Appendix K

Compensatory Mitigation for Raptor Habitat in the Morley Nelson Snake River Birds of Prey National Conservation Area: Methods and Conceptual Model Example

1 INTRODUCTION

Congress established the Morley Nelson Snake River Birds of Prey National Conservation Area (SRBOP) in part "to provide for the conservation, protection, and enhancement of raptor populations and habitats and the natural and environmental resources and values associated therewith, and of the scientific, cultural, and educational resources and values of the public lands in the conservation area" (Section 3(a)(2) of P.L. 103-64 [1993]). Therefore, the BLM must demonstrate that the proposed right-of-way (ROW) for the Gateway West Transmission Line Project (Project), which would use portions of the SRBOP if approved, would meet the established purposes of the SRBOP, especially the protection and enhancement of identified SRBOP resources and values.

Other federal policies mandate that mitigation be implemented to offset impacts incurred within the SRBOP. These include: 1) the Presidential Memorandum of November 3, 2015; 2) Department of the Interior Manual 600 DM 6; and 3) the BLM Interim Mitigation Policy (2013-WO-IM-142).

- The November 3, 2015, Presidential Memorandum *Mitigating Impacts on Natural Resources from Development and Encouraging Related Private Investment* (80 Federal Register 68743) directs agencies to implement landscape-scale mitigation for project development impacts. The Memorandum states that "Agencies' mitigation policies should establish a net benefit goal or, at a minimum, a no net loss goal for natural resources the agency manages that are important, scarce, or sensitive, or wherever doing so is consistent with agency mission and established natural resource objectives." In addition, it states that mitigation "occurs through policies that direct the planning necessary to address the harmful impacts on natural resources by avoiding and minimizing impacts, then compensating for impacts that do occur."

- In October 2015, the Department of the Interior released Manual 600 DM 6: "Implementing Mitigation at the Landscape-scale" (DOI 2015), which implements landscape-scale mitigation for impacts from projects. The mitigation guidance states that "compensatory mitigation means to compensate for remaining unavoidable impacts after all appropriate and practicable avoidance and minimization measures have been applied, by replacing or providing substitute resources, or environments."

- The BLM Interim Mitigation Policy (2013-WO-IM-142) states that the BLM will identify, analyze and require compensatory mitigation, as appropriate, to address reasonably foreseeable residual effects from land use activities to resources, values, and functions.

Idaho Power and Rocky Mountain Power (the Proponents) developed a Mitigation and Enhancement Portfolio (MEP) as part of the Proposed Action (Appendix C to this document), which is intended to offset impacts to and enhance resources and values found in the SRBOP. The MEP proposes measures to address the effects that persist

after all appropriate and practicable avoidance and minimization measures have been applied to return an impacted area to baseline conditions, such as 1) habitat restoration, 2) purchasing private inholdings within the SRBOP, 3) added funding of law enforcement, 4) funding for visitor services, and 5) removal of some existing powerlines in the SRBOP.

The lack of details or specifics in the MEP makes it unclear how the proposal's goals would be achieved. Most importantly, the MEP does not contain a methodology and a reliable, consistent, and repeatable accounting system to determine the expected impacts of actions and the measures necessary to compensate for those impacts based on a common "currency" (i.e., raptor habitat value per acre). Therefore, it is not adequate in the form submitted as part of the Revised Plan of Development for the Project.

To address this deficiency, the BLM has developed a model compensatory mitigation accounting system that can be used to assess impacts to raptor habitat in the SRBOP. Raptor habitat is assumed to be a suitable surrogate for assessing adverse impacts (i.e., debits) and beneficial effects (i.e., credits) to raptor populations. The methods described in this Appendix and demonstrated in the conceptual model would determine compensatory mitigation debits and credits for any authorization that impacts raptor habitat in the SRBOP. If an action alternative is selected in the Final SEIS, the BLM will fully apply compensatory mitigation analysis to the selected route alignments and present that analysis and the appropriate calculations in the Final SEIS. The model may also be revised or refined between the Draft and Final SEIS based on feedback received on the Draft SEIS.

