencies). 2002. Mule Deer Habitat of the Western United States. GIS Dataset. Remote Sensing/Geographic Information Systems Laboratory, Utah State University. Logan, UT.

Soil types	The NRCS Soil Survey Geographic Database (SSURGO) data were reviewed and the following soils were identified on the property (**Figure 3**): *Anatone-Klicker complex* (**168 acres**). Anatone soils consist of shallow, well drained soils found on mountain side slopes, ridgetops, hills, and and plateaus at elevations of 2,000 to 6,200 feet. Anatone soils are mostly used for livestock grazing, wildlife habitat, and recreation. Native vegetation is mainly bluebunch wheatgrass, Idaho fescue, Sandberg bluegrass, mossy stonecrop, curlleaf mountain mahogany and stiff sagebrush. Klicker soils consist of moderately deep, well drained soils on mountains, plateaus, and benches at elevations from 2,500 to 6,200 feet. Klicker soils are used mainly for timber production and wildlife habitat. Native vegetation is an open stand of ponderosa pine and Douglas-fir with an understory of bluebunch wheatgrass, slender wheatgrass, brome grass, elk sedge, Oregon-grape, common snowberry, Saskatoon serviceberry, creambush oceanspray, mallow ninebark, and wild rose.

Soil types (cont.)

Encina silt loam (**57 acres**). Encina silt loam soils consist of deep, well drained soils found on dissected slopes of terrace fronts, usually with southern aspects, at elevations from 2,000 to 4,000 feet. Used for rangeland, small grains, hay pasture, wildlife habitat, and water supply. Native vegetation dominantly is bluebunch wheatgrasss, Sandberg bluegrass, Idaho fescue, rabbitbrush, big sagebrush, and squaw apple.

Gwinly-Rockly complex (**20 acres**). The Gwinly soils consist of shallow, well drained soils found on hills, plateaus, structural benches, mountains, and canyons at elevations from 1,400 to 4,600 feet. Used for livestock grazing and wildlife habitat. Potential native vegetation is dominantly bluebunch wheatgrass, Idaho fescue, Sandberg bluegrass and low sagebrush. The Rockly soils consist of shallow and very shallow, well drained soils on mesas, ridges, plateaus, structural benches, canyon walls, and nearly level to very steep south and west slopes on uplands at elevations of 300 to 5,000 feet. These soils are used for livestock grazing, wildlife habitat, and water supply purposes. Native vegetation is mostly stiff sagebrush, lomatium, bluebunch wheatgrass, and Sandberg bluegrass.

Gwinly very cobbly silt loam (**67 acres**). The Gwinly soils consist of shallow, well drained soils found on hills, plateaus, structural benches, mountains, and canyons at elevations from 1,400 to 4,600 feet. Used for livestock grazing and wildlife habitat. Potential native vegetation is dominantly bluebunch wheatgrass, Idaho fescue, Sandberg bluegrass, and low sagebrush.

Klicker-Anatone complex (**157 acres**). Klicker soils consist of moderately deep, well drained soils on mountains, plateaus, and benches at elevations from 2,500 to 6,200 feet. Klicker soils are used mainly for timber production and wildlife habitat. Native vegetation is an open stand of ponderosa pine and Douglas-fir with an understory of bluebunch wheatgrass, slender wheatgrass, brome grass, elk sedge, Oregon-grape, common snowberry, Saskatoon serviceberry, creambush oceanspray, mallow ninebark, and wild rose. Anatone soils consist of shallow, well drained soils found on mountain side slopes, ridgetops, hills, and and plateaus at elevations of 2,000 to 6,200 feet. Anatone soils are mostly used for livestock grazing, wildlife habitat, and recreation. Native vegetation is mainly bluebunch wheatgrass, Idaho fescue, Sandberg bluegrass, mossy stonecrop, curlleaf mountain mahogany, and stiff sagebrush.

Klicker stony silt loam (**765 acres**). Klicker soils consist of moderately deep, well drained soils on mountains, plateaus, and benches at elevations from 2,500 to 6,200 feet. Klicker soils are used mainly for timber production and wildlife habitat. Native vegetation is an open stand of ponderosa pine and Douglas-fir with an understory of bluebunch wheatgrass, slender wheatgrass, brome grass, elk sedge, Oregon-grape, common snowberry, Saskatoon serviceberry, creambush oceanspray, mallow ninebark and wild rose.

