

COVER SHEET

FEDERAL ENERGY REGULATORY COMMISSION

**FINAL ENVIRONMENTAL IMPACT STATEMENT
FOR THE LEWIS RIVER PROJECTS**

Docket Nos. P-2071-000, et al.

**Section 5
Staff's Conclusions
Pages 5-1 to 5-44
FEIS**

5.0 STAFF'S CONCLUSIONS

5.1 COMPREHENSIVE DEVELOPMENT AND RECOMMENDED ALTERNATIVE

Sections 4(e) and 10(a) of the FPA require the Commission to give equal consideration to all uses of the waterway on which a project is located. When we review a hydropower project, we consider the water quality, fish and wildlife, recreational, and other non-developmental values of the involved waterway equally with its electric energy and other developmental values. Accordingly, any license issued shall be best adapted to a comprehensive plan for improving or developing a waterway or waterways for all beneficial public uses.

This section contains the basis for and a summary of our recommendations to the Commission for relicensing the Lewis River Projects. We weigh the costs and benefits of our recommended alternative against other proposed measures.

Based on our independent review and evaluation of the proposed projects, and the no-action alternative, we select the proposed action (including the terms of the SA), with some modifications by staff, as the preferred alternative.

We recommend this alternative because (1) issuance of new licenses would allow PacifiCorp and Cowlitz PUD to continue to operate the projects as a dependable source of electric energy for their customers; (2) the electricity generated by the Lewis River Projects (total installed capacity of 580 MW) would avoid the need for an equivalent amount of fossil-fuel fired electric generation and capacity, continuing to help conserve these nonrenewable energy resources while reducing atmospheric pollution; and (3) the recommended environmental measures would protect and enhance aquatic and terrestrial resources, improve public use of recreational facilities and resources, and maintain and protect historic and archaeological resources within the area affected by project operations. We also recommend that many of the plans and specific measures for implementation be filed with the Commission for approval. This would allow Commission staff to monitor compliance with the conditions of the licenses and review the results of many of the studies and measures to be implemented by PacifiCorp and Cowlitz PUD.

We recommend that most terms of the SA be approved and made conditions of the licenses to be issued for the Lewis River Projects,³⁰ although there are a few specific measures that we do not recommend be included. These include funding for certain measures under the Aquatic Fund, the In Lieu Fund, funding for improvements to lower

³⁰ The precise wording of these staff recommendations may differ from similar recommendations made by PacifiCorp and Cowlitz PUD, or as presented in the SA. These wording changes are primarily the result of summarization and are not intended to change any of the terms of the SA that we recommend.

river access sites, funding for Forest Service dispersed camping sites, funding for Forest Service maintenance of FR 90, and funding for law enforcement (see sections 3.3.3, *Aquatic Resources*, 3.3.6, *Recreational Resources*, and 3.3.7, *Land Management and Use*). These measures do not appear to have a clear nexus to the projects (are not tied to either project effects or purposes), are located outside of the project boundaries, or appear to be general measures that should be the responsibility of other governmental agencies. PacifiCorp and Cowlitz PUD still may elect to provide these measures as terms of the SA, but we do not recommend them as license conditions. We are also recommending modifications to some of the SA measures as indicated below in italics. The following discussion summarizes our recommendations and some of our rationale for these recommendations. We first list the recommended measures by project, and then we discuss our rationale.

By letter dated November 21, 2005, the Forest Service filed final terms and conditions, under section 4(e) of the FPA. Because the final terms and conditions are consistent with the provisions of the SA, we discuss them in the context of our discussions of the SA measures throughout this final EIS. We do not recommend some of the measures included in the Forest Service section 4(e) conditions, because, similar to some of the SA measures, the 4(e) measures are not directly associated with project purposes or their effects. However, we recognize that the Commission may include valid final section 4(e) conditions in any licenses issued for the Lewis River Projects.

5.1.1 Swift No. 1 Project

We evaluate numerous recommendations in the resource sections of this EIS and, given the environmental benefits, we recommend including the following measures that PacifiCorp proposes in any license issued by the Commission for the Swift No. 1 Project.