These methods apply only to compensatory mitigation for raptor habitat in the SRBOP. Other impacts to resources that warrant compensatory mitigation are addressed in other sections of this Draft SEIS and/or the original 2013 Final EIS for the Gateway West project (e.g., Greater sage-grouse compensatory mitigation in Final EIS Appendix C).

2 MANAGEMENT OBJECTIVES AND GOALS FOR THE SRBOP

The Resource Management Plan (RMP) for the SRBOP emphasizes the restoration and rehabilitation of all areas outside the Idaho Army National Guard Orchard Combat Training Area to bring raptor populations and habitat to more desirable conditions. The RMP identifies appropriate management actions to avoid or minimize environmental impacts where practicable, while meeting the purposes for which the SRBOP was established. The RMP states that mitigation may also be developed during site-specific activity and project-level analysis to meet management direction for the SRBOP. This direction includes:

- Protecting remaining shrub communities,
- Restoring shrub habitat,
- Completing fuels management projects,
- Designating rights-of-way and energy corridors, and

- Managing visual resources.

Three Management Areas (MAs) and corresponding Desired Future Conditions (DFCs) for vegetation are designated and prioritized in the RMP. The MAs identify locations where specific management actions, including rehabilitation and fire suppression, are prioritized based on ecological resiliency and function to achieve highest restoration potential and fire management priority.

- MA 1 is composed of sagebrush and salt desert shrub communities, and is identified in the RMP as the area within the SRBOP most resistant and resilient to disturbance with the highest probability of restoration success (BLM 2008).
- Areas designated as MA 2 still contain habitat structure (e.g., shrub communities) that provide some habitat connectivity value for supporting a raptor prey base, but to a lesser extent than what is found in MA 1.
- MA 3 is managed at a lower priority level than MA 1 or 2 due to almost complete loss of shrub structure and the associated lack of ecological resilience and resistance of the current plant communities.

Table 1. Vegetation Community Condition Classes and Relative Raptor Habitat Value

Condition Class	Canopy Cover of Primary Components (%)			Habitat Value
	Sage-brush	Invasive Annual Grass	Other	
Ecological Potential (EP)	≥ 15	< 50	native perennial grass > seeding	1.0
Early-seral Native Shrubland/Grassland (NSG)	< 15	< 50	native perennial grass > seeding	0.8
Shrublands/Invasive Annual Grasses (SX)	≥ 5	≥ 50	NA	0.6
Non-native Seeding (NNS)	< 15	< 50	seeding > native perennial grass	0.4
Invasive Annual Grassland/Forbs (X)	< 5	≥ 50	NA	0.2
Facility/Developed Sites	0	0	NA	0.0

Table 1 shows the various condition classes for vegetation communities found in the SRBOP. The DFC of MA 1 is a mosaic of multi-aged shrubs, forbs, and native and adapted non-native perennial grasses (i.e., Ecological Potential [EP]). Although this DFC is synonymous with the highest-valued raptor habitat, other condition classes provide *suitable* raptor habitat (i.e., grass-dominated native shrubland/grassland [NSG]) or *adequate* raptor habitat (i.e., multi-aged shrubland with an invasive grass understory [SX]) due to the community's increased ability to move to a higher condition class (via the restoration pathways shown in Figure E) or remaining vegetative structure.

3 COMPENSATORY MITIGATION FRAMEWORK

Mitigation Standard for the SRBOP

The overall credits from compensatory mitigation must exceed the overall debits of the Project to result in enhancement (i.e., net benefit) to SRBOP raptor populations and habitats (see Section 3.1 below for Calculation of Baseline). Enhancement is defined as an improvement over current baseline conditions.

Compensatory Mitigation Measures

Habitat restoration treatments are the primary compensatory mitigation the BLM will require to address impacts from the construction of Gateway West to SRBOP raptor populations and habitats.

Siting Compensatory Mitigation

Habitat restoration treatments would primarily be conducted within MA 1 because the RMP identifies this area as having the highest probability of restoration success (BLM 2008). The method assumes that the EP of an area is specific to the Ecological Site Descriptions (ESDs) of the vegetation community.

In addition, habitat restoration treatments would be located within fuel break compartments that contain a gradient of the raptor habitat condition classes described in Table 1. Fuel breaks will compartmentalize habitat restoration areas to provide durability for treatments.