Lookingglass very stony silt loam (**45 acres**). Lookingglass soils consist of very deep, moderately well drained soils found on uplands at elevations of 1,800 to 4,000 feet. Lookingglass soils are used mainly for timber production. Cleared areas are cropped to small grains, hay, pasture, and peas. The native vegetation is ponderosa pine and Douglas-fir with an understory of spirea, oceanspray, Idaho fescue, pinegrass, and elksedge.

Soil types (cont.)	*Olot stony silt loam* (**4 acres**). Olot soils consist of moderately deep, well drained soils found on plateaus, canyons, mountains and structural benches at elevations typically between 2,800 to 5,000 feet. Olot soils are used mainly for timber production. Also used for wildlife habitat. Vegetation is western larch, Douglas fir, willow, mountain alder, common snowberry, elk sedge, and pinegrass. *Starkey very stony silt loam* (**2 acres**). Starkey soils consist of shallow, well drained soils found on mountains and hills at elevations of 2,400 to 4,000 feet. Starkey soils used for rangeland. Native vegetation is mainly Idaho fescue, bluebunch wheatgrass and Sandberg bluegrass. *Tolo silt loam* (**289 acres**). Tolo soils consist of deep and very deep, well drained soils found on nearly level upland plateaus and steep north and east-facing mountain side slopes at elevations of 2,800 to 5,400 feet. Tolo soils used for timber production and livestock grazing with small areas at lower elevations cleared for cultivation. Principal trees include Douglas fir, grand fir, larch, ponderosa pine, and lodgepole pine. *Ukiah-Starkey complex* (**166 acres**). Ukiah soils consist of moderately deep, well drained soils found on hills with an elevation of 2,400 to 4,600 feet. Ukiah soils are mainly used for range. Some areas are cultivated for dryland hay and small grains. Native vegetation is mainly Idaho fescue, bluebunch wheatgrass and Sandberg bluegrass. Starkey soils consist of shallow, well drained soils found on mountains and hills at elevations of 2,400 to 4,000 feet. Starkey soils used for rangeland. Native vegetation is mainly Idaho fescue, bluebunch wheatgrass and Sandberg bluegrass. *Ukiah silty clay loam* (**8 acres**). Ukiah soils consist of moderately deep, well drained soils found on hills with an elevation of 2,400 to 4,600 feet. Ukiah soils are mainly used for range. Some areas are cultivated for dryland hay and small grains. Native vegetation is mainly Idaho fescue, bluebunch wheatgrass and Sandberg bluegrass. *Veazie-Voats complex* (**32 acres**). Veazie soils consist of very deep, well drained soils found on flood plains broken by old stream channels at elevations of 750 to 4,000 feet. Veazie soils are used mainly for irrigated hay and pasture. Other uses are livestock grazing and wildlife. Native vegetation is bluebunch wheatgrass, basin wildrye, sedges, rushes and willows. Voats soils consist of very deep, well drained soils found on flood plains broken by old stream channels and occur at elevations of 1,600 to 4,000 feet. Voats soils are used mainly for pasture. Other uses are livestock grazing and wildlife habitat. Potential native vegetation is bluebunch wheatgrass, basin wildrye, timothy, Kentucky bluegrass, sedges, rushes, and scattered willow, alder, hawthorne, and rose.
Mitigation Site Manager	Fee title acquisition with transfer of ownership to the State of Oregon to be managed as part of ODFW's Elkhorn WMA.