Continue the following measures currently being implemented under the existing license:³¹

1. Periodically monitor TDG in the project tailrace.
2. Maintain flood management storage of 70,000 acre-feet, in conjunction with other Lewis River Projects.
3. Maintain the current high runoff procedure from November 1 to April 1.
4. Net bull trout from the Swift No. 2 tailrace, and haul to a location defined by FWS using NMFS and FWS facility and handling guidelines for anadromous fish and bull trout.
5. In conjunction with other Lewis River Projects, maintain current salmon and steelhead smolt production levels (3,125,000) to achieve a goal of 92,000 ocean recruits.

³¹ See section 2.1.2 and table 2.1-2 for a further description of these measures.

6. In conjunction with other Lewis River Projects, maintain current hatchery production levels for kokanee and rainbow trout.
7. In conjunction with other Lewis River Projects, evaluate bull trout and kokanee populations annually.
8. Buffer sensitive aquatic and terrestrial habitat from ground-disturbing activities (e.g., timber harvest, construction).
9. Maintain road closures through sensitive habitat areas by installing and maintaining gates, and identify additional areas for access control on PacifiCorp lands.
10. Manage PacifiCorp lands to benefit wildlife habitat.
11. Continue to manage project roads to maintain existing aquatic connectivity, and control runoff and erosion.
12. Conduct annual raptor nest surveys on PacifiCorp lands.
13. Allow recreational access to project lands except where conditions are unsafe.
14. Continue to operate existing recreational and river access sites.
15. Upgrade barrier-free facilities when developed recreational sites are improved.
16. Preserve tribal access for traditional uses.
17. In consultation with the Washington SHPO, conduct archeological surveys of areas with high potential for cultural resources proposed for soil disturbances that have not been previously surveyed or disturbed.

The SA includes several new or continuing measures related to protection and enhancement of aquatic and terrestrial habitat, maintenance and restoration of anadromous fish species in the Lewis River Basin, improvements to existing recreational facilities, improved flood protection, and cultural resource and socioeconomic enhancements. We recommend the following measures agreed to in the SA be included in any license issued for the Swift No. 1 Project, and according to the schedule in the SA:³²

1. Develop a Water Quality Management Plan as required by the 401 WQC, to monitor compliance with state water quality criteria.
2. In conjunction with the Swift No. 2 Project, design and construct a new flow release structure from the Swift No. 2 canal to the upper Lewis River bypassed reach; interim release schedule, when combined with the 47 cfs from the downstream canal drain would be 7/1–10/31, 60 cfs; 11/1–1/31, 100

³² See section 2.1.3 and table 2.1-4 for a further description of these measures.

cfs; 2/1–6/30, 75 cfs; and file for Commission approval a combined release schedule *by the first anniversary of Swift No. 2 license issuance*.

3. In conjunction with other projects, maintain 17 feet of flood management storage, develop and implement a forecast-based high runoff procedure, reduce flood management season by 2 weeks, and provide funding to authorities responsible for flood notification.
4. Develop an adult salmon and steelhead trap and transport facility above Yale Lake (assumed to be at Swift No. 2 tailrace), once upstream fish passage is established at the downstream projects.
5. Install a modular surface collector system with guide walls and nets at Swift dam; collect downstream migrating salmon and steelhead smolts, sort, mark a subsample, and truck to a release pond (to be constructed by the applicant) below Merwin dam; and release bull trout (if they reach a defined smolt-like development phase) to Yale Lake or to the lower river.
6. If directed by NMFS, and subject to Commission approval, seasonally install spring Chinook smolt satellite collection facility (modular screw trap) upstream of Swift Creek reservoir.
7. In conjunction with other projects, develop and implement a hatchery supplementation plan for spring Chinook, steelhead, and coho; target production to return 12,800 spring Chinook, 13,200 steelhead, and 60,000 coho pre-harvest adult ocean recruits; and reduce production on a 1:1 basis when natural production exceeds settlement threshold levels.
8. In conjunction with the Swift No. 2 Project, transport supplementation spring Chinook and steelhead juveniles above Swift dam for 10 years after completion of Swift downstream collection facility.
9. In conjunction with the Swift No. 2 Project, transport supplementation coho juveniles above Swift dam for 6 years after completion of the Swift downstream collection facility.
10. In conjunction with other projects, fund upgrades and maintenance to all three Lewis River hatcheries.
11. In conjunction with the Swift No. 2 Project, place juvenile acclimation sites above Swift Creek reservoir if there are suitable and accessible sites.
12. In conjunction with other projects, update the Hatchery and Supplementation Plan.
13. In conjunction with other projects, fund production of no more than 20,000 pounds of rainbow trout annually for placement in Swift Creek reservoir.
14. In conjunction with other projects, manage conservation covenants for bull trout.
15. In conjunction with other projects, implement a Habitat Preparation Plan, releasing hatchery salmonids into each reservoir to prepare habitat for anadromous fish re-introduction, 4 years prior to construction of anadromous fish collection facilities.

