

LEWIS RIVER WILDLIFE HABITAT MANAGEMENT PLAN
VOLUME II – APPENDICES 1-1 TO 6-2

Federal Energy Regulatory Commission
Project Nos. 935, 2071, and 2111



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December 23, 2008

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Appendix 1-1
Settlement Agreement Schedule 10.8: Wildlife Objectives

SETTLEMENT AGREEMENT SCHEDULE 10.8: WILDLIFE OBJECTIVES

1.0 INTRODUCTION

The purpose of the Lewis River Wildlife Habitat Management Plan (WHMP, or the Plan) is to offset habitat impacts and associated wildlife losses resulting from continued operation of the Lewis River Projects by protecting (including from further development), mitigating and enhancing existing wildlife habitat on the Licensees' owned and/or controlled lands that are associated with the Projects.

This document presents broad objectives that will be used by the Terrestrial Coordinating Committee and the Licensees in developing more specific objectives, standards and guidelines, standard operating procedures and specific management actions for the Plan. While the broad objectives provide direction and guidance for developing the Plan, the standards and guidelines and specific management actions will govern the Plan's implementation. They will offer the clarity and specificity about intent and desired outcomes that will ensure that the Plan is being implemented in a way that achieves the broad objectives. It is the intent of the parties to develop the plan by the time the current licenses expire.

These wildlife objectives reflect current thinking, information and management practices. Over time, current thinking may change. In that event, the objectives may need to change, too. Any changes to the objectives must be consistent with the Settlement Agreement and agreed upon by the members of the TCC before they are finalized. These objectives take into consideration culturally significant species. The Plan must also be developed with the preservation and protection of culturally significant species in mind. Any proceeds that may occur from the implementation of the Plan may be used to offset costs incurred from implementing the Plan.

2.0 OVERALL OBJECTIVES

2.1 Old-Growth Habitat Management

- Provide habitat for wildlife species associated with old-growth habitats as well habitat components preferred by these species (e.g. snags, down wood, "wolf" trees, and multistoried stands).
- Identify designated old-growth areas as being managed towards one of three categories:

2.1.1 Category I

Old Growth designation includes forested lands that may exhibit few, if any, old-growth characteristics (e.g., large snags, down wood, multistoried canopies).

Management may include intensive forestry actions intended to accelerate succession and create optimal cover for big game while also providing benefits for old-growth associated species. Optimal big game cover provides both forage

and cover for deer and elk. Optimal cover is further defined as a coniferous forest stand with overstory trees that exceed twenty-one inches in diameter, have a canopy cover of at least seventy percent with scattered small openings, and at least four canopy layers including an herbaceous ground cover.

2.1.2 Category II

This Old Growth designation includes forested lands that are primarily young to mature conifer cover types, but lack many characteristics of functional old-growth habitat (e.g., large snags, down wood, uneven-aged multistoried canopies). Management may include low-intensity forestry actions (i.e., no clearcuts) intended to enhance old-growth structure (e.g., create limby “wolf” trees, topping mature trees to produce snags, thinning sub-dominant trees). The objective is to provide both large diameter trees and snags for denning and nesting habitat and trees with large branches for roosting, perching, and foraging habitat in an association that will benefit old growth and mature forest dependent species.

2.1.3 Category III

Old Growth designation includes forest lands that largely exhibit old-growth characteristics and functions (e.g., large snags, down wood, multistoried canopies). Management is conducted only when monitoring indicates need targeted toward increasing habitat diversity and promoting old-growth associated species.

2.2 Snags and Coarse Woody Debris Management

- Provide nesting, perching, and foraging habitat for a variety of wildlife species associated with these habitat components across all appropriate areas covered by the Plan.
- In general, do not compromise management for snags or coarse woody by forest management.
- Conduct actions for snags and coarse woody debris in all management areas, with timber harvest planned to accomplish snag and coarse woody debris objectives.
- Emphasize retention of hollow trees, snags and logs, retention of western red cedar snags and coarse woody debris and manage snags in clumps and groups where appropriate, and when safety is not an issue.
- Provide random isolated snags where possible to reduce territorial conflicts for some species.

2.3 Shrub-land Habitat Management

- Provide winter browse for deer and elk, habitat for upland game and nongame birds, and habitat diversity.
- Manage vegetation to perpetuate and enhance shrub-lands. In managing shrub-lands, consider the variation between shrub-land sites and apply management options that take advantage of desirable attributes for the specific site to optimize benefits for desired groups of wildlife species.

- Retain a limited number of large cedar trees or other conifers to provide perch trees and future snags where they will not preclude specific shrub-land management objectives.
- Designate and manage shrub-lands to meet the objectives of one of the three following categories:

2.3.1 Big Game

Maintain or improve the current structure (i.e., thick hiding cover in some areas and travel lanes), especially in the central portion of the shrubland. Produce available browse (i.e., within reach of animals) and encourage palatable species by pruning and/or reducing competition from less desirable species.

2.3.2 Birds/Wildlife Diversity

Encourage desired fruit or soft mast bearing species native to the site and maintain structural diversity.

2.3.3 Unique Areas

Maintain unique character and promote regeneration of unique species. Minimum management is preferred.

2.4 Farmland and Meadow Management

- Provide and maintain quality forage and browse conditions for elk and deer from 1 November through 30 April (including reducing disturbance) while also creating or maintaining screening, cover, and structure between fields or along edges of meadows to encourage use by other wildlife species.

2.4.1 Farmland

Consistent with the Merwin Wildlife Habitat Management Plan, manage to provide high quality forage benefits for wildlife, as well as reduce disturbance during the elk use period, and maintain screening, cover and structure between fields.

2.4.2 Meadow

Consistent with the Merwin Wildlife Habitat Management Plan, manage to improve and maintain permanent forage and browse areas for elk and deer while maintaining irregular shaped meadow areas and existing shrub islands and hedgerows for diversity and screening. "Natural" meadows acquired in the future will be evaluated as to whether active management is appropriate, as little or no management may provide the greatest benefits for the majority of wildlife species.

2.5 Right-of Way (ROW) Management

- As currently practiced at Merwin, maintain desirable shrub species for browse, enhance grass-forbs for forage, and reduce disturbance to wildlife using the ROW. The ROW should continue to provide a travel corridor with abundant forage for big game and other wildlife species and the diversity of habitats should be maintained.

2.6 Wetland Management

- Within existing wetlands, provide wetland areas with diverse aquatic and riparian vegetation to promote diversity for waterfowl, shorebirds, amphibians and other wildlife species.

2.7 Orchard Management

- Provide a food source (fruit and buds) for big game and upland game birds, provide food and nesting cover for non-game birds, and increase habitat diversity.

2.8 Raptor Management

- Provide habitat for and minimize disturbance to raptors, including northern bald eagles, ospreys, accipiters, and owls.
- A secondary objective related to raptor management is to conduct inventories and monitoring surveys for identified species and at appropriate intervals.

2.9 Forest Management

- Improve big game (i.e., deer and elk) wintering areas by developing high quality forage opportunities using timber management, while maintaining an appropriate ratio of cover to forage in the forest management zone to provide habitat diversity.

2.10 Oak Tree/Habitat Management

- Maintain or enhance the composition of oak in areas it occupies. If ecologically feasible, active management should be accomplished to maintain and enhance stands of oak, including selecting against conifer encroachment.

2.11 Noxious and Invasive Weed Species Prevention and Control

- Prevent or minimize the establishment and spread of noxious and invasive weed species on Licensee-owned and/or controlled lands and to control known noxious and invasive weed species on said lands to meet State and local objectives and requirements. Inventory and monitoring are key aspects for a successful integrated weed management program on these lands.

2.12 Riparian Zone Management

- Maintain or restore native plant species assemblages and vegetation structures that benefit riparian-associated wildlife species. Management will primarily entail protecting riparian habitats (i.e., buffer zones) from impacts due to forestry or recreational activities.
- Emphasize preserving multiple canopies in riparian zones, where present (including a dense over-story component where appropriate), maximizing ground cover and managing to restore the ecological processes associated with riparian zones.

2.13 Access Management

- Allow reasonable public access (not necessarily vehicular) for recreation, including hunting, subject to restrictions related to capacity, safety, security, and to protect environmental and cultural resources, as long as that level of access does not hinder meeting other objectives of the WHMP or the protection and enhancement of wildlife habitat. Access management may include gating roads, controlling disturbance of sensitive areas (e.g., nest sites, cultural resources), temporal restrictions (e.g., Saddle Dam farm), and requirements related to implementation of state and federal law.

2.14 Bull Trout Conservation

The management objective for Devil's Backbone and Cougar Creek Conservation Covenant areas is to benefit bull trout conservation. The intent is to have no management within these zones with the exceptions of noxious plant treatment and actions needed to protect the objectives of protecting bull trout habitat, consistent with the recorded conservation covenant.

2.15 Swift Reservoir and Yale Valley Management Zone

Due to the undefined nature of these potential zones, management objectives and procedures will be developed when management rights are obtained and/or land acquisition is complete. Management of these lands will be consistent with the already described objectives for habitat types that are ultimately included in the management zone.

3.0 MONITORING AND HABITAT EVALUATION PROCEDURES (HEP)

3.1 The Monitoring Component

The Lewis River Wildlife Habitat Management Plan shall include a monitoring component that sufficiently documents plan implementation, assesses effectiveness of the

management activities and documents progress toward meeting the WHMP's objectives. The HEP study is part of the assessment of progress toward meeting the Plan's objectives. More specifically, the assessment shall include: baseline evaluation and update to include all wildlife lands; mid-course HEP evaluation at year 17; and use of HEP results to fine-tune the management plan.

Appendix 1-2:
Merwin, Yale, and Swift License Articles 403 and 404

Merwin Yale Hydroelectric License Articles 403 and 404

Article 403. *Wildlife Habitat Management Plan.* Within 6 months from the issuance of this license, the licensee shall file with the Commission for approval, a Wildlife Habitat Management Plan (Habitat Plan) as described in section 10.8 of the Settlement Agreement (Agreement) filed on December 3, 2004. The Habitat Plan shall be developed for lands that are associated with the Merwin Project (as shown in Exhibit A to the Agreement and designated in section 10.8.1 of the Agreement). The purpose of the Habitat Plan shall be to accomplish the wildlife objectives referenced in Schedule 10.8 of the Agreement. The licensee shall continue to implement the current Merwin Project Wildlife Habitat Management Plan in the Merwin Wildlife Habitat Management Area until approval of the new Habitat Plan required by this article.

The Habitat Plan shall be developed after consultation with Terrestrial Coordination Committee (as defined in section 14 of the Agreement). The licensee shall include with the Habitat Plan an implementation schedule, documentation of consultation, copies of recommendations on the schedule, documentation of consultation, copies of recommendations on the completed plan after it has been prepared and provided to the entities above, and specific descriptions of how the entities' comments are accommodated by the plan. The licensee shall allow a minimum of 30 days for the entities to comment and to make recommendations before filing the plan with the Commission. If the licensee does not adopt a recommendation, the filing shall include the licensee's reasons, based on project-specific reasons.

The Commission reserves the right to require changes to the plan. Implementation of the Habitat Plan shall not begin until the licensee is notified by the Commission that the plan is approved. Upon Commission approval the licensee shall implement the plan, including any changes required by the Commission.

The licensee shall file annual plans provided by section 10.8.3 of the Agreement, for Commission approval, outlining the proposed wildlife measures and costs and showing the benefit to resources affected by project structures or operations. The annual plans shall explain the consistency with wildlife objectives outlined in the Agreement.

The licensee shall review the effectiveness of the Habitat Plan consistent with section 10.8.4 of the Agreement. The licensee shall file for Commission approval, within 18 years of issuance of the license, the results of the analysis, and any proposed changes to the Habitat Plan.

Article 404. *Wildlife and Terrestrial Resources Management Measures.* The licensee shall continue to implement the following measures to protect wildlife and terrestrial resources:

(a) buffer sensitive aquatic and terrestrial habitat from ground-disturbing activities (timber harvest, construction, etc.);

(b) maintain road closures through sensitive habitat areas by installing and maintaining gates, and identify additional areas for access control on PacifiCorp lands;

(c) manage PacifiCorp lands to benefit wildlife habitat; and

(d) continue to manage project roads to maintain existing aquatic connectivity and control runoff and erosion.

The licensee shall include evidence of compliance with these measures in the annual reports filed with the Commission under section 14.2.6 of the Settlement Agreement filed on December 3, 2004.

Swift Hydroelectric License Articles 403 and 404

Article 403. *Wildlife Land Acquisition and Habitat Management.* The licensee shall acquire or enhance wildlife habitat as described in sections 10.3, 10.3.1, 10.3.2, 10.3.3, 10.4, 10.5, 10.6.3, and 10.7 of the Settlement Agreement (Agreement) filed on December 3, 2004 (Lewis River Land Acquisition and Habitat Enhancement Fund).

All lands acquired for wildlife habitat under the Swift No. 1 and Swift No. 2 Land Acquisition and Habitat Protection Fund and the Lewis River Land Acquisition and Habitat Enhancement Fund shall be included within the project boundary.

Within 6 months from the issuance of this license, the licensee shall file with the Commission for approval, a Wildlife Habitat Management Plan (Habitat Plan) as described in section 10.8 of the Agreement filed on December 3, 2004. The Habitat Plan shall be developed for lands that are associated with the Swift No. 1 Project (as shown in Exhibit A to the Agreement and designated in section 10.8.5.1 of the Agreement). The purpose of the Habitat Plan shall be to accomplish the wildlife objectives referenced in Schedule 10.8 of the Agreement.

The Habitat Plan shall be developed after consultation with the Terrestrial Coordination Committee (as defined in section 14 of the Agreement). The licensee shall include with the Habitat Plan an implementation schedule, documentation of consultation, copies of recommendations on the schedule, documentation of consultation, copies of recommendations on the completed plan after it has been prepared and provided to the entities above, and specific descriptions of how the entities' comments are accommodated by the plan. The licensee shall allow a minimum of 30 days for the entities to comment and to make recommendations before filing the plan with the Commission. If the licensee does not adopt a recommendation, the filing shall include the licensee's reasons, based on project-specific reasons.

The Commission reserves the right to require changes to the plan. Implementation of the Habitat Plan shall not begin until the licensee is notified by the Commission that the plan is approved. Upon Commission approval the licensee shall implement the plan, including any changes required by the Commission.

The licensee shall file annual plans consistent with section 10.8.3 of the Agreement, for Commission approval. The annual plans shall include: (a) a description of lands proposed to be acquired under the Swift No. 1 and Swift No. 2 Land Acquisition and Habitat Protection Fund [Forest Service condition 11]; (b) a description of lands proposed to be acquired under the Lewis River Land Acquisition and Habitat Enhancement Fund associated with the Swift No. 1 Project (article 403); (c) a description of how the funds are proposed to be used for land acquisition during the following year and explain the consistency with wildlife objectives outlined in the Agreement; (d) a description of the proposed measures to be implemented under the Habitat Plan for the current year, including costs benefits to resources affected by project structures or

operations. The annual plans shall explain the consistency with wildlife objectives outlined in the Agreement.

The licensee shall review the effectiveness of the Habitat Plan consistent with section 10.8.4 of the Settlement Agreement. The licensee shall file for Commission approval, within 18 years of issuance of the license, the results of the analysis, and any proposed changes to the Habitat Plan.

Article 404. Wildlife and Terrestrial Resources Management Measures. The licensee shall continue to implement the following measures to protect wildlife and terrestrial resources:

- (a) buffer sensitive aquatic and terrestrial habitat from ground-disturbing activities (e.g., timber harvest, construction);
- (b) maintain road closures through sensitive habitat areas by installing and maintaining gates, and identify additional areas for access control on licensee-owned lands;
- (c) manage lands within the project boundary for the benefit of wildlife;
- (d) manage project roads to maintain existing aquatic connectivity, and control runoff and erosion; and
- (e) conduct annual raptor nest surveys on licensee-owned lands.

The licensee shall include evidence of compliance with these measures in the annual reports filed with the Commission under section 14.2.6 of the Settlement Agreement filed on December 3, 2004.

Yale Hydroelectric License Articles 403 and 404

Article 403. *Wildlife Land Acquisition and Habitat Management.* The licensee shall acquire or enhance wildlife habitat as described in sections 10.1, 10.3, 10.3.1, 10.3.2, 10.4, 10.5, 10.6.3, and 10.7 of the Settlement Agreement (Agreement) filed on December 3, 2004 (Yale and Lewis River Land Acquisition and Habitat Enhancement Funds).

All lands acquired for wildlife habitat under the Yale and Lewis River Land Acquisition and Habitat Protection Funds shall be included in the project boundary.

The licensee shall, within 6 months from the issuance of this license, file for Commission approval, a Wildlife Habitat Management Plan (Habitat Plan) as described in section 10.8 of the Agreement filed on December 3, 2004. The Habitat Plan shall be developed for lands that are associated with the Yale Project (as shown in Exhibit A to the Agreement and designated in section 10.8.1 of the Agreement). The purpose of the Habitat Plan shall be to accomplish the wildlife objectives referenced in Schedule 10.8 of the Agreement.

The Habitat Plan shall be developed after consultation with the Terrestrial Coordination Committee (as defined in section 14 of the Agreement). The licensee shall include with the Habitat Plan an implementation schedule, documentation of consultation, copies of recommendations on the schedule, documentation of consultation, copies of recommendations on the completed plan after it has been prepared and provided to the entities above, and specific descriptions of how the entities' comments are accommodated by the plan. The licensee shall allow a minimum of 30 days for the entities to comment and to make recommendations before filing the plan with the Commission. If the licensee does not adopt a recommendation, the filing shall include the licensee's reasons, based on project-specific reasons.

The Commission reserves the right to require changes to the plan. Implementation of the Habitat Plan shall not begin until the licensee is notified by the Commission that the plan is approved. Upon Commission approval the licensee shall implement the plan, including any changes required by the Commission.

The licensee shall file annual plans consistent with section 10.8.3 of the Agreement, for Commission approval. The annual plans shall include: (a) a description of lands proposed to be acquired under the Yale Land Acquisition and Habitat Protection Fund; (b) a description of lands proposed to be acquired under the Lewis River Land Acquisition and Habitat Enhancement Fund associated with the Yale Project; (c) a description of how the funds are proposed to be used for land acquisition during the following year; and (d) a description of the proposed measures to be implemented under the Habitat Plan for the current year, including costs benefits to resources affected by project structures or operations. The annual plans shall explain the consistency with wildlife objectives outlined in the Agreement.

The licensee shall review the effectiveness of the Habitat Plan consistent with section 10.8.4 of the Agreement. The licensee shall file for Commission approval, within 18 years of issuance of the license, the results of the analysis, and any proposed changes to the Habitat Plan.

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- (b) maintain road closures through sensitive habitat areas by installing and maintaining gates, and identify additional areas for access control on licensee-owned lands;
- (c) manage lands within the project boundary for the benefit of wildlife;
- (d) manage project roads to maintain existing aquatic connectivity, and control runoff and erosion; and
- (e) conduct annual raptor nest surveys on licensee-owned lands.

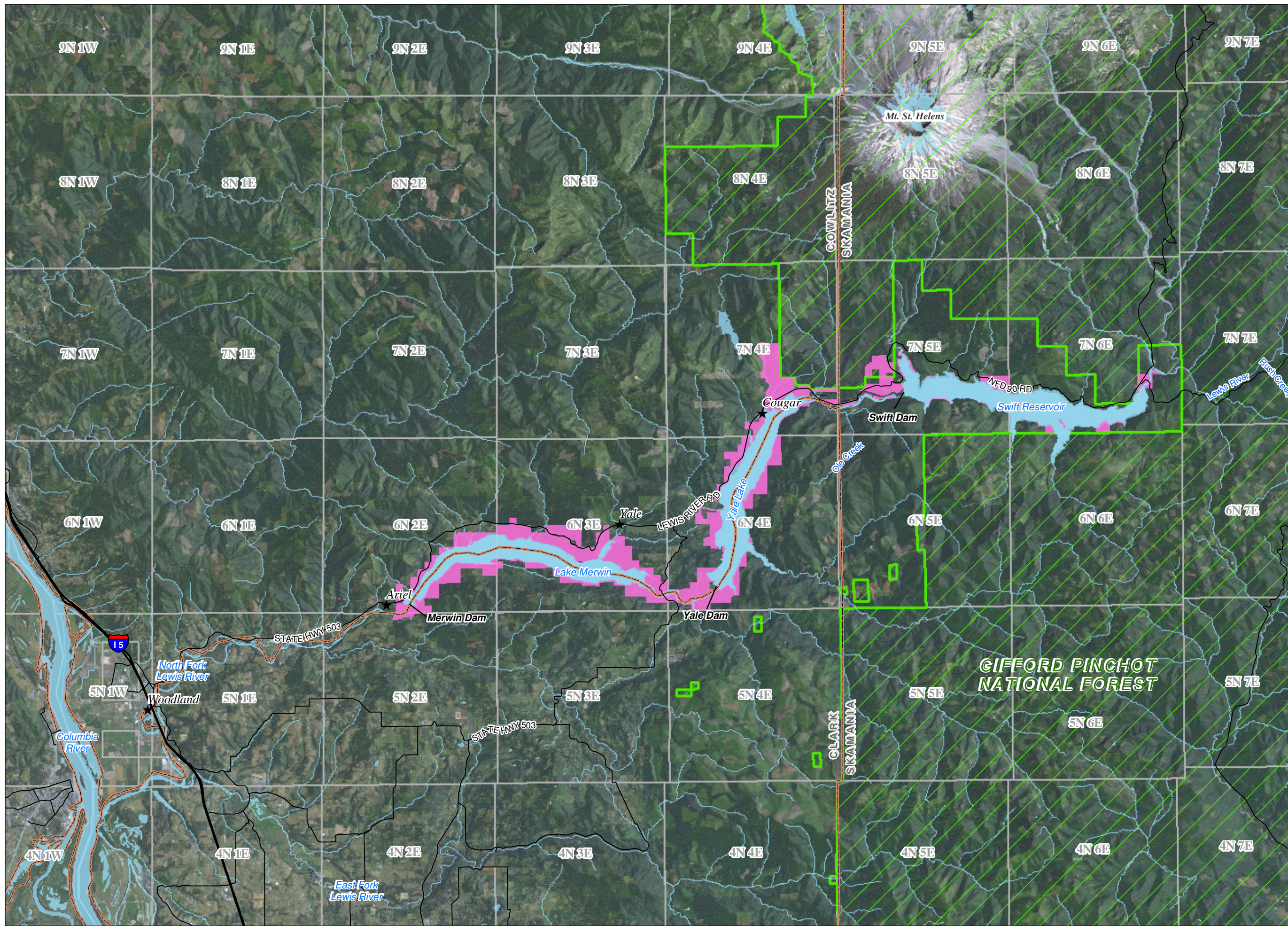
The licensee shall include evidence of compliance with these measures in the annual reports filed with the Commission under section 14.2.6 of the Settlement Agreement filed on December 3, 2004.

Appendix 2-1:
Vicinity Map of the Lewis River Hydroelectric Projects

Lewis River WHMP

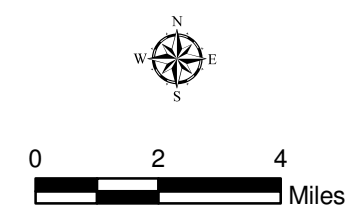
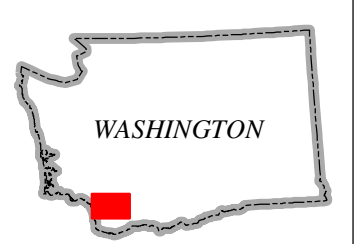
Area Overview

Appendix 2-1



Legend

- PacifiCorp Ownership
- City
- Stream
- Primary Road
- Secondary Road
- County
- Water Body
- National Forest



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**Appendix 2-2:
Settlement Agreement Exhibit A Maps**

(See Additional Web link)















Appendix 2-3:
Wildlife Habitat Management Plan Lands Management Units

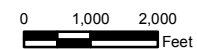
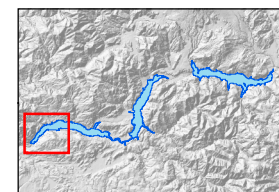
Lewis River WHMP

Management Units
Appendix 2-3

Sheet 1 of 9

Legend

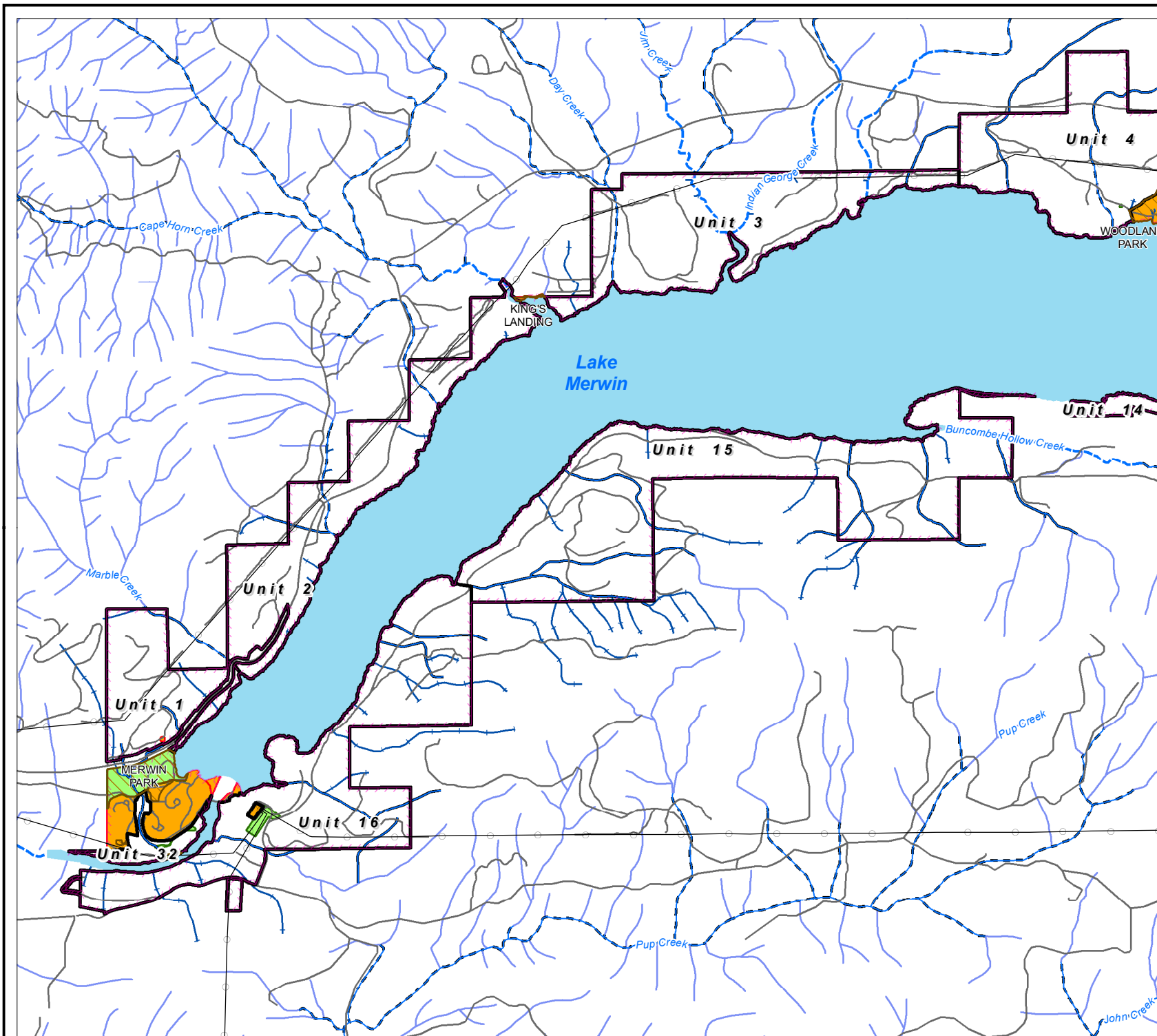
-  PacifiCorp Property
-  Management Unit
-  Exclusion Area
-  Secondary Management Area
-  Conservation Covenant
-  Recreation Area
-  Transmission Line
-  Road
-  Water Body
- Stream Type**
-  Fish
-  Anadromous Fish
-  Non-fish Perennial
-  Non-fish Seasonal
-  Other



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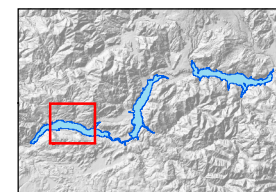
Lewis River WHMP

Management Units
Appendix 2-3

Sheet 2 of 9

Legend

-  PacifiCorp Property
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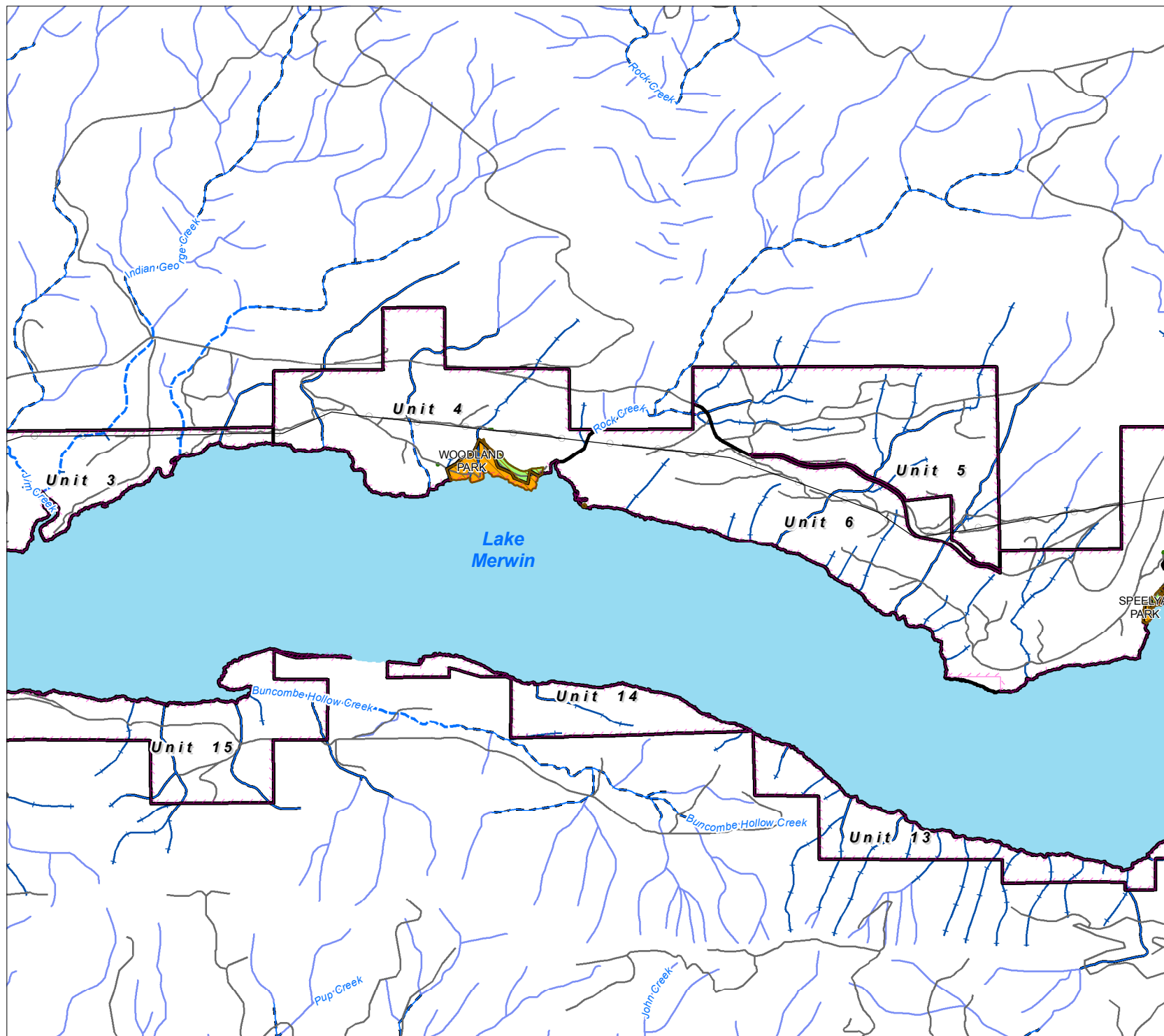


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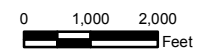
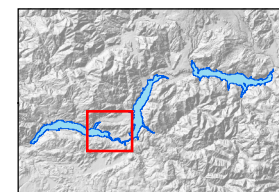
Lewis River WHMP

Management Units
Appendix 2-3

Sheet 3 of 9

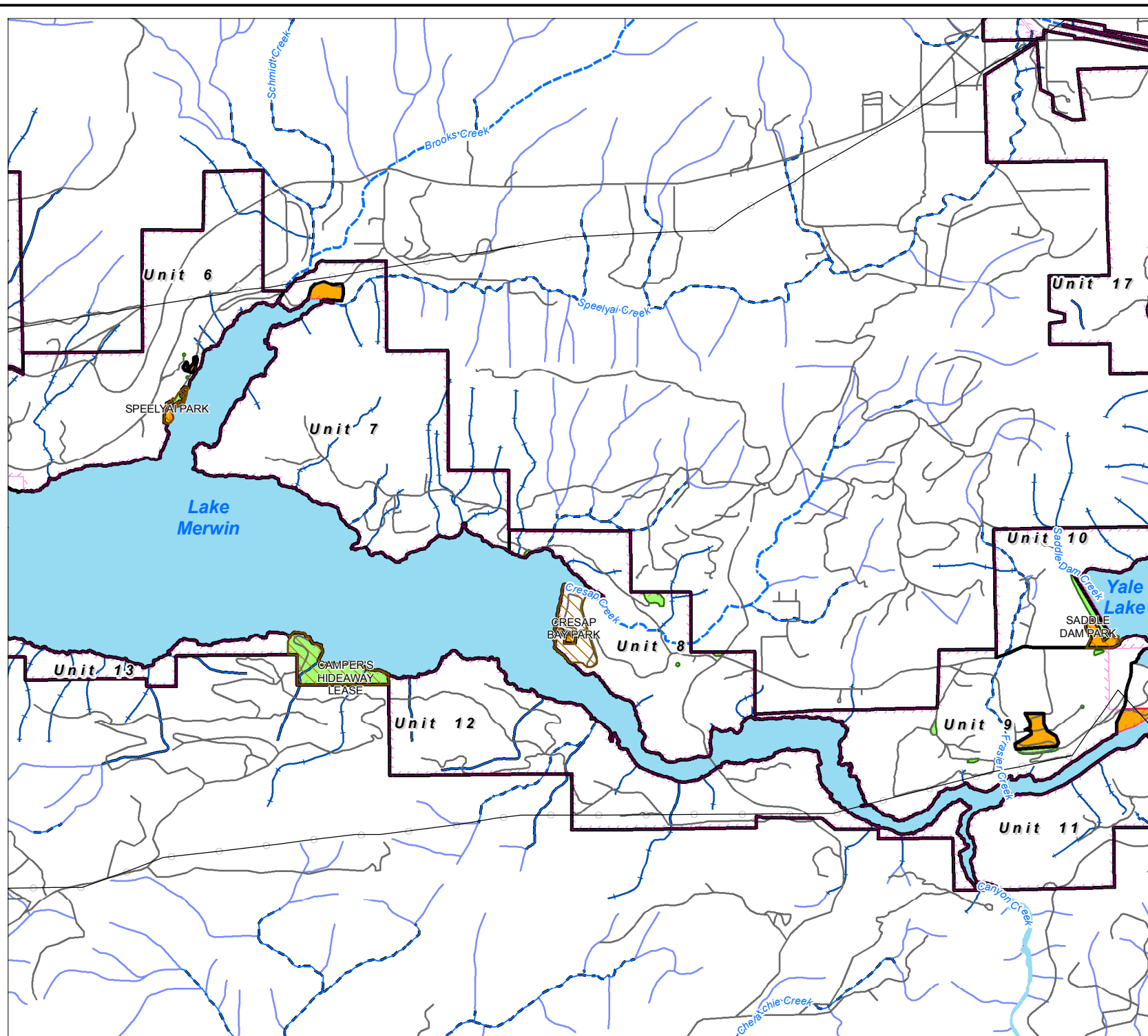
Legend

-  PacifiCorp Property
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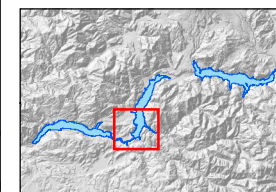
Lewis River WHMP