Mitigation Actions	The following mitigation actions are proposed in order to earn 1, 75.8 acres of mitigation credit at this mitigation site. • *Fence Installation/Repair* – Boundary fencing will be installed and/or repaired/replaced on approximately 15 miles. This will include the use of wildlife friendly fence designs. • *Slash Pile Treatment* (**Figure 4**) – Extensive logging has taken place on the property resulting in nearly 200 slash piles that are visible on satellite imagery. Slash piles will be treated (re-distribution, burning, or other method) and revegetation and weed control will occur at the slash pile scars. • *Road Closure and/or Decommissioning* (**Figure 4**) – Several miles of logging roads, landing areas, and skid trails exist within the mitigation site. Mitigation actions will include any activity that results in the stabilization and restoration of unneeded roads to a more natural state. Actions may include scarifying and spreading slash at landing areas and skid trails, denying access (eliminate traffic), and ripping, waterbarring, and seeding of roads. IPC has preliminarily identified roads to maintain and roads to decommission. Roads that are proposed for decommissioning are symbolized by a black line in **Figure 4**, and roads that will be maintained on the property are symbolized by a white line. Existing easements for other parties are unknown at this time, but will not be affected. Access to maintained roads will be limited to ODFW use. Up to 12 miles of roads and trails will be closed or decommissioned.
Monitoring	A specific plan for monitoring will be developed, but in general, mitigation progress will be monitored through establishment of photo locations and vegetation monitoring. Monitoring will occur annually for the first 3-5 years and an annual report will be produced. Long-term monitoring will be developed with reporting that will occur at larger time intervals (i.e., 5 years, 10 years).
Success Criteria	Specific success criteria will be developed once mitigation actions have been confirmed for the site. Success criteria may include but are not limited to: • Completion of fence improvement and/or removal projects. • Completion of slash pile treatments. • Completion of road closure and/or decommissioning.