16. In conjunction with the Swift No. 2 Project, construct a channel with enhanced habitat features in the Lewis River bypassed reach to maximize benefits of flow releases from the existing release device in Swift No. 2 canal.
17. Store LWD for habitat improvement projects, and contribute funds annually for such projects. *Funds, however, should only be used for LWD projects that provide a demonstrated benefit to resources affected by project structures or operations, and the projects must be approved by the Commission.*
18. In conjunction with other projects, perform Phase I and Phase II Status Checks, to determine if anadromous fish reintroduction goals are being met, 27 and 37 years after the issuance of all the licenses.
19. In conjunction with other projects, implement aquatic resource protection measures to benefit fish recovery, support the reintroduction of anadromous fish, and enhance fish habitat in the Lewis River Basin, with priority given to the North Fork Lewis River (the Aquatic Enhancement Fund). *Measures should provide a demonstrated benefit to resources affected by project structures or operations. To ensure project nexus, the annual report describing proposed resource projects (as required by section 7.5.3.2 of the SA) should be filed with the Commission for approval, so that approval can be made on a suite of measures for the following year.*
20. In conjunction with other projects, develop monitoring and evaluation plans for aquatic measures and monitor performance of upstream and downstream passage facilities and bull trout collections, subsample and tag outmigrants from the project downstream transport facility, monitor anadromous fish hatchery returns, complete limiting factors analysis for bull trout in Swift Creek reservoir, and evaluate status of ESA-listed anadromous species and bull trout.
21. Develop and implement WHMP on project lands using the previous HEP analysis as the baseline.
22. Acquire interests in land to protect wildlife habitat to meet the objectives of the Wildlife Habitat Management Plan, on lands within 5 miles of the Swift No. 1 and Swift No. 2 project boundaries (the Swift No. 1 and Swift No. 2 Land Acquisition and Habitat Protection Fund). *Interests in land should provide a demonstrated benefit to resources affected by project structures or operations. To ensure project nexus, the “annual plan” prepared under section 10.8.3 of the SA, should also be filed with the Commission for approval, after the plan has been approved by the TCC.*
23. In conjunction with other projects, acquire or enhance wildlife habitat anywhere in the Lewis River Basin in the vicinity of the projects to meet the objectives of the Wildlife Habitat Management Plan (the Lewis River Land Acquisition and Habitat Enhancement Fund). *Interests in land should*

provide a demonstrated benefit to resources affected by project structures or operations. To ensure project nexus, the “annual plan” prepared under section 10.8.3 of the SA should also be filed with the Commission for approval, after the plan has been approved by the TCC.

24. Reduce dispersed campsites in shoreline and riparian areas, and post visitor use rules.
25. Monitor the effectiveness of the WHMP in improving wildlife habitat using the HEP.
26. Implement a timber management program on PacifiCorp lands, if applicable under the WHMP.
27. Continue to manage roads on project lands to control runoff and erosion; develop a culvert replacement plan and schedule, *for culverts associated with project roads and facilities*, to reduce barriers to wildlife and improve aquatic and riparian habitat connectivity.
28. Monitor dispersed camping and day use on PacifiCorp lands.
29. Implement BMPs to protect sensitive species and habitats during construction activities.
30. Finalize the RRMP as directed by the Commission, and implement the recreation measures described therein.
31. Increase visitor management controls, such as additional signs, barriers, and enforcement.
32. Develop and implement an interpretation and education (I&E) program, including information about protecting bull trout.
33. Provide earlier public notice that project recreation sites are full.
34. Discourage dispersed upland camping and motorized use on project lands.
35. Eliminate some shoreline campsites along Swift Creek reservoir, and harden and manage others.
36. Expand Swift Camp when monitoring establishes a sustained need.
37. Allow public use of RV holding tank dump sites in PacifiCorp campgrounds for a fee.
38. Provide one new picnic shelter at Swift Camp.
39. Renovate Eagle Cliff Park.
40. Develop a non-motorized trail from Eagle Cliff Park to the Forest Service boundary.
41. Improve barrier-free accessibility at upgraded facilities.
42. Implement an HPMP.
43. Protect the integrity of properties listed in the National Register.
44. Contribute cultural information to an I&E program.
45. Curate artifacts at a secure location in the basin.