Management Units
Appendix 2-3

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Legend

-  PacifiCorp Property
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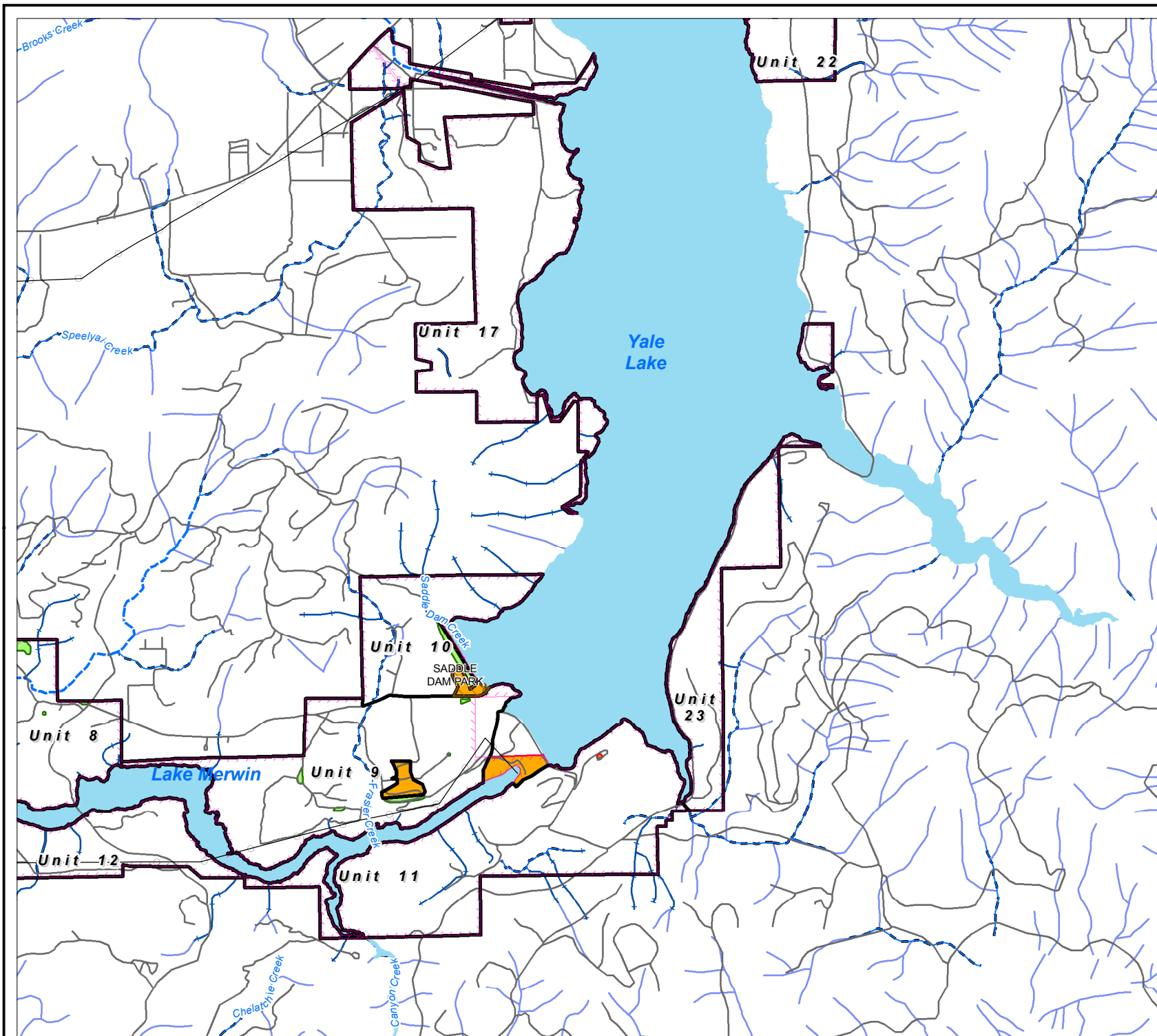


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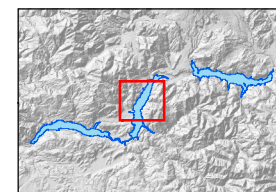
Lewis River WHMP

Management Units
Appendix 2-3

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Legend

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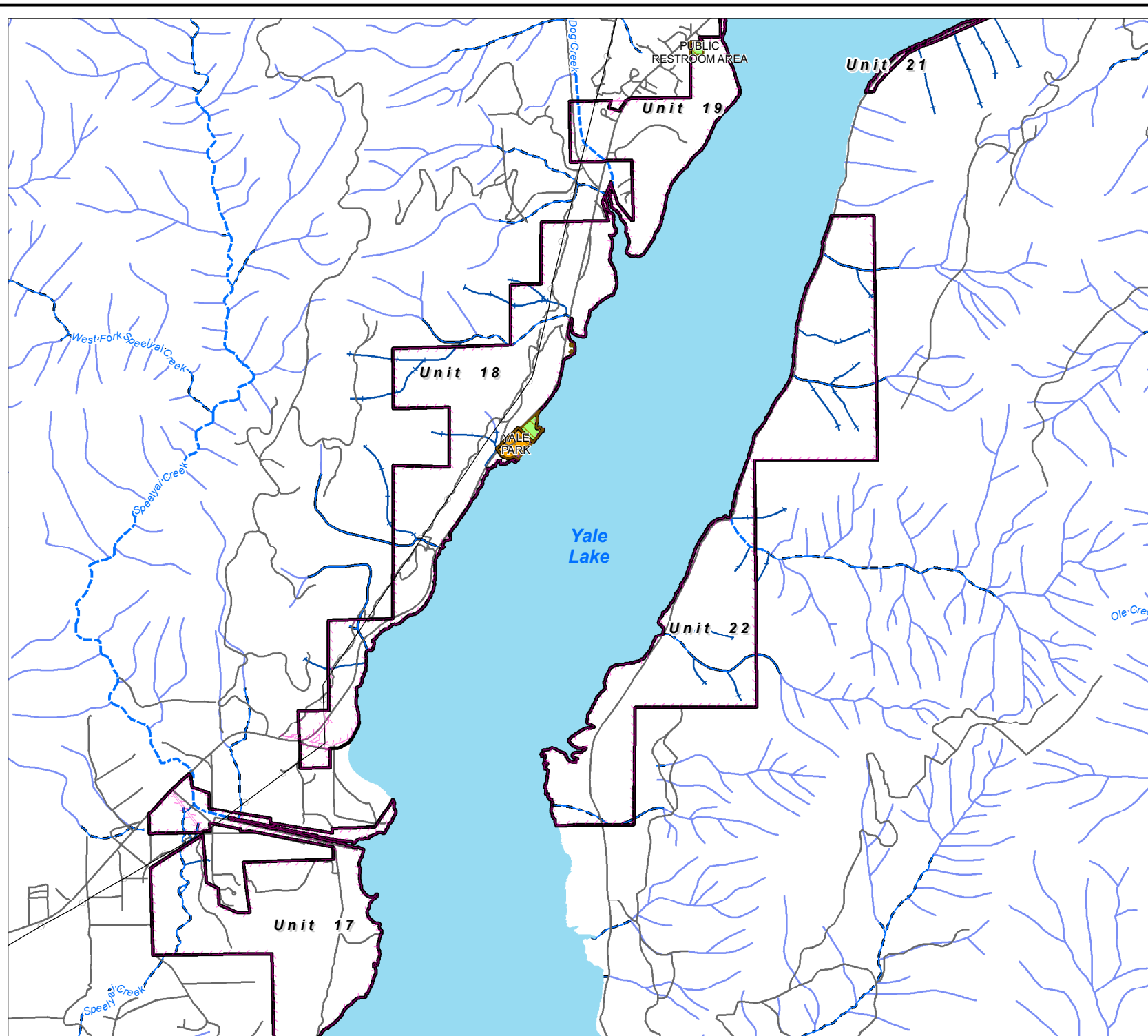


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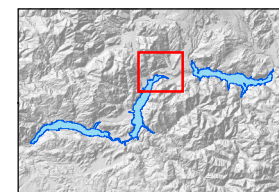
Lewis River WHMP

Management Units
Appendix 2-3

Sheet 6 of 9

Legend

-  PacifiCorp Property
-  Management Unit
-  Exclusion Area
-  Secondary Management Area
-  Conservation Covenant
-  Recreation Area
-  Transmission Line
-  Road
-  Water Body
- Stream Type**
-  Fish
-  Anadromous Fish
-  Non-fish Perennial
-  Non-fish Seasonal
-  Other

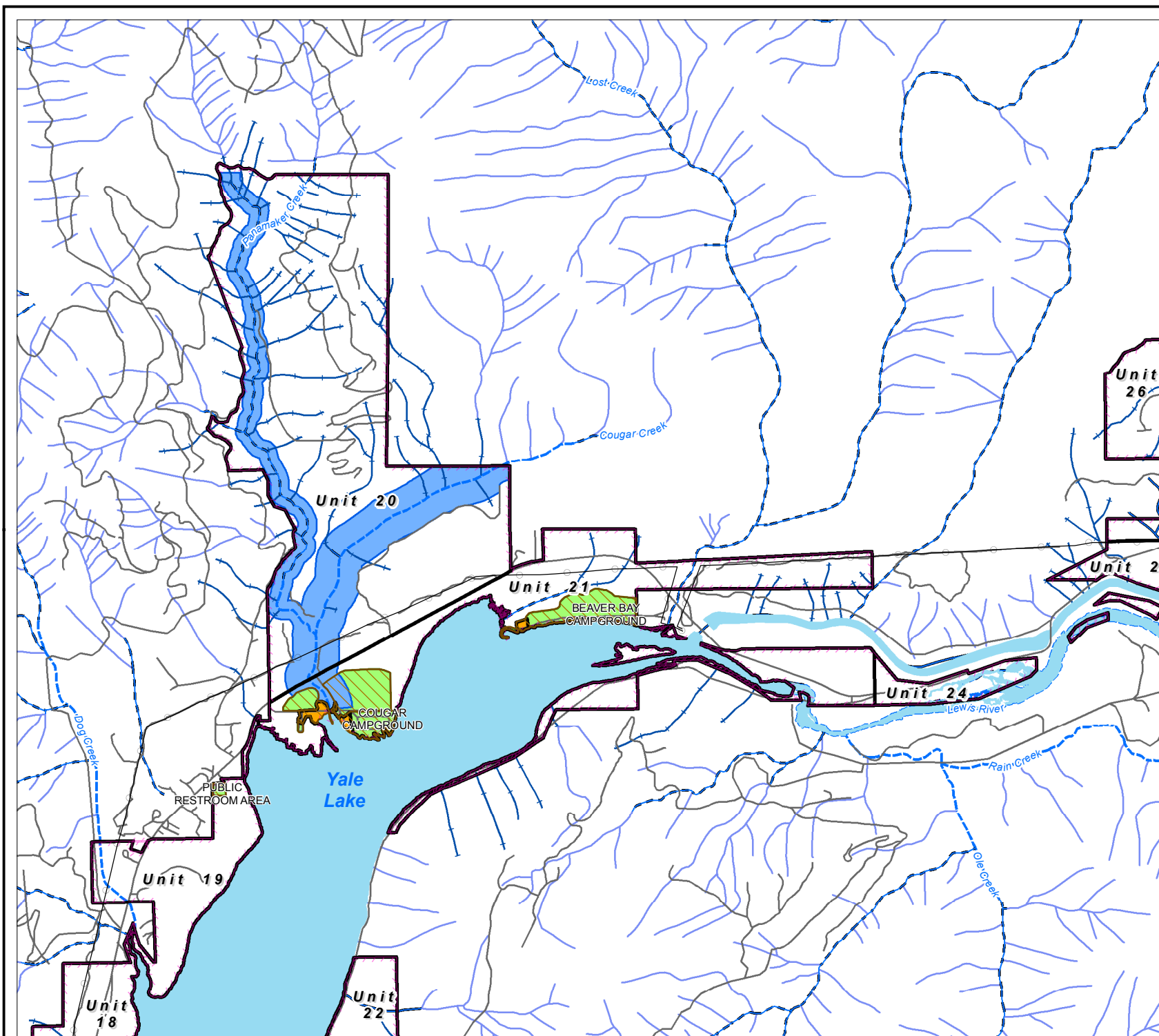


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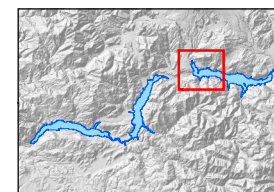
Lewis River WHMP

Management Units
Appendix 2-3

Sheet 7 of 9

Legend

-  PacifiCorp Property
 -  Management Unit
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 -  Secondary Management Area
 -  Conservation Covenant
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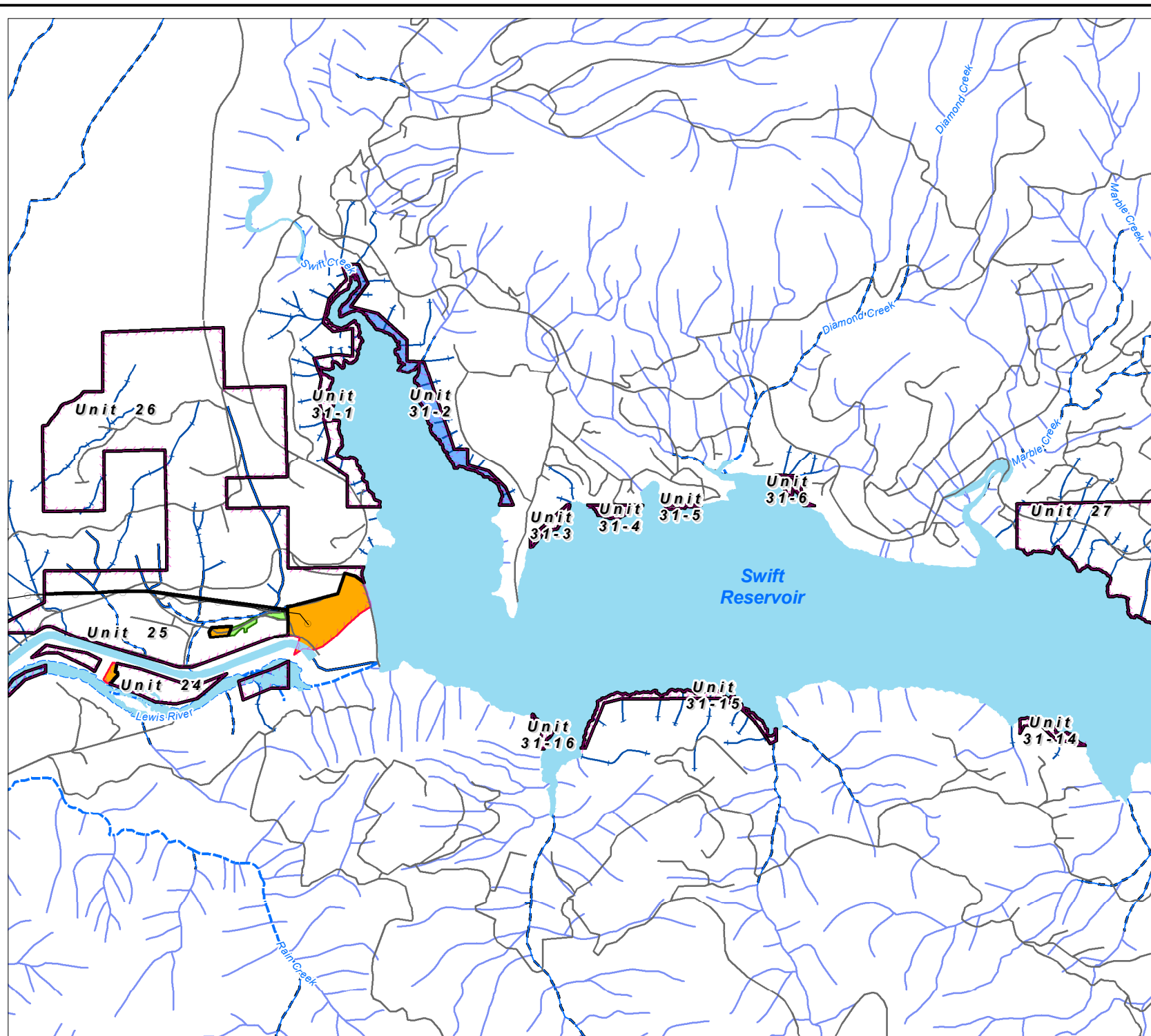
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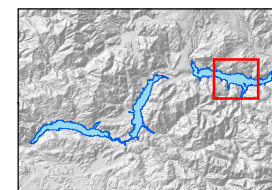
Lewis River WHMP

Management Units
Appendix 2-3

Sheet 8 of 9

Legend

-  PacifiCorp Property
-  Management Unit
-  Exclusion Area
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-  Conservation Covenant
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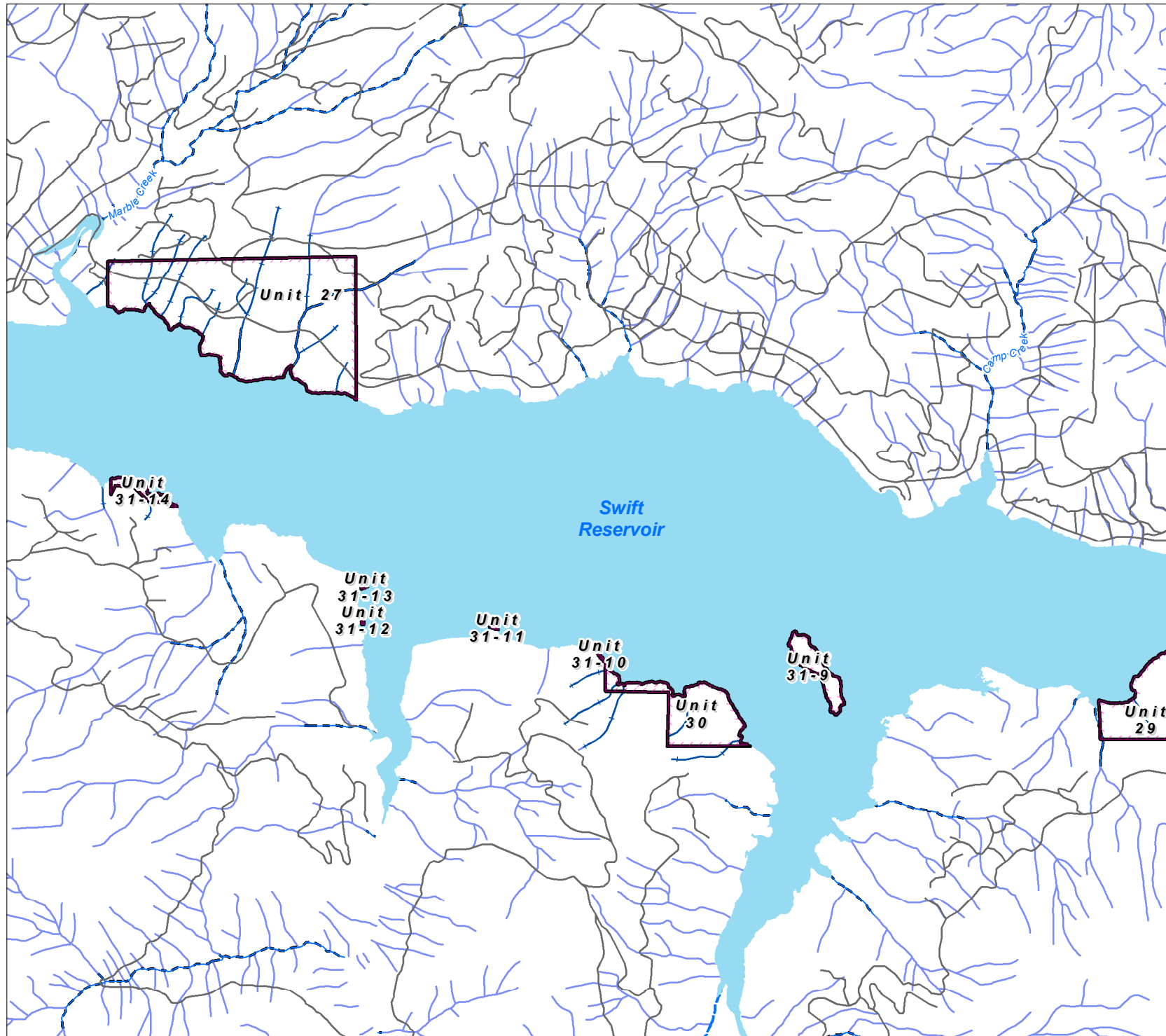


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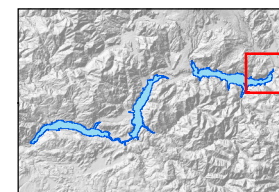
Lewis River WHMP

Management Units
Appendix 2-3

Sheet 9 of 9

Legend

-  PacifiCorp Property
 -  Management Unit
 -  Exclusion Area
 -  Secondary Management Area
 -  Conservation Covenant
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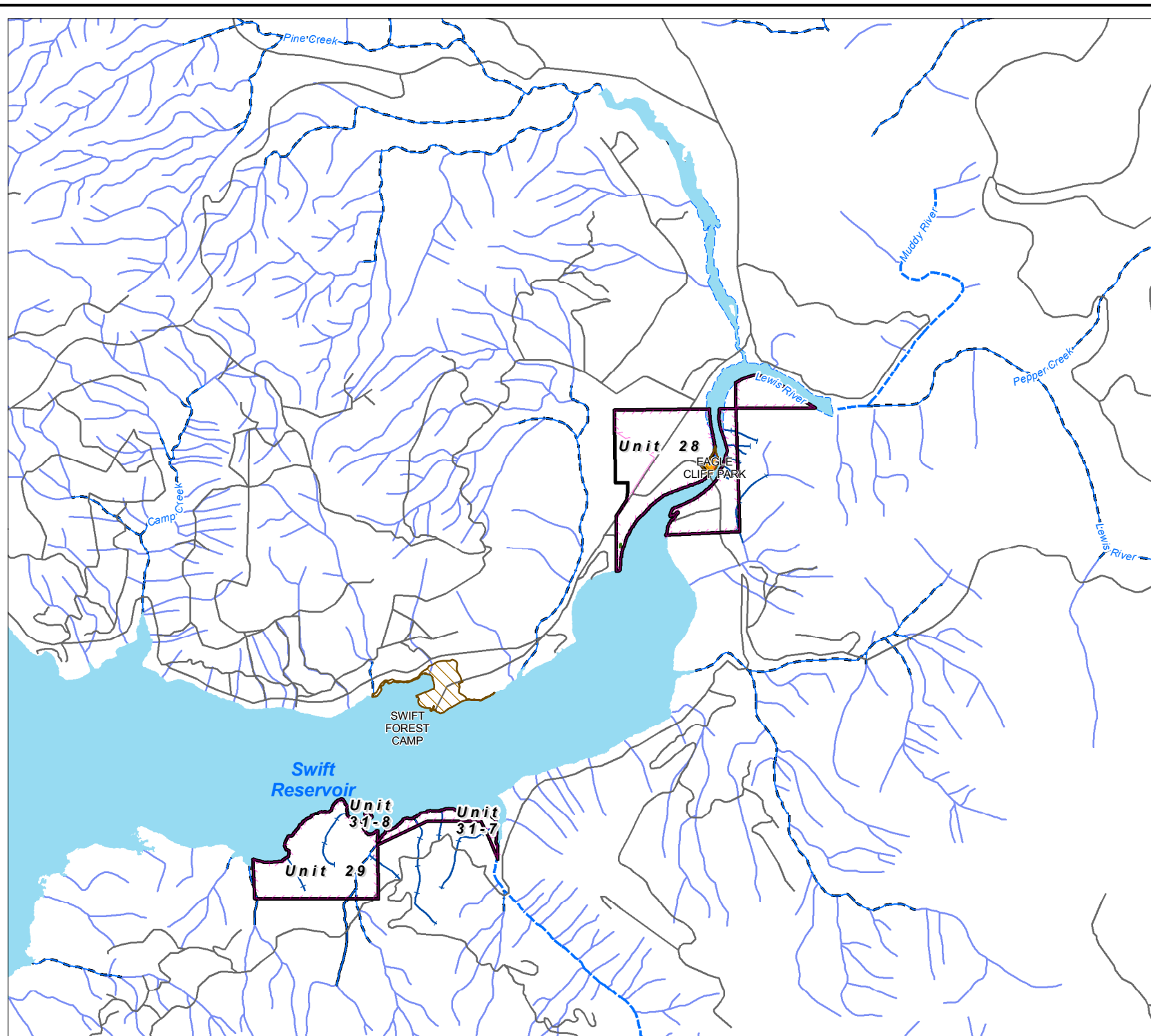


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**Appendix 2-4:
Settlement Agreement Section 10**

SECTION 10: TERRESTRIAL

10.1 Yale Land Acquisition and Habitat Protection Fund. PacifiCorp shall establish and maintain a fund in a Tracking Account for acquisition of interests in land to protect wildlife habitat (which may include, without limitation, fee interests and conservation easements) (“Interests in Land”) in the vicinity of the Yale Project (the “Yale Fund”). The TCC described in Section 14.2 will select Interests in Land for acquisition and approve the final terms of proposed acquisitions to be made with the Yale Fund. Once Interests in Land are selected for acquisition, PacifiCorp shall execute approved transactions and the Interests in Land acquired will be owned by PacifiCorp, unless otherwise agreed by PacifiCorp and the TCC. PacifiCorp shall contribute a total of \$2.5 million to the Yale Fund. The following goals serve as guidelines for the selection of Interests in Land to be acquired with the Yale Fund:

- a. Provide movement corridors for elk through the Yale Project area between high- and low-elevation winter range;
- b. Protect approximately 660 acres of low-elevation winter range in the vicinity of the Yale Project nearby or adjacent to PacifiCorp-owned lands;
- c. Provide approximately 100 acres of land on which forage for elk may be maintained or cultivated in the vicinity of the Yale Project.

10.1.1 Funding Amount, Timing, and Schedule of Funding. PacifiCorp shall provide \$1.5 million to the Yale Fund by the first day of PacifiCorp’s first fiscal year following the Effective Date of this Agreement. PacifiCorp shall contribute an additional \$1 million to the Yale Fund on the first day of PacifiCorp’s second fiscal year following the Effective Date of this Agreement. PacifiCorp’s contributions shall be made in 2003 dollars, Adjusted for Inflation. PacifiCorp’s current fiscal year begins on April 1.

10.1.2 Matching Funds. The TCC may elect, in its discretion, to direct the use of all or part of the Yale Fund to match the cash contributions made by local, state, and federal agencies, and other persons or organizations, for acquisition of Interests in Land in the vicinity of the Yale Project. Any Party may propose a source of matching funds under this subsection.

10.1.3 Use of Funds Beyond the Vicinity of Yale. If suitable Interests in Land are not available or are only available at unreasonable prices in the vicinity of the Yale Project within ten years after the Effective Date, the TCC may direct that such funds be used to accomplish similar goals in other areas of the Lewis River Basin.

10.2 Swift No. 1 and Swift No. 2 Land Acquisition and Habitat Protection Fund. The Licensees shall establish and maintain a fund in a Tracking Account for the purpose of acquiring Interests in Land to protect wildlife habitat, in order to meet the objectives of the Wildlife Habitat Management Plan as described in Section 10.8 below, on lands within five miles of the Swift No. 1 and Swift No. 2 Project Boundaries (laterally and upstream, but not downstream) or lands managed by the Licensees associated with Swift No. 1 and Swift No. 2 (laterally and upstream, but not downstream) (the “Swift Fund”). The TCC will select Interests in Land for acquisition and will approve the final terms of proposed acquisitions to be made using the Swift

Fund. The Licensees have agreed that PacifiCorp shall make all cash contributions to the Swift Fund, shall execute transactions made with such funds, and shall own the Interests in Lands so acquired. However, for the purpose of credit for wildlife habitat protection during the terms of the New Licenses for the Swift No. 1 and Swift No. 2 Projects, Cowlitz PUD shall be credited with the resource benefits accruing from Interests in Land purchased with the Swift Fund as if it had contributed \$1.82 million toward such purchases.

10.2.1 Funding Amount, Timing, and Schedule. PacifiCorp shall contribute a total of \$7.5 million to the Swift Fund according to the following payment schedule: make available \$3.22 million within 9 months after Issuance of the New License for the Swift No. 1 Project; make available \$780,000 within 18 months after Issuance of the New License for the Swift No. 1 Project; and make available \$500,000 six months after each of the 3rd, 4th, 5th, 6th, 7th, 8th, and 9th anniversaries of the Issuance of the New License for the Swift No. 1 Project. PacifiCorp's contributions shall be made in 2003 dollars, Adjusted for Inflation.

10.2.2 Matching Funds. The TCC may elect, in its discretion, to use all or part of the Swift Fund to match the cash contributions made by local, state, and federal agencies, and other persons or organizations, for acquisition of Interests in Land in the vicinity of the Swift Projects. Any Party may propose a source of matching funds under this subsection.

10.3 Lewis River Land Acquisition and Habitat Enhancement Fund. PacifiCorp shall establish and maintain a fund in a Tracking Account to acquire or enhance wildlife habitat anywhere in the Lewis River Basin in the vicinity of the Projects (the "Lewis River Fund") in order to meet the objectives of its Wildlife Habitat Management Plan as described in Section 10.8 below. Enhancement projects may be carried out on lands owned by third parties. The TCC will select Interests in Land for acquisition or enhancement and approve final restoration or enhancement measures implemented with the Lewis River Fund. PacifiCorp shall execute approved transactions and implement approved measures. Interests in Land acquired will be owned by PacifiCorp, unless otherwise agreed by PacifiCorp. PacifiCorp shall contribute a total of \$2.2 million to the Lewis River Fund.

10.3.1 Funding Amount, Timing, and Schedule. PacifiCorp shall initially contribute \$550,000 to the Lewis River Fund by six months after the fourth anniversary of the Issuance of the New License for the Yale Project, and \$550,000 to the Lewis River Fund by six months after the fourth anniversary of the Issuance of the New License for the Swift No. 1 Project. PacifiCorp shall contribute an additional \$550,000 to the Lewis River Fund by six months after the sixth anniversary of the Issuance of the New License for the Yale Project, and \$550,000 to the Lewis River Fund by six months after the sixth anniversary of the Issuance of the New License for the Swift No. 1 Project. PacifiCorp's contributions shall be made in 2003 dollars, Adjusted for Inflation.

10.3.2 Matching Funds. The TCC may elect, in its discretion, to use all or part of the Lewis River Fund to match the cash contributions made by local, state, and federal agencies, and other persons or organizations, for acquisitions of Interests in Land or for implementation of habitat enhancement measures in the Lewis River Basin. Any Party may propose a source of matching funds under this subsection.

10.3.3 Contribution of Additional Matching Funds. In addition to the contributions made under Section 10.3.1, beginning 18 months after Issuance of the New License for the Yale Project or Swift No. 1 Project, whichever is earlier, PacifiCorp shall match the contributions of local, state, and federal agencies, and other persons or organizations, made for the purposes of this Section 10.3, in an amount not to exceed \$100,000 per year, and not to exceed \$500,000 in any ten consecutive years. Any Party may propose a source of matching funds under this subsection. If and only if a commitment of funds is made by a party other than PacifiCorp, for acquisitions of Interests in Land or for implementation of habitat enhancement projects approved by the TCC, PacifiCorp shall provide matching funds within the limits set forth above at closing of the real estate transaction; no fund will be created. The TCC will identify Interests in Land for acquisitions or identify habitat enhancement projects to be funded with matching funds, and PacifiCorp shall execute approved acquisitions and implement approved enhancement measures.

10.4 Transaction Costs. The Parties agree that certain transaction costs associated with acquisitions of Interests in Land under Sections 10.1, 10.2, and 10.3 above and habitat enhancement measures under Section 10.3 will be covered by the funds established in those Sections. Covered transaction costs include, but are not limited to, the costs associated with land acquisition, such as completion of appropriate site assessments for hazardous materials; land surveys, including timber cruise if needed; appraisals; habitat surveys; filing fees; excise taxes; title searches, reports, fees, and insurance; closing costs; preparation of land acquisition agreements; and any required governmental approvals. Transaction costs that are not covered by the funds established under Sections 10.1 through 10.3 include internal personnel and administrative costs of the parties associated with land acquisitions, such as staff salaries and benefits; attorney fees and other legal expenses incurred by PacifiCorp or any other party; and fees paid by PacifiCorp to third parties for administrative costs associated with a third party's acquisition of Interests in Land on behalf of PacifiCorp. During the execution of any transaction, PacifiCorp shall notify the TCC if it appears that transaction costs will be significantly higher than expected, and the TCC may determine not to proceed with that transaction.

10.5 Management of Funds. Funds provided by PacifiCorp, as described in Sections 10.1, 10.2, and 10.3 above, shall be held by PacifiCorp in a Tracking Account until acquisitions of Interests in Land are executed or habitat enhancement measures under Section 10.3 are implemented. PacifiCorp shall accrue interest on Fund monies held by PacifiCorp from the date the monies are due to be placed into the Fund at the prime interest rate printed in the *Wall Street Journal* for the weekday nearest to April 1 of each year. If such rate ceases to be published in the *Wall Street Journal*, the Parties shall meet and agree upon an alternate source for the prime interest rate. Interest shall be computed, compounded, and added to the Fund once annually as of that date. PacifiCorp shall use monies in the Funds to pay the purchase price for Interests in Land and for covered transaction and implementation costs as they are incurred. Funds not expended in any given year shall be carried over to a subsequent year. PacifiCorp shall provide annual reports to the TCC regarding Fund expenditures under Sections 10.1, 10.2 and 10.3 above. Such annual reports may be included as part of the detailed annual reports of the TCC activities required by Section 14.2.6.

10.6 Completed Implementation; Advance Purchases.

10.6.1 Cowlitz PUD. In 2001, Cowlitz PUD purchased, for \$950,000, 283.7 acres of wildlife habitat on the north side of Swift Reservoir, known as the Devil's Backbone. Cowlitz

PUD has since managed those lands for the long-term benefit of a broad range of fish, wildlife, and native plants and shall manage such lands under its Wildlife Habitat Management Plan as described in Section 10.8 below. Those lands include an 87.6-acre conservation covenant which Cowlitz PUD shall manage in perpetuity for the protection of bull trout rearing areas in the Swift Creek Arm of Swift Reservoir, which was dedicated for mitigation of ongoing operations under the existing licenses for the Projects (“Devil’s Backbone Conservation Covenant”). The Parties agree and acknowledge that the costs and resource benefits associated with the purchase of Cowlitz PUD’s Devil’s Backbone property, as well as Cowlitz PUD’s commitment to maintain such lands under this Agreement, are included in this Settlement Agreement as partial fulfillment of Cowlitz PUD’s mitigation obligations, but the cost of purchasing such lands shall not be credited toward the funding commitments in Section 10.2 above.