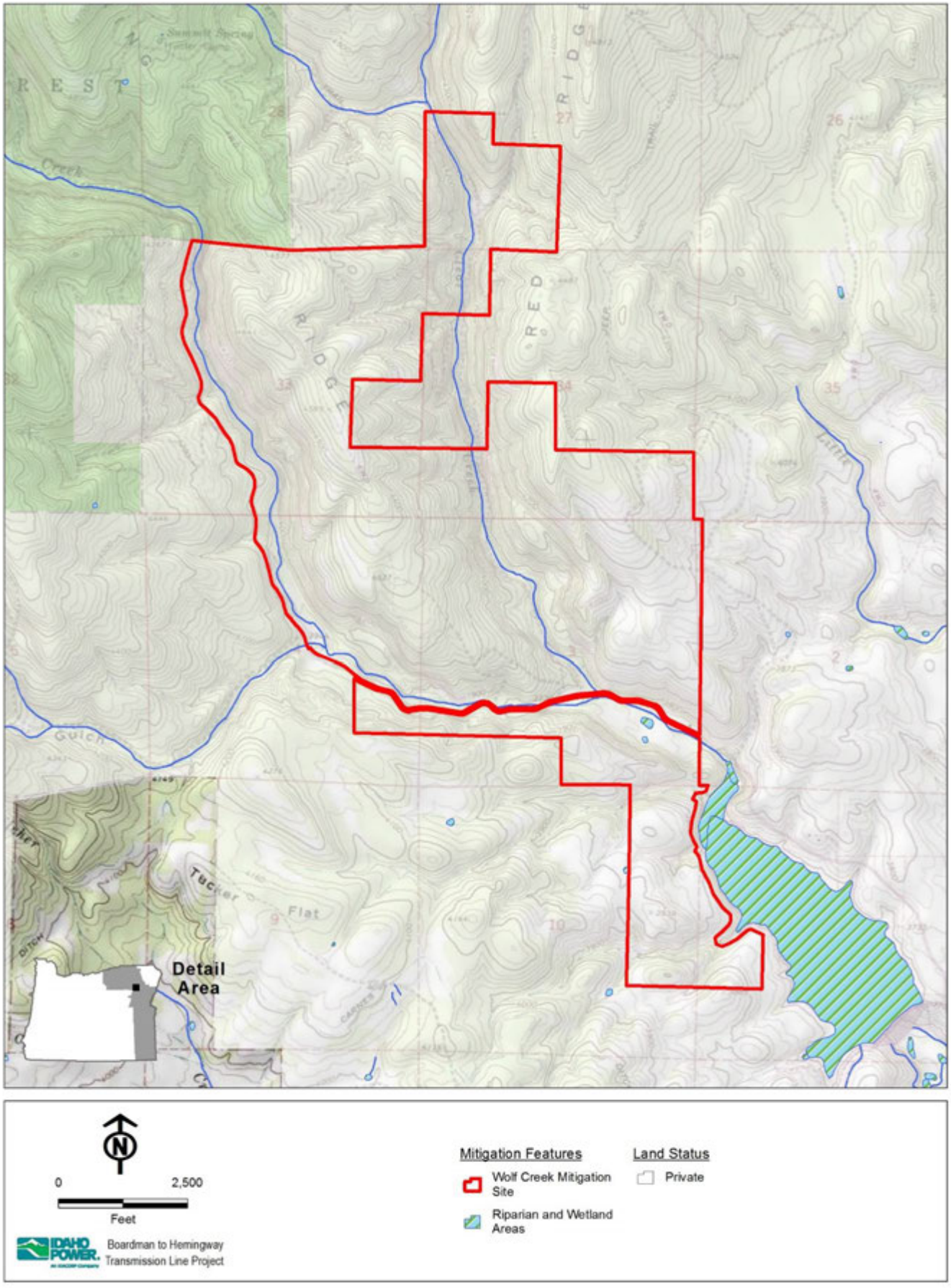

Figure 1. Wolf Creek Mitigation Site Ownership and Water

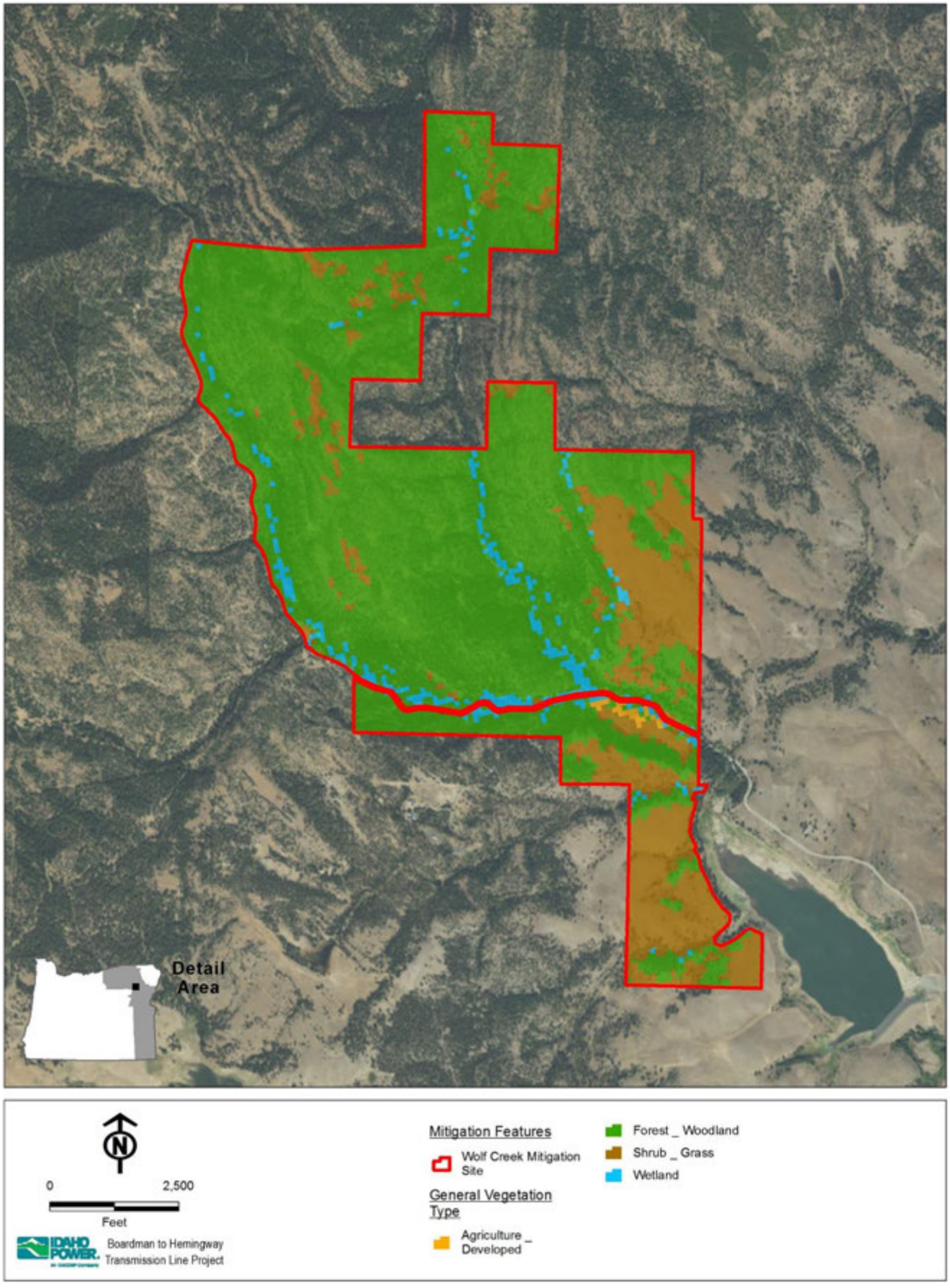