46. In conjunction with other projects, contribute to county-developed installation and maintenance of emergency phone system for flood notification.
47. In conjunction with the other projects, reimburse NOAA for the installation and maintenance of a weather radio transmitter to notify the public of flood events.
48. In conjunction with other projects, develop a Visitor Information Center near Cougar, to provide public information about the upper Lewis River Basin, including information about project facilities, operations, and resources (total contribution of \$75,000 or enter into a maintenance agreement).
49. In conjunction with the Swift No. 2 Project, make a one-time payment of \$10,100 for repair of the FR 90 road bridge over the Swift No. 2 canal (PacifiCorp's share is \$7,474).
50. Continue to support Pine Creek Work Center communication link.
51. In conjunction with other projects, conduct a feasibility study and construct a new barrier-free bank fishing facility at one of the following locations: the Lewis River between Merwin dam and the Island River access site, Swift reservoir, Yale Lake, or Lake Merwin.

In addition to the applicant-proposed project-related environmental measures listed above, we recommend including the following staff-recommended environmental measures in any license issued for the Swift No. 1 Project:

1. In the event that proposed fish passage facilities are not feasible or appropriate, and the licensees elect to implement measures in lieu of fish passage, prepare, for Commission approval, a report that presents the rationale for how the decision to forego fish passage was made, and a plan that describes the procedures for determining which specific measures in lieu of fish passage would be implemented and how those measures would provide a demonstrated benefit to resources affected by project structures or operations. The licensees would also file annual plans for Commission approval describing all plans and measures in lieu of fish passage proposed for funding in the following year.
2. Include lands acquired with the habitat acquisition and protection/enhancement funds, and all other lands to be managed under the WHMP, within the project boundary.
3. Include the proposed Visitor Information Center in the project boundary for one of the projects (the Yale Project would be in closest proximity).
4. Develop the proposed barrier-free shoreline fishing site within the project boundary (it may also fall within another project boundary if located at another project).

5.1.2 Swift No. 2 Project

We evaluate numerous recommendations in the resource sections of this EIS and, given the environmental benefits, we recommend including the following measures that Cowlitz PUD proposes in any license issued by the Commission for the Swift No. 2 Project.

Continue the following measures currently being implemented under the existing license:³³

1. Net bull trout from the Swift No. 2 tailrace, and haul to a location defined by FWS using NMFS and FWS facility and handling guidelines for anadromous fish and bull trout.
2. Partially fund operation of Speelyai Hatchery.
3. Manage Cowlitz PUD lands on Devil's Backbone to allow natural succession.³⁴
4. Continue to manage project roads to maintain existing aquatic connectivity and control runoff and erosion.
5. Allow recreational access to project lands except where conditions are unsafe.
6. Preserve tribal access for traditional uses.
7. Conduct archaeological surveys of areas proposed for soil disturbance that have not been previously surveyed or disturbed.

The SA includes several new or continuing measures related to protection and enhancement of aquatic and terrestrial habitat, maintenance and restoration of anadromous fish species in the Lewis River Basin, improvements to existing recreational facilities, improved flood protection, and cultural resource and socioeconomic enhancements. We recommend the following new or continuing measures agreed to in the SA be included in any license issued for the Swift No. 2 Project, and according to the schedule in the SA:³⁵

1. Develop a Water Quality Management Plan as required by the 401 WQC, to monitor compliance with state water quality criteria.
2. Continuously release flow to the upper Lewis River bypassed reach through the existing flow release device in Swift No. 2 canal, upon completion of canal reconstruction.
3. In conjunction with the Swift No. 1 Project, design and construct a new flow release structure from Swift No. 2 canal to the upper Lewis River bypassed

³³ See section 2.1.2 and table 2.1-2 for a further description of these measures.