10.6.2 PacifiCorp. In 2000, PacifiCorp purchased, for \$450,000, 156 acres of wildlife habitat on the south-facing slope of Swift Reservoir, known as Swift Parcel 2. In 2000, PacifiCorp purchased, for \$1.85 million, 770 acres of wildlife habitat near Cougar and Panamaker Creeks. Those lands include a 213-acre conservation covenant in perpetuity for the protection of bull trout (the “Cougar Creek Conservation Covenant”). In addition, a 34-acre conservation covenant in perpetuity is provided on PacifiCorp land on the Devil’s Backbone of Swift Reservoir. Both conservation covenants were dedicated for mitigation of ongoing operations under the existing licenses for the Projects. PacifiCorp has since managed those lands for the long-term benefit of a broad range of fish, wildlife, and native plants and shall manage such lands under its Wildlife Habitat Management Plan as described in Section 10.8 below. The Parties agree and acknowledge that the costs and resource benefits associated with the purchase of such lands, as well as PacifiCorp’s commitment to maintain such lands under this Agreement, are included in this Settlement Agreement as partial fulfillment of PacifiCorp’s mitigation obligations, but the cost of purchasing such lands shall not be credited toward the funding commitments in Sections 10.1 through 10.3 above.

10.6.3 Advance Purchases. From time to time after the Effective Date, one or more of the Parties may become aware of a short-term opportunity to purchase Interests in Land that may serve the purposes of the Funds created under Sections 10.1 through 10.3 at a favorable price and may communicate that opportunity to PacifiCorp. PacifiCorp may, at its sole risk and expense, but shall not be obligated to, purchase such Interests in Land believing that the TCC may desire the same. Within 30 days of acquiring such Interests in Land, PacifiCorp shall offer such Interests in Land to the TCC to serve the purposes of Sections 10.1 through 10.3 above. The TCC shall have 45 days after receiving such offer in which to determine whether to accept such Interests in Land under one of those Sections at the purchase price paid by PacifiCorp. If accepted, the monies expended by PacifiCorp to acquire such Interests in Land shall be credited toward the next contributions due from PacifiCorp and such lands shall be managed under PacifiCorp’s Wildlife Habitat Management Plan. If the Interests in Land are not accepted by the TCC within such 45-day period, PacifiCorp shall be free to use or dispose of such Interests in Land as it sees fit and PacifiCorp shall not be required to manage such Interests in Land under its Wildlife Habitat Management Plan.

10.7 Conservation Easements. The Parties recognize the value of pursuing conservation easements, since it is possible that more acres of land may be protected for wildlife habitat through conservation easements as compared to the fee-simple acquisition of lands. The Parties do not intend to be limited to statutory conservation easements but may pursue other similar

Interests in Land. The following are guidelines for the selection and acquisition of conservation easements to be purchased with the Funds described in Sections 10.1 through 10.3:

- a. Easement areas should be selected that will protect wildlife habitat from further development;
- b. Easement areas should be selected that will allow the CIT and Yakama Nation reasonable access for cultural activities on lands acquired under this Section 10.7;
- c. Easement areas should be selected that will allow reasonable public access for recreation, including hunting on lands acquired under this Section 10.7; and
- d. When feasible, easements should be selected in areas where the property owner is agreeable to easement terms providing for the management of the lands encumbered by the easement to provide for enhanced habitat management, such as modified timber harvest practices, that will result in greater protection of habitat areas.

The TCC may select easements that satisfy fewer than all of the above guidelines.

10.8 Wildlife Habitat Management Plans. Beginning on the Effective Date and prior to the Issuance of the New Licenses, PacifiCorp and Cowlitz PUD, in Consultation with the TCC, shall develop Wildlife Habitat Management Plans (“WHMPs”) for their respective lands designated in Section 10.8.5 below in order to accomplish the wildlife objectives referenced in the attached Schedule 10.8. The purpose of the WHMPs shall be to benefit a broad range of fish, wildlife, and native plant species, including, but not limited to, large and small game, amphibians, bats, forest raptors, neo-tropical birds, and culturally significant native plants. PacifiCorp and Cowlitz PUD may collaborate to produce a single WHMP.

10.8.1 Development of WHMPs. Beginning on the Effective Date, the Licensees, in Consultation with the TCC, shall develop specific standards and guidelines based upon on the objectives identified in Schedule 10.8. PacifiCorp and Cowlitz PUD shall then prepare their respective draft WHMPs that achieve the objectives and the specific standards and guidelines. The WHMPs shall provide for monitoring of the WHMPs’ effectiveness and progress toward meeting their objectives. Each WHMP shall identify those WHMP-managed lands for which wildlife habitat is a secondary use, and shall describe how such lands will be managed under the WHMP. After PacifiCorp and Cowlitz PUD have prepared the draft WHMPs, they will submit them to the TCC for review, comment, and approval. After the TCC has approved the WHMPs, PacifiCorp and Cowlitz PUD shall finalize the WHMPs and submit them to the Commission. Any disputes regarding provisions of the final WHMPs shall be resolved under Section 15.10 below. Within six months after Issuance of each New License, the Licensees shall implement their respective WHMPs for lands associated with that Project (as shown in Exhibit A for PacifiCorp and Exhibit B for Cowlitz PUD) up to the limits of the funding provided in Section 10.8.2, except as expressly provided in Section 10.8.3 below. From the Effective Date until six months after Issuance of the New License for the Merwin Project, PacifiCorp shall continue to manage lands associated with the Merwin Project pursuant to Article 48 of the existing Merwin license.

10.8.2 Funding. PacifiCorp and Cowlitz PUD shall provide annual funding for the implementation of the WHMPs on their respective lands identified in Section 10.8.5 as follows:

10.8.2.1 PacifiCorp. PacifiCorp's level of funding will be tied to the Interests in Land that PacifiCorp owns or controls, as follows: (i) PacifiCorp shall fund \$27 (in 2003 dollars, Adjusted for Inflation) per acre for lands it owns in fee simple that are managed under its WHMP as of that date; and (ii) PacifiCorp shall fund \$13.50 (in 2003 dollars, Adjusted for Inflation) per acre for other Interests in Land, including, without limitation, conservation easements and similar Interests in Land that are managed under its WHMP as of that date.

10.8.2.2 Cowlitz PUD. Cowlitz PUD shall fund \$27 per acre (in 2003 dollars, Adjusted for Inflation) for lands it owns in fee simple that are managed under its WHMP as of that date.

10.8.2.3 Management of Funds. Funds provided by Licensees under this Section 10.8.2 shall be made available for lands associated with each Project (as shown in Exhibit A for PacifiCorp and Exhibit B for Cowlitz PUD) six months after the relevant Project's New License is Issued and annually thereafter. Such funds shall be held in a Tracking Account and shall be expended by the Licensees on their respective lands as their WHMPs are implemented under Section 10.8. The Licensees shall accrue interest on Fund monies held by the Licensees from the date the monies are due to be placed into the Fund, at the prime interest rate printed in the *Wall Street Journal* for the weekday nearest to April 1 of each year. If such rate ceases to be published in the *Wall Street Journal*, the Parties shall meet and agree upon an alternate source for the prime interest rate. Interest shall be computed, compounded, and added to the Fund once annually as of that date. PacifiCorp's total funding (but not the amount per acre) will increase as additional acres of Interests in Land are acquired to be managed under its WHMP. However, except as provided in Section 10.8.5 below, the funding provided in this Section 10.8.2 shall completely fulfill and satisfy the Licensees' respective obligations to fund implementation, modification, and monitoring of the Interests in Land subject to their respective WHMPs. No provision of the WHMPs, nor any action of the Parties under this Agreement, shall increase the monetary obligations of the Licensees with respect to their WHMPs without the express written consent of the affected Licensee. Funds that are not spent in a given year will be carried over to be used for future implementation of the respective WHMP. Any funds derived from management of lands subject to the WHMPs, including compensation for timber removed pursuant to the WHMPs, shall be retained by the Licensees for their respective properties.

10.8.3 Management of Plan. Subject to the oversight of the TCC, PacifiCorp and Cowlitz PUD shall implement their respective WHMPs. The Licensees shall submit to the TCC annually a written plan (the "Annual Plan") to use the funds available to implement the WHMPs on their respective lands. The Annual Plan may be included as part of the detailed annual reports of the TCC activities required by Section 14.2.6. Once the TCC has approved such Annual Plans, they shall be implemented by the Licensees using the funds made available for that purpose under Section 10.8.2. The funds shall be used to reimburse Licensees for use of their employees and contractors to manage, implement, and monitor actions taken under the WHMPs as provided in the Annual Plan. Further, the WHMPs shall not prevent either of the Licensees

from carrying out any other legal requirement with respect to or upon its respective lands in any lawful manner, including, without limitation, in compliance with the conditions of the New Licenses, subject to Section 10.8.5.5 below. If the TCC believes that another party can implement the WHMPs more cost effectively, the respective Licensee shall, at the request of the TCC, seek bids from third party contractors to implement their respective WHMP for some period during the term of the applicable New License(s). If the bidding process identifies third party contractors who can do the work more cost effectively, the respective Licensee shall engage such contractors, provided that they are acceptable to the Licensee, in its reasonable discretion, considering policies, contracting requirements, and procedures and qualifications normally applied by the Licensees when engaging other contractors to work on their respective properties, and subject to dismissal if any contractor's performance violates such policies and requirements. If contractors are retained at the recommendation of the TCC, such contractors shall have full responsibility, during the period of their engagement, for implementation of the respective WHMPs as provided under this Section 10.8, including preparation of Annual Plans and any required reporting to the TCC. During the period such third party is retained, the Licensees' obligations for implementation of their respective WHMPs shall be fulfilled in their entirety by providing the funds as required under Section 10.8.2. In no event shall Licensees be required to fund implementation of their respective WHMPs in excess of the amounts provided for in Section 10.8.2.

10.8.4 Habitat Evaluation Procedures. The Licensees shall update and repeat the Habitat Evaluation Procedure (Final Lewis River Technical Report – TER 2 (Cowlitz PUD and PacifiCorp 2004) (the “HEP”) as provided in this Section 10.8.4, and the costs of such actions shall be in addition to the funding provided under Section 10.8.2.

10.8.4.1 Updating Existing Information. As PacifiCorp expends Fund assets to acquire lands that will be managed under its WHMP, PacifiCorp shall update the existing HEP data. This will require mapping and cover-typing the newly acquired lands, but assumes that Habitat Suitability Index (“HSI”) values from the current HEP are applicable. If new or different habitat types are encountered, new HSI values will be determined.

10.8.4.2 Review of Effectiveness of WHMPs. At year 17 after Issuance of all New Licenses, PacifiCorp shall repeat the HEP for all WHMP lands that it manages, and Cowlitz PUD shall repeat the HEP for all WHMP lands that it manages, using essentially the same sample density that was used to develop the existing HEP, with a focus on measuring any changes in habitat value of these lands compared with the baseline HEP data, and determining whether the original HEP projections regarding habitat values (based on the objectives in the WHMPs) have been met. If the original HEP projections have not been met, each Licensee shall modify its respective WHMP to achieve its WHMP objectives, subject to the review and approval of the TCC, but shall not be obligated to increase in any way its funding obligations under Section 10.8.2. The Licensees shall base any modifications on the results of the HEP, although the Licensees may include species model updates and new management priorities as appropriate. The TCC must approve modifications before they are filed with the Commission and implemented by PacifiCorp and Cowlitz PUD.

10.8.5 WHMP Lands. The following lands shall be managed under the respective WHMPs. The maps and tables attached as Exhibit A for PacifiCorp and Exhibit B for Cowlitz PUD more fully describe lands that shall be managed under the respective WHMPs, as well as those lands that will not be managed under the WHMPs, and identifies which lands are associated with which Projects. Exhibits A and B shall be updated by PacifiCorp and Cowlitz PUD, respectively, as new lands are acquired as provided below.

10.8.5.1 Lands Owned or Controlled by PacifiCorp as of the Effective Date.

10.8.5.1.1 156 acres on the south-facing slope of Swift Reservoir, known as the Swift Parcel 2, purchased by PacifiCorp in 2000;

10.8.5.1.2 770 acres near Cougar and Panamaker Creeks purchased by PacifiCorp in 2000;

10.8.5.1.3 The 129 acres associated with the Yale Project that were acquired by PacifiCorp in 2002;

10.8.5.1.4 The 5,600 acres that are currently managed as part of the existing Merwin Wildlife Habitat Management Plan;

10.8.5.1.5 The lands proposed to be managed under the Yale application filed with the Commission in 1999; and

10.8.5.1.6 All other PacifiCorp-owned lands adjacent to the Projects as of the Effective Date, except as provided in attached Exhibit A.

10.8.5.2 Lands Owned or Controlled by Cowlitz PUD as of the Effective Date.

10.8.5.2.1 283 acres on the south-facing slope of Swift Reservoir, known as the Devil's Backbone, purchased by Cowlitz PUD in 2001; and

10.8.5.2.2 All other Cowlitz PUD-owned lands within the Swift No. 2 Project Boundary and related to the operation of the Swift No. 2 Project as of the Effective Date, except as provided in attached Exhibit B.

10.8.5.3 Interests in Land Acquired with the Yale Fund and the Lewis River Fund. PacifiCorp shall manage Interests in Land acquired by the Yale Fund and the Lewis River Fund under its WHMP, subject to Section 10.8.3, provided that such Interests in Land are within five miles of the Project reservoirs or other lands managed by PacifiCorp under its WHMP. PacifiCorp shall not develop or use lands acquired beyond such five-mile radius in a manner inconsistent with the objectives of its WHMP, and such lands shall not be subject to active management under its WHMP.

10.8.5.4 Interests in Land Acquired with the Swift Fund. PacifiCorp shall manage Interests in Land acquired with the Swift Fund that it owns under its WHMP, subject to Section 10.8.3.

10.8.5.5 Mitigation for Impacts on Wildlife Habitat. If PacifiCorp proposes to take action on its Interests in Land that are managed under its WHMP, other than those actions specifically prescribed under this Agreement, and that action makes those lands no longer available for wildlife habitat, PacifiCorp shall consult with the TCC to determine if any mitigation is necessary. If Cowlitz PUD proposes to take action on its Interests in Land managed under its WHMP, other than those actions specifically prescribed under this Agreement, and that action makes those lands no longer available for wildlife habitat, Cowlitz PUD shall consult with the TCC to determine if any mitigation is necessary. If the TCC determines that mitigation is necessary, then whichever Licensee is responsible in the specific case shall implement that mitigation. Mitigation shall not be required for land parcels specifically identified in the WHMPs as having wildlife habitat as the secondary use.

Appendix 3-1:
Settlement Agreement Section 14: Coordination and Decision Making

SECTION 14: COORDINATION AND DECISION MAKING

14.1 Coordination and Decision Making. The provisions of this Section 14 describe the processes for coordination and decision making among the Parties for the implementation of the terrestrial and aquatic PM&E Measures provided for in this Agreement. As provided for in Section 14.2 below, the Licensees shall convene a Terrestrial Coordination Committee (“TCC”) to coordinate implementation of the terrestrial PM&E Measures described in Section 10 (including any exhibits, schedules, and appendices related to Section 10), and shall accomplish the purposes set forth in Section 14.1.1 below. The Licensees shall convene an Aquatics Coordination Committee (“ACC”) to coordinate implementation of the aquatics PM&E Measures described in Sections 3 through 9 (including any exhibits, schedules, and appendices related to those Sections), referred to below as terrestrial and aquatic PM&E Measures.

14.1.1 Purposes of the TCC. The TCC is intended to accomplish the purposes set forth below:

- a. Provide a forum for coordination between the Licensees and the other Parties on terrestrial resources PM&E Measure implementation.
- b. Oversee the development by the Licensees of an objective-oriented WHMP prior to the Issuance of the New Licenses.
- c. Monitor implementation of that WHMP.
- d. Oversee the HEP study in the 17th year after Issuance of the New Licenses, and modify the WHMP if necessary based on the HEP’s results.
- e. Oversee and make decisions regarding the: (1) Yale Fund; (2) the Swift Fund; and (3) the Lewis River Fund.
- f. Oversee the annual budget for the WHMP.

14.2 Coordination Committees. Within 60 days after the Effective Date, PacifiCorp and Cowlitz PUD shall convene the TCC and the ACC.

14.2.1 Committee Coordinators. Within 30 days after the Effective Date, PacifiCorp and Cowlitz PUD each shall designate one Committee Coordinator for the TCC and one Committee Coordinator for the ACC. PacifiCorp and Cowlitz PUD shall make their designations by notice to the Parties in accordance with the notice provisions in Section 16.6. The PacifiCorp Committee Coordinator(s) shall be employed or retained by PacifiCorp and may represent PacifiCorp on the TCC and the ACC. The Cowlitz Committee Coordinator(s) shall be employed or retained by Cowlitz PUD and may represent Cowlitz PUD on the TCC and the ACC. The PacifiCorp Committee Coordinator(s) shall, as their primary responsibilities, oversee the coordination and implementation of the terrestrial and aquatics PM&E Measures that are the responsibility of PacifiCorp as provided in this Agreement. The Cowlitz PUD Committee Coordinator(s) shall oversee the coordination and implementation of the terrestrial and aquatics PM&E Measures that are the responsibility of Cowlitz PUD as provided in this Agreement.

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PacifiCorp and Cowlitz PUD Committee Coordinators together shall oversee the coordination and implementation of terrestrial and aquatic PM&E Measures for which PacifiCorp and Cowlitz PUD have joint responsibility as provided in this Agreement.

14.2.2 TCC and ACC Membership. Within 30 days after the Effective Date, or at any time thereafter with 30 days' notice to the Licensees, each Party, at its own discretion and cost, may designate one representative for membership on the TCC and may designate one representative for membership on the ACC and may designate one or more alternates. The Party shall make its designation(s) by notice to the Parties in accordance with Section 16.6. A Party not participating on the TCC, the ACC, or both may request, by notice to the Parties in accordance with Section 16.6, to be placed on a contact list to receive notices of committee meetings and releases of information, including annual reports and other interim reports, that the TCC or the ACC may issue.

14.2.3 TCC and ACC Functions. The TCC and the ACC will:

- a. Coordinate and Consult on development of plans by the Licensees as provided in this Agreement;
- b. Review information and oversee, guide, and make comments and recommendations on implementation and monitoring of the terrestrial and aquatic PM&E Measures, including plans;
- c. Consult with the Licensees on their respective reports prepared under this Agreement regarding implementation of the terrestrial and aquatic PM&E Measures as referred to in Section 14.2.6 below;
- d. Make decisions, grant approvals, and undertake any additional duties and responsibilities expressly given to the TCC or the ACC with respect to the terrestrial and aquatic PM&E Measures;
- e. Establish, among other things, (i) procedures and protocols for conducting committee meetings and deliberations to ensure efficient participation and decision making; (ii) rules for quorum and decision making in the absence of any member; (iii) alternative meeting formats as desired, including phone or teleconference; and (iv) the methods and procedures for updating committee members on interim progress of development and implementation of the terrestrial and aquatic PM&E Measures;
- f. As deemed necessary and appropriate by the TCC or the ACC, establish subcommittees to carry out specified committee functions and responsibilities described in this Section 14.2.3, and establish the size of, membership of, and procedures for any such subcommittees; and
- g. Discuss the protocols and the content of public information releases; provided that each Party retains the right to release information to the public at any time without such discussion.

14.2.4 TCC and ACC Decision-Making Process and Limitations. The TCC and the ACC shall make comments, recommendations, and decisions in a timely manner as provided below:

- a. Each Party represented on the TCC and the ACC will have the authority to participate in all committee discussions relating to, and to provide input and advice on, decisions regarding implementation of the terrestrial or aquatic PM&E Measures;
- b. The TCC and the ACC shall strive to operate by Consensus. Whether or not the TCC or the ACC has final authority over decisions on terrestrial and aquatic PM&E Measures, the Licensees and other Parties may proceed with actions necessary to implement the New Licenses or this Agreement, even though Consensus is not achieved; provided that in such cases the responsible Licensee or Licensees shall notify the Commission of the comments of the ACC or TCC members and the areas of disagreement. If the TCC or ACC does not reach Consensus, then any member of the TCC or ACC, respectively, may initiate the ADR Procedures as provided in Section 15 below.
- c. Where one or more Parties have approval authority under this Agreement, Licensees shall notify the Commission of any approvals that were not obtained, include the relevant comments of the Parties with approval authority, describe the impact of the lack of approval on the schedule for implementation of PM&E Measures, and describe proposed steps to be taken to gain the approval, including dispute resolution.
- d. In no event shall the TCC or the ACC increase or decrease the monetary, resource, or other commitments made by PacifiCorp and Cowlitz PUD in this Agreement; override any other limitations set forth in this Agreement; or otherwise require PacifiCorp to modify its three Projects' facilities without PacifiCorp's prior written consent or require Cowlitz PUD to modify its Project's facilities without Cowlitz PUD's prior written consent, which consent may be withheld in the applicable Licensee's discretion.
- e. At any juncture where discussion or other contact with the ACC or TCC is required by this Agreement, when requested by the Services or as required by the Agreement, the ACC or TCC Committee Coordinator, respectively, shall schedule an opportunity to discuss the relevant issue with the ACC or TCC. This event shall consist of either a conference call, in-person meeting, or other appropriate forum to enable full consideration of the issue.

14.2.5 TCC and ACC Meetings. Commencing in the first year after the Effective Date and each year thereafter for the terms of the New Licenses, the TCC and ACC Committee Coordinators shall arrange and provide an agenda for an annual meeting of their respective committees. The TCC and ACC Committee Coordinators also shall arrange and provide an agenda for any additional meetings deemed necessary by either coordinator for a committee or at the request of any two Parties on that committee, which request shall be sent simultaneously to all members of that committee. Members of the TCC and the ACC shall be given a minimum of

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30 days' notice prior to any meeting, unless otherwise agreed to by the members of the applicable committee.

14.2.6 TCC and ACC Reports. The Committee Coordinators for the TCC and the Committee Coordinators for the ACC shall prepare and file with the Commission detailed annual reports on the TCC and ACC activities, monitoring and evaluations under the M&E Plan, and implementation of the terrestrial and aquatic PM&E Measures occurring during the prior year, as well as plans for the coming year as required in this Agreement. The annual reports may also include plans and reports required pursuant to Sections 4.9.1, 7.7.1, 8.2.3, 8.2.4, 10.5, and 10.8.3. Copies of such reports will be made available to each Party. The annual reports shall be prepared in Consultation with the TCC and ACC committee members and shall be submitted to the committees for review each year, commencing after the Effective Date. Committee members shall have a minimum of 30 days to review and provide comment on a draft report before a final report is prepared and filed with the Commission. The Licensees shall submit the final report to the Commission not later than 30 days after the close of the ACC and TCC comment periods. To the extent that comments are not incorporated into the final report, an explanation will be provided in writing, and such explanation shall be included in the report.

Appendix 3-2:
Terrestrial and Aquatic Coordination Committees Final Structure and Ground Rules

Terrestrial and Aquatic Coordination Committees FINAL Structure and Ground Rules

Introduction

This document has been established to facilitate the purposes of the Lewis River Terrestrial Coordination Committee (TCC) and the Lewis River Aquatics Committee (ACC) collectively known as “Coordination Committees”. This document does not supersede language in the Lewis River Settlement Agreement or any future Federal Energy Regulatory Commission (Commission) licenses which govern this process. Both Coordination Committees reserve the right to amend or modify this document as necessary and upon approval of the other committee.

Purpose

The purpose of the Coordination Committees is to coordinate:

- 1.) For the TCC, the implementation of terrestrial protection, mitigation, and enhancement (PM&E) Measures described in Section 10 of the Settlement Agreement (Agreement)(including any exhibits, schedules, and appendices related to that Section).
- 2.) For the ACC, the implementation of aquatics protection, mitigation, and enhancement (PM&E) Measures described in Sections 3 through 9 of the Agreement (including any exhibits, schedules, and appendices related to that Section).

In accordance with Section 14.2.1, of the Settlement Agreement (see Appendix C), PacifiCorp and Cowlitz have designated Coordinators for the Coordination Committees and alternative representatives (see Appendix A for a complete list of TCC membership, Appendix B for a complete list of ACC membership).

The Committee Coordinator(s) shall, as their primary responsibilities, oversee the coordination and implementation of the terrestrial and aquatic PM&E Measures that are the responsibility of their respective organizations as provided in the Agreement.

Roles and Responsibilities (Section 14.2.3 of the Agreement, see Appendix C)

Each Coordination Committee has the following responsibilities:

- a. Coordinates and Consults on development of plans by the Licensees as provided in the Agreement;
- b. Reviews information and oversees, guides, and makes comments and recommendations on implementation and monitoring of the terrestrial and aquatic PM&E Measures, including plans;
- c. Consults with the Licensees on their respective reports prepared under the Agreement and New Licenses regarding implementation of the terrestrial and aquatic PM&E Measures as referred to in Section 14.2.6 of the Agreement, (see Appendix C);

- d. Makes decisions, grants approvals, and undertakes any additional duties and responsibilities expressly given to the TCC or ACC with respect to the terrestrial or aquatic PM&E Measures;
- e. Establishes, among other things, (i) procedures and protocols for conducting committee meetings and deliberations to ensure efficient participation and decision making; (ii) rules for quorum and decision making in the absence of any member; (iii) alternative meeting formats as desired, including phone or teleconference; and (iv) the methods and procedures for updating committee members on interim progress of development and implementation of the terrestrial and aquatic PM&E Measures;
- f. As deemed necessary and appropriate by either Coordination Committee, establishes subcommittees to carry out specified committee functions and responsibilities described in this Section 14.2.3 of the Agreement (see Appendix C), and establishes the size of, membership of, and procedures for any such subcommittees; and
- g. Discusses the protocols and the content of public information releases; provided that each Party, speaking only for itself and not the Coordination Committees, retains the right to release information to the public at any time without such discussion.

Comments, Decisions and Recommendations (Section 14.2.4 of the Agreement, see Appendix C)

Each of the Coordination Committees shall make comments, recommendations, and decisions in a timely manner as provided below:

- a. Each Party represented on a Coordination Committee will have the authority to participate in all committee discussions relating to, and to provide input and advice on, decisions regarding implementation of the terrestrial and/or aquatic PM&E Measures;
- b. The Coordination Committees shall strive to operate by Consensus. Whether or not the TCC or ACC has final authority over decisions on PM&E Measures, the Licensees and other Parties may proceed with actions necessary to implement the New Licenses or the Agreement, even though Consensus is not achieved; provided that in such cases where “Consultation” is required, the responsible Licensee or Licensees shall provide copies of the TCC or ACC comments to the Commission and highlight the areas of disagreement. If this circumstance occurs, and the Licensees do not adopt the recommendations of a TCC or ACC member, then the material filed with the Commission will also include the member’s comments along with Licensee’s reasons, based on project specific information, as identified in the definition of consult or consultation in the Agreement and as follows:

“*Consultation*” or “*Consult*” means that the Licensees shall obtain the views of and attempt to reach Consensus among the specified Parties

whenever this Agreement requires the Licensees to Consult with one or more of the Parties. When Consultation is required under this Agreement, the Licensees shall allow a minimum of 30 days for the specified Parties to provide comments prior to filing written plans, reports, or other items with the Commission. If Consensus is not reached, the Licensees shall take action according to the schedule provided in this Agreement or the New Licenses and shall describe to the Commission how the Licensees' submission accommodates the comments and recommendations of the Parties. If the Licensees do not adopt a recommendation, the filing shall include the Licensees' reasons, based on Project-specific information. The Licensees shall provide the Commission with a copy of the Parties' comments. Any Party may seek to resolve such disagreements in accordance with the ADR Procedures provided under Section 15.10 of the Agreement (see Appendix C). The Parties may submit their own comments to the Commission.

c. Where one or more Parties have approval authority under this Agreement, Licensees shall notify the Commission of any approvals that were not obtained, include the relevant comments of the Parties with approval authority, describe the impact of the lack of approval on the schedule for implementation of PM&E Measures, and describe proposed steps to be taken to gain the approval, including dispute resolution.

d. In no event shall the Coordination Committees increase or decrease the monetary, resource, or other commitments made by PacifiCorp and Cowlitz PUD in the Agreement; override any other limitations set forth in the Agreement; or otherwise require PacifiCorp to modify its three Projects' facilities without PacifiCorp's prior written consent or require Cowlitz PUD to modify its Project's facilities without Cowlitz PUD's prior written consent, which consent may be withheld at the applicable Licensee's discretion.

e. At any juncture where Consultation, discussion or other contact with the either the TCC or ACC is required by the Agreement or New Licenses, when requested by the Services or as required by the Agreement, the respective Coordination Committee Coordinator shall schedule an opportunity to discuss the relevant issue with the respective Coordination Committee. This event shall consist of either a conference call, in-person meeting, or other appropriate forum to enable full consideration of the issue.

Roles of Parties

Interested Parties. Interested parties are those people or entities that are interested in TCC and/or ACC activities but were not Parties to the Agreement (e.g. general public) or are Agreement Parties that have not designated Coordination Committee representatives. To the extent desired by an individual or party, they may receive respective Coordination Committee information and attend meetings; however they will not be included in the Consensus process or during confidential sessions, unless so designated by the respective party. Time will be provided at each meeting for public comment as needed and determined by respective Coordination Committees (e.g. 15 minutes before lunch break and 15 minutes at conclusion of meeting).

Designated Representatives. Designated representatives (Representatives), see Appendices A and B, are Parties to the Settlement Agreement that have identified (in writing) representatives to participate in the TCC and/or ACC. Representatives will have the authority to participate in all respective committee discussions relating to, and to provide input and advice on, decisions regarding implementation of the terrestrial or aquatic PM&E Measures in the Agreement or new Licenses. Representatives are included in the consensus process. At any time a Representative may provide proxy representation to either the TCC or ACC via written notification to the Licensees' Coordinators this includes electronic mail notification. It is expected that TCC Representatives will want to meet in a confidential manner specific to discussion of land acquisition interests. Those Representatives wishing to participate in such meetings will be required to sign a Confidentiality Agreement. Since it is unlikely that the ACC will need to conduct confidential discussions, no Confidentiality Agreement has been prepared for ACC membership at this time.

Licensees' Coordinators. The Licensees' Coordinators (Coordinator(s)) oversee the coordination and implementation of the respective terrestrial and aquatic PM&E Measures that are the responsibility of their respective organizations (PacifiCorp or PUD of Cowlitz County) as provided in the Agreement. The Coordinators may be the Licensees' Representatives if so designated. The Coordinators shall act as full participants in the Coordination Committee process and, as appropriate, will take the lead in developing necessary information and preparing formal documents.

Consultants. A Consultant will serve as a source of technical expertise to the appropriate task or assignment. A Consultant will not have the authority to participate as a Coordination Committee Representative on behalf of or bind any Party unless the Party specifically delegates that authority (in writing) on specific issues, and informs the other Representatives about such delegation.

Facilitator. If deemed necessary by the Licensees or the TCC or the ACC, a facilitator may be utilized during a part or all of the committee proceedings. The facilitator is an independent third party. The facilitator's role is to help reach consensus. The facilitator will help the Representatives to identify goals, identify issues, develop and maintain critical paths, accomplish creative problem solving, reach resolution of issues (facilitate and mediate as necessary). The facilitator will also help the Parties to stay organized and keep track of issues, committee progress, and assignments. The facilitator may assist the development of agendas (for review and input by Representatives) and focus discussions and efforts. If either the TCC or ACC deems that an outside facilitator is unnecessary at any time, the Licensee(s) Coordinator(s) or any other Representative may assume that role, as determined by the respective committee.

Ground Rules

The TCC and ACC meetings are a process that is subject to the following ground rules. These ground rules are not intended to modify or limit any party's legal rights, authorities, or remedies.

Meetings

The meetings will be open to the public who may observe and provide comment at the appropriate time. Non-member participants (i.e., interested parties) can not participate in the

determination of consensus. The TCC may schedule meetings that are not open to non-TCC participants; confidential or otherwise. Consultants and legal representatives of the Parties shall not act as advocates during Coordination Committee meetings unless they have been designated as a Representative for a Party.

The Coordination Committees will have the respective meeting times:

- The TCC will meet regularly from 9:00am until 3:00pm on the second Wednesday of each month unless determined otherwise by the TCC.
- The ACC will meet regularly from 9:00am until 3:00pm on the second Thursday of each month unless determined otherwise by the ACC.

In general, Members of the TCC and ACC shall be given a minimum of 30 days' notice prior to any meeting, unless otherwise agreed to by the Representatives. This does not preclude the committees from conducting meetings with less notice as needed.

Agendas. Agenda items for the following TCC or ACC meeting will be determined by Representatives at the close of each meeting. Agendas will identify when decisions are expected to be made. Representatives may contact the Coordinator(s) at any time to suggest additional agenda items. The agenda for each meeting shall be distributed at least one (1) week in advance of the meeting date. At the beginning of each meeting, the agenda will be reviewed, edited, and amended as necessary by the Representatives. A public comment period will be included in each meeting agenda as needed. The Coordinators shall arrange and provide a draft agenda for the TCC or ACC meetings or for subgroups formed at the request of any two Representatives, which request shall be sent simultaneously to all Representatives of the respective committee. (See section 14.2.5 of the Agreement, or Appendix C).

Meeting Notes. The Coordinators will provide for the preparation, review and distribution of draft meeting notes within 7 days following the committee meeting. Representatives may provide editorial comments directly to the Coordinators by email, but substantive comments should be raised during the review of the notes at the next meeting for discussion and resolution, as necessary. Following that meeting, the Coordinators will finalize the meeting notes and distribute to the Representatives. Any changes to meeting notes that were suggested by a Representative but not accepted by the TCC for inclusion will be appended to meeting notes.

Coordination Committee Written Record. When the TCC or ACC has reached consensus on an action item(s) (See Decision Making below), the decision will be recorded in the notes of the meeting. Meeting notes will be provided to respective committee members for review prior to the following regularly scheduled meeting.

Responsibilities of Coordination Committee Representatives

Attendance. Representatives will make a reasonable effort to attend meetings and inform the Coordinators in advance of any absence at a TCC or ACC meeting or any change in representation. If possible, each Representative will have designated one or more alternates who can represent their organization when needed. A teleconference line will be available at each meeting for Representatives who cannot attend in person. Representatives attending by teleconference, or who have designated a proxy (in writing), are considered present at the meeting, and will be included in the Consensus process.

Preparation. Representatives will make a reasonable effort to complete action items, come prepared for meetings, and review previously distributed material relating to agenda items. If a Representative is new to the TCC or ACC, the committee should provide a short introduction briefing during the committee meeting. If a Representative would like the TCC or ACC to consider a specific proposal, that Representative will notify the Coordinator(s) to include the item on the agenda, and prepare and provide whatever written material that may be useful to the Representatives and allow for a 7-day review period prior to the meeting in which the proposal will be discussed.

Participation. Each Representative is expected to be a willing contributor at meetings, to communicate actively, to share all necessary factual information, and to strive for Consensus on a timely basis. Each Representative is expected to be open minded, to listen to others, to respect others' points of view, to be direct and considerate, to show respect for the other Representatives, to suggest solutions, and to be willing to explain their concerns to others. If a Representative has a personal communication device, they will strive to limit its use in a manner that is least disruptive to meeting participants (i.e. turn it off or to meeting mode during meetings).

Authority. If a Representative does not have authority to bind its organization, the Representative will keep its organization briefed on an on-going basis about the activities of the respective Coordination Committee, the issues being addressed, and possible solutions to those issues. The Representative will incorporate the input they have received from their internal discussions into their participation at the TCC and/or ACC. As previously stated, at any time a Representative may provide proxy representation to either the TCC or ACC via written notification to the Licensees' Coordinators.

Meeting Guidelines

Response Time. Representatives will have at least 30 days unless otherwise agreed to by the TCC or ACC members or the period as specified by the Settlement Agreement or New Licenses, to review reports, documents, and draft deliverables to be filed with the Commission, so that members can meaningfully participate in the collaborative process. In some instances, additional time will be provided to enable the Representatives' internal review. Specifically, Representatives will have sufficient time for internal review of major policy matters before making decisions on such matters. Future decision points will be noticed in meeting notes.