Figure 2. Wolf Creek Mitigation Site General Vegetation Types

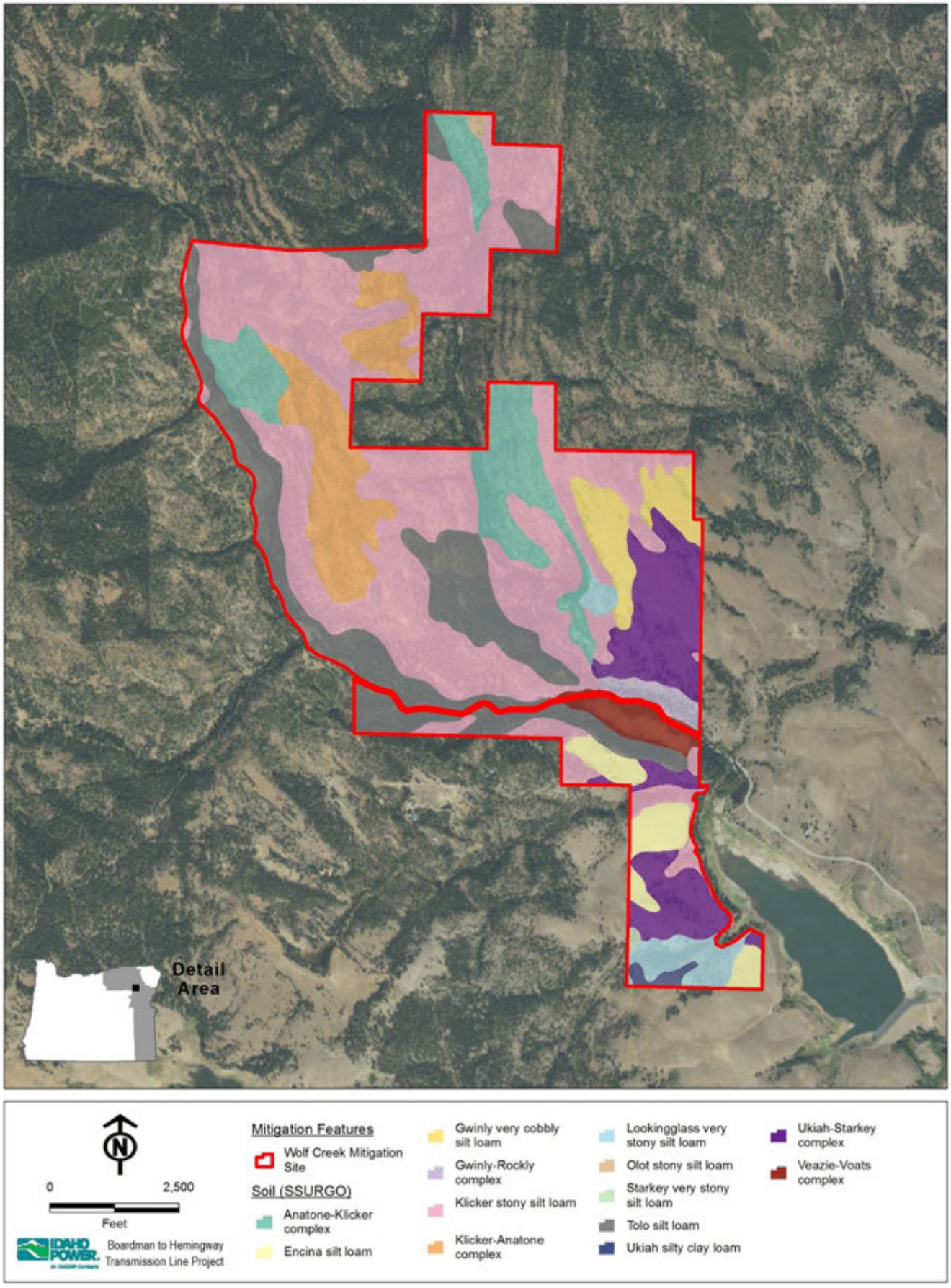