³⁴ Management goals and objectives would change according to the management goals and objectives included in the proposed WHMP, which includes Devil's Backbone.

³⁵ See section 2.1.3 and table 2.1-4 for a further description of these measures.

reach; interim release schedule, when combined with the 47 cfs from the above measure would be 7/1–10/31, 60 cfs; 11/1–1/31, 100 cfs; 2/1–6/30, 75 cfs; and file for Commission approval a combined release schedule *by the first anniversary of Swift No. 2 license issuance.*

4. In conjunction with the Swift No. 1 Project, develop an adult salmon and steelhead trap and transport facility above Yale Lake (assumed to be at Swift No. 2 tailrace), once upstream fish passage is established at the downstream projects.
5. In conjunction with the Swift No. 1 Project (installation by PacifiCorp), assist in the installation of a modular surface collector system with guide walls and nets at the Swift No.1 dam; collect downstream migrating salmon and steelhead smolts, sort, mark a subsample, and truck to a release pond below Merwin dam; and release bull trout (if they reach a defined smolt-like development phase) to Yale Lake or to the lower river.
6. In conjunction with other projects, develop and implement a hatchery supplementation plan for spring Chinook, steelhead, and coho; target production to return 12,800 spring Chinook, 13,200 steelhead, and 60,000 coho pre-harvest adult ocean recruits; and reduce production on a 1:1 basis when natural production exceeds settlement threshold levels.
7. In conjunction with the Swift No. 1 Project, assist in transporting supplementation spring Chinook and steelhead juveniles above Swift dam for 10 years after completion of Swift downstream collection facility.
8. In conjunction with the Swift No. 1 Project, assist in transporting supplementation coho juveniles above Swift dam for 6 years after completion of the Swift downstream collection facility.
9. In conjunction with other projects, fund upgrades and maintenance to the Lewis River hatcheries.
10. In conjunction with the Swift No. 1 Project, assist in placement of juvenile acclimation sites above Swift Creek reservoir if there are suitable and accessible sites.
11. In conjunction with other projects, update the Hatchery and Supplementation Plan.
12. In conjunction with other projects, fund production of no more than 20,000 pounds of rainbow trout annually for placement in Swift Creek reservoir.
13. Manage conservation covenants for bull trout on Cowlitz PUD lands.
14. In conjunction with the Swift No. 1 Project, construct a channel with enhanced habitat features in the Lewis River bypassed reach to maximize benefits of releases from the existing release device in Swift No. 2 canal.
15. In conjunction with other projects, implement aquatic resource protection measures to benefit fish recovery, support the reintroduction of anadromous fish, and enhance fish habitat in the Lewis River Basin, with priority given to the North Fork Lewis River (the Aquatic Enhancement Fund). *Measures*

should provide a demonstrated benefit to resources affected by project structures or operations. To ensure project nexus, the annual report describing proposed resource projects (as required by section 7.5.3.2 of the SA) should be filed with the Commission for approval, so that approval can be made on a suite of measures for the following year.

16. In conjunction with other projects, develop monitoring and evaluation plans for aquatic measures and monitor performance of upstream and downstream fish passage facilities and bull trout collections; subsample and tag outmigrants from the project downstream transport facility; monitor anadromous hatchery returns; and evaluate status of ESA-listed anadromous species and bull trout.
17. In conjunction with other projects, perform Phase I and Phase II Status Checks, to determine if anadromous fish reintroduction goals are being met, 27 and 37 years after the issuance of all the licenses.
18. Develop and implement WHMPs on project lands using the previous HEP analysis as the baseline.
19. Assist with acquiring interests in land to protect wildlife habitat, in order to meet the objectives of the Wildlife Habitat Management Plan, on lands within five miles of the Swift No. 1 and Swift No. 2 project boundaries (the Swift No. 1 and Swift No. 2 Land Acquisition and Habitat Protection Fund – funding by PacifiCorp). *Interests in land should provide a demonstrated benefit to resources affected by project structures or operations. To ensure project nexus, the “annual plan” prepared under section 10.8.3 of the SA, should also be filed with the Commission for approval, after the plan has been approved by the TCC.*
20. In conjunction with other projects, assist with acquisition or enhancement of wildlife habitat anywhere in the Lewis River Basin in the vicinity of the projects to meet the objectives of the Wildlife Habitat Management Plan (the Lewis River Land Acquisition and Habitat Enhancement Fund – funding by PacifiCorp). *Interests in land should provide a demonstrated benefit to resources affected by project structures or operations. To ensure project nexus, the “annual plan” prepared under section 10.8.3 of the SA should also be filed with the Commission for approval, after the plan has been approved by the TCC.*
21. Buffer sensitive aquatic and terrestrial habitat from ground-disturbing activities (timber harvest, construction, etc.).
22. Monitor the effectiveness of the WHMP in improving wildlife habitat using the HEP.
23. Develop and implement measures to maintain existing aquatic connectivity and control runoff and erosion from roads through Cowlitz PUD lands on Devil’s Backbone.