Brainstorming

To allow open discussion and collaboration, Representatives will be encouraged to "brainstorm" a variety of solutions to specific issues. When a Representative identifies possible solutions as part of this process it is on behalf of the Coordination Committee, not their individual organizations, and a Representative will not be held to any brainstorming ideas until such time as they have indicated a willingness to live with a proposed solution.

Decision Making. The TCC and ACC will make decisions by Consensus, as defined in the Agreement. With respect to assuring that all Representatives have a voice in the Consensus process, the following method will be applied:

1. Discuss the issue to surface all points of view. Invite everyone to speak.

2. The group may decide when there has been enough discussion about a topic and they are ready for a decision to be scheduled.
3. Those voting in the **minority** get the floor. They're invited to say whatever they want and convince others of the rights of their view by:
 - a. Adding to the body of information already presented.
 - b. Clarifying their position.
 - c. Point out flaws, errors, deficiencies. . . in the other's point of view.
4. Continue to ask those in the minority:
 - a. Do you think you have now been heard by the others in the group?
 - b. Is there more you want to say?
 - c. Are you ready to have the entire group vote again?
5. Vote again. Those voting in the **minority** again get the floor.
6. Invite them again to say whatever they want to try and convince others to agree with their point of view.

This process will continue until those in the minority are able to say: "We are clear about what the majority would like to do. While we personally would not make that choice, we do think the others understand what our alternative is. We've had sufficient opportunity to sway others to our point of view, and we do think we have been heard."

If agreement is not possible, minority parties may pursue Dispute Resolution (see below), or other agreed upon approach.

If the Settlement Agreement or the new Licenses requires "Consultation" or to "Consult" the Agreement definition previously identified will be applied unless the new Licenses have a differing definition.

To account for the absence of a Representative during a decision making process, decisions will be considered "informal" for a period of 7-continuous days post-decision, unless extended by the Committee. If all committee Representatives are present or have provided a proxy, the informal period is not needed. The Coordinators will notify absent parties of the "informal" decision via email promptly after the TCC or ACC meeting and request a decision response by the end of the 7 day period. If a Representative fails to respond in the 7-day period, their silence will be considered as no objection to the decision.

Dispute Resolution. The Coordinators or facilitator will use a variety of dispute resolution techniques (including mediation) to work through difficult issues and reach consensus. If necessary, the Representatives may follow the Alternative Dispute Resolution Procedures as defined in Section 15.10.2 of the Agreement (see Appendix C).

Caucuses. Time will be allowed at each meeting for caucuses, as necessary.

Tracking Issue and Resolutions. The Coordinators will track the progress of the Coordination Committees by maintaining an annotated list of issues that identifies specific issues, status of the issues, and resolutions. While a Representative will not be precluded from reopening a resolved issue, the Representatives will make a reasonable effort to move forward once decisions have been made and to only request that the group revisit decisions in limited situations.

Information. Representatives will have access to all documents developed during Coordination Committee activities. The Coordinators and all Representatives will distribute or make available via a website or email necessary information on a timely basis to all the Representatives. Some information (most likely from the TCC) will need to be subject to a Confidentiality Agreement. It is the responsibility of a Representative providing confidential information to ask the group to treat it confidentially. All Representatives will honor the Confidentiality Agreement to the limits defined by the law. To the extent that non-confidential data or information is draft, preliminary or otherwise qualified, if Representatives use such data/information outside of the context of meetings or activities, they will appropriately qualify the data/information.

Annual Reports

The Coordinators for the committees shall prepare and file with the Commission detailed annual reports on the TCC and ACC activities, monitoring and evaluations, and implementation of the terrestrial and aquatic PM&E Measures occurring during the prior year, as well as plans for the coming year as required in the Agreement. The annual reports may also include, but not be limited to, plans and reports required pursuant to Sections 4.9.1, 7.7.1 8.2.3, 8.2.4, 10.5, 10.8.3 of the Agreement (see Appendix C), and any other applicable sections. Copies of such reports will be made available to each Party. The annual reports shall be prepared in Consultation with the Coordination Committee Representatives and shall be submitted to the appropriate committee for review each year, commencing after the Effective Date. Committee Representatives shall have a minimum of 30 days to review and provide comment on a draft report before a final report is prepared and filed with the Commission. The Licensees shall submit the final report to the Commission not later than 30 days after the close of the comment period. To the extent that comments are not incorporated into the final report, an explanation will be provided in writing, and such explanation shall be included in the report.

Appendix A
Terrestrial Coordination Committee Membership

Party	Designated Representative	Alternate Representative
American Rivers	No representative at this time	
City of Woodland	No representative at this time	
Clark County	No representative at this time	
Cowlitz County	No representative at this time	
City of Woodland	No representative at this time	
Cowlitz Indian Tribe	Taylor Aalvik	Mike Iyall
Cowlitz-Skamania Fire District No. 7	No representative at this time	
Fish First	Jim Malinowski	
Lewis River Citizens at-large	John Clapp	
Lewis River Community Council	Mariah Stoll-Smith Reese	
Lower Columbia River Fish Recovery	No representative at this time	
National Marine Fisheries Service	Michelle Day	
National Park Service	No representative at this time	
North County Emergency Medical	No representative at this time	
PacifiCorp	Monte Garrett	Kirk Naylor
PUD of Cowlitz County	Diana M. Gritten-MacDonald	
Rocky Mountain Elk Foundation	Bob Nelson	
Skamania County	No representative at this time	
The Native Fish Society	No representative at this time	
Trout Unlimited	No representative at this time	
US Bureau of Land Mgmt	No representative at this time	
US Fish & Wildlife	Gene Stagner	
USDA Forest Service	Ruth Tracy	Mitch Wainwright
Washington Dept of Fish & Wildlife	Curt Leigh	John Weinheimer Brock Applegate
Washington Interagency Committee	No representative at this time	
Woodland Chamber of Commerce	No representative at this time	
Yakama Nation	Clifford Casseseka	

Diana M. Gritten-MacDonald (PUD of Cowlitz County) and Monte Garrett (PacifiCorp) are the Licensees' Coordinators for the TCC.

Appendix B
Aquatic Coordination Committee Membership

Party	Designated Representative	Alternate Representative
American Rivers	Brett Swift	
City of Woodland	No representative at this time	
Clark County	No representative at this time	
Cowlitz County	No representative at this time	
City of Woodland	No representative at this time	
Cowlitz Indian Tribe	Janne Kaje	Mike Iyall & Taylor Aalvik
Cowlitz-Skamania Fire District No. 7	No representative at this time	
Fish First	Jim Malinowski	
Lewis River Citizens at-large	John Clapp	
Lewis River Community Council	Mariah Stoll-Smith Reese	
Lower Columbia River Fish Recovery	Jeff Breckel	
National Marine Fisheries Service	Michelle Day	
National Park Service	No representative at this time	
North County Emergency Medical	No representative at this time	
PacifiCorp	Frank Shrier	
PUD of Cowlitz County	Diana M. Gritten-MacDonald	
Rocky Mountain Elk Foundation	No representative at this time	
Skamania County	No representative at this time	
The Native Fish Society	Brett Swift	
Trout Unlimited	Brett Swift	
US Bureau of Land Mgmt	No representative at this time	
US Fish & Wildlife	Gene Stagner	
USDA Forest Service	Ruth Tracy	
Washington Dept of Fish & Wildlife	Curt Leigh	Craig Burley John Weinheimer
Washington Interagency Committee	No representative at this time	
Woodland Chamber of Commerce	No representative at this time	
Yakama Nation	George Lee	

Diana M. Gritten-MacDonald (PUD of Cowlitz County) and Frank Shrier (PacifiCorp) are the Licensees' Coordinators for the ACC.

Appendix C
Lewis River Hydroelectric Projects Settlement Agreement

4.9.1 Collect-and-Haul Programs. Until the earlier of (a) operation of the Yale Upstream Facility and the Swift Upstream Facility or (b) alternative measures are implemented as provided under Section 4.9.2 below, and unless otherwise directed by USFWS, PacifiCorp shall implement the collect-and-haul programs at Yale tailrace and Cowlitz PUD and PacifiCorp shall implement the collect-and-haul program below Swift No. 2. A description of the collect-and-haul programs to be implemented below Swift No. 2 and at Yale tailrace is provided on attached Schedule 4.9.1. The operational practices at Yale included on Schedule 4.9.1 are not precluded by Section 4.1.6. PacifiCorp shall provide for the transport of bull trout collected at the Yale tailrace to Yale Lake. The Licensees shall provide for the transport of bull trout collected at Swift No. 2 to above Swift No. 1. Upon the request of and subject to approval by USFWS, the Licensees, in Consultation with the ACC, shall develop criteria, based on the latest research, to determine if, when, and where alternative release locations are needed. Any such alternative locations shall be accessible by transport truck or other mutually acceptable transportation system. At the direction of USFWS, the Licensees (PacifiCorp for the Yale tailrace, and PacifiCorp and Cowlitz PUD for below Swift No. 2) shall provide for the transport of bull trout to such alternative locations. Within 12 months from the Effective Date, and annually thereafter, the Licensees, in Consultation with the ACC and with the approval of USFWS, shall prepare a Bull Trout Collection and Transport Program outlining the manner of and schedule for bull trout collection and passage at Project facilities, incorporating as appropriate either (1) the collection method identified in this Section 4.9.1 and testing of alternative interim collection methods as provided in Section 4.9.2 below; or (2) an alternative collection method developed pursuant to Section 4.9.2. The Licensees may propose minor modifications to the program identified in Schedule 4.9.1 as part of the Bull Trout Collection and Transport Program. The Licensees shall not implement any modifications to the Bull Trout Collection and Transport Program until USFWS has approved those changes.

7.7.1 Review. The Licensees shall provide an annual report regarding Aquatics Fund activities and expenditures under Section 7.5, and PacifiCorp shall provide such annual reports regarding In Lieu Fund activities and expenditures under Section 7.6, both including any monitoring information collected regarding Resource Projects or mitigation measures implemented through the Aquatics and In Lieu Funds. Such annual report may be included as part of the detailed annual reports of the ACC activities required by Section 14.2.6. Each Licensee shall make or cause to be made available its underlying records relating to the Aquatics Fund, and PacifiCorp shall make available its underlying records relating to the In Lieu Fund, for review by the Parties.

8.2.3 Annual Operating Plan. The Licensees shall provide for the implementation of the Hatchery and Supplementation Plan through an annual plan (“Annual Operating Plan”). The Annual Operating Plan shall be consistent with the Hatchery and Supplementation Plan. The Licensees, in Consultation with the hatchery managers and with the approval of the Services, shall develop the initial Annual Operating Plan as part of the Hatchery and Supplementation Plan. The Licensees shall develop subsequent Annual Operating Plans in Consultation with the hatchery managers and subject to the approval of the Services. The Annual Operating Plan may be included as part of the detailed annual reports of the ACC activities required by Section 14.2.6.

The Annual Operating Plan shall, at a minimum, contain: (1) a production plan, which shall specify the species and broodstock sources; (2) the current Hatchery Target and Juvenile Production Target for each species to be produced at the Hatchery Facilities; (3) a release plan which shall identify by species the rearing schedule and planned distribution of fish and the schedules and locations for releases; (4) a list of facility upgrades to be undertaken that year; and (5) a description of relevant monitoring and evaluation to be undertaken that year.

8.2.4 Reporting Requirements. On an annual basis, the Licensees shall provide to the ACC for review and comment a report compiling all information gathered pursuant to implementation of the Hatchery and Supplementation Plan. The report also will include recommendations for ongoing management of the Hatchery and Supplementation Program. The ACC shall have 60 days to comment on the annual report. Within 60 days of the close of the comment period, the Licensees shall finalize the report after consideration of all comments. The Licensees shall also provide the comprehensive periodic review undertaken pursuant to Section 8.2.6 below to the ACC. The Licensees shall provide final annual reports and the comprehensive periodic review to the Services during the development of any required ESA permit or authorization for hatchery operations, including NOAA Fisheries' HGMP process. The report may be included as part of the detailed annual reports of the ACC activities required by Section 14.2.6.

10.5 Management of Funds. Funds provided by PacifiCorp, as described in Sections 10.1, 10.2, and 10.3 above, shall be held by PacifiCorp in a Tracking Account until acquisitions of Interests in Land are executed or habitat enhancement measures under Section 10.3 are implemented. PacifiCorp shall accrue interest on Fund monies held by PacifiCorp from the date the monies are due to be placed into the Fund at the prime interest rate printed in the *Wall Street Journal* for the weekday nearest to April 1 of each year. If such rate ceases to be published in the *Wall Street Journal*, the Parties shall meet and agree upon an alternate source for the prime interest rate. Interest shall be computed, compounded, and added to the Fund once annually as of that date. PacifiCorp shall use monies in the Funds to pay the purchase price for Interests in Land and for covered transaction and implementation costs as they are incurred. Funds not expended in any given year shall be carried over to a subsequent year. PacifiCorp shall provide annual reports to the TCC regarding Fund expenditures under Sections 10.1, 10.2 and 10.3 above. Such annual reports may be included as part of the detailed annual reports of the TCC activities required by Section 14.2.6.

10.8.3 Management of Plan. Subject to the oversight of the TCC, PacifiCorp and Cowlitz PUD shall implement their respective WHMPs. The Licensees shall submit to the TCC annually a written plan (the "Annual Plan") to use the funds available to implement the WHMPs on their respective lands. The Annual Plan may be included as part of the detailed annual reports of the TCC activities required by Section 14.2.6. Once the TCC has approved such Annual Plans, they shall be implemented by the Licensees using the funds made available for that purpose under Section 10.8.2. The funds shall be used to reimburse Licensees for use of their employees and contractors to manage, implement, and monitor actions taken under the WHMPs as provided in the Annual Plan. Further, the WHMPs shall not prevent either of the Licensees from carrying out any other legal requirement with respect to or upon its respective lands in any lawful manner, including, without limitation, in compliance with the conditions of the New Licenses, subject to Section 10.8.5.5 below. If the TCC believes that another party can implement the WHMPs more cost effectively, the respective Licensee shall, at the request of the TCC, seek bids from third party contractors to implement their respective WHMP for some period during the term of the applicable New License(s). If the bidding process identifies third party contractors who can do the work more cost effectively, the respective Licensee shall engage such contractors, provided that they are acceptable to the Licensee, in its reasonable discretion, considering policies, contracting requirements, and procedures and qualifications normally applied by the Licensees when engaging other contractors to work on their respective properties, and subject to dismissal if any contractor's performance violates such policies and requirements. If contractors are retained at the recommendation of the TCC, such contractors shall have full responsibility, during the period of their engagement, for implementation of the respective WHMPs as provided under this Section 10.8, including preparation of Annual Plans and any required reporting to the TCC. During the period such third party is retained, the Licensees' obligations for implementation of their respective WHMPs shall be fulfilled in their entirety by providing the funds as required under Section 10.8.2. In no event shall Licensees be required to fund implementation of their respective WHMPs in excess of the amounts provided for in Section 10.8.2.

14.2.1 Committee Coordinators. Within 30 days after the Effective Date, PacifiCorp and Cowlitz PUD each shall designate one Committee Coordinator for the TCC and one Committee Coordinator for the

ACC. PacifiCorp and Cowlitz PUD shall make their designations by notice to the Parties in accordance with the notice provisions in Section 16.6. The PacifiCorp Committee Coordinator(s) shall be employed or retained by PacifiCorp and may represent PacifiCorp on the TCC and the ACC. The Cowlitz Committee Coordinator(s) shall be employed or retained by Cowlitz PUD and may represent Cowlitz PUD on the TCC and the ACC. The PacifiCorp Committee Coordinator(s) shall, as their primary responsibilities, oversee the coordination and implementation of the terrestrial and aquatic PM&E Measures that are the responsibility of PacifiCorp as provided in this Agreement. The Cowlitz PUD Committee Coordinator(s) shall oversee the coordination and implementation of the terrestrial and aquatic PM&E Measures that are the responsibility of Cowlitz PUD as provided in this Agreement. PacifiCorp and Cowlitz PUD Committee Coordinators together shall oversee the coordination and implementation of terrestrial and aquatic PM&E Measures for which PacifiCorp and Cowlitz PUD have joint responsibility as provided in this Agreement.

14.2.3 TCC and ACC Functions. The TCC and the ACC will:

- a. Coordinate and Consult on development of plans by the Licensees as provided in this Agreement;
- b. Review information and oversee, guide, and make comments and recommendations on implementation and monitoring of the terrestrial and aquatic PM&E Measures, including plans;
- c. Consult with the Licensees on their respective reports prepared under this Agreement regarding implementation of the terrestrial and aquatic PM&E Measures as referred to in Section 14.2.6 below;
- d. Make decisions, grant approvals, and undertake any additional duties and responsibilities expressly given to the TCC or the ACC with respect to the terrestrial and aquatic PM&E Measures;
- e. Establish, among other things, (i) procedures and protocols for conducting committee meetings and deliberations to ensure efficient participation and decision making; (ii) rules for quorum and decision making in the absence of any member; (iii) alternative meeting formats as desired, including phone or teleconference; and (iv) the methods and procedures for updating committee members on interim progress of development and implementation of the terrestrial and aquatic PM&E Measures;
- f. As deemed necessary and appropriate by the TCC or the ACC, establish subcommittees to carry out specified committee functions and responsibilities described in this Section 14.2.3, and establish the size of, membership of, and procedures for any such subcommittees; and
- g. Discuss the protocols and the content of public information releases; provided that each Party retains the right to release information to the public at any time without such discussion.

14.2.4 TCC and ACC Decision-Making Process and Limitations. The TCC and the ACC shall make comments, recommendations, and decisions in a timely manner as provided below:

- a. Each Party represented on the TCC and the ACC will have the authority to participate in all committee discussions relating to, and to provide input and advice on, decisions regarding implementation of the terrestrial or aquatic PM&E Measures;
- b. The TCC and the ACC shall strive to operate by Consensus. Whether or not the TCC or the ACC has final authority over decisions on terrestrial and aquatic PM&E Measures, the Licensees and other Parties may proceed with actions necessary to implement the New Licenses or this Agreement, even though Consensus is not achieved; provided that in such cases the

responsible Licensee or Licensees shall notify the Commission of the comments of the ACC or TCC members and the areas of disagreement. If the TCC or ACC does not reach Consensus, then any member of the TCC or ACC, respectively, may initiate the ADR Procedures as provided in Section 15 below.

c. Where one or more Parties have approval authority under this Agreement, Licensees shall notify the Commission of any approvals that were not obtained, include the relevant comments of the Parties with approval authority, describe the impact of the lack of approval on the schedule for implementation of PM&E Measures, and describe proposed steps to be taken to gain the approval, including dispute resolution.

d. In no event shall the TCC or the ACC increase or decrease the monetary, resource, or other commitments made by PacifiCorp and Cowlitz PUD in this Agreement; override any other limitations set forth in this Agreement; or otherwise require PacifiCorp to modify its three Projects' facilities without PacifiCorp's prior written consent or require Cowlitz PUD to modify its Project's facilities without Cowlitz PUD's prior written consent, which consent may be withheld in the applicable Licensee's discretion.

e. At any juncture where discussion or other contact with the ACC or TCC is required by this Agreement, when requested by the Services or as required by the Agreement, the ACC or TCC Committee Coordinator, respectively, shall schedule an opportunity to discuss the relevant issue with the ACC or TCC. This event shall consist of either a conference call, in-person meeting, or other appropriate forum to enable full consideration of the issue.

14.2.5 TCC and ACC Meetings. Commencing in the first year after the Effective Date and each year thereafter for the terms of the New Licenses, the TCC and ACC Committee Coordinators shall arrange and provide an agenda for an annual meeting of their respective committees. The TCC and ACC Committee Coordinators also shall arrange and provide an agenda for any additional meetings deemed necessary by either coordinator for a committee or at the request of any two Parties on that committee, which request shall be sent simultaneously to all members of that committee. Members of the TCC and the ACC shall be given a minimum of 30 days' notice prior to any meeting, unless otherwise agreed to by the members of the applicable committee.

14.2.6 TCC and ACC Reports. The Committee Coordinators for the TCC and the Committee Coordinators for the ACC shall prepare and file with the Commission detailed annual reports on the TCC and ACC activities, monitoring and evaluations under the M&E Plan, and implementation of the terrestrial and aquatic PM&E Measures occurring during the prior year, as well as plans for the coming year as required in this Agreement. The annual reports may also include plans and reports required pursuant to Sections 4.9.1, 7.7.1, 8.2.3, 8.2.4, 10.5, and 10.8.3. Copies of such reports will be made available to each Party. The annual reports shall be prepared in Consultation with the TCC and ACC committee members and shall be submitted to the committees for review each year, commencing after the Effective Date. Committee members shall have a minimum of 30 days to review and provide comment on a draft report before a final report is prepared and filed with the Commission. The Licensees shall submit the final report to the Commission not later than 30 days after the close of the ACC and TCC comment periods. To the extent that comments are not incorporated into the final report, an explanation will be provided in writing, and such explanation shall be included in the report.

15.10 Alternative Dispute Resolution.

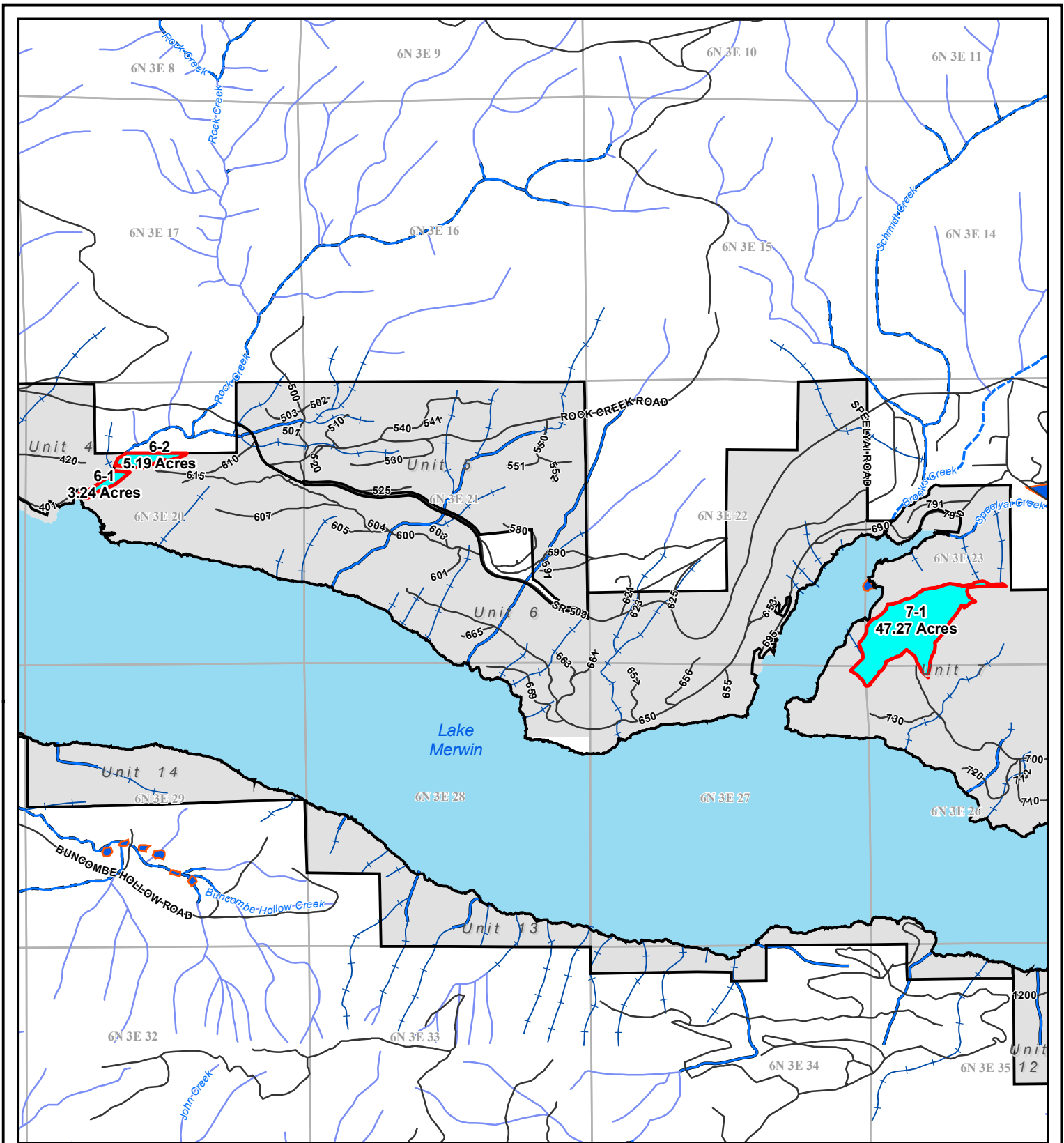
15.10.1 General. The Parties intend that disputes under this Agreement be resolved as expeditiously and informally as possible, and that issues within the scope of the TCC and the ACC be discussed in those committees before being referred to the ADR Procedures. All remaining disputes among the Parties regarding the obligations of the Parties under this Agreement shall, at the request of any Party, be the subject of nonbinding ADR Procedures among the disputing Parties. Each Party shall cooperate in good

faith promptly to schedule, attend, and participate in the ADR Procedures. The Parties agree to devote such time, resources, and attention to the ADR Procedures as are needed to attempt to resolve the dispute at the earliest time possible. Each Party shall implement promptly all final agreements reached through the ADR Procedures, consistent with the Party's applicable statutory and regulatory responsibilities. Nothing in Sections 15.10.1 through 15.10.2 is intended or shall be construed to affect or limit the authority of the Commission, the Agencies, or any other agency with jurisdiction over the Projects to resolve a dispute brought before it in accordance with its own authorities and procedures, or to alter the statute of limitations or other requirements for Appeal of any action.

15.10.2 ADR Procedures. A Party claiming a dispute shall give notice of the dispute within 60 days of the Party's actual knowledge of a dispute, event, or omission that gives rise to the dispute, unless this Agreement provides otherwise. If a Party communicates with another Party informally and believes that the dispute is being resolved, the time for notice will not commence until it has been determined that such informal efforts have failed to resolve the dispute. Notification under Section 16.6 shall constitute actual knowledge. At a minimum, in any dispute subject to the ADR Procedures, the Parties shall hold two informal meetings within 30 days after notice, to attempt to resolve the disputed issue or issues. If, within 15 days after the second meeting or any meeting thereafter, a Party notifies the other Parties that such informal meetings failed to resolve the dispute, the Parties may agree to attempt to resolve the dispute using a neutral mediator. The agreement to use a neutral mediator will address allocation of costs and the scope of the dispute. The neutral mediator will be selected by the Parties participating in the mediation. Upon selection, the mediator will mediate the dispute for 60 days. Any of these time periods may be reasonably extended or shortened by agreement of the Parties, or as necessary to conform to the procedure of an agency or court with jurisdiction over the dispute. Unless otherwise agreed among the Parties, each Party shall bear its costs for its own participation in the ADR Procedures. Pending resolution of any dispute under the ADR procedures, and subject to the authority of the Commission or other agency with jurisdiction to order otherwise, PacifiCorp and Cowlitz PUD may continue operating their respective Projects in the manner of their operation prior to the point at which the dispute arose.

15.10.3 Enforcement of Agreement After ADR Procedures. Any Party may seek specific performance of this Agreement by any other Party at the Commission or in a court of competent jurisdiction after compliance with the ADR Procedures, where required, and, to the extent allowed by applicable law, may seek to recover its costs and fees associated with bringing such action. No Party shall be liable in damages for any breach of this Agreement, except that a Party may seek monetary penalties under applicable law. Nothing in Sections 15.10.1 through 15.10.3 is intended or shall be construed to affect or limit the jurisdiction of any agency or court as established under applicable law.

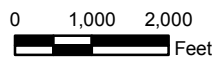
Appendix 4-1:
Lewis River Wildlife Habitat Management Plan Old-growth Stands



Lewis River Wildlife Habitat Management Plan

Old Growth
Appendix 4-1

Sheet 1 of 5



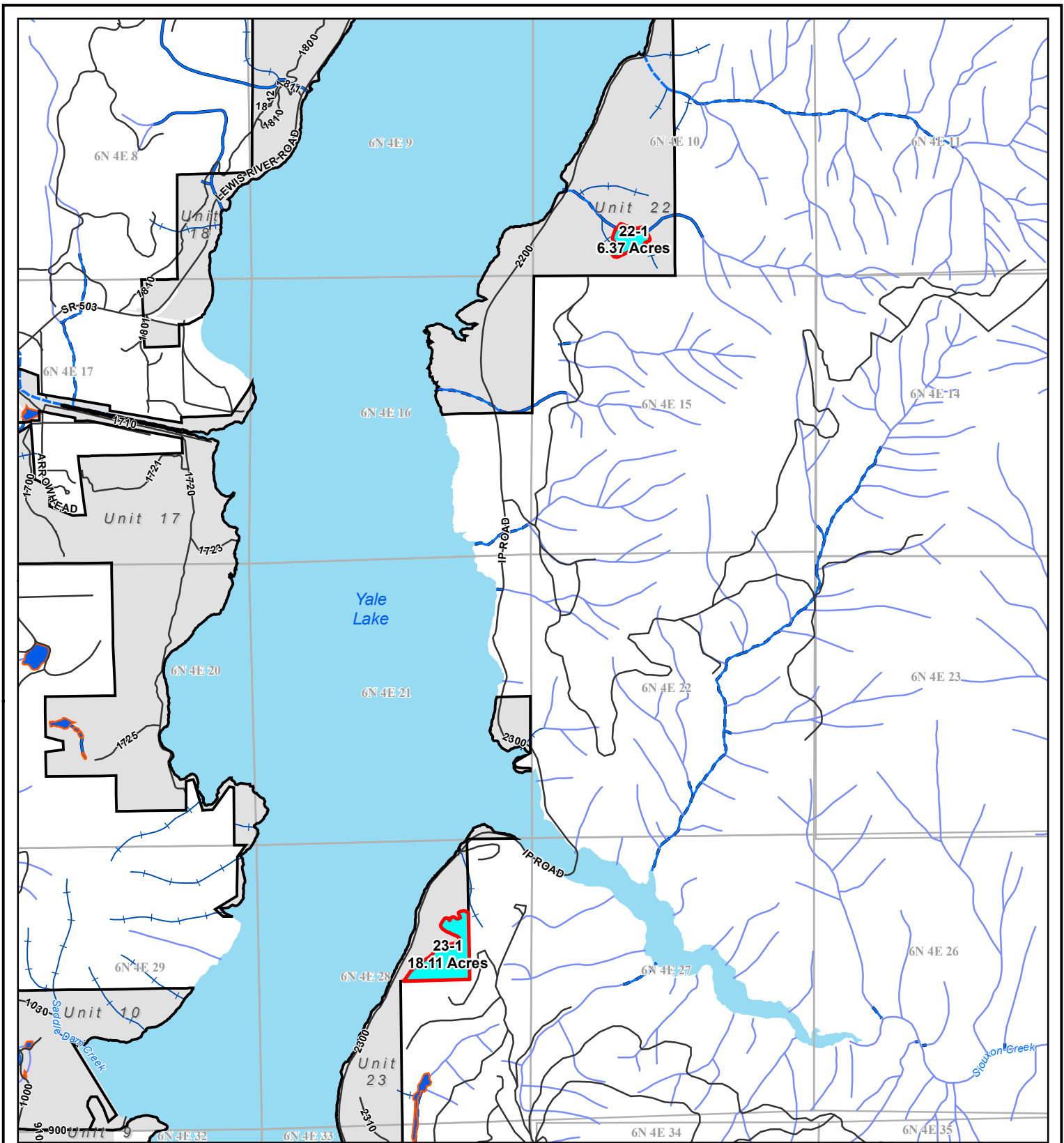
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	Management Unit
	PacifiCorp Ownership
	Section
	Water Body
	Wetlands
	Road
	Stream Type
	Fish
	Anadromous Fish
	Non-fish Perennial
	Non-fish Seasonal
	Other



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Geographic Information Systems
gisdept@pacifiCorp.com

Data are projected in UTM Zone 10, NAD83, meters.