Figure 3. Wolf Creek Mitigation Site Soil Types

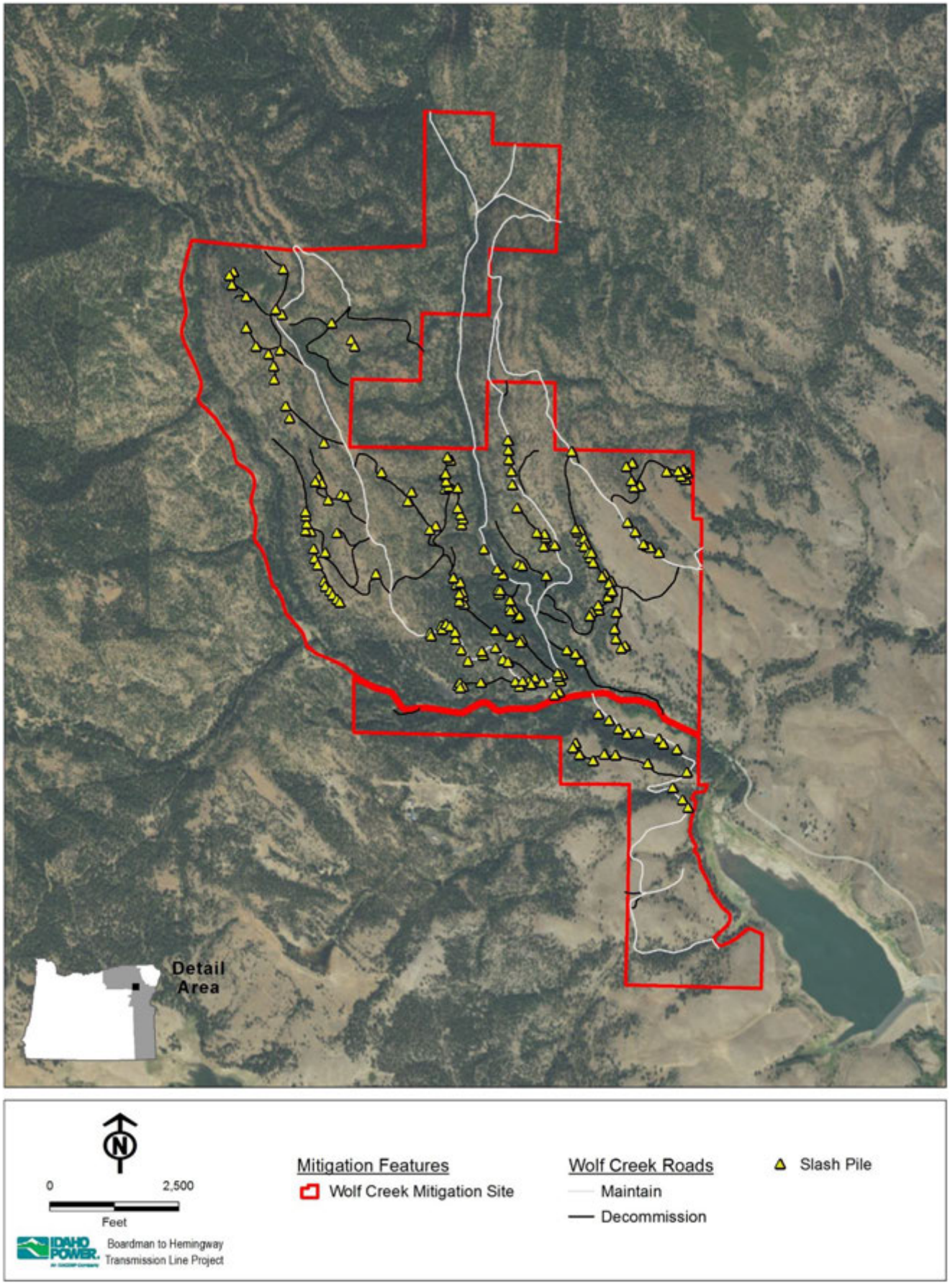

Figure 4. Wolf Creek Mitigation Site Slash Piles and Roads