24. Implement BMPs to protect sensitive species and habitats during construction activities.
25. Allow managed recreational access to project lands except where conditions are unsafe.
26. Develop and implement an I&E program, including information about protecting bull trout.
27. Seasonally install portable restrooms at Swift No. 2 canal.
28. Manage parking at the Swift No. 2 fishing facility.
29. Construct a barrier-free concrete fishing pier at the Swift No. 2 canal.
30. Renovate Eagle Cliff Park.
31. In conjunction with other projects, develop the Visitor Information Center near Cougar (total contribution of \$75,000 or enter into maintenance agreement).
32. In conjunction with the Swift No. 1 Project, make a one-time payment of \$10,100 for repair of the FR 90 road bridge over the Swift No. 2 canal (Cowlitz PUD's share is \$2,626).

In addition to the applicant-proposed project-related environmental measures listed above, we recommend including the following staff-recommended environmental measures in any license issued for the Swift No. 2 Project:

1. Include lands acquired with the habitat acquisition and protection/enhancement funds, and all other lands to be managed under the WHMP, within the project boundary, including the Devil's Backbone parcel.
2. Include the proposed Visitor Information Center in the project boundary for one of the projects (the Yale Project would be in closest proximity).

5.1.3 Yale Project

We evaluate numerous recommendations in the resource sections of this EIS and, given the environmental benefits, we recommend including the following measures that PacifiCorp proposes in any license issued by the Commission for the Yale Project.

Continue the following measures currently being implemented under the existing license.³⁶

1. Periodically monitor TDG in project tailrace.
2. Maintain flood management storage of 70,000 acre-feet, in conjunction with other Lewis River Projects.
3. Maintain the current high runoff procedure from November 1 to April 1.

³⁶ See section 2.1.2 and table 2.1-2 for a further description of these measures.

4. Net bull trout in the Yale tailrace, and transport to Cougar Creek following NMFS and FWS facility and handling guidelines for anadromous fish and bull trout.
5. In conjunction with other Lewis River Projects, maintain current salmon and steelhead smolt production levels (3,125,000) to achieve a goal of 92,000 ocean recruits.
6. In conjunction with other Lewis River Projects, maintain current production levels for kokanee and rainbow trout.
7. Annually evaluate bull trout and kokanee populations.
8. Buffer sensitive aquatic and terrestrial habitat from ground-disturbing activities (timber harvest, construction, etc.).
9. Manage designated conservation lands on Cougar Creek for the protection of bull trout.
10. Maintain road closures through sensitive habitat areas by installing and maintaining gates and identify additional areas for access control on PacifiCorp lands.
11. Manage PacifiCorp lands outside the MWHMA to benefit wildlife habitat.³⁷
12. Continue to manage project roads to maintain existing aquatic connectivity and control runoff and erosion.
13. Conduct annual raptor nest surveys on PacifiCorp lands.
14. Allow recreational access to project lands except where conditions are unsafe.
15. Continue to operate existing recreation and river access sites.
16. Re-gravel group campsites and roads at Beaver Bay Campground and Cougar Park (Yale interim measure).³⁸
17. Improve the boat launches at Speelyai Bay Park, Yale Park, and Beaver Bay Campground (Yale interim measure).
18. Provide trails and an interpretive sign at Beaver Bay wetland (Yale interim measure).
19. Upgrade barrier-free facilities when developed recreation sites are improved.
20. Preserve tribal access for traditional uses.
21. In consultation with the Washington SHPO, conduct archeological surveys of areas with high potential for cultural resources proposed for soil disturbances that have not been previously surveyed or disturbed.