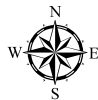
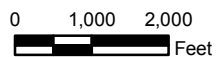
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Lewis River Wildlife Habitat Management Plan

Old Growth
Appendix 4-1

Sheet 2 of 5



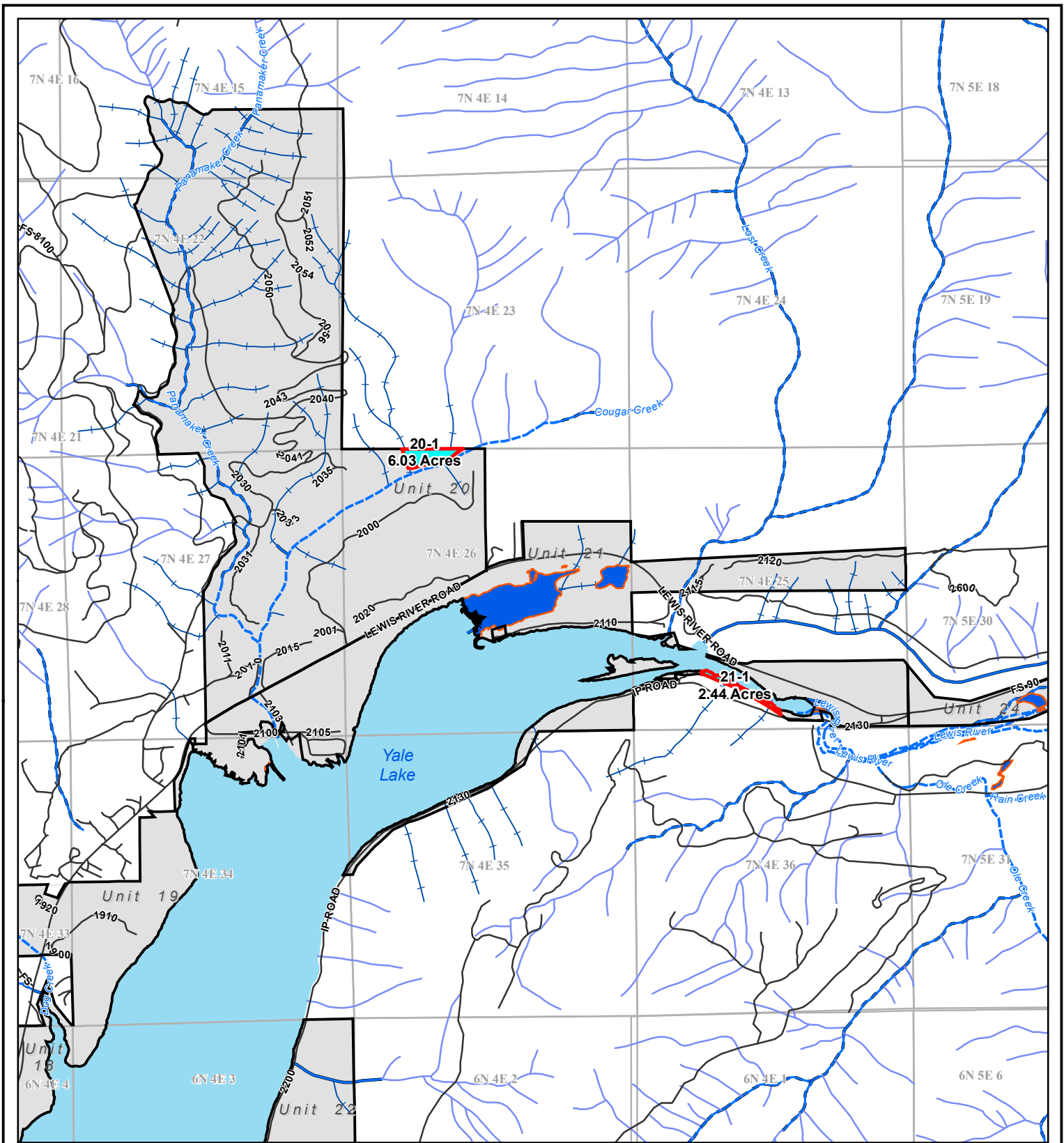
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	Management Unit
	PacifiCorp Ownership
	Section
	Water Body
	Wetlands
	Road
	Stream Type
	Fish
	Anadromous Fish
	Non-fish Perennial
	Non-fish Seasonal
	Other



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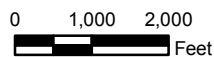
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Lewis River Wildlife Habitat Management Plan

Old Growth
Appendix 4-1

Sheet 3 of 5



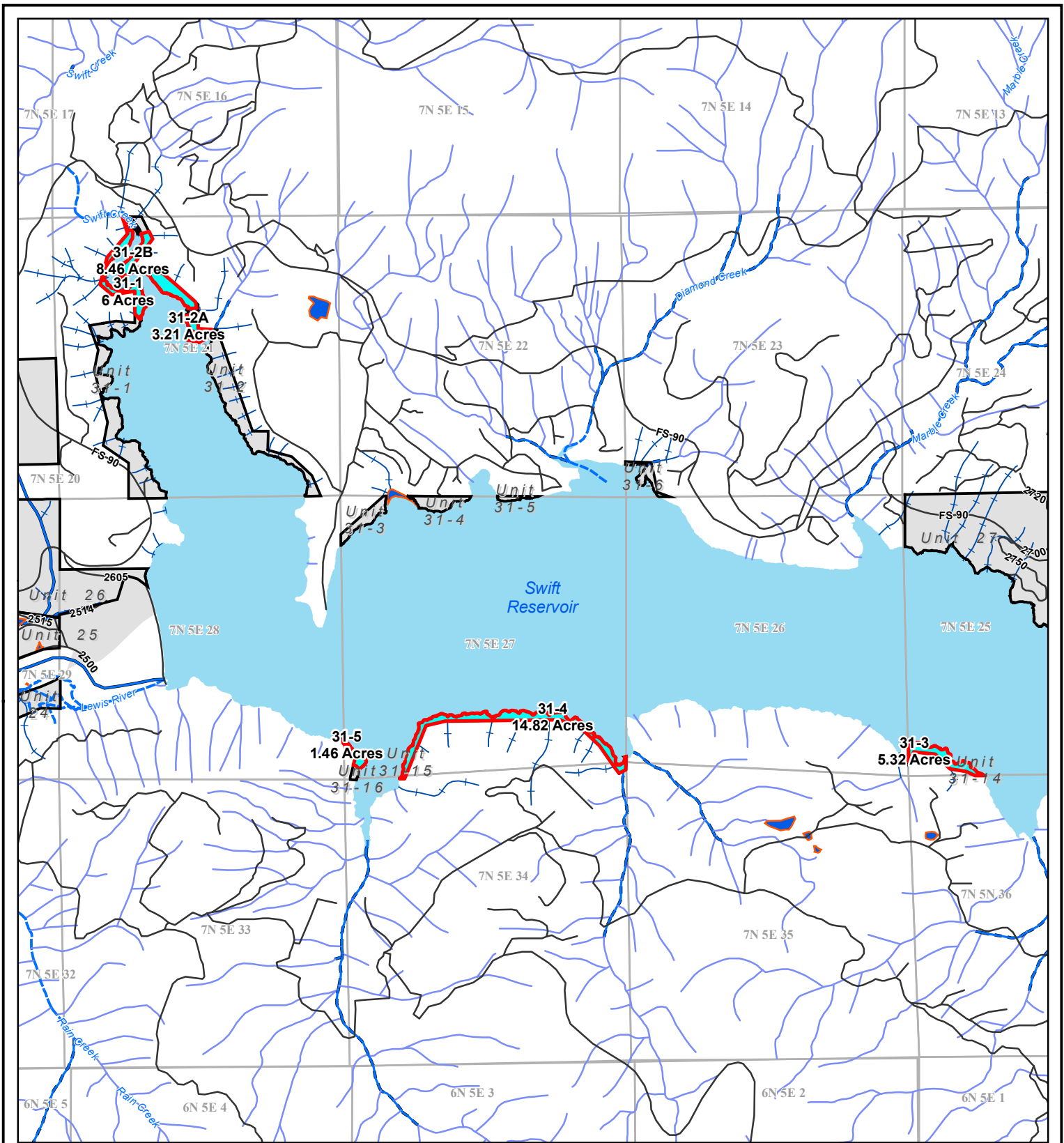
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	Management Unit
	PacifiCorp Ownership
	Section
	Water Body
	Wetlands
	Road
	Stream Type
	Fish
	Anadromous Fish
	Non-fish Perennial
	Non-fish Seasonal
	Other



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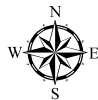
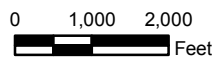
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Lewis River Wildlife Habitat Management Plan

Old Growth
Appendix 4-1

Sheet 4 of 5



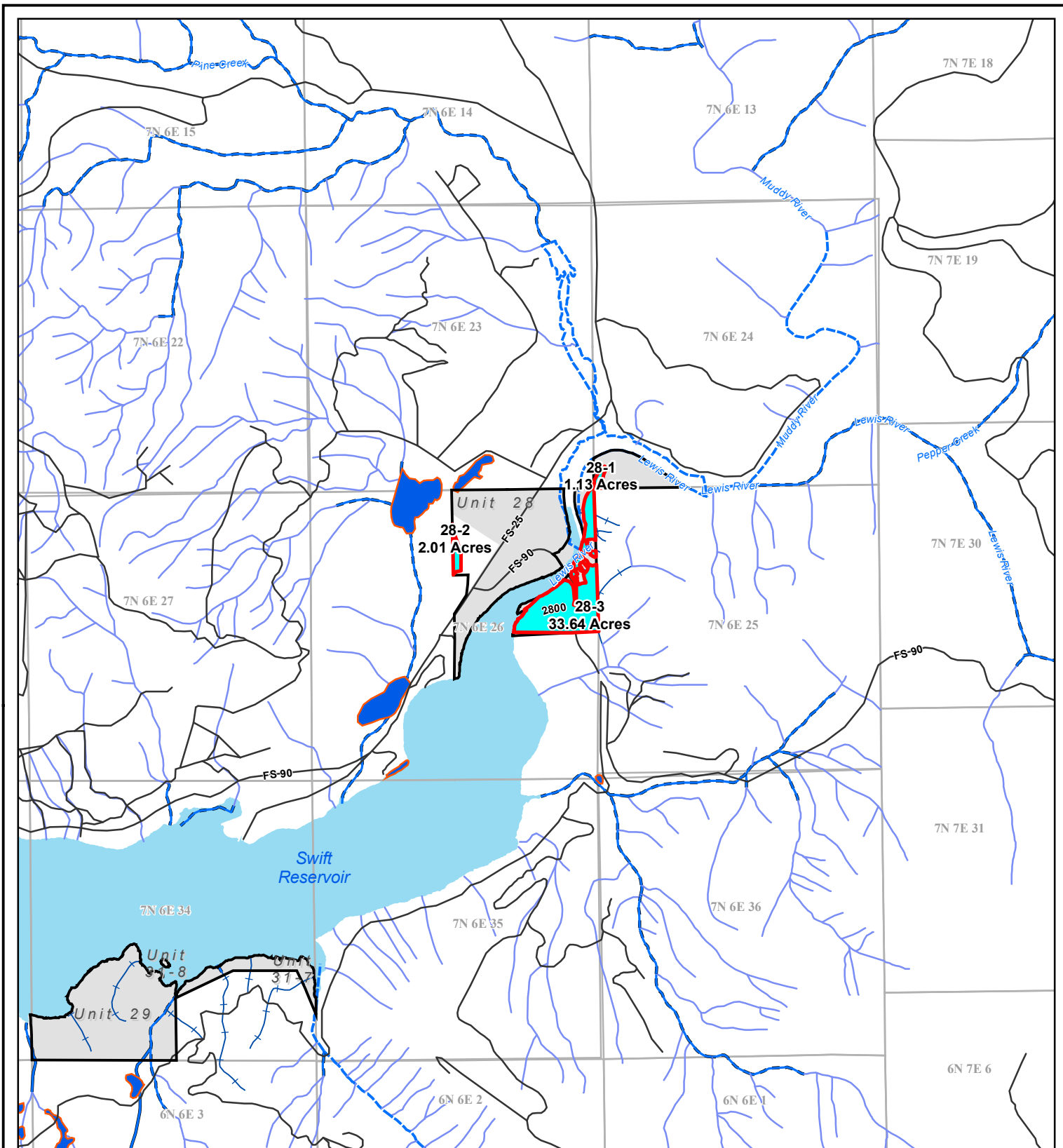
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	Old Growth
	Management Unit
	PacifiCorp Ownership
	Section
	Water Body
	Wetlands
	Road
Stream Type	
	Fish
	Anadromous Fish
	Non-fish Perennial
	Non-fish Seasonal
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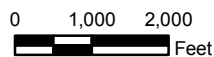
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Lewis River Wildlife Habitat Management Plan

Old Growth
Appendix 4-1

Sheet 5 of 5



Legend	
	Old Growth
	Management Unit
	PacifiCorp Ownership
	Section
	Water Body
	Wetlands
	Road
	Stream Type
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	Anadromous Fish
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Appendix 4-2:
Initial Evaluation Procedures and Data Forms

Old-Growth Stand Initial Evaluation Form

Old-Growth Stand Id No.: _____ **Date:** _____

Observers: _____

Canopy Layers: _____

Invasive Plant Species: _____

Unique Habitat Features: _____

Disturbance Source: _____

Wildlife Observations: _____

Comments: _____

Attach a copy of an aerial photo, map, or schematic of the old-growth stand include roads, disturbances, and/or unique features.

Old –Growth Stand Transect Data

Transect Number: _____ Azimuth: _____ Width: _____

Snag and Live Decay Tree Data

Species Code ¹	Diameter Breast Height Class (inches)				Height Class (feet)		Decay Class					
	10-19	20-30	31- 60	61+	20 - 74	75+	1	2	3	4	5	

¹Species Code: ALRU (red alder), ACMA (bigleaf maple), HARD (unknown hardwood snag), PICO (lodgepole pine), PIMO (western white pine), POTR (black cottonwood), PSME (Douglas-fir), SOFT (unknown conifer snag), THPL (western red cedar), TSHE (western hemlock).

Old-Growth Stand Transect Data

Down Wood Data

Type (C=Conifer, H= Hardwood)	Diameter Class ¹ (inches)				Decay Class			
	7-15	16-23	24-50	51+	1	2	3	4

¹ Diameter is measured at the smallest end.

Old-Growth Stand Plot Data

Plot Number: _____

Distance: _____

Canopy Cover at Plot Center:

N (360°): _____ **E (90°):** _____ **S (180°):** _____ **W (270°):** _____

Average of all 4 readings: _____

Species	Diameter Breast Height (dbh) Class								
	0-9	10-15	16 -20	21- 25	26-30	31- 40	41- 60	61 +	Total
Bigleaf Maple									
Douglas-fir									
Red Alder									
Western Hemlock									
Western Red Cedar									
Unknown Conifer									
Unknown Hardwood									
Total									

Old-Growth Stand Id No. _____

Old-Growth Stand Initial Evaluation

Old-Growth Stand Id No.: Old-growth stands are areas that are vegetation cover typed as old-growth and are equal to or greater than 1.0 ac (0.4 ha). Each old-growth stand has an identification number that is comprised of the unit number followed by a unique number (e.g., 6-2). Old-growth stands and their corresponding identification numbers are located in Appendix X-1 and Table X.3.1

Date: Record the date(s) the initial evaluation was conducted

Observers: List the names of observers conducting the initial evaluation

Canopy Layers: Describe the presence of the above and sub-canopy tree layer, shrub layer, and herbaceous layers, as well as provide a description of the dominant vegetation for each canopy layer.

Invasive Plant Species: Record the presence of invasive plant species identified during the evaluation and provides recommended control methods, if needed.

Unique Habitat Features: Describe unique habitat features identified during the evaluation. This may include, but are not limited too, oak stands, cliffs, talus/lava flows, caves, and areas that support culturally sensitive plant species.

Disturbance Source: Describe potential disturbance sources (e.g. open roads, development) within or adjacent to the old-growth stand.

Wildlife Observations: Record wildlife species and/or signs observed during the initial evaluation.

Comments: Provide additional management recommendations or observations for the old-growth stand.






Transect Data

Azimuth: The compass direction that the observer walked along the transect.

Diameter Breast Height: Record the diameter breast height (4.5 ft [1.4 m] from the forest floor on the uphill side of the tree) for each live decay trees and snags greater than or equal to 10 in (25 cm) diameter breast height and categorize into the appropriate class.

Down wood decay class: Qualifying down wood will be categorized into 1 of the 5 decay classes. Figure 1 is similar to the down wood decay classes and are adapted from Johnson, M.D. 2000 and Maser et al. 1979. Class 5 logs are not recorded for the purposes of this evaluation.






Figure 1: Down Wood Decay Class Description

	Log decomposition class 1 	Log decomposition class 2 	Log decomposition class 3 	Log decomposition class 4 	Log decomposition class 5 
Decay Class	1	2	3	4	5
Bark	Intact	Intact	Intact	Absent	Absent
Twigs < 1.2 in (3 cm)	Present	Absent	Absent	Absent	Absent
Texture	Intact	Intact to partly soft	Hard, large pieces	Small, soft, blocky pieces	Soft and powdery
Shape	Round	Round	Round	Round to Oval	Oval
Color of Wood	Original color	Original color	Original color to faded	Light brown to faded brown or yellowish	Faded to light yellow or gray
Portion of Log on Ground	Log elevated on support points	Log elevated on support points, but sagging slightly	Log is sagging near ground	All of log on ground	All of log on ground

Height: Only live decay trees and snags that are greater than or equal to 20 ft (6 m) in height will be recorded. Qualifying trees and snags will be categorized into two height classes: 20 ft (6 m) to 74 ft (22 m) and greater than or equal to 75 ft (23 m).

Snag and Live Decay Tree Decay Class: Qualifying snag and live decay trees will be categorized into one of the 5 decay classes. Figure 2 is similar to the habitat evaluation procedures study snag decay classes and are adapted from Johnson, M.D. 2000 and Maser et al. 1979.

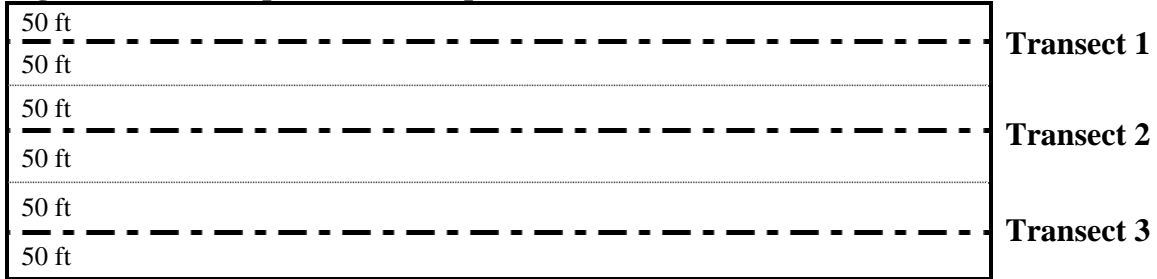
Figure 2: Snags and Live Decay Tree Decay Classes and Descriptions

					
Description					
Class	1	2	3	4	5
Stage	Live decay or declining	Dead	Loose Bark	Clean	Broken
Bark	Tight and Intact	Tight and Intact	Approximately 50 percent loose or missing	Approximately 75 percent loose or missing	Approximately 75 percent loose or missing
Limbs	At least 2/3 of the limbs and twigs have green leaves or needles	Mostly present including small twigs	Only the larger limbs remain	Only a few of the larger limbs remain	No limbs remain
Top Breakage	May be present	May be present	May be present	The top 1/3 is broken	The top 1/2 is broken

Species Code: Use one of the following codes for snag and live decay species = ALRU (red alder), ACMA (bigleaf maple), HARD (unknown hardwood snag), PICO (lodgepole pine), PIMO (western white pine), POTR (black cottonwood), PSME (Douglas-fir), SOFT (unknown conifer snag), THPL (western red cedar), TSHE (western hemlock).

Transect Number: Each transect is identified by a unique number that is preferably a consecutive number within the old-growth stand. Figure 3 shows an example of transect placement and nomenclature.

Figure 3: An example of transect placement and nomenclature

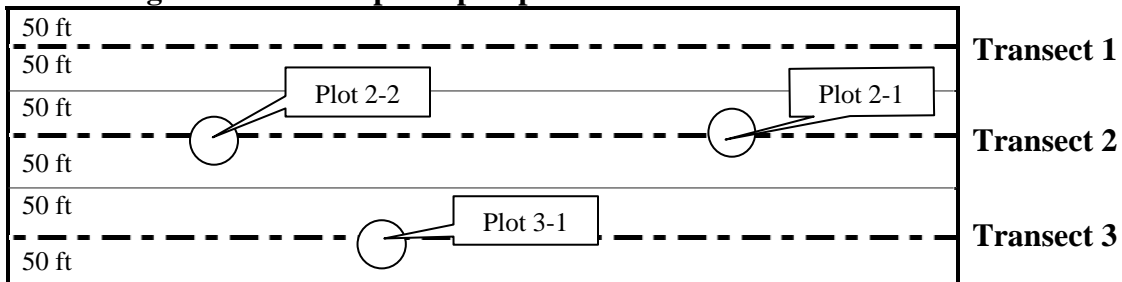


Width: Figure 3 illustrates that the transect width is 100 ft (30 m). Therefore all qualifying snags within 50 ft (15 m) of either side of the transect line will be recorded. Transect widths should be 100 feet (30 m) (50 ft [15 m] on both sides of the transect), but may be adjusted to maintain adequate visibility of the canopy cover and/or communication between observers.

Plot Data

Plot Number: Each plot will have a unique identification number that will begin with the transect number followed by a number that represents the consecutive number of plots within the transect. Figure 4 shows an example of plot placement and nomenclature.

Figure 4: An example of plot placement and nomenclature.



Distance: This is the distance the plot is from the start of the transect. For example if Plot 2-1 is 50 ft from the start and Plot 2-2 is 294 ft from Plot 2-1, then Plot 2-2 distance is 344 ft. Plots will start at a random distance from the start of the transect to stagger the plots throughout the stand.

Average Percent Canopy Cover at Plot Center: Canopy cover will be determined by taking four spherical densiometer readings from the plot center facing north (360°), east (90°), south (180°), and west (270°). The four readings will be averaged to determine an canopy cover for the plot.

Species: Identify each living tree that has more than 2/3 of the crown is green and is greater than or equal to 20 ft (6 m) in height and 16 in (40 cm) diameter breast height. Species that are not able to be identified will be categorized as conifer unknown or hardwood unknown.

Diameter Breast Height (dbh): Record the diameter breast height (4.5 ft [1.4 m] from the forest floor on the uphill side of the tree) for each qualifying tree and categorized into the appropriate class.

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Appendix 4-3:
Washington Department of Fish and Wildlife Management Recommendations for
Washington's Priority Species – Pileated Woodpecker



WASHINGTON DEPARTMENT OF FISH AND WILDLIFE
Management Recommendations for Washington's Priority Species
FOR USE TO GUIDE SITE SPECIFIC MANAGEMENT OF PRIORITY SPECIES

Pileated Woodpecker (*Dryocopus pileatus*)

Washington Department of Fish and Wildlife's (WDFW) *Management Recommendations for Washington's Priority Species* do not have regulatory authority. Therefore, the following are recommendations only. This abbreviated version of a chapter in *Management Recommendations for Washington's Priority Species: Volume IV* (see http://wdfw.wa.gov/hab/phs/vol4/phs_vol4_birds.pdf) has been streamlined for easier application. Where applicable, these recommendations should be put into practice consistently across a landscape to be most effective. The following recommendations are not site-specific. Where available, a professional in a relevant field (e.g., wildlife biologist) should evaluate the site and surrounding landscape when applying these recommendations.

Attach parcel map with species location indicated if available.

General Recommendations

- Management should be conducted within use areas (home ranges) of pileated woodpeckers.
- Maintain large standing dead trees (snags) and large decaying live trees for nesting and roosting within home ranges.
- Retain large naturally formed stumps and numerous large logs in various stages of decay to improve foraging habitat within home ranges.
- Use average size standards (rather than minimums) for managing pileated woodpecker habitat (e.g., If ≥ 5 snags/acre is recommended, that does not imply that a landowner retain exactly 5 snags on every acre. In this instance, variability in the number of snags from acre-to-acre is preferred).
- A variety of snag creation techniques are available and such techniques can produce suitable snags for pileated woodpeckers in older second growth forests (e.g., removal of tree-top, girdling).

Western Washington

- Estimated nesting/breeding home ranges average 1480 ac surrounding nests west of the Cascades. Larger home ranges are estimated at just over 2100 ac on the Olympic Peninsula.
- Maintain coniferous forests (stands with >70% conifer trees) of about 60 years of age or older at >70% canopy cover. Manage these forests for an average of 2 snags/10 ac that are 30'' in diameter.
- Retain an average of 7 snags/ac $\geq 90'$ in height with diameters ranging between 61-122'' in forests used for both nesting and roosting (Note: Retained trees should consist of those within this diameter range rather than consisting entirely of trees at the minimum recommended diameter).
- In addition to snags retained for nesting and roosting, retain an average of 12 snags/ac as foraging trees in the following size classes:

<u>Size class (diameter)</u>	<u>Snags retained</u>
10-20''	$\geq 7/ac$
20-30 in''	$\geq 3/ac$
> 30''	$\geq 2/ac$

Eastern Washington

- Nesting/breeding home ranges east of the Cascades are approximately 1000 ac.
- Maintain mature forest with several canopy layers within home ranges: the uppermost comprised of large live trees 82-98' in height that can provide cover and eventual replacement of dead trees; large dead trees for nesting; and dead trees and downed wood for foraging.
- Retain 3 snags/ac with at least 20% being $\geq 20''$ in diameter for both nesting and roosting within home ranges. Also retained available snags that are at least 92' tall for nesting structures.
- Retain an average of ≥ 40 logs/ac for foraging, with a preference for logs $\geq 15''$ in diameter.

January 2005

Urban/Suburban Areas

- Some of the above recommendations may not be possible due to the availability of trees, snags, and habitat on a proposed development in urban/suburban areas. Where habitat and tree availability is sufficient, follow the western/eastern Washington guidelines above. Where availability is insufficient we recommend the following guidelines:
 - ▶ Target larger forest patches with large trees and snags for conservation during the planning process.
 - ▶ Retain forest in the largest patches available (>74 ac would be considered large). Where large patches are unavailable, smaller patches should be retained; the average size of smaller patches should be no less than approximately 7 ac. This acreage could be attained through cumulative retention by various adjacent landowners within an urban landscape.
 - ▶ Retain or create snags as well as retain live trees in the largest size classes available in the stand.

I have read and understand the above recommendations (s) placed on Parcel # _____ located in the _____ Quarter of _____ Quarter of Section _____, Township _____, Range _____ (East/West meridian) with actual street address of _____ .

**Washington Department of Fish & Wildlife's
Priority Habitat and Species Management Recommendations
Volume IV: Birds**

Pileated Woodpecker
Dryocopus pileatus

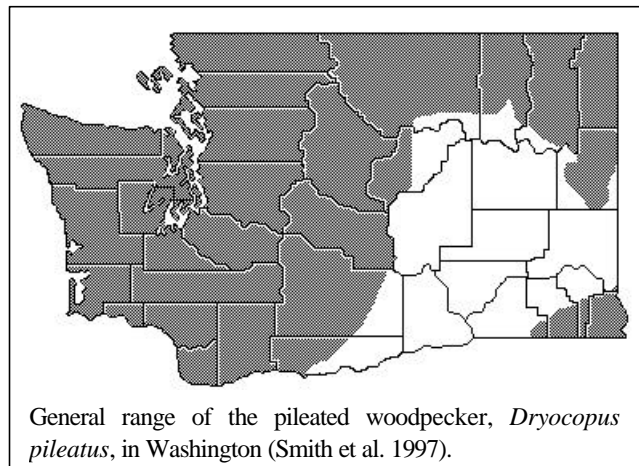
Prepared by Jeffrey C. Lewis and Jeffrey M. Azerrad

GENERAL RANGE AND WASHINGTON DISTRIBUTION

Pileated woodpeckers are year-round residents from northern British Columbia, across Canada to Nova Scotia, south through central California, Idaho, Montana, eastern Kansas, the Gulf Coast and Florida (Bull and Jackson 1995). The Washington range encompasses the forested areas of the state (Smith et al. 1997).

RATIONALE

The pileated woodpecker is listed as a State Candidate species in Washington. The pileated woodpecker is a significant functional component of a forest environment because it creates nesting cavities used by other forest wildlife species (Aubry and Raley 2002a). Their deep foraging excavations provide foraging opportunities for weak excavators, and they accelerate the decay process by physically breaking apart wood and exposing prey that can be consumed by other species (Aubry and Raley 2002a). For these reasons the pileated woodpecker is considered a “keystone habitat modifier” (Aubry and Raley 2002a). The availability of large snags (standing dead trees) and large decaying live trees used for nesting and roosting by pileated woodpeckers has declined in many areas as a result of forest conversion (e.g. removal of forest for urban development) and timber management practices (Bull and Jackson 1995, Ferguson et al. 2001).



HABITAT REQUIREMENTS

Pileated woodpeckers inhabit mature and old-growth forests, and second-growth forests with large snags and fallen trees (Bull and Jackson 1995, Aubry and Raley 1996). Large snags and large decaying live trees in older forests are used by pileated woodpeckers for nesting and roosting throughout their range (Mellen et al. 1992, Bull and Jackson 1995, Aubry and Raley 2002b). In western Oregon and western Washington, they may use younger forests (<40 years old) as foraging habitat (Mellen et al. 1992, Aubry and Raley 1996).

Nesting and Roosting

Pileated woodpeckers excavate large nest cavities in snags or large decaying live trees (Bull et al. 1986, Aubry and Raley 2002b). In northeast Oregon, Bull (1987) reported the dimension of the nest entrances were 12 cm (5 in) in height and 9 cm (4 in) in width; the internal dimensions were 57 cm (22 in) deep and 21 cm (8 in) wide. Wood chips are typically found on the cavity floor (Bull and Jackson 1995). During the breeding season, birds may start a number of cavity excavations, but only complete one nest cavity (Bull and Jackson 1995, Aubry and Raley 2002a). The breeding and nesting periods of the pileated woodpecker extends from late March to early July (Bull et al. 1990). Pileated woodpeckers lay 1-6 eggs/clutch; the eggs are white in coloration and are about 3.3 cm (1.3 in) in length and 2.5 cm (1 in) in breadth (Bull and Jackson 1995).

Preferred nest tree species and characteristics vary to some degree among different regions of the northwest (Table 1). Most nest cavities were observed in hard snags with intact bark and broken tops, or live trees with dead tops. Hard snags are characterized as being comprised of sound wood while soft snags are composed primarily of wood in advanced stages of decay or deterioration (Brown 1985). Researchers studying pileated woodpeckers on the Olympic Peninsula found that woodpeckers used snags and large decaying live trees for nesting (Aubry and Raley 2002b). Sites used for nesting and roosting in the Olympics had a higher diversity of tree species and a greater density of large decaying live trees and large snags than surrounding forested areas (Aubry and Raley 2002b).

Table 1. Diameter at breast height (DBH), height, and tree species reported for pileated woodpecker nest trees in Oregon and Washington.

Location	DBH (average)	DBH (range)	Height (average)	Height (range)	Species	References
Olympic Peninsula	101 cm (40 in)	65-154 cm (26-61 in)	39 m (128 ft)	17-56 m (56-184 ft)	Pacific silver fir (<i>Abies amabilis</i>), western hemlock (<i>Tsuga heterophylla</i>)	Aubry and Raley 2002b
Western Oregon	69 cm (27 in)	--	27 m (87 ft)	--	Douglas-fir (<i>Pseudotsuga menziesii</i>), grand fir (<i>Abies grandis</i>)	Mellen 1987, Nelson 1989
Northeastern Oregon	80-84 cm (31-33 in)	52-119 cm (20-47 in)	28 m (92 ft)	10-43 m (33-141 ft)	grand fir, ponderosa pine (<i>Pinus ponderosa</i>), western larch (<i>Larix occidentalis</i>)	Bull 1987; Bull et al. 1992b; E. Bull, personal communication

Pileated woodpeckers roost in hollow trees or vacated nest cavities at night and during inclement weather (Bull and Jackson 1995). Excavation of roost cavities may occur at any time during the year (E. Bull, personal communication). Pileated woodpeckers may use up to 11 roosts over a 3-10 month period; however, some individuals will use one roost for a long period before switching to a new roost, while others regularly switch among several roosts (Bull et al. 1992b). The availability of roost trees apparently explained why some birds roosted in a limited number of trees (Bull et al. 1992b).

Roost and nest trees of pileated woodpeckers differ with respect to species and physical characteristics. Pileated woodpeckers used live trees or snags for roosting and nesting and selected these based on tree species, wood condition and diameter at breast

height (dbh) in both northeastern Oregon and the Olympic peninsula (Bull et al. 1992b, Aubry and Raley 2002b). Bull et al. (1992b) reported that roost trees [mean = 70 cm dbh (28 in)] were smaller than nest trees [mean = 80 cm dbh (31 in)]; in contrast to nest trees, roost trees in northeastern Oregon were often hollow. The hollow interior of roost chambers was typically the result of heartwood decay rather than excavation (Bull et al. 1992b, Aubry and Raley 2002b). In northeastern Oregon, roost chambers had more entrance holes than nests, and roosts were predominantly in grand fir, whereas nest trees were predominantly ponderosa pine and western larch (Bull et al. 1992b). In the Olympics, pileated woodpeckers preferred to roost within western redcedar (*Thuja plicata*) (Aubry and Raley 2002b). The extensive use of grand fir in northeast Oregon and western redcedar in the Olympics was attributed to the greater propensity for these species to form large, hollow chambers (Bull et al. 1992b, Aubry and Raley 2002b). Aubry and Raley (1996) found that 88% of all roosts were located in old or mature forests. The remaining roosts were primarily found in naturally regenerated young forests that were approximately 75 years old (Aubry and Raley 1996). Roosts east of the Cascades were also primarily found in old-growth forests (Bull et al. 1992b, McClelland and McClelland 1999). General characteristics of roost trees in Oregon and Washington are described in Table 2.

Table 2. DBH, height, and tree species reported for pileated woodpecker roost trees in Oregon and Washington.

Location	DBH (average)	DBH (range)	Height (average)	Height (range)	Species	References
Olympic Peninsula	149 cm (59 in)	37-309 cm (15-122 in)	36.5 m (120 ft)	11-63 m (36-207 ft)	Pacific silver fir, western hemlock, western redcedar	Aubry and Raley 2002b
Western Oregon	112 cm (44 in)	40-208 cm (16-82 in)	--	--	--	Mellen et al. 1992
Northeastern Oregon	71 cm (28 in)	40-131 cm (16-52 ft)	22 m (72 ft)	6-44 m (20-144 ft)	grand fir, ponderosa pine, western larch	Bull et al. 1992b; E. Bull, personal communication

Foraging

Pileated woodpeckers forage in forests containing large trees and snags that support abundant insect prey associated with dead and dying wood. Large rectangular/oval excavations in snags are indicative of pileated woodpecker foraging (McClelland 1979, Neitro et al. 1985, Bull and Jackson 1995). In Oregon and Washington, prey consisted of carpenter and thatching ants (Hymenoptera), beetle larvae (Coleoptera), termites (Isoptera), and other insects (Bull et al. 1992a, Torgersen and Bull 1995, Aubry and Raley 1996). Mature and old-growth coniferous forest are considered high quality foraging habitat (Aubry and Raley 1996), but forests as young as 40 years of age are used if snags, particularly large residual snags from burns or harvests, are present (Mellen et al. 1992). Pileated woodpeckers seldom use clearcuts, but will forage in clearcuts or shelterwood cuts if substantial foraging habitat is retained (see Mannan 1984, Mellen 1987). Researchers working in the Oregon Coastal Range determined that pileated woodpeckers used deciduous riparian for foraging activities (Mellen et al. 1992).

Pileated woodpeckers forage on large snags [>50 cm (20 in) dbh], live trees, logs, and stumps (Bull et al. 1986, Bull 1987, Torgersen and Bull 1995). Snags and live trees take on special importance in winter when logs and stumps may be covered with snow (McClelland 1979, Bull and Holthausen 1993). Pileated woodpeckers forage on snags in a broad range of decay conditions but appear to prefer large snags that may harbor more insects and larvae than smaller snags (Mannan et al. 1980). In contrast to foraging behavior east of the Cascade Range, downed logs are rarely used as foraging substrate in wet coastal forests (Aubry and Raley 2002b).

Home Range

Home ranges vary in size within the Pacific Northwest, ranging from 407 ha (1,006 ac)/breeding pair (data collected between June and March) in northeastern Oregon (Bull and Holthausen 1993), 480 ha (1,186 ac)/breeding pair during the summer in the central Oregon Coast Range (Mellen et al. 1992), and 863 ha (2,132 ac)/breeding pair annually on the Olympic Peninsula (Aubry and Raley 1996). The home range figures reported in the central Oregon Coast Range are likely smaller than the actual year-round home range for the pileated (Mellen et al. 1992). Home ranges for individuals that lost mates are larger than those of mated individuals (Bull and Holthausen 1993, Aubry and Raley 1996), and pairs with young have larger home ranges than pairs without young (Mellen et al. 1992). Although home ranges in the central Oregon Coast Range were actively defended, the ranges of adjacent birds overlapped (9-30% of an individual's home range overlapped) (Mellen et al. 1992). Home ranges in northeastern Oregon generally consisted of >85% forested habitat (Bull and Holthausen 1993). Home ranges consisted primarily of late-successional forested habitat or second-growth forest with residual large snags (Bull and Holthausen 1993, Bull and Jackson 1995, Aubry and Raley 1996).

Urban/Suburban Habitat Use

Pileated woodpeckers are residents in some developing areas throughout Washington (M. Tirhi; P. Thompson; H. Ferguson, personal communications). In these areas they occupy remnant patches of forest, parks, and green-belts. Because of their need for large trees and their sizeable territory requirements, loss or reduction of extensive wooded tracts and large trees will impact the species (Moulton and Adams 1991). Pileated woodpeckers in suburban areas forage on a variety of substrates, including large and small diameter coniferous and hardwood trees and snags (P. Thompson, personal communication; J. Lewis, unpublished data), and occasionally on suet feeders, utility poles, and fruit trees (Bull and Jackson 1995; J. Buchanan, personal communication).

Although habitat use in urbanizing environments in Washington has been given little attention, it is likely that pileated woodpeckers select large diameter trees and snags for nesting and roosting. Similarly, sizes of home ranges in urban environments are unknown, but they may be relatively large due to the fragmented nature of remnant forest habitats in most suburban landscapes. The relationship between cavity-nesters and urbanizing areas in Washington has only been investigated by a single study in the greater Seattle area (see Rohila 2002)

LIMITING FACTORS

Timber harvest can significantly impact pileated woodpecker habitat (Bull and Jackson 1995). The removal of large snags, large decaying live trees and downed woody debris of the appropriate species, size and decay class eliminates nest and roost sites and foraging habitat. Intensively managed forests typically do not retain these habitat features (Spies and Cline 1988). However, more recent state and federal forest management guidelines call for the retention of a specified number of wildlife trees during timber harvest (Washington Forest Practices Board 2001, Aubry and Raley 2002a). Bull and Jackson (1995) suggest that fragmentation of forested habitat may lead to reduced population density and increased vulnerability to predation as birds are forced to fly between fragmented forested stands; however, information on predation effects is currently lacking. Known predators include the northern goshawk (*Accipiter gentiles*), Cooper's hawk (*A. cooperii*), red-tailed hawk (*Buteo jamaicensis*), great horned owl (*Bubo virginianus*), American martin (*Martes americana*), and gray fox (*Urocyon cinereoargenteus*) (Bull and Jackson 1995).