Restoration treatment areas within MA 1 will be defined and prioritized, based on:

1. where treatments would provide the best connectivity between existing shrub communities;
2. where perennial native and non-native vegetation (seedings) exist and provide stable ecological conditions that facilitate restoration success;
3. where existing ongoing restoration and research demonstration projects can continue to be leveraged; and,
4. where sites have the ability to achieve EP or NSG (i.e., DFCs for SRBOP raptor habitat).

It should be noted that, depending on initial condition class, it may take multiple treatments to achieve DFC for raptor habitat (Figure E). In addition, the entire SRBOP is a finite area, and areas identified for restoration treatments will be further bounded to ensure a relationship between Project impacts and mitigation measures. All compensatory mitigation measures must be durable for the duration of the Project impacts, and thus provide benefit to SRBOP raptor populations and habitats for that duration.

3.1 Mechanics of the Model

Calculating Current Baseline

One method for establishing a baseline for SRBOP raptor habitat is to assign values to vegetation community condition classes based on the services and functions they provide as habitat for raptors and raptor prey. For this example, one of five condition classes (Table 1) is assigned to each acre within the analysis area. Each condition class carries a habitat value between 0 and 1. When considered cumulatively, a mean per-acre habitat value can be calculated for the area and impacts (i.e., debits) and offsets (i.e., credits) assessed for habitat loss and restoration treatments, respectively. The mean SRBOP habitat value for an analysis area is calculated by averaging the habitat values of each acre within the analysis area. The resulting mean habitat value would represent the current baseline before Project impacts.

Calculating Debits

The construction, operation and maintenance of the Gateway West Project would result in complete loss and degradation of SRBOP raptor habitats at locations where facilities are sited and construction areas surrounding these facilities, which generally would be cleared of vegetation during construction. Some of these construction areas would be restored over time to EP, while other areas immediately surrounding facilities would be periodically re-disturbed or maintained in a condition class with relatively lower habitat value (e.g., NSG or NNS). These areas may continue to experience ongoing disturbance during operation but could also retain some raptor habitat component. A minor subset of the Project's overall disturbances would result in complete loss of habitat value; within the SRBOP this would mostly be limited to the footprint of individual facilities.

3.2 Conceptual Model Example: Mitigation Calculations for Impacts Resulting in Complete Loss of Habitat within Management Area 1

The following example uses the model method to calculate the debits and required credits (i.e., the mitigation requirements) related to impacts of a hypothetical project sited within MA 1 for acres with a complete loss of habitat (i.e., mitigation to compensate for the Project's permanent footprint). Similar but modified methods would be used for the other impacts (i.e., temporary, non-periodic and temporary, periodic impacts) in MA 1, as well as all impacts in MA 2 and MA 3.

Calculation of Existing Baseline Condition

First, assume that each cell in Figure 1 represents one acre of a Wyoming Big Sagebrush habitat of varying condition classes, each of which has a different potential restoration pathway (as shown in Figure E). The example area (Figure A) has a finite area of 30 acres (A1) that contain a variety of condition classes with different habitat values (A2). The mean value of the raptor habitat in this area is **0.57/acre** (A3).

Figure A. Existing Baseline Condition

EP (1.0)	EP (1.0)	EP (1.0)	NSG (0.8)	SX (0.6)
EP (1.0)	EP (1.0)	EP (1.0)	SX (0.6)	X (0.2)
EP (1.0)	EP (1.0)	SX (0.6)	NNS (0.4)	X (0.2)
NSG (0.8)	NNS (0.4)	NSG (0.8)	X (0.2)	X (0.2)
X (0.2)	X (0.2)	X (0.2)	SX (0.6)	SX (0.6)
X (0.2)	X (0.2)	X (0.2)	SX (0.6)	NNS (0.4)

A1). 30 acre area of Wyoming Big Sagebrush Ecological Site
A2). EP: 8*1.0 = 8.0; NSG: 3*0.8 = 2.4; SX: 6*0.6 = 3.6; NNS: 3*0.4 = 1.2; X: 10*0.2 = 2.0
A3). Mean habitat condition value = (8.0+2.4+3.6+1.2+2.0) = 17.2/30 acres = **0.57/acre**