The SA includes several new or continuing measures related to protection and enhancement of aquatic and terrestrial habitat, maintenance and restoration of

³⁷ Future management of these lands would fall under the proposed PacifiCorp WHMP.

³⁸ Yale interim measure PacifiCorp agreed to implement prior to issuance of new license for the Yale Project.

anadromous fish species in the Lewis River Basin, improvements to existing recreational facilities, improved flood protection, and cultural resource and socioeconomic enhancements. We recommend the following new or continuing measures agreed to in the SA be included in any license issued for the Yale Project, and according to the schedule in the SA:³⁹

1. Develop a Water Quality Management Plan as required by the 401 WQC, to monitor compliance with state water quality criteria.
2. In conjunction with other projects, maintain 17 feet of flood management storage, develop and implement a forecast-based high runoff procedure, reduce the flood management season by 2 weeks, and provide funding to authorities responsible for flood notification.
3. Net bull trout in the Yale tailrace, and transport to Cougar Creek twice per week during migratory periods. Investigate alternative measures for trapping bull trout.
4. Develop trap and transport facility for adult salmon and steelhead at Yale in accordance with the SA schedule.
5. Construct modular surface collector and transport facilities for salmon and steelhead smolts at Yale in accordance with the SA schedule.
6. Modify the Yale spillway to improve downstream resident fish survival during spill events.
7. Install barrier nets in Yale and Merwin forebays to reduce bull trout entrainment up to and until the modular surface collector is installed.
8. In conjunction with other projects, construct a release pond for downstream-migrating smolts downstream of Merwin dam.
9. Construct a bull trout collection facility if anadromous fish facilities are not constructed.
10. In conjunction with other projects, develop and implement a hatchery supplementation plan for spring Chinook, steelhead, and coho; target production to return 12,800 spring Chinook, 13,200 steelhead, and 60,000 coho pre-harvest adult ocean recruits; and reduce production on a 1:1 basis when natural production exceeds settlement threshold levels.
11. In conjunction with other projects, transport supplementation spring Chinook and steelhead juveniles above Swift dam for 10 years after completion of Swift downstream collection facility.
12. In conjunction with other projects, transport supplementation spring Chinook, coho, and steelhead juveniles to Yale Lake and Lake Merwin.

³⁹ See section 2.1.3 and table 2.1-4 for a further description of these measures.

13. In conjunction with other projects, transport supplementation adult spring Chinook, coho, and steelhead above Swift through the term of the new license, and as directed to Yale Lake and Lake Merwin.
14. In conjunction with other projects, fund upgrades and maintenance to all three Lewis River hatcheries.
15. In conjunction with other projects, place temporary juvenile acclimation sites above Swift Creek reservoir if suitable and accessible sites are available.
16. In conjunction with other projects, update the Hatchery and Supplementation Plan.
17. In conjunction with other projects, fund production of no more than 20,000 pounds of rainbow trout annually for placement in Swift Creek reservoir.
18. In conjunction with other projects, manage conservation covenants for bull trout.
19. Implement Habitat Preparation Plan, releasing hatchery salmonids into each reservoir to prepare habitat for anadromous fish re-introduction, 4 years prior to construction of anadromous fish collection facilities.
20. In conjunction with other projects, implement aquatic resource protection measures to benefit fish recovery, support the reintroduction of anadromous fish, and enhance fish habitat in the Lewis River Basin, with priority given to the North Fork Lewis River (the Aquatic Enhancement Fund). *Measures should provide a demonstrated benefit to resources affected by project structures or operations. To ensure project nexus, the annual report describing proposed resource projects (as required by section 7.5.3.2 of the SA) should be filed with the Commission for approval, so that approval can be made on a suite of measures for the following year.*
21. Monitor kokanee populations in Yale Lake each fall.
22. In conjunction with other projects, develop monitoring and evaluation plans for aquatic measures and monitor performance of upstream and downstream fish passage facilities and bull trout collections; subsample and tag outmigrants from the project downstream transport facility; monitor anadromous fish hatchery returns; and evaluate status of ESA-listed anadromous species and bull trout.
23. In conjunction with other projects, perform Phase I and Phase II Status Checks, to determine if anadromous fish reintroduction goals are being met, 27 and 37 years after the issuance of all the licenses.
24. Develop and implement WHMPs on project lands using the previous HEP analysis as the baseline.
25. Acquire interests in land to protect wildlife habitat in the vicinity of the Yale Project (the Yale Land Acquisition and Habitat Protection Fund). *Interests in land should provide a demonstrated benefit to resources affected by project structures or operations. To ensure project nexus, the “annual plan”*