The amount of forest retained in the suburban and urbanizing environment will influence the degree to which an area is used by pileated woodpeckers for foraging and reproduction (Moulton and Adams 1991, Rohila 2002). If the collective area of these retained forest tracts is large enough, suburban and other urbanizing environments could support pileated woodpeckers (Rohila 2002). However, because of their need for larger trees and their sizeable territory requirements, loss or reduction of wooded tracts and large trees could eliminate or preclude pileated woodpeckers from an urbanizing area (Moulton and Adams 1991).

MANAGEMENT RECOMMENDATIONS

General Recommendations

Specific management prescriptions should be developed for actions that will be undertaken at the home range scale (Mellen et al. 1992, Bull and Holthausen 1993) as discussed later in this chapter. Management activities for pileated woodpeckers should focus on providing and maintaining a sufficient number of appropriate large snags and large decaying live trees for nesting and roosting (Aubry and Raley 2002b). Retaining snags and decaying live trees (of appropriate size, species and decay classes) provides suitable nesting and roosting structure for a longer period of time than retaining only hard snags (Aubry and Raley 2002b). Trees, snags and stumps with existing pileated nest cavities and foraging excavations should be retained (Bonar 2001).

Management of nesting and roosting habitat may be accomplished in several ways in managed forests. A variety of snag creation techniques are being developed and it is likely that such techniques can produce suitable snags in older second growth forests (e.g., removal of tree-top, girdling) (Neitro et al. 1985, Bull and Partridge 1986, Lewis 1998). Properly conducted uneven-aged management of forest stands can create adequate canopy closure and sufficient large snags and large decaying live trees to maintain suitable nesting and roosting habitat for pileated woodpeckers. Defective or cull trees can be retained during commercial thinning operations, or these can be recruited to become snags in subsequent rotations (Neitro et al. 1985). Because of the difficulties in recruiting large snags in managed forests (Wilhere 2003), one of the most effective means to improve snag densities may involve extending the length of harvest rotations (Neitro et al. 1985).

Managers may have some flexibility when providing foraging habitat. Naturally formed stumps and numerous large logs in various stages of decay can be retained to improve foraging habitat (Torgersen and Bull 1995). Management for large snags, culls, and green replacement trees can ultimately provide large downed logs as foraging habitat. Protection of riparian habitat throughout Washington and the provisions of buffers along streams may also ensure that adequate foraging habitat exists for pileated woodpeckers (Mellen et al. 1992, Knutson and Naef 1997). However, we currently lack adequate information to define appropriate riparian buffers for pileated woodpeckers in managed forests.

Forest managers often apply minimum size standards that are determined through research (e.g., the smallest recorded nest tree dbh) to achieve a combination of wildlife conservation and resource extraction goals (McClelland and McClelland 1999). Conner (1979) argued that managing forests using minimum size standards may cause gradual population declines and suggested that average values for habitat components should be used in forest management. The following set of recommendations is based primarily on average (rather than minimum) standards.

Western Washington

The following recommendations are primarily based on the goals identified by the Partners in Flight (PIF) Conservation Plan for the Westside Coniferous Forest region (Altman 1999). These goals were derived from research conducted in the Oregon Coast Range and Washington's Olympic Peninsula (Nelson 1989, Mellen et al. 1992, Aubry and Raley 1996, 2002b). The PIF recommendations for managed coniferous forests (stands with >70% conifer stems) of about 60 years of age or older include maintaining >70% canopy closure and an average of ≥ 5 nest snags/10 ha (2 snags/10 ac) that are >76 cm dbh (30 in). In areas used for both nesting and roosting, an average of 18 large snags/ha (7 snags/ac) and 8 decaying large trees/ha (3 trees/ac) should be retained (Aubry and Raley 2002b). Trees ≥ 27.5 m (≥ 90 ft) in height should be retained to provide nesting and roosting structures (Aubry and Raley 2002b). Overall, pileated woodpeckers selected larger trees for roosting than those used for nesting (see Buchanan, in press). Based on Aubry and Raley's (2002b) work in the Olympics, trees between 155 and 309 cm dbh (61-122 in) should be retained for roosting. In addition, an average of 30 foraging snags/ha (12 snags/ac) (mix of hard and soft snags) should be provided in the following size classes (Altman 1999):

Size class	Foraging snags retained
• 25-50 cm dbh (10-20 in) = ≥ 18 snags/ha (7 snags/ac)	
• 51-76 cm dbh (20-30 in) = ≥ 8 snags/ha (3 snags/ac)	
• >76 cm dbh (>30 in) = ≥ 5 snags/ha (2 snags/ac)	

Population targets suggested by the PIF conservation plan called for about nine pairs of pileated woodpeckers per township (9.7 pairs/100 km²), based on an average breeding season home range of 600 ha (Altman 1999:36-37). Using the annual home range size of 863 ha for the Olympic Peninsula (Aubry and Raley 1996), a comparable target could be adjusted to about six pairs per township (6.4/100 km²) on the Olympic Peninsula (Buchanan, in press). At the landscape-level, an average of 60% of a landscape management unit (e.g., watershed, township) should be retained as suitable habitat (early successional forest with adequate snag densities, young forest [40-80 years] with adequate snag densities, and late successional forest), and >40% of this suitable habitat should be retained in late-successional forest. Adequate snag densities are defined as the combination of nesting, roosting and foraging snag numbers (see above).

Eastern Washington

The following recommendations are based on research conducted in the Blue Mountains of northeastern Oregon (Bull 1987, Bull and Holthausen 1993) as well as research conducted in northwestern Montana (McClelland and McClelland 1999). Because most work on pileated woodpeckers in the inland northwest was conducted in the Blue Mountains, it should be noted that the following recommendations might be less applicable to areas outside of this region.

Several key habitat components are necessary to maintain suitable pileated woodpecker habitat. These include a mature forest with ≥ 2 canopy layers, the uppermost being 25-30 m (82-98 ft) in height; large live trees to provide cover and eventual replacement of dead trees; large dead trees for nesting; and dead trees and downed woody material for foraging (Bull 1987). Territory size for breeding pairs in the Blue Mountains averaged 407 ha (1006 ac) and was considered an adequate size to manage for each breeding pair in that region (Bull and Holthausen 1993). Researchers working in the Blue Mountains recommended that 75% of management areas be in grand fir forest types and they suggested that the composition of this area include 25% old growth and 75% mature stands. Additionally, they suggested that $\geq 50\%$ of the management areas have $\geq 60\%$ canopy closure and that at least 40% of the stands remain unlogged (Bull and Holthausen 1993).

Bull and Holthausen (1993) recommended retaining 8 snags/ha (3.2 snags/ac) with at least 20% being ≥ 51 cm (20 in) dbh for both nesting and roosting. Based on Bull's (1987) research, trees ≥ 28 m (92 ft) should be retained to provide nesting structures. Bull and Holthausen (1993) recommended retaining ≥ 100 logs/ha (40/ac) as foraging substrate in management areas, with a preference for logs ≥ 38 cm (15 in) dbh that include all species except lodgepole pine (*Pinus contorta* var. *latifolia*). McClelland and McClelland (1999) suggested that the optimum dbh for nest and roost trees should be: 77-91 cm (30-36 in) for western larch, 76-96 cm (30-38 in) for ponderosa pine, and 75-100 cm (30-39 in) for black cottonwood (*Populus balsamifera*).

Urban/Suburban Areas

Although pileated woodpeckers are known to use suburban and other urbanizing areas (Moulton and Adams 1991, Rohila 2002), few studies have examined habitat use in these areas. Consequently, the following generalized recommendations address the principle needs of pileated woodpeckers based primarily on the findings of a recent study conducted in the greater Seattle area (Rohila 2002). Additional research will be necessary to develop specific guidelines for urban and suburban areas.

In urbanizing areas, the greatest negative influence to pileated woodpeckers is likely the clearing of remnant forest patches. Based on research in greater Seattle, Rohila (2002) recommended that planners retain forest in the largest patches available (>30 ha [74 ac] would be considered large). Where large patches are unavailable, smaller patches should be retained; where the average size of smaller patches should be no less than approximately 3 ha (7 ac) (see Rohila 2002). Forest patches with high densities of existing snags and live trees should be targeted when selecting areas to retain during the planning process (Rohila 2002). The

creation of snags or decaying live trees (Lewis 1998) may benefit pileated woodpeckers in suburban areas (see previous sections for preferred snag and tree size guidelines). Pileated woodpeckers and other cavity-dependent species would benefit from the retention of snags as well as the retention of live trees in the largest size classes available in the stand (Rohila 2002). Because designated suburban and urban parks often contain large forested tracts, park managers should also consider pileated woodpecker requirements.

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KEY POINTS

Habitat Requirements

- Inhabits mature and old-growth forests, and second-growth forests with large snags and fallen trees
- Excavates large nest cavities in snags or large decaying live trees
- Breeds and nests between late March to early July
- Roosts in hollow trees or vacated nest cavities at night and during inclement weather
- Forages in forests containing large trees and snags, and dead and dying wood
- Preys on carpenter and thatching ants, beetle larvae, termites, and other insects
- Present in some urban and suburban areas throughout Washington

Management Recommendations

General Recommendations

- Maintain large snags and large decaying live trees for nesting and roosting
- Retain naturally formed stumps and numerous large logs in various stages of decay to improve foraging habitat
- Use average size standards (rather than minimums) for managing pileated woodpecker habitat components (e.g., nest size standards).

Western Washington

- Maintain managed coniferous forests (stands with >70% conifer stems) of about 60 years of age or older at >70% canopy closure and an average of ≥ 5 nest snags/10 ha (2 snags/10 ac) that are >76 cm dbh (30 in)
- Retain an average of 18 large snags/ha (7 snags/ac) and 8 decaying large trees/ha (3 trees/ac) in areas used for both nesting and roosting
- Retain trees ≥ 27.5 m (≥ 90 ft) in height to provide nesting and roosting structures. Trees between 155 and 309 cm dbh (61-122 in) should be retained for roosting
- Retain an average of 30 foraging snags/ha (12 snags/ac)

Eastern Washington

- Maintain mature forest with ≥ 2 canopy layers, the uppermost being 25-30 m (82-98 ft) in height; large live trees to provide cover and eventual replacement of dead trees; large dead trees for nesting; and dead trees and downed woody material for foraging
- Retain 8 snags/ha (3.2 snags/ac) with at least 20% being ≥ 51 cm (20 in) dbh for both nesting and roosting
- Retain ≥ 100 logs/ha (40/ac) as foraging substrate in management areas, with a preference for logs ≥ 38 cm (15 in) dbh

Urban/Suburban Areas

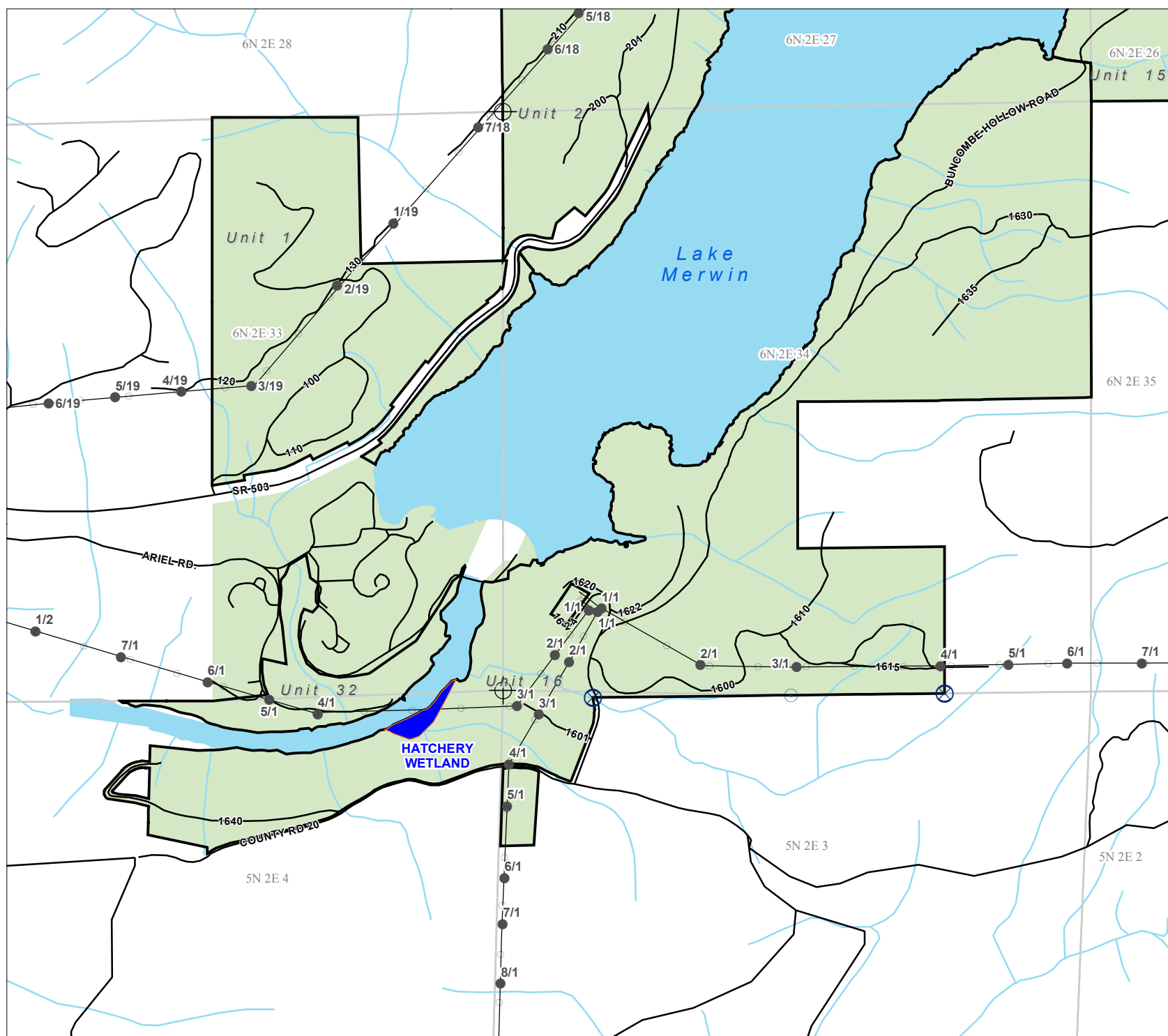
- Conserve larger forest patches with large trees and snags
- Retain forest in the largest patches available (≥ 30 ha [74 ac] would be considered large). Where large patches are unavailable, smaller patches should be retained; where the average size of smaller patches should be no less than approximately 3 ha (7 ac).
- Retain or create snags as well as the retain live trees in the largest size classes available in the stand

Appendix 5-1:
Lewis River Wildlife Habitat Management Plan
Wetland Area's Locations, Size, Type, and Estimated Acres

Lewis River Wildlife Habitat Management Plan

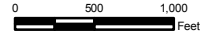
Wetlands
Appendix 5-1

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Legend

- WHMP Wetland
- Surveyed Section Corner
- Surveyed Property Corner
- Other Surveyed Corner
- Transmission Tower
- Road
- Stream
- Water Body
- Transmission Line
- Frasier Creek Diversion Channel
- Management Unit
- PacifiCorp Ownership



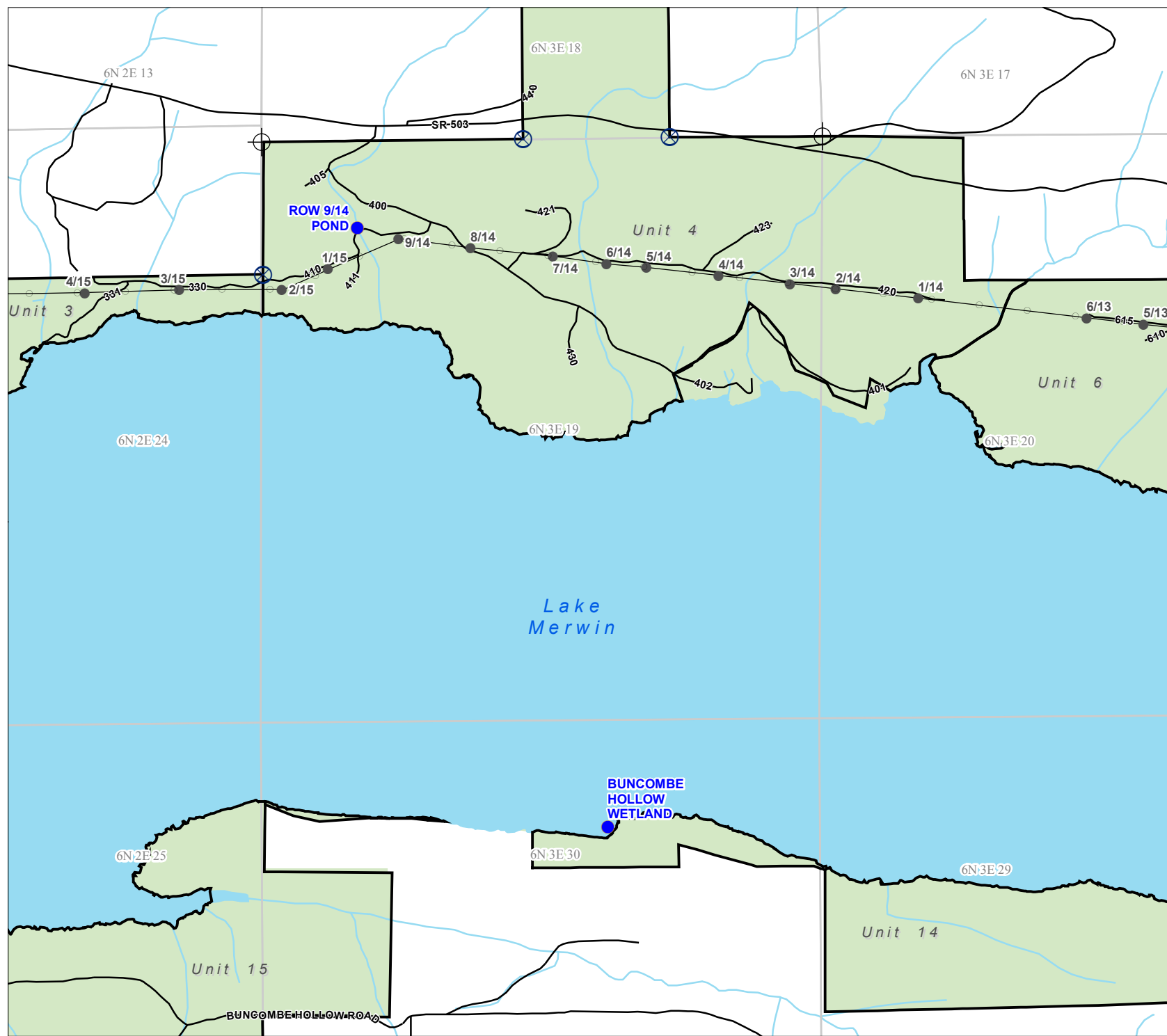
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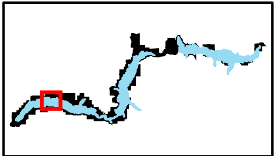
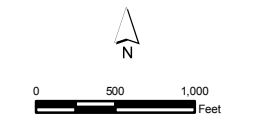
Wetlands
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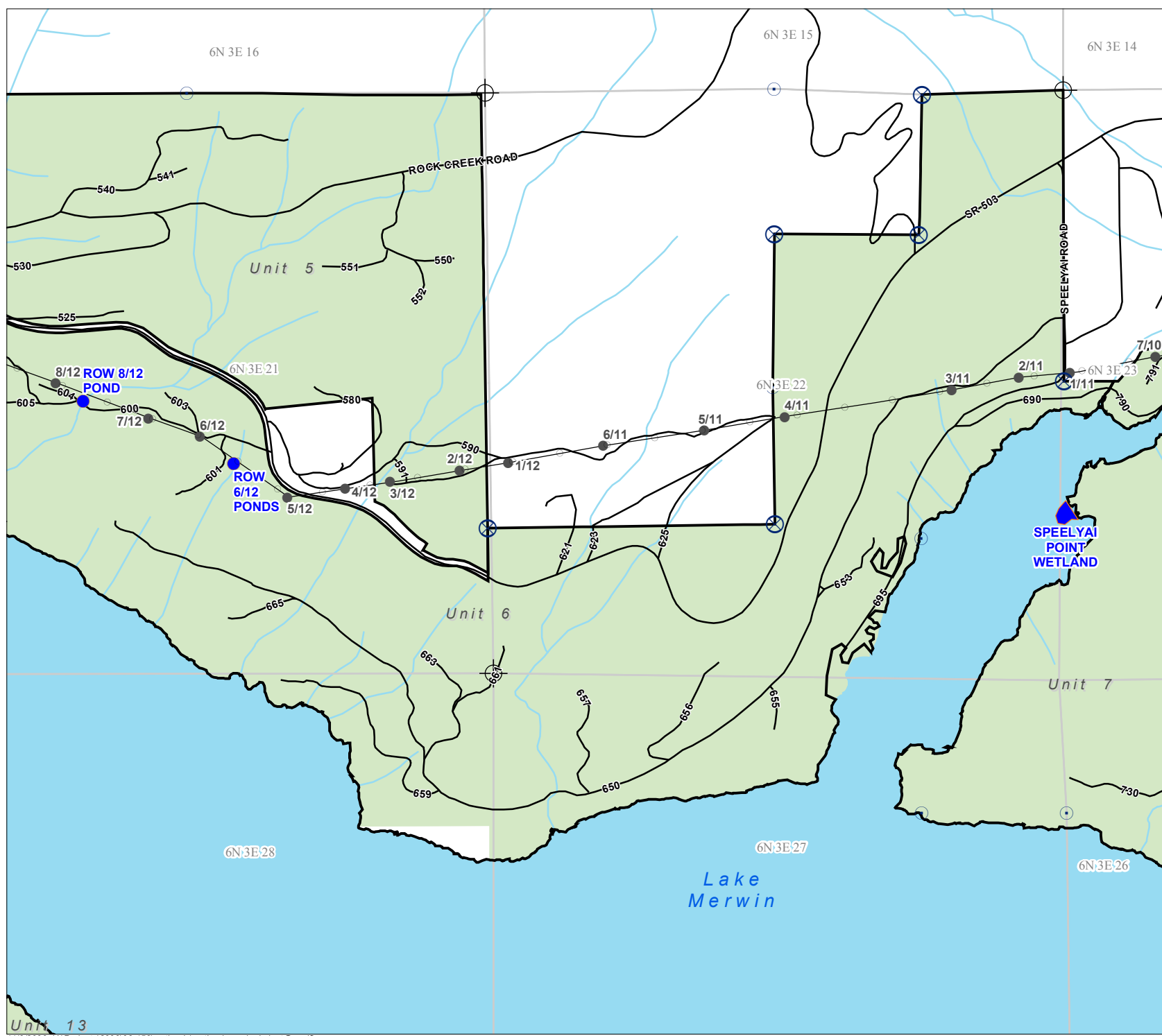
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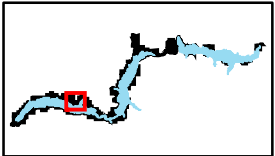
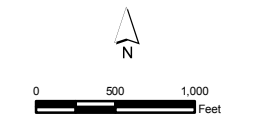
Wetlands
Appendix 5-1

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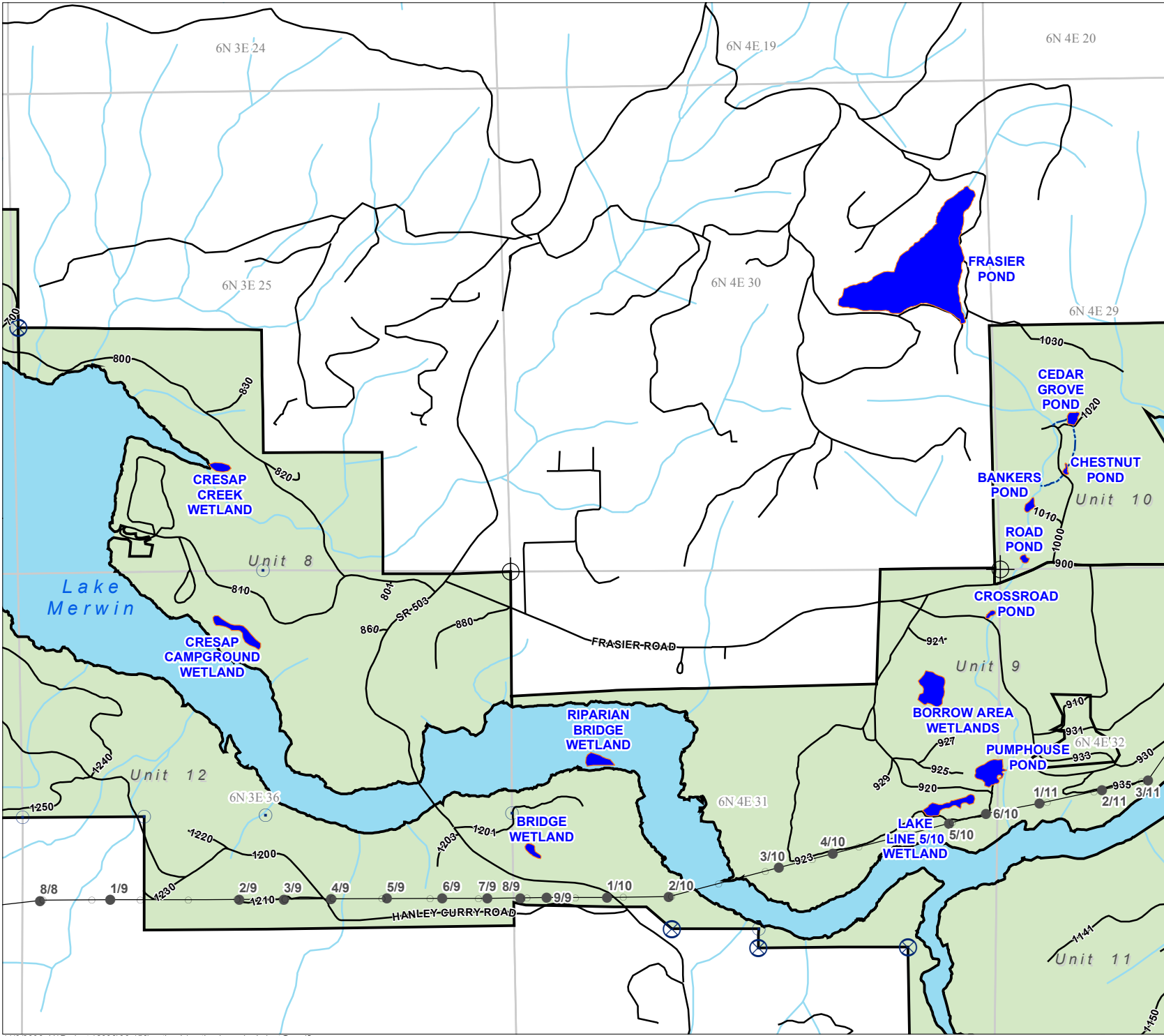
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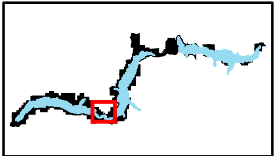
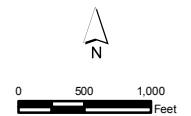
Lewis River Wildlife Habitat Management Plan

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Legend

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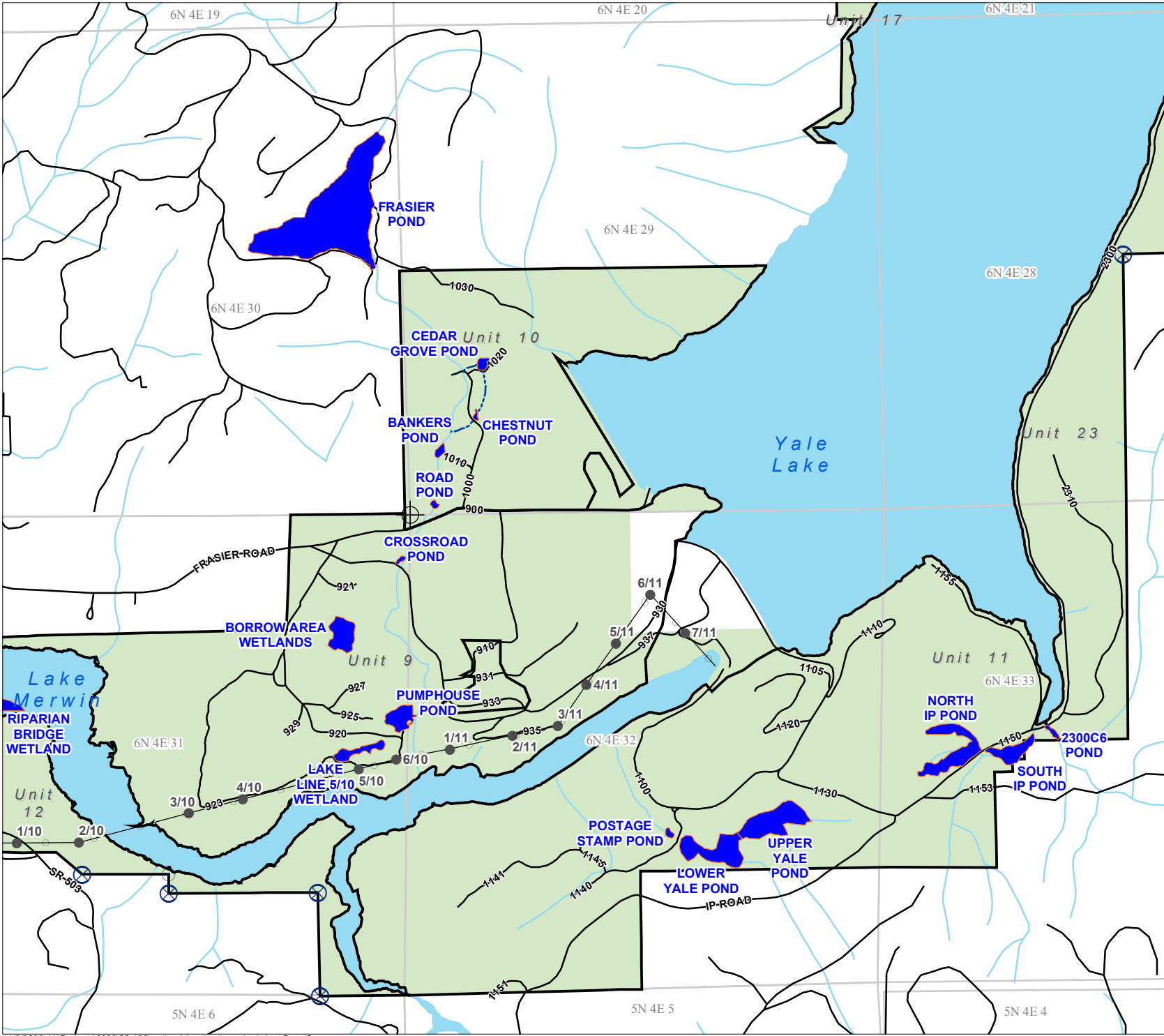
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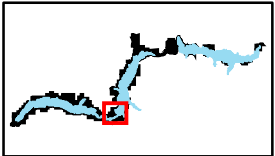
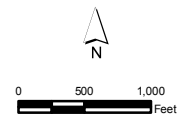
Lewis River Wildlife Habitat Management Plan

Wetlands
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Legend

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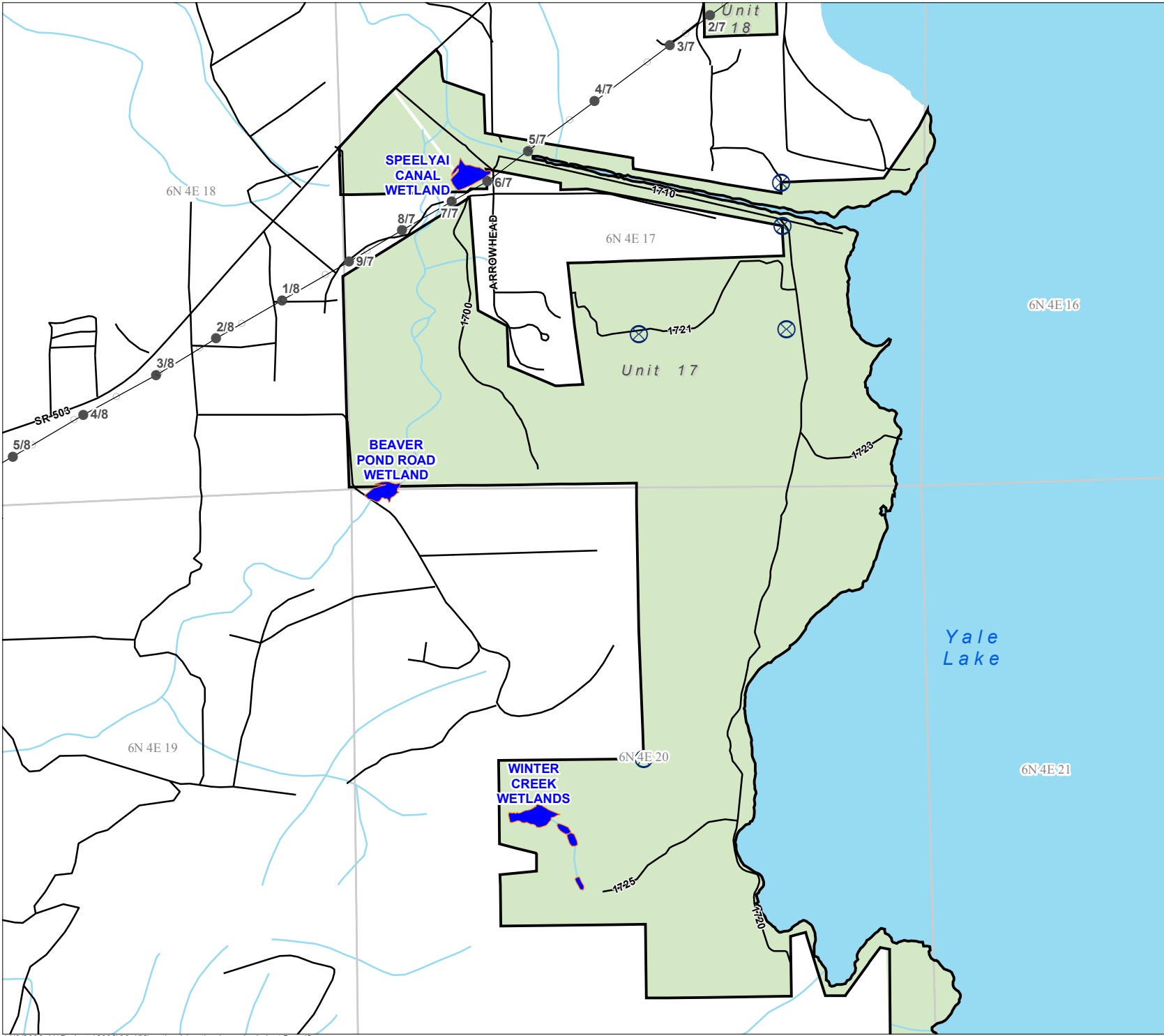
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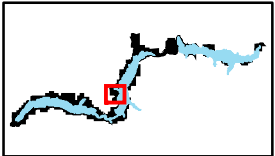
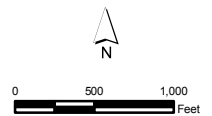
Wetlands
Appendix 5-1

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Legend

- WHMP Wetland
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- WHMP Wetland
- Surveyed Section Corner
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










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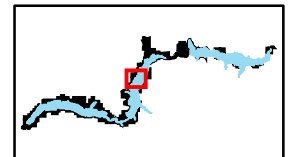
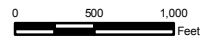
Lewis River Wildlife Habitat Management Plan