Calculation of Debits for Permanent Project Impacts

Figure B displays the effects of the hypothetical project consisting of components that result in a complete loss of 5 acres of habitat (e.g., conversion of habitat to permanent facility footprint; red rectangles in Figure B). In this example, habitat loss within the area would last for the life of the project (i.e., a permanent impact; B1), and the BLM would permanently lose the ability to restore the impacted acres to their EP (as per RMP Objectives and Management Actions, BLM 2008). The habitat values for each of the lost acres would be reduced to 0, and consequently, the resulting mean habitat value is reduced to **0.49/acres** (B2 and B3).

Figure B. Debits for Permanent Project Impacts

EP (1.0)	EP (1.0)	EP (1.0)	NSG (0.8)	SX (0.6)
EP (1.0)	EP (1.0)	EP (1.0)	SX (0.6)	X (0.2)
EP (1.0)	EP (1.0)	SX (0.6)	NNS (0.4)	X (0.2)
NSG (0.0)	**NNS** (0.0)	**NSG** (0.0)	**X** (0.0)	**X** (0.0)
X (0.2)	X (0.2)	X (0.2)	SX (0.6)	SX (0.6)
X (0.2)	X (0.2)	X (0.2)	SX (0.6)	NNS (0.4)

B1). Permanent loss of 5 ac of EP potential (red rectangles)
B2). EP: 8*1.0 = 8.0; NSG: 1*0.8 = 0.8; SX: 6*0.6 = 3.6; NNS: 2*0.4 = 0.8; X: 8*0.2 = 1.6
B3). Mean habitat condition value = (8.0+0.8+3.6+0.8+1.6) = 14.8/30 acres = **0.49/acre**

Calculation of Credits for Habitat Restoration Treatments

To return the area to the mean habitat value that existed at baseline, habitat restoration treatments would be required (see Figure C). In the first step, 5 acres at other locations within the affected area (green rectangles in Figure C) would be treated to mitigate the lost habitat value and compensate for the lost opportunity to restore the developed acres to their EP (C1). Habitat values for each treated acre would increase to 1.0 (i.e., the EP; C2). As a result, mean habitat value would increase to **0.55/acre** (C3); however, this would still be below the baseline of **0.57/acre**.

Figure C. Credits for Initial Habitat Restoration Actions

EP (1.0)	EP (1.0)	EP (1.0)	**NSG→EP** (1.0)	**SX→EP** (1.0)
EP (1.0)	EP (1.0)	EP (1.0)	**SX→EP** (1.0)	X (0.2)
EP (1.0)	EP (1.0)	**SX→EP** (1.0)	NNS (0.4)	X (0.2)
NSG (0.0)	NNS (0.0)	NSG (0.0)	X (0.0)	X (0.0)
X (0.2)	X (0.2)	X (0.2)	SX (0.6)	**SX→EP** (1.0)
X (0.2)	X (0.2)	X (0.2)	SX (0.6)	NNS (0.4)

C1). Treat 5 ac to replace lost opportunity to restore 5 ac to EP potential at developed sites
C2). EP: 13*1.0 = 13.0; NSG: 0*0.8 = 0; SX: 2*0.6 = 1.2; NNS: 2*0.4 = 0.8; X: 8*0.2 = 1.6
C3). Mean habitat condition value = (13.0+0+1.2+0.8+1.6) = 16.6/30 acres = **0.55/acre**

Credits for Additional Habitat Restoration Actions

Because the mean habitat value following the initial step would remain below the baseline (i.e., **0.55/acre** after mitigation treatments <**0.57/acre** at baseline), additional acres would need to be treated (Figure D). One approach that could be used to equal or exceed baseline conditions (i.e., increase habitat values) would be treating additional acres to attain DFC for raptor habitat (orange rectangles in Figure D; D1).

In practice, SX (Shrublands/Invasive Annual Grasses) is not a target DFC for habitat restoration treatments. However, SX does provide better structure, and therefore better raptor habitat, than NNS (Non-native Seeding). In turn, although NNS is more desirable for long-term soil stabilization and reduced fire risk than X (Invasive Annual Grassland/ Forbs), NNS is also not a DFC for SRBOP raptor habitat (i.e., the focus of habitat management objectives and actions in MA 1).