Wetlands
Appendix 5-1

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Legend

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 -  Surveyed Section Corner
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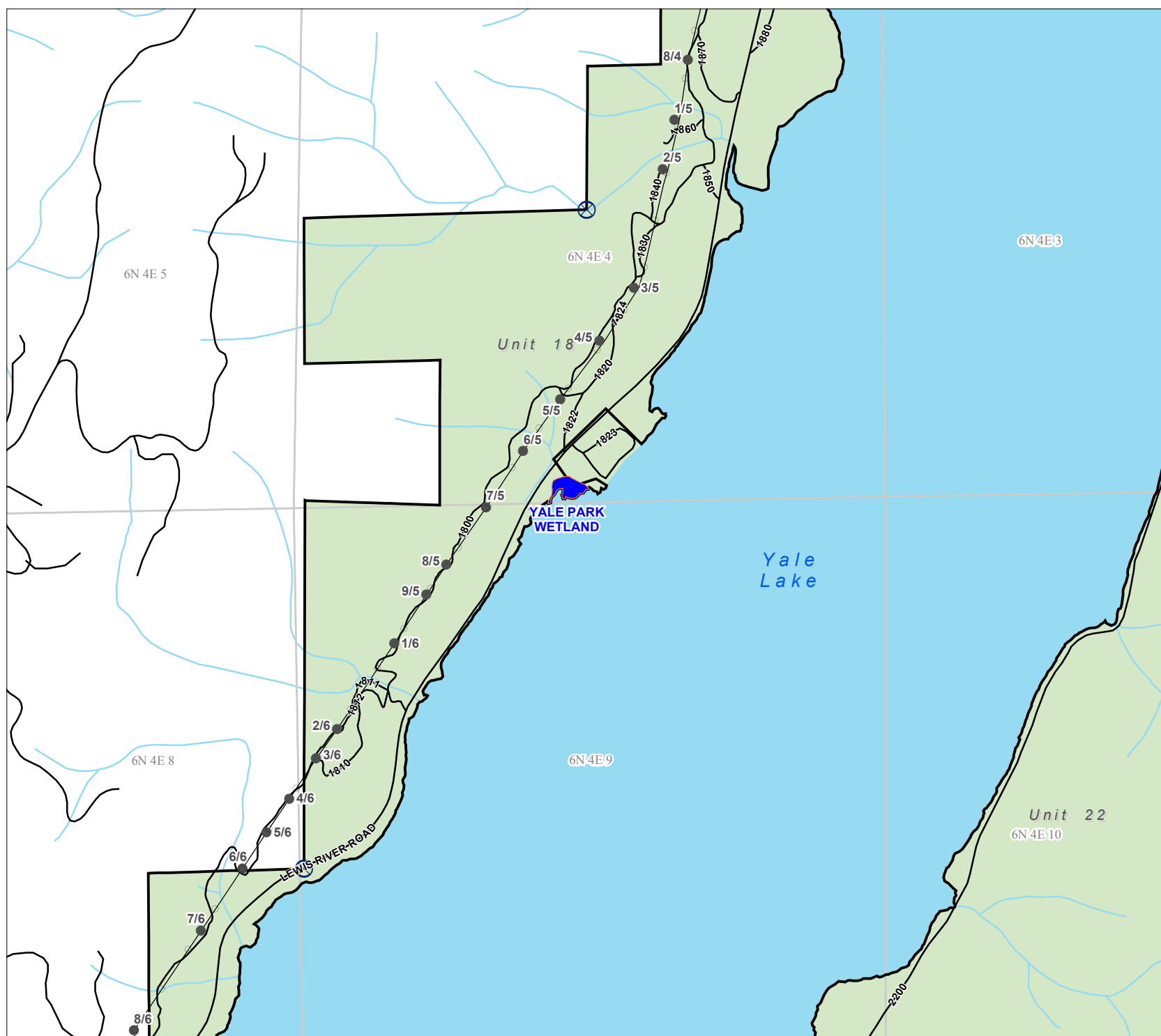


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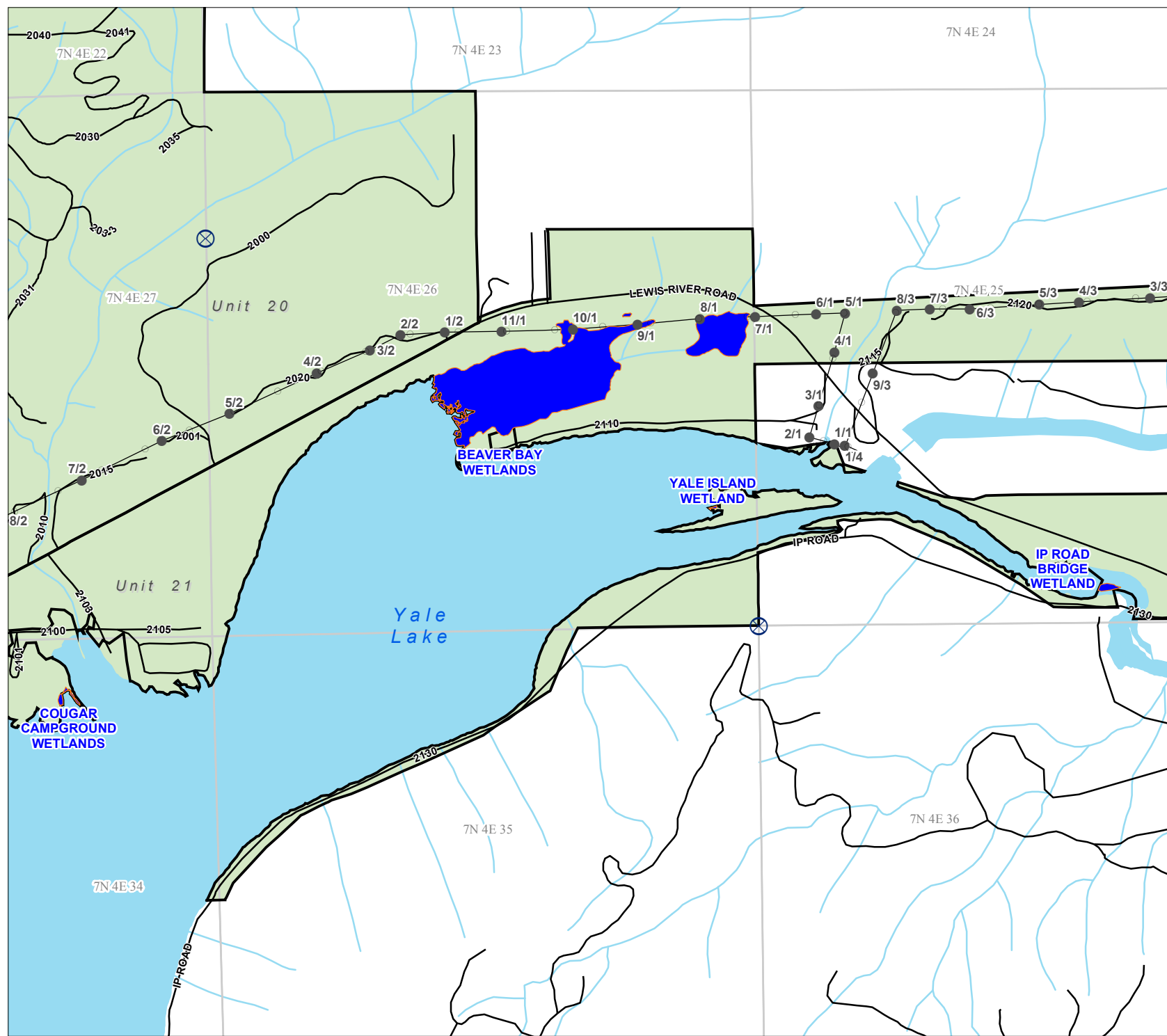
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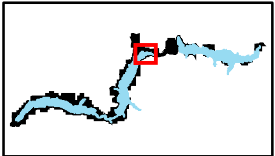
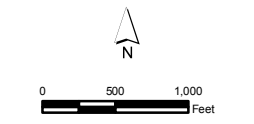
Wetlands
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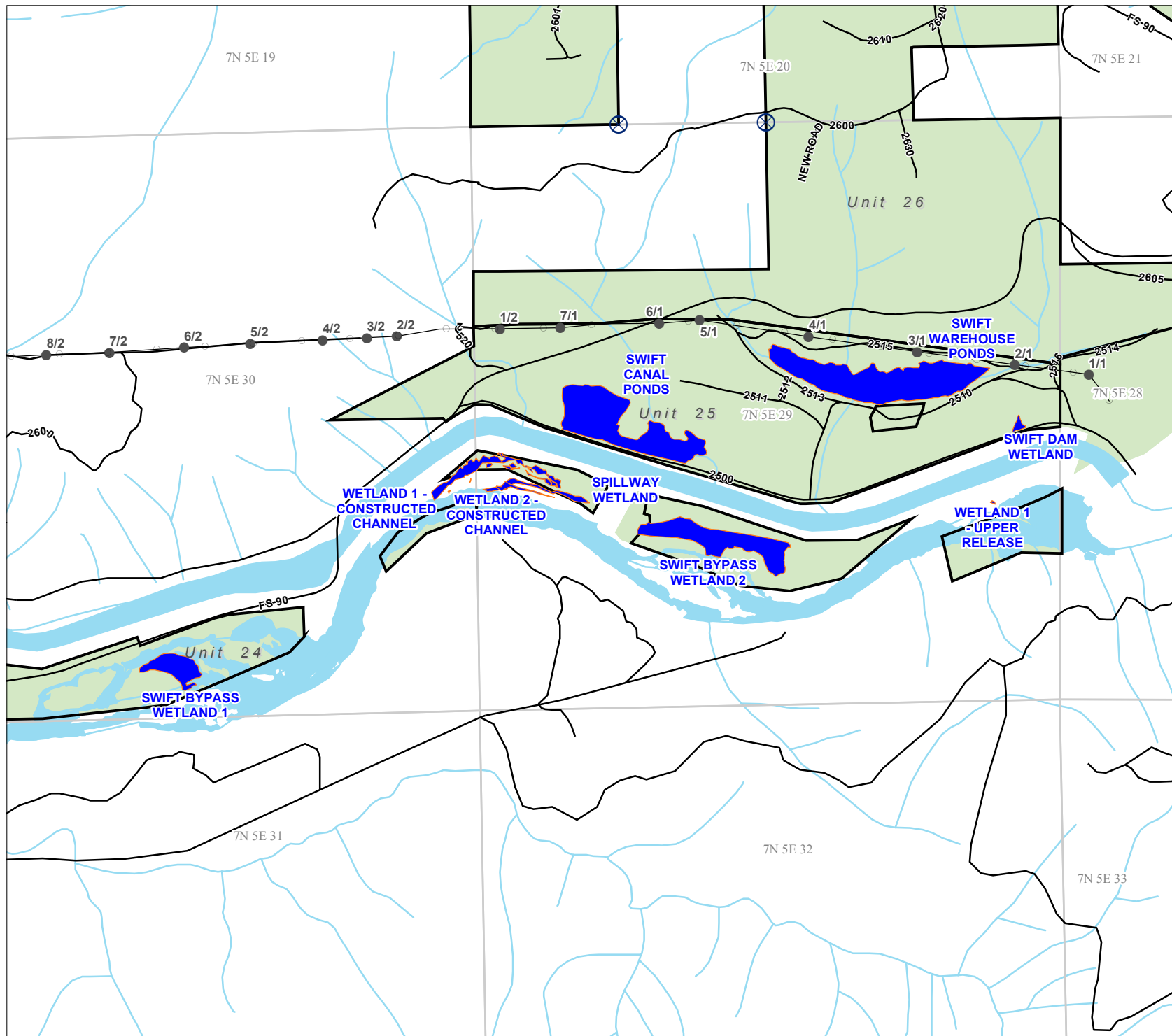
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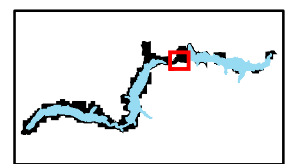
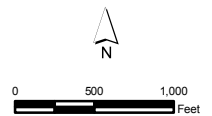
Wetlands
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**Appendix 5-2:
Wetland Initial Evaluation Form**

WETLAND INITIAL EVALUATION FORM

Wetland Name: _____ **Observer's Name:** _____

Management Unit: _____ **Estimated Wetland Size:** _____

Location (describe access and directions to wetland): _____

General View Photograph (Picture that represents the overall wetland. The photo should be from a selected point that is GPS and/or marked. Record photo number and location): _____

Aquatic Habitat

Hydrological Source: Reservoir _____ Groundwater _____ Surface run-off _____
Spring/Seeps _____ Intermittent Stream _____
Perennial Stream _____ circle one: fish-bearing non-fish unknown
Seasonal Stream _____ circle one: fish-bearing non-fish unknown

Hydroperiod Types (Identify the wetland hydroperiods [water regimes] that are $\geq 10\%$ of the total wetland area):
Permanently Flooded _____ Seasonally Flooded _____ Saturated _____ Occasionally Flooded _____

Water Velocity: _____ ≤ 2 inches/second _____ > 2 inches/second

Water Depth (estimate the percent of the wetland area that is at the following depths):
 < 0.5 ft _____ 0.5 to 2.0 ft _____ 2.0 to 3.0 ft _____ > 3.0 ft _____

Water Control Structure: Yes or No If yes, then provide the potential draw down depth (e.g. dry to 10 inches): _____

Dikes or Berms Present: Yes or No If yes, then describe: _____

Wetland Vegetation

(Each cover type must be $\geq 10\%$ of the total area of the wetland and within the ordinary high water mark)

Percent Cover Aquatic Bed: _____
List Dominant Vegetation: _____

Percent Cover Emergent Wetland: _____

List Dominant Vegetation: _____

Percent Cover Forested Wetland: _____

List Dominant Vegetation: _____

Percent Cover Scrub/Shrub: _____

Percent of shrubs that are greater than 6.6 ft (2 m): _____ Percent of hydrophytic shrubs: _____

List Dominant Vegetation: _____

Percent Cover Unconsolidated Bottom: _____

List Dominant Vegetation: _____

Down wood surrounding the wetland (Logs that are > 16 in. (40 cm) in diameter and >6 ft. (2 m) in length): _____

Invasive Plant Species Present within Wetland

Species	%	D	C	Species	%	D	C
Himalayan blackberry			I				
Reed canarygrass			C				

Distribution (D) CL=Clumpy SP=Scattered Patchy SE=Scattered Even LI=Linear Percent Cover (%) T=Trace (0-5%), L=Low (6-25%), M=Moderate (26-50%), MH=Moderate to High (50 -75%) H=High (75-100%) Classification (C)= A= State lists Noxious Weed Class A, B8 = State listed Noxious Weed Class B designated for region 8, B= State listed Noxious Weed Class B not designated for region 8, C = State listed Noxious Weed Class C, I= Introduced species

Recommended Management Actions: _____

Surrounding Wetland Vegetation

Vegetation Cover Types (Identify/confirm vegetation cover types within 656 ft (200 m) of the wetland edge):

Invasive Plant Species Surrounding the Wetland

Species	%	D	C	Species	%	D	C	Species	%	D	C
Bull thistle			C	Himalayan blackberry			I				
Canada thistle			C	Queen Anne's Lace			B				
Common Burdock			I	Scot's broom			B				

Wetland Name: _____

Common catsear			B	Tansy ragwort			B			
----------------	--	--	---	---------------	--	--	---	--	--	--

Distribution (D) CL=Clumpy SP=Scattered Patchy SE=Scattered Even LI=Linear Percent Cover (%) T=Trace (0-5 %), L=Low (6-25 %), M=Moderate (26-50%), MH=Moderate to High (50 -75%) H=High (75-100%) Classification (C)= A= State lists Noxious Weed Class A, B8 = State listed Noxious Weed Class B designated for region 8, B= State listed Noxious Weed Class B not designated for region 8, C = State listed Noxious Weed Class C, I= Introduced species

Recommended Management Actions: _____

Waterfowl and Bat Habitat

Down wood within the wetland (Logs that are > 16 in. (40 cm) in diameter and >6 ft. (2 m) in length): _____

Snags (Snags within wetland that are greater than 20 feet [6 meters] tall):

Conifer <12 in. (30 cm) dbh _____ Hardwood < 12 in. (30 cm) dbh _____
 Conifer > 12 in. (30 cm) and < 20 in. (50 cm) dbh _____ Hardwood > 12 in. (30 cm) and < 20 in. (50 cm) dbh _____
 Conifer > 20 in (50 cm) dbh _____ Hardwood > 20 in (50 cm) dbh _____

Snags within the wetland buffer:

Conifer <12 in. (30 cm) dbh _____ Hardwood < 12 in. (30 cm) dbh _____
 Conifer > 12 in. (30 cm) and < 20 in. (50 cm) dbh _____ Hardwood > 12 in. (30 cm) and < 20 in. (50 cm) dbh _____
 Conifer > 20 in (50 cm) dbh _____ Hardwood > 20 in (50 cm) dbh _____

Are there undercut banks or vegetation overhanging into inundated areas: Yes or No

If yes, then describe: _____

Wildlife Observations

Wildlife Observations: _____

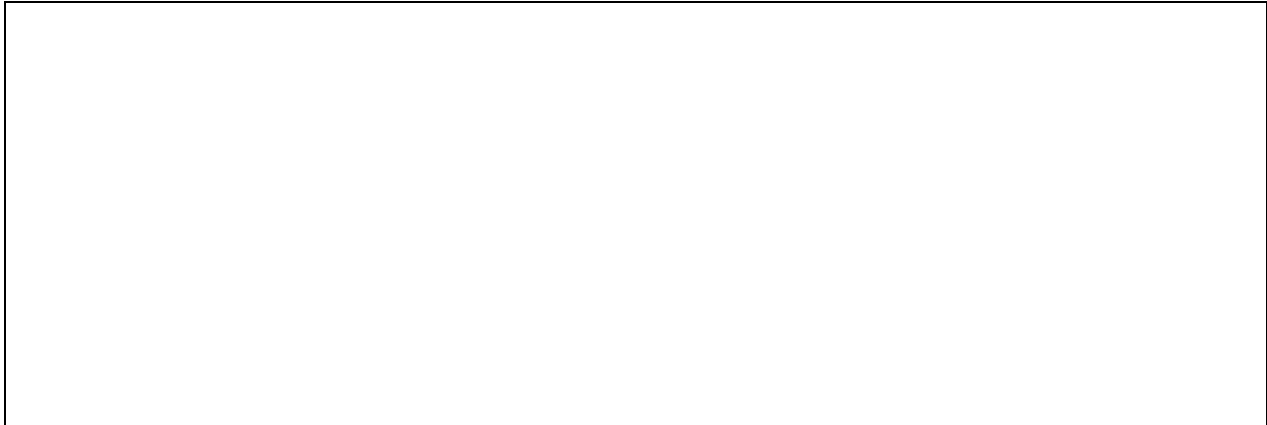
Is the wetland within 2.5 mi. (4.0 km) of great blue heron rookery? Yes or No

Potential Disturbances (Describe disturbance sources [i.e. such as structures, roads, landscaping, or daily human use] that are within the 656 feet [200 meters]): _____

Comments or Recommendations

Wetland Name: _____

Schematic of Wetland



Definitions

Buffer: Buffers are equal to buffers described in Objective e (1) 150 feet (45 meters) as measured from the edge of the hydric vegetation, or height of one site potential tree, whichever is greater, for wetlands less than or equal to 1.0 acre (0.4 hectare); and (2) 100 feet (30 meters) as measured from the edge of the hydric vegetation, or the height of one site potential tree, whichever is greater, for wetlands less than 1.0 acre (0.4 hectare). Buffer widths are measured horizontally from the edge of the hydric vegetation.

Growing Season¹: Growing season for Cowlitz County is 220 days with a 70 percent chance of these days occurring between April 10 and November 16.

Hydroperiod²:

Permanently Flooded: Surface water covers the land surface throughout the year, in most years.

Seasonally Flooded: Surface water is present for more than 2 months during a year, especially early in the growing season, but is absent by the end of the season in most years.

Occasionally Flooded: Surface water is present for brief periods of less than one month during the growing season, but the water table usually lies below the soil surface for most of the season.

Saturated: The soil is saturated near the surface for long enough to create a wetland, but surface water is seldom present.

Wetland Vegetation Cover Types³:

Aquatic Bed Wetland: Area with greater than 30 percent submerged or floating-leaf hydrophyte cover (e.g., *Potamogeton*)

Emergent Wetland: Areas with emergent herbaceous hydrophytes present throughout most of the growing season. Emergent vegetation include rooted plants that emerge above the surface water and are capable of supporting its stalk in the absence of water during the growing season (e.g., cattail)².

Forested Wetland: Area is dominated by woody vegetation that is greater than 20 feet (6 meters) tall.

Scrub-Shrub Wetland: Area is dominated by woody shrubs and stunted trees that are less than 20 feet (6 meters) tall.

Unconsolidated Bottom (pond open water): Areas of open water that have less than 30 percent vegetation cover.

¹Natural Resource Conservation Service. May 3, 2007. Climate Analysis for Wetlands by County. Available at URL: <ftp://ftp.wcc.nrcs.usda.gov/support/climate/wetlands/wa/53015.txt>

²Hruby, T. 2004. Washington State wetland rating system for western Washington – Revised. Washington State Department of Ecology Publication # 04-06-025.

³PacifiCorp and Cowlitz PUD. 2004C. Lewis River Hydroelectric Projects Technical Report 5.1 TER 1 Vegetation Cover Type Mapping. FERC Project Nos. 935, 2071, 2111, and 2213.

**Appendix 5-3:
Wetland Annual Inspection Form**

WETLAND ANNUAL INSPECTION FORM

Wetland Name: _____ **Observer's Name:** _____

Management Unit: _____ **Estimated Wetland Size:** _____

Aquatic Habitat

Water Depth (estimate the percent of the wetland area that is at the following depths):

< 0.5 ft _____ 0.5 to 2.0 ft _____ 2.0 to 3.0 ft _____ >3.0ft _____

Water Control Structure: Yes or No If yes, is it sound: _____

Dikes or Berms Present: Yes or No If yes, is it sound: _____

Vegetation within Wetland

(Each cover type must be ≥ 10% of the total area of the wetland and within the ordinary high water mark)

Percent Cover Aquatic Bed: _____ **Dominant Species:** _____

Percent Cover Emergent Wetland: _____ **Dominant Species:** _____

Percent Cover Forested Wetland: _____ **Dominant Species:** _____

Percent Cover Scrub/Shrub: _____ **Dominant Species:** _____

Percent of shrubs that are greater than 6.6 feet (2 meters): _____

Percent of shrubs that are hydrophytic: _____

Percent Cover Unconsolidated Bottom: _____ **Dominant Species:** _____

Overall Vegetation Condition and Recommendations: _____

Invasive Plant Species Present within Wetland –

Species	%	D	C	Species	%	D	C
Himalayan blackberry			I				
Reed canarygrass			C				

Distribution (D) CL=Clumpy SP=Scattered Patchy SE=Scattered Even LI=Linear Percent Cover (%) T=Trace (0-5 %), L=Low (6-25 %), M=Moderate (26-50%), MH=Moderate to High (50 -75%) H=High (75-100%) Classification (C) = A= State lists Noxious Weed Class A, B8 = State listed Noxious Weed Class B designated for region 8, B= State listed Noxious Weed Class B not designated for region 8, C = State listed Noxious Weed Class C, I= Introduced species

Recommended Management Actions: _____

Waterfowl and Bat Habitat

Snags (Snags within wetland that are greater than 20 feet [6 meters] tall):

Conifer <12 in. (30 cm) dbh _____ Hardwood < 12 in. (30 cm) dbh _____

Conifer > 12 in. (30 cm) and < 20 in. (50 cm) dbh _____ Hardwood > 12 in. (30 cm) and < 20 in. (50 cm) dbh _____

Conifer > 20 in (50 cm) dbh _____ Hardwood > 20 in (50 cm) dbh _____

Down wood within the wetland (Logs that are > 16 in. (40 cm) in diameter and >6 ft. (2 m) in length): _____

Snags ((Snags within wetland buffer that are greater than 20 feet [6 meters] tall):

Conifer <12 in. (30 cm) dbh _____ Hardwood < 12 in. (30 cm) dbh _____

Conifer > 12 in. (30 cm) and < 20 in. (50 cm) dbh _____ Hardwood > 12 in. (30 cm) and < 20 in. (50 cm) dbh _____

Conifer > 20 in (50 cm) dbh _____ Hardwood > 20 in (50 cm) dbh _____

Wetland Name: _____

Vegetation within Buffer

Vegetation Cover Types: _____

Dominant Vegetation and Overall Condition: _____

Down wood (Logs that are > 16 in. (40 cm) in diameter and >6 ft. (2 m) in length): _____

Invasive Plant Species Present within Wetland Buffer

Species	%	D	C	Species	%	D	C	Species	%	D	C
Bull thistle			C	Himalayan blackberry			I				
Canada thistle			C	Queen Anne’s Lace			B				
Common Burdock			I	Scot’s broom			B				
Common catsear			B	Tansy ragwort			B				

Distribution (D) CL=Clumpy SP=Scattered Patchy SE=Scattered Even LI=Linear Percent Cover (%) T=Trace (0-5 %), L=Low (6-25 %), M=Moderate (26-50%), MH=Moderate to High (50 -75%) H=High (75-100%) Classification (C)= A= State lists Noxious Weed Class A, B8 = State listed Noxious Weed Class B designated for region 8, B= State listed Noxious Weed Class B not designated for region 8, C = State listed Noxious Weed Class C, I= Introduced species

Wildlife Observations: _____

Comments or Recommendations: _____

Definitions

Buffer: Buffers are equal to buffers described in Objective e (1) 150 feet (45 meters) as measured from the edge of the hydric vegetation, or height of one site potential tree, whichever is greater, for wetlands less than or equal to 1.0 acre (0.4 hectare); and (2) 100 feet (30 meters) as measured from the edge of the hydric vegetation, or the height of one site potential tree, whichever is greater, for wetlands less than 1.0 acre (0.4 hectare). Buffer widths are measured horizontally from the edge of the hydric vegetation.

Growing Season¹: Growing season for Cowlitz County is 220 days with a 70 percent chance of these days occurring between April 10 and November 16.

Wetland Vegetation Cover Types²:

Aquatic Bed Wetland: Area with greater than 30 percent submerged or floating-leaf hydrophyte cover (e.g., *Potamogeton*)

Emergent Wetland: Areas with emergent herbaceous hydrophytes present throughout most of the growing season. Emergent vegetation include rooted plants that emerge above the surface water and are capable of supporting it’s stalk in the absence of water during the growing season(e.g., cattail)².

Forested Wetland: Area is dominated by woody vegetation that is greater than 20 feet (6 meters) tall.

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²PacifiCorp and Cowlitz PUD. 2004C. Lewis River Hydroelectric Projects Technical Report 5.1 TER 1 Vegetation Cover Type Mapping. FERC Project Nos. 935, 2071, 2111, and 2213.

Appendix 5-4:
Wetland Post-Treatment Inspection Form

WETLAND POST-TREATMENT INSPECTION

Date: _____

Observer: _____

Wetland: _____

Size: _____

Describe Past Management Action (include type, area, and date the action occurred):

Results of Management Actions: _____

Recommended Revisions to Management Action: _____

Wildlife Observations or Signs: _____

Appendix 5-5:
Great Blue Heron Colony Site Managements Recommendations



WASHINGTON DEPARTMENT OF FISH AND WILDLIFE

***Management Recommendations for Washington's Priority Species*
FOR USE TO GUIDE SITE SPECIFIC MANAGEMENT OF PRIORITY SPECIES**

Great Blue Heron (*Ardea herodias*)

Washington Department of Fish and Wildlife's (WDFW) *Management Recommendations for Washington's Priority Species* do not have regulatory authority. Therefore, the following are recommendations only. This abbreviated version of a chapter in *Management Recommendations for Washington's Priority Species: Volume IV* (see http://wdfw.wa.gov/hab/phs/vol4/phs_vol4_birds.pdf) has been streamlined for easier application. Where applicable, these recommendations should be put into practice consistently across a landscape to be most effective. The following recommendations are not site-specific. Where available, a professional in a relevant field (e.g., wildlife biologist) should evaluate the site and surrounding landscape when applying these recommendations.

Attach parcel map with species location indicated if available.

Planning Considerations for Great Blue Herons

- WDFW recommends that land use planning should protect existing great blue heron colonies using colony site-specific management plans that consider the colony size, location, relative isolation and the degree of habituation to human disturbance. Washington Department of Fish and Wildlife biologists can assist those that are developing a plan.

General Recommendations

In the absence of a colony site-specific management plan, adhere to the following general guidelines:

- Assure retention of several alternate forest stands at least 10 ac in size with dominant trees at least 56 ft tall within 2.5 mi of nesting colonies (Colonies with > 50 nests will require a greater number of stands). These protected stands will need to be surrounded by a 328 ft buffer where human disturbance is restricted.
- If pesticide use is planned within 2.5 miles of a known heron colony or feeding area, consult Appendix A of the Priority Habitat and Species bird volume (see <http://wdfw.wa.gov/hab/phs/vol4/appndxa.pdf>) for contacts to help assess the use of pesticides, herbicides, and their alternatives.
- See table below for buffers.

Table. Recommended protective buffers from the outer edge of active heron colonies for specified activities.

Activities	Buffer width	Time of Year
All human activity	820 – 985 ft	15 Feb - 31 July ^b
Aircraft flight	2130 ft ^a	15 Feb - 31 July ^b
Logging, construction, blasting or any other intensive land use activity.	3280 ft	15 Feb - 31 July ^b
Any activity that necessitates tree, shrub, or ground cover removal. Use of off-road motorized vehicles.	820 – 985 ft	year-round ^c

^a Vertical buffer distance. ^b Seasonal buffer. ^c Permanent buffer.

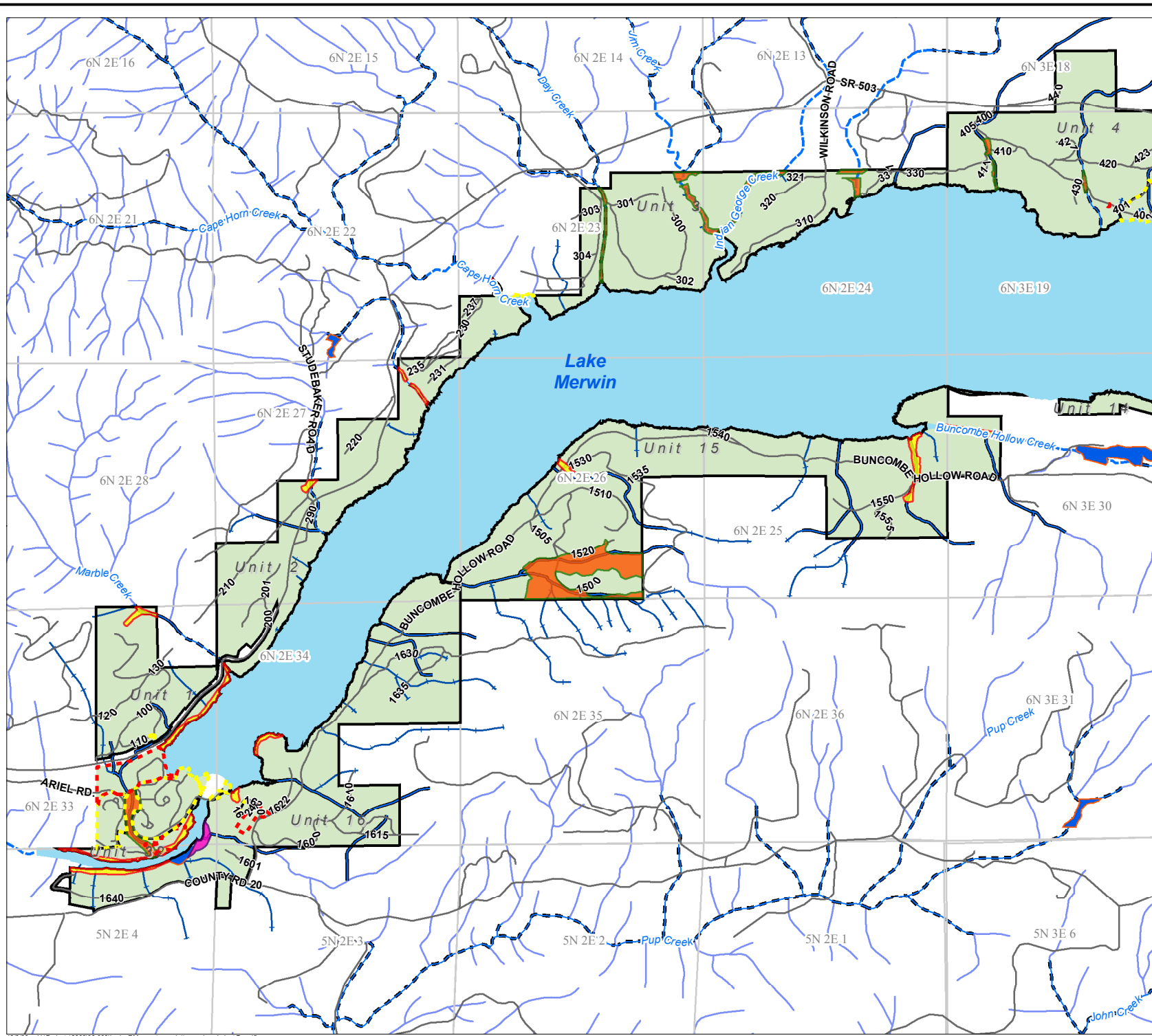
I have read and understand the above recommendations (s) placed on Parcel # _____ located in the _____ Quarter of _____ Quarter of Section _____, Township _____, Range _____ (East/West meridian) with actual street address of _____.

Appendix 6-1:
Lewis River Wildlife Habitat Management Plan Riparian Areas Locations and Type

Lewis River Wildlife Habitat Management Plan

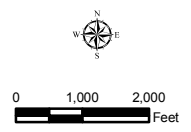
Riparian Areas
Appendix G-1

Sheet 1 of 9



Legend

- Riparian Deciduous Forest
- Riparian Mixed Vegetation
- Riparian Shrubland
- Young Riparian Mixed Forest
- WHMP Management Lands
- Exclusion
- Secondary Management Area
- Seasonal Management Area
- Conservation Covenant
- Management Unit
- PacifiCorp Ownership
- Stream
- Fish
- Anadromous Fish
- Non-fish Perennial
- Non-fish Seasonal
- Other
- Road
- Water Body
- Wetlands



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Lewis River Wildlife Habitat Management Plan

Riparian Areas
Appendix 6-1


Sheet 2 of 9

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0 1,000 2,000 Feet

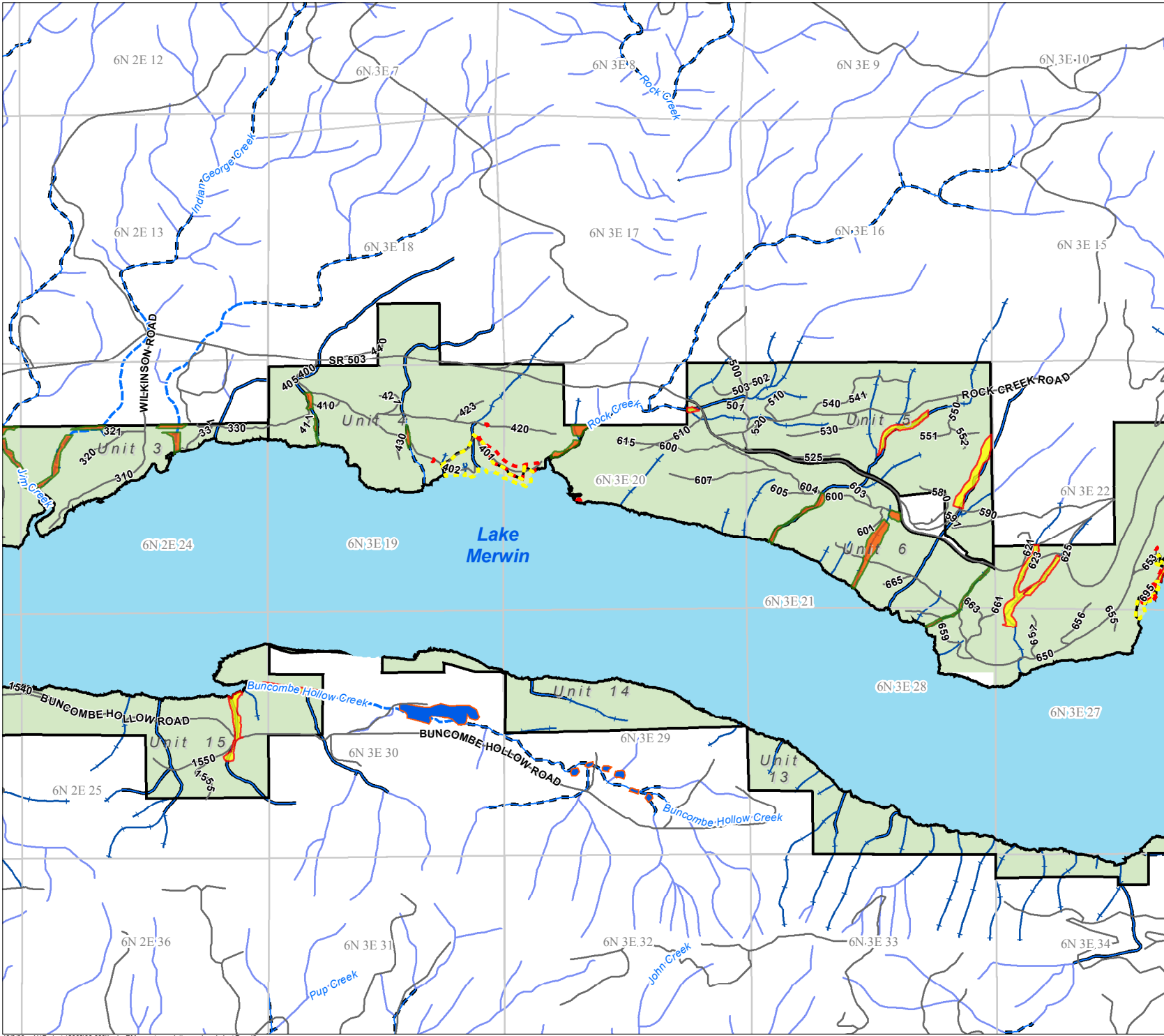


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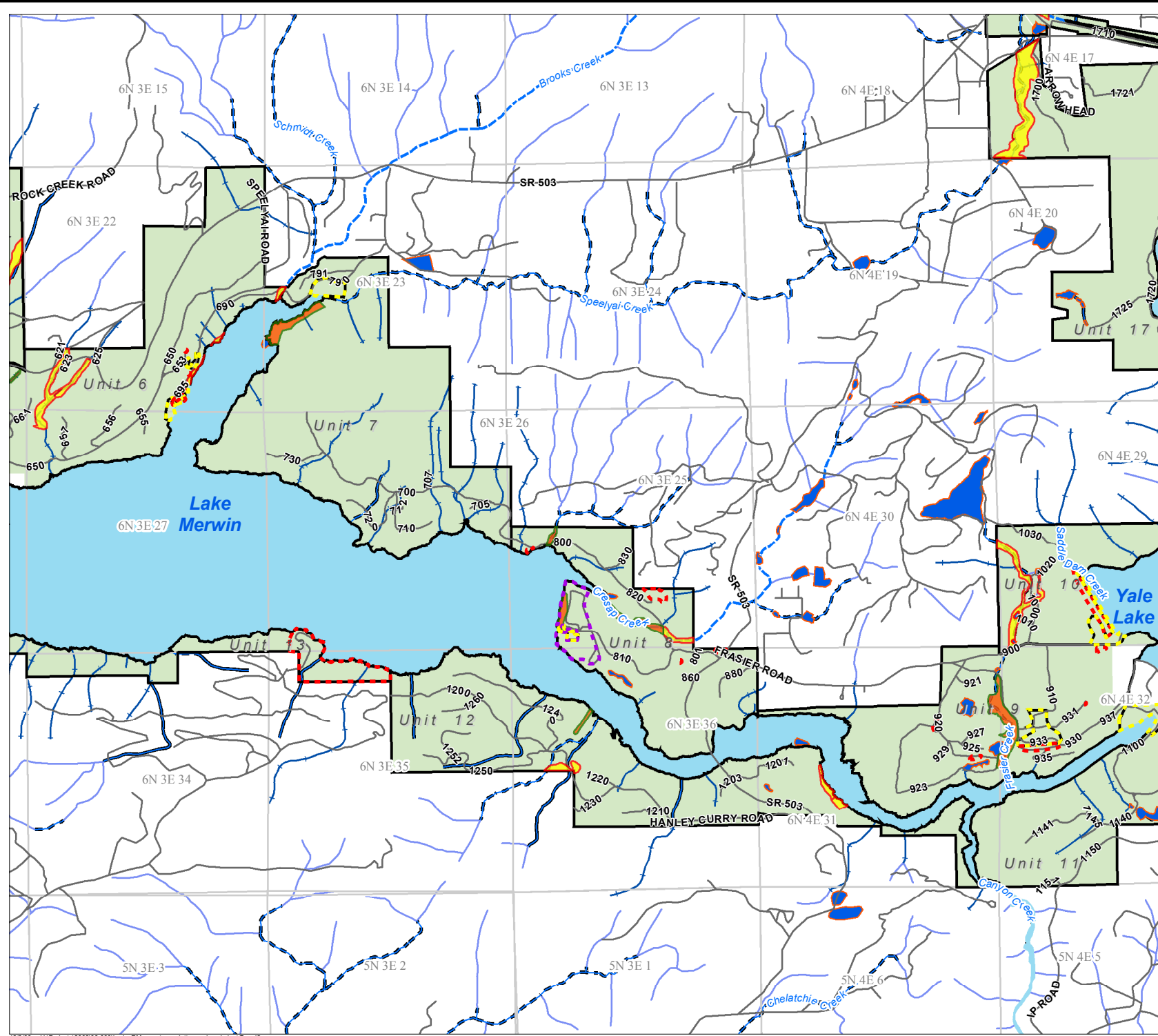
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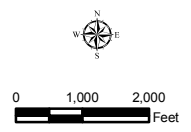
Riparian Areas
Appendix 6-1

Sheet 3 of 9



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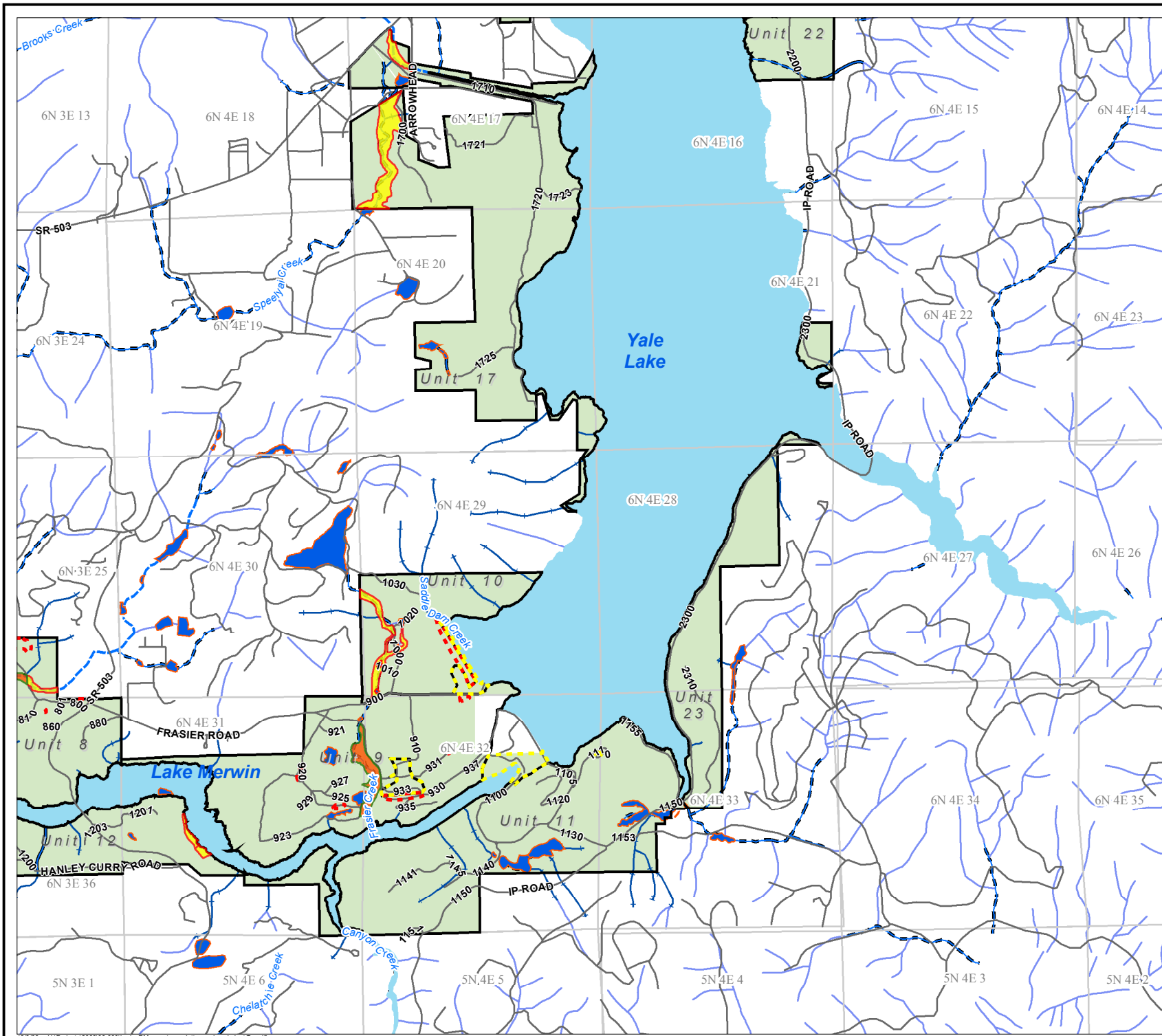
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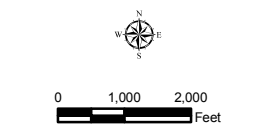
Riparian Areas
Appendix 6-1

Sheet 4 of 9



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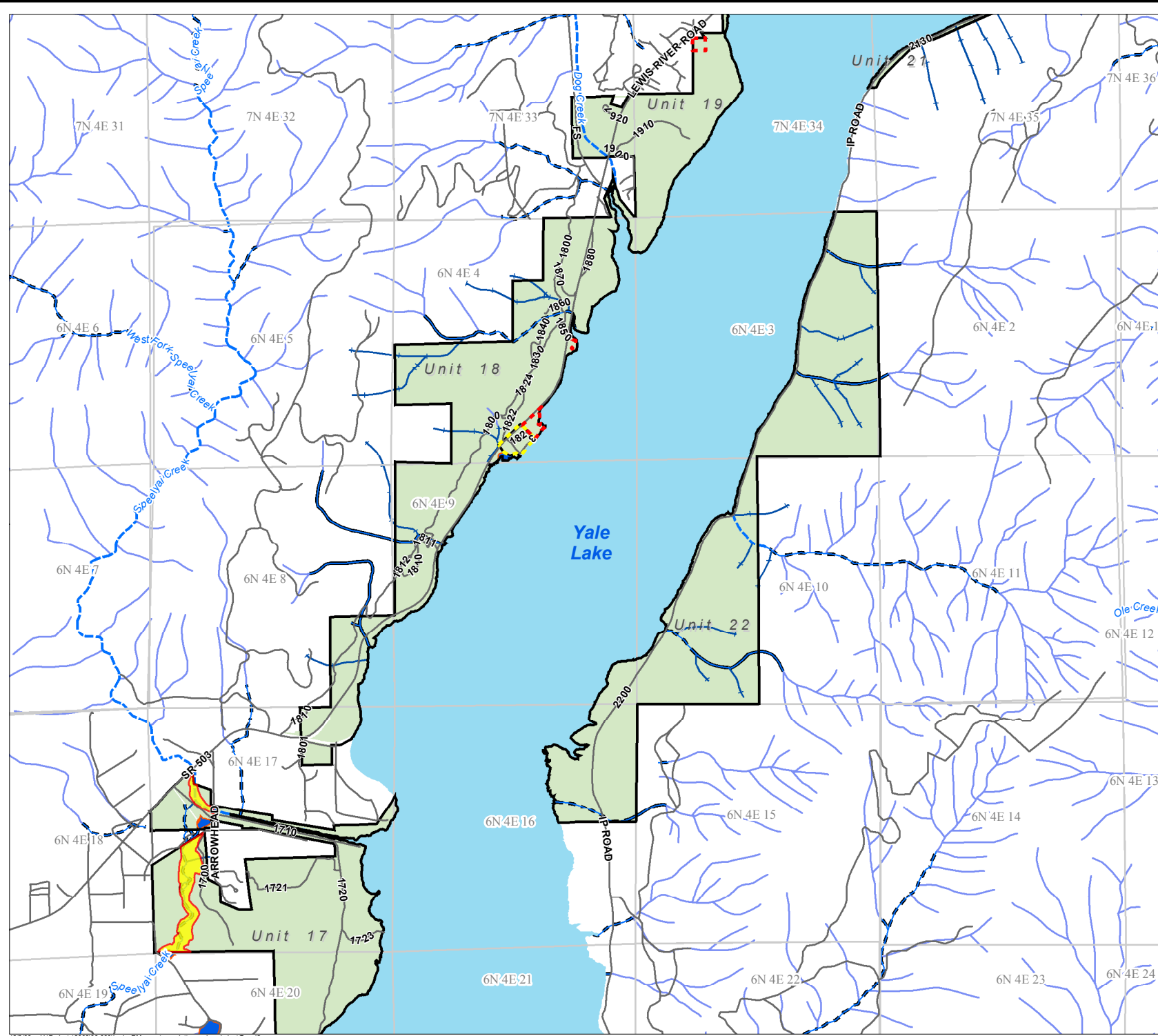
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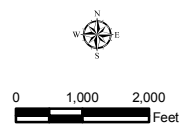
Riparian Areas
Appendix 6-1

Sheet 5 of 9



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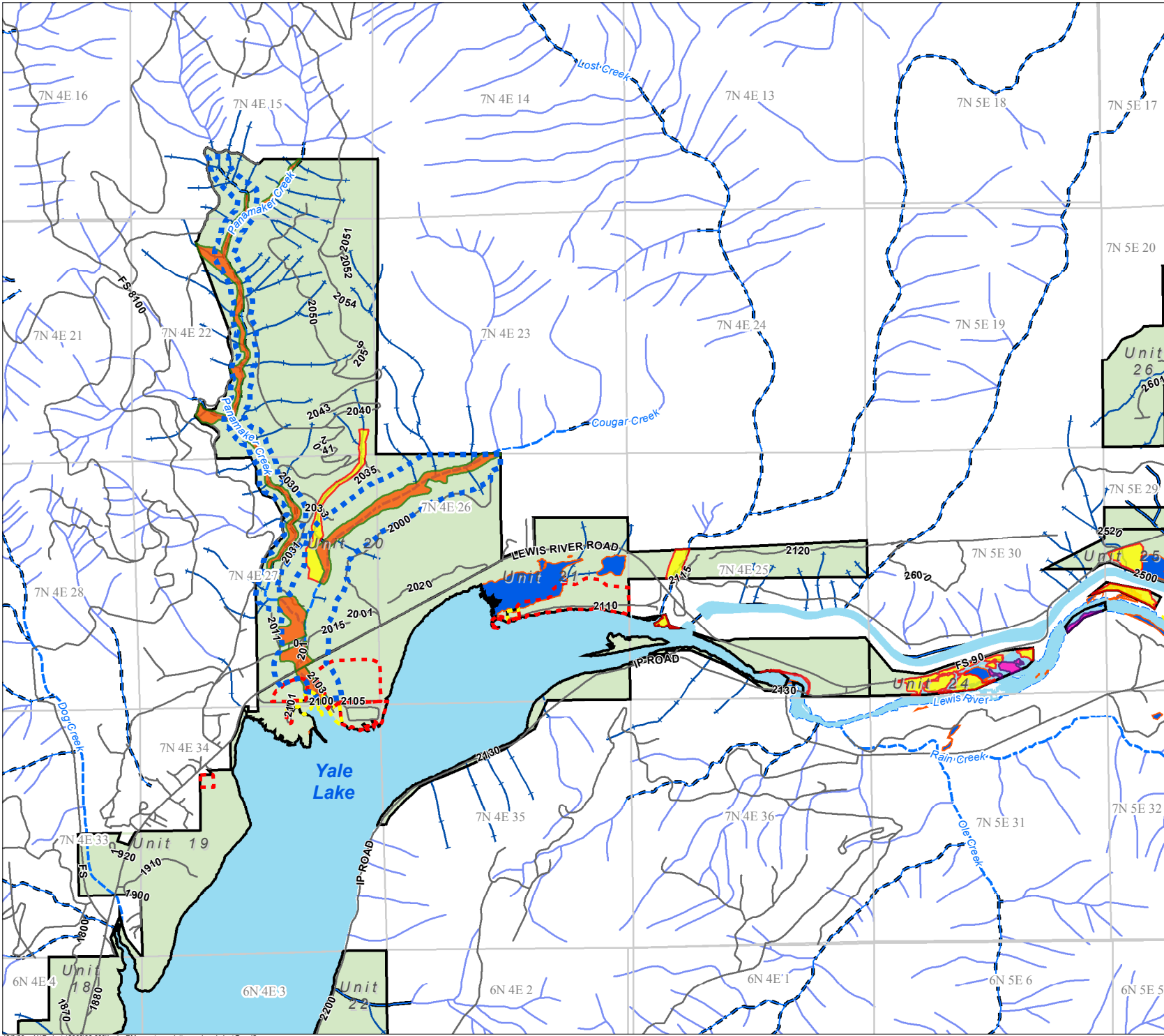
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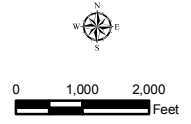
Riparian Areas
Appendix 6-1

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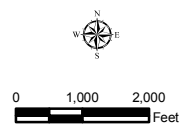
Lewis River Wildlife Habitat Management Plan

Riparian Areas
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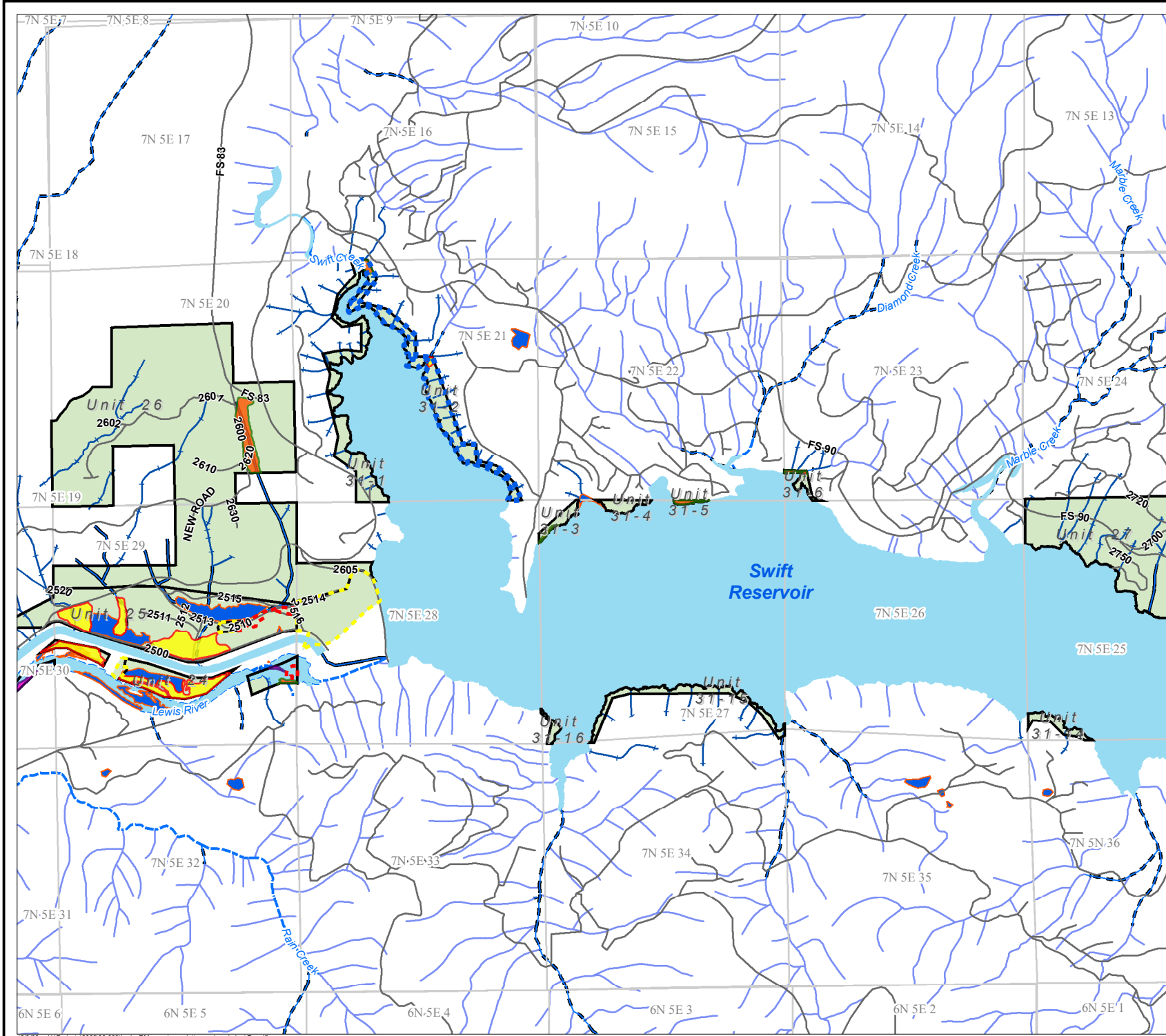
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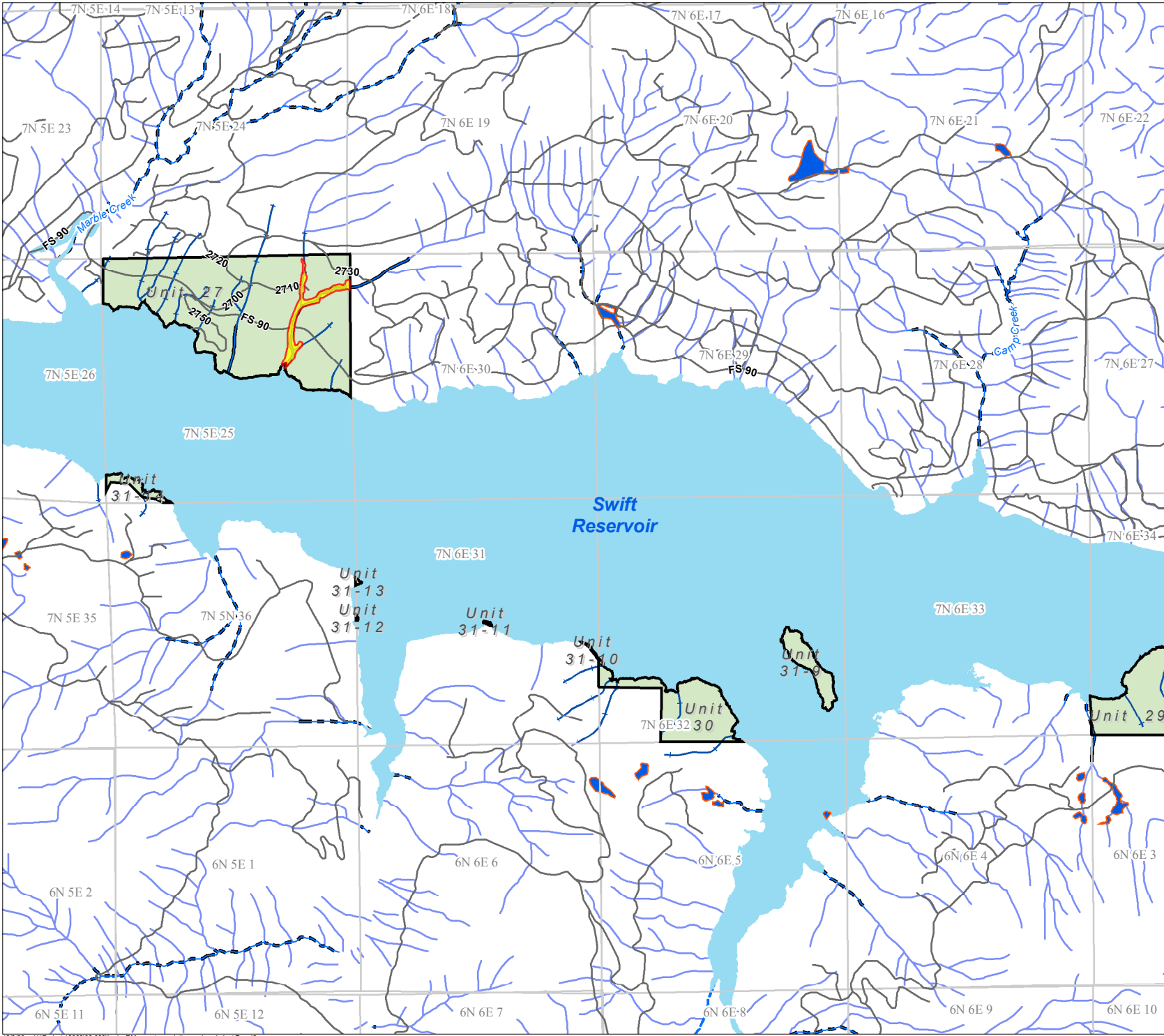
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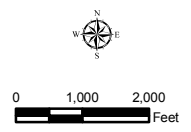
Riparian Areas
Appendix 6-1

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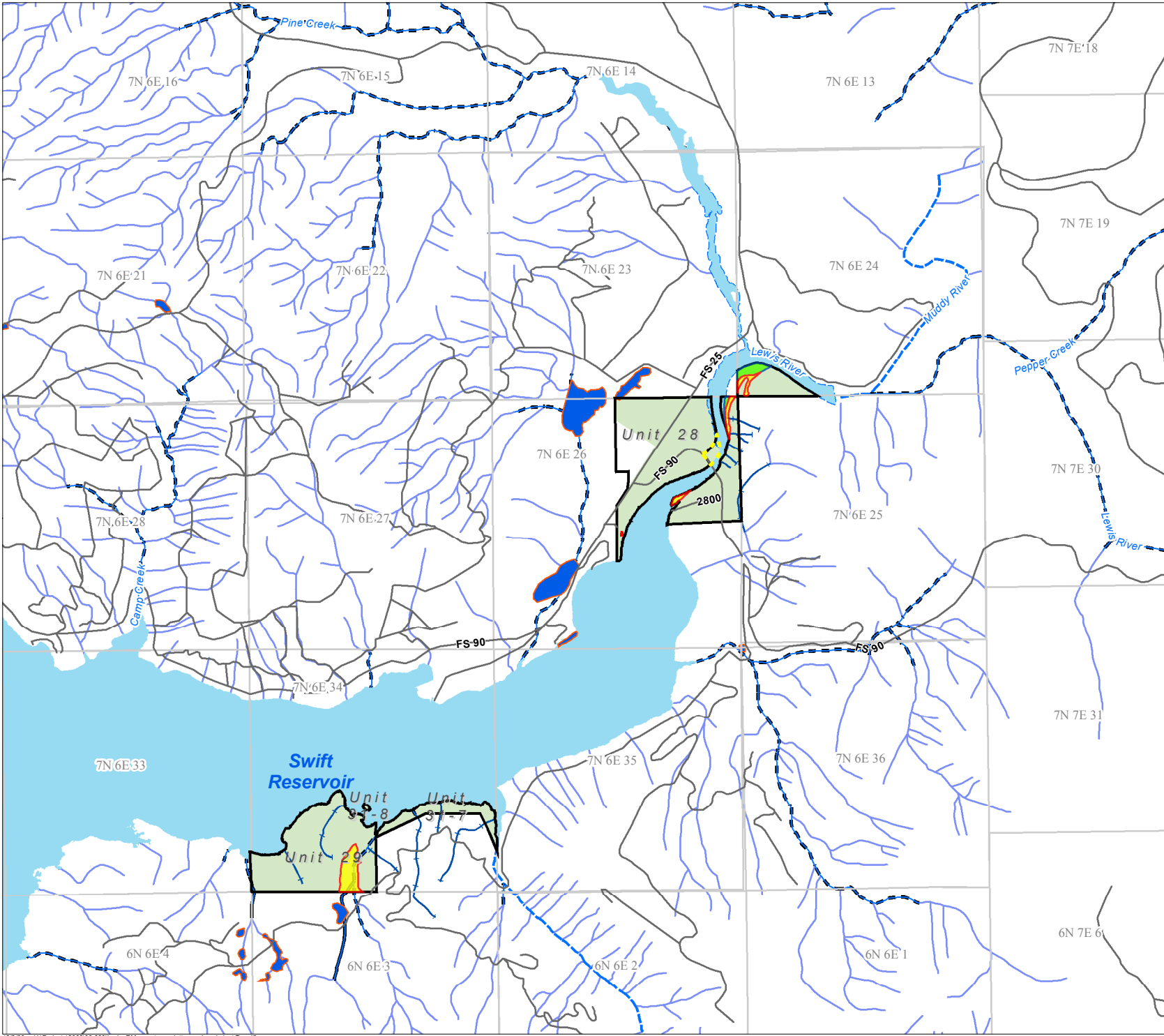
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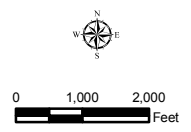
Riparian Areas
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**Appendix 6-2:
Tree Transect Data Form, Snag and Live Decay Tree Transect Data Form,
and Riparian Mixed Forest Stand Snag Inventory**

Tree Transect Data

Riparian Mixed Forest Stand Id No: _____ **Acres:** _____ **Management Unit:** _____

Transect Number: _____ **Azimuth:** _____ **Width:** _____

Observers Names: _____ **Date:** _____

Wildlife Observations: _____

General Stand Description: _____

Snag Development Recommendation: _____

Comments: _____

Tree Data

Species Code ¹	Diameter at Breast Height Class (inches)						Height Class (feet)		Decay Class					
	0-9	10-19	20-24	25-30	30-50	50+	20 - 74	75+	Live	1	2	3	4	5

¹Species Code: ALRU (red alder), ACMA (bigleaf maple), HARD (unknown hardwood snag), PICO (lodgepole pine), PIMO (western white pine), POTR (black cottonwood), PSME (Douglas-fir), SOFT (unknown conifer snag), THPL (western red cedar), TSHE (western hemlock).

Tree Data

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Riparian Mixed Forest Stand Snag Inventory






Azimuth: The compass direction that the observer walked along the transect.

Comments: Provide additional management recommendations or observations for the stand.

Date: Record the date(s) the evaluation was conducted

Decay Class: Qualifying snags and live decay trees will be categorized into one of the 5 decay classes. Figure 1 is similar to the habitat evaluation procedures study snag decay classes and are adapted from Johnson, M.D. 2000 and Maser et al. 1979.

Figure 1: Decay Classes and Descriptions for Snags and Live Decay Trees

Description					
Class	1	2	3	4	5
Stage	Live decay or declining	Dead	Loose Bark	Clean	Broken
Bark	Tight and Intact	Tight and Intact	Approximately 50 percent loose or missing	Approximately 75 percent loose or missing	Approximately 75 percent loose or missing
Limbs	At least 2/3 of the limbs and twigs have green leaves or needles	Mostly present including small twigs	Only the larger limbs remain	Only a few of the larger limbs remain	No limbs remain
Top Breakage	May be present	May be present	May be present	The top 1/3 is broken	The top 1/2 is broken

Diameter at breast height (dbh): Tree the tree's diameter at breast height (4.5 ft [1.4 m]) from the forest floor on the uphill side of the tree.

Height: Only live decay trees and snags that are greater than or equal to 20 ft (6 m) in height will be recorded. Qualifying trees and snags will be categorized into two height classes: 20 ft (6 m) to 74 ft (22 m) and greater than or equal to 75 ft (23 m).

General Stand Description: Record general observation about vegetation and habitat of the stand.

Observers: List the names of observers conducting the evaluation

Riparian Mixed Forest Stand Id No.: Riparian mixed forest stands are areas that are vegetation cover typed as riparian mixed forest and are equal to or greater than 1.0 ac (0.4 ha). Each stand has an identification number that should begin with the unit number followed by a unique number (e.g., 6-2).

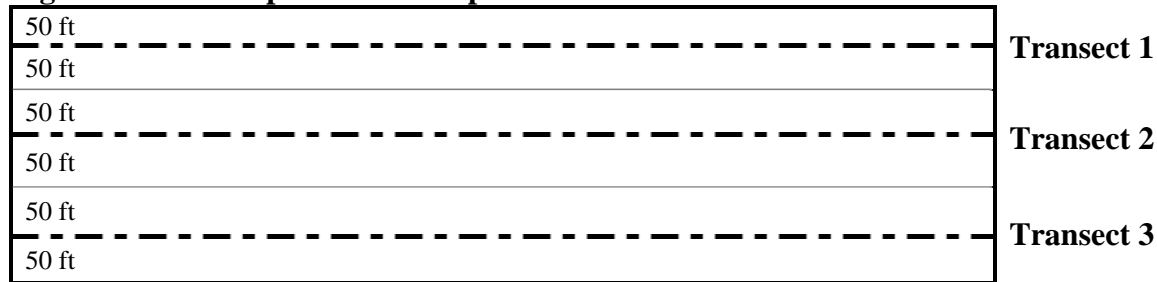
Snag Development Recommendations: General comments on the best snag development methods or potential areas within the stand to develop snags.

Species: Identify each live tree that has more than 2/3 of the crown is green and is greater than or equal to 20 ft (6 m) in height and 20 in (50 cm) in diameter at breast height. Identify any snag or live decay tree that is greater then or equal to 20 ft (6 m) in height. A live decay tree is any conifer tree with less than or equal to 2/3 of a green crown.

Species Code: Use one of the following codes for snag, live decay, and live on conifer trees species = ALRU (red alder), ACMA (bigleaf maple), HARD (unknown hardwood snag), PICO (lodgepole pine), PIMO (western white pine), POTR (black cottonwood), PSME (Douglas-fir), SOFT (unknown conifer snag), THPL (western red cedar), TSHE (western hemlock).

Transect Number: Each transect is identified by an unique number that is preferably a consecutive number within the riparian mixed forest stand. Figure 2 shows an example of transect placement and nomenclature.

Figure 2: An example of transect placement and nomenclature



Width: Figure 2 illustrates that the transect width is 100 ft (30 m). Therefore all qualifying snags within 50 ft (15 m) of either side of the transect line will be recorded. Transect widths should be 100 feet (30 m) (50 ft [15 m] on both sides of the transect), but may be adjusted to maintain adequate visibility of the canopy cover and/or communication between observers.

Wildlife Observations: Record wildlife species and/or signs observed during the initial evaluation.

References

- Johnson, M. D. 2000. Region 6 Inventory & Monitoring System field procedures for the current vegetation survey Version 2.04. U.S. Forest Service, Portland, Oregon, USA.
- Maser, C., R. G. Anderson, K. Cromack, J. T Williams, and R. E Martin. 1979. Dead and down woody material. Pages 78 – 95 in Thomas, J. W., technical editors. Wildlife habitats in managed forests: the Blue Mountains of Oregon and Washington. U.S. Forest Service. Washington D.C, USA.