However, if the existing condition of SX acres not treated in the first step (C1) were replaced at additional treatment sites to condition classes that would provide DFC for raptor habitat (i.e., EP or NSG; D2), the resulting mean habitat values would increase to **0.64/acre** (D3), which would exceed the baseline mean habitat value (A3).

Figure D. Credits for Additional Habitat Restoration Actions

EP (1.0)	EP (1.0)	EP (1.0)	NSG→EP (1.0)	SX→EP (1.0)
EP (1.0)	EP (1.0)	EP (1.0)	SX→EP (1.0)	**X→NSG** (0.8)
EP (1.0)	EP (1.0)	SX→EP (1.0)	**NNS→EP** (1.0)	X (0.2)
NSG (0.0)	NNS (0.0)	NSG (0.0)	X (0.0)	X (0.0)
X (0.2)	X (0.2)	X (0.2)	**SX→EP** (1.0)	SX→EP (1.0)
X (0.2)	X (0.2)	X (0.2)	**SX→EP** (1.0)	**NNS→EP** (1.0)

D1). Treat 5 ac to replace loss of 5 ac of Existing Condition (or DFC) at Treatment Sites
D2). EP: 17*1.0 = 17.0; NSG: 1*0.8 = 0.8; SX: 0*0.6 = 0; NNS: 0*0.4 = 0; X: 7*0.2 = 1.4
D3). Mean condition value = (17.0+0.8+0+0+1.4) = 19.2/30 acres = **0.64/acre**

Any number of alternative scenarios to achieve mean baseline conditions could be substituted for or added to the additional credit step in Figure D, on the condition that treated acres end up in a DFC for SRBOP raptor habitat. Figure E shows various potential pathways for restoration to DFC.

Conceptual Model Example Summary

This model establishes a logical and transparent approach to assessing baseline conditions as they apply to raptor habitat within the finite area of the SRBOP and provides a simple method for calculating the mitigation required to achieve a return to or exceedance of baseline raptor habitat conditions in the SRBOP, using flexible habitat restoration treatments.

The most important and primary point of the example presented is that returning to baseline conditions requires a habitat restoration ratio greater than 1:1.

General guidelines for habitat restoration treatments that return to or exceed mean baseline conditions include:

- Habitat restoration treatment sites should be prioritized by ability to achieve EP or DFC for raptor habitat.
- Loss of the possibility to achieve EP at permanent impact sites (i.e., Project footprint) should be compensated by uplifting vegetation conditions to EP at additional habitat restoration treatment sites.
- Loss of existing condition at habitat restoration treatment sites could be compensated by uplifting vegetation conditions to DFC for SRBOP raptor habitat (i.e., EP or NSG) at additional habitat restoration treatment sites.

Additional Considerations for Compensatory Mitigation

The risk of failure of habitat restoration treatments will be accounted for in two ways:

1. The party responsible for the habitat restoration treatments (i.e., proponent) will be required to achieve the outcome (i.e., a specific habitat condition class), as opposed to specific amount of output;
2. The BLM will adjust the acreage of required habitat restoration treatments to account for the potential failure to achieve improved raptor habitat outcomes.

All compensatory mitigation measures will be managed adaptively to achieve their required outcomes, based on required monitoring and reporting.

Finally, any time lag between the onset of impacts from the Project and the achievement of compensatory mitigation outcomes will also be accounted for by adjusting the acreage of habitat restoration treatments.

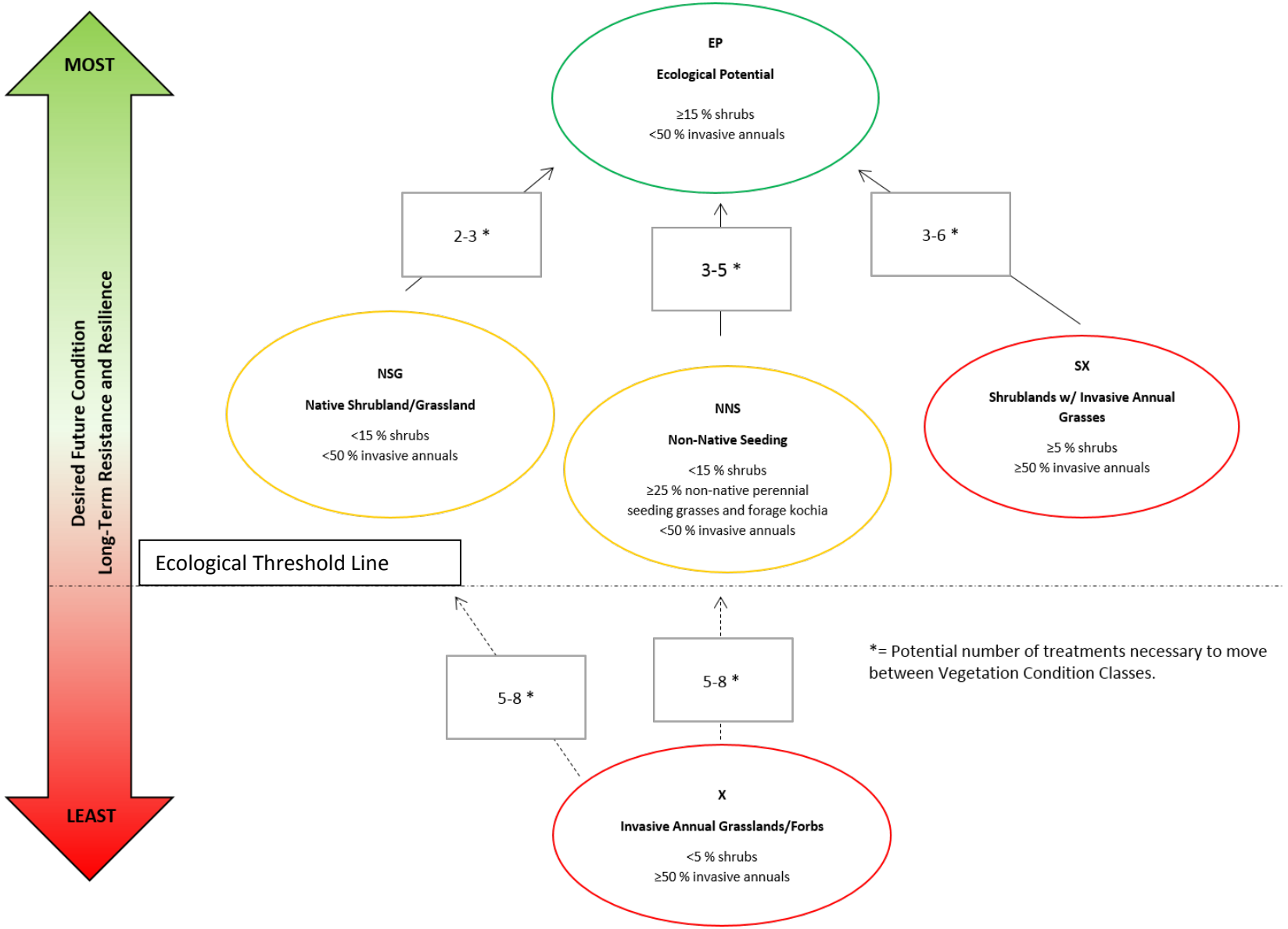

Figure E. Raptor habitat condition classes: Pathways and estimated number of required restoration treatments

4 LITERATURE CITED

BLM (Bureau of Land Management). 2008. Snake River Birds of Prey National Conservation Area Resource Management Plan and Record of Decision. September 2008. Bureau of Land Management, Boise District Office, Idaho.

Acronyms and Abbreviations

DFC	desired future condition
EP	ecological potential
ESD	ecological site description
IM	Instruction Memorandum
MA	management area
MEP	Mitigation and Enhancement Portfolio
NNS	non-native seeding [vegetation condition class]
NSG	early-seral native shrubland/grassland [vegetation condition class]
RMP	resource management plan
ROW	right of way
SRBOP	Morley Nelson Snake River Birds of Prey National Conservation Area
SX	shrublands/invasive annual grasses [vegetation condition class]
X	invasive annual grassland/forbs [vegetation condition class]