prepared under section 10.8.3 of the SA should also be filed with the Commission for approval, after the plan has been approved by the TCC.

26. Implement a timber management program on PacifiCorp lands, if applicable under the WHMP.
27. In conjunction with other projects, acquire or enhance wildlife habitat anywhere in the Lewis River Basin in the vicinity of the projects to meet the objectives of the Wildlife Habitat Management Plan (the Lewis River Land Acquisition and Habitat Enhancement Fund). *Interests in land should provide a demonstrated benefit to resources affected by project structures or operations. To ensure project nexus, the “annual plan” prepared under section 10.8.3 of the SA, should also be filed with the Commission for approval, after the plan has been approved by the TCC.*
28. Reduce dispersed campsites in shoreline and riparian areas and post visitor use rules.
29. Monitor the effectiveness of the WHMP in improving wildlife habitat using the HEP.
30. Continue to manage roads on project lands to control runoff and erosion; develop a culvert replacement plan and schedule, *for culverts associated with project roads and facilities*, to reduce barriers to wildlife and improve aquatic and riparian habitat connectivity.
31. Monitor dispersed camping and day use on PacifiCorp lands.
32. Implement BMPs to protect sensitive species and habitats during construction activities.
33. Allow managed recreational access to project lands except where conditions are unsafe.
34. Finalize the RRMP as directed by the Commission and implement the recreation measures described therein.
35. Increase visitor management controls, such as additional signs, barriers and enforcement.
36. Develop and implement an I&E program, including information about protecting bull trout.
37. Install interpretative signs at Beaver Bay wetland.
38. Provide earlier public notice that project recreation sites are full.
39. Discourage dispersed upland camping and motorized use on project lands.
40. Eliminate some shoreline campsites at Yale, and harden and manage others.
41. Expand Cougar Camp when monitoring establishes a sustained need. At Cougar, accomplish this by closing the boat ramp and converting parking areas to campsites; renovate Cougar Camp.
42. Redesign Beaver Bay Campground, and replace older restrooms.
43. Allow public use of RV holding tank dump sites in PacifiCorp campgrounds for a fee.

44. Provide four new picnic shelters at Yale Lake.
45. Increase separation between wetland and day-use parking area at Beaver Bay day-use area.
46. Formalize Saddle Dam Trailhead parking for horse trailers.
47. Develop non-motorized trail link from Saddle Dam Park to Saddle dam area trails. Develop shoreline trail from Cougar Camp to Beaver Bay Campground. If feasible, improve the Yale-IP Road as a non-motorized recreation trail.
48. Improve boat launch facilities at Yale Park and Beaver Bay.
49. Improve barrier-free accessibility at upgraded facilities.
50. Implement an HPMP.
51. Protect the integrity of properties listed in the National Register.
52. Contribute cultural information to an I&E program.
53. Curate artifacts at a secure location in the basin.
54. In conjunction with other projects, contribute to county-developed installation and maintenance of emergency phone system for flood notification.
55. In conjunction with the other projects, reimburse NOAA for the installation and maintenance of a weather radio transmitter to notify the public of flood events.
56. In conjunction with other projects, develop the Visitor Information Center near Cougar (total contribution of \$75,000 or enter into maintenance agreement).
57. In conjunction with other projects, conduct a feasibility study and construct a new barrier-free bank fishing facility at one of the following locations: the Lewis River between Merwin dam and the Island River access site, Swift Reservoir, Yale Lake, or Lake Merwin.

In addition to the applicant-proposed project-related environmental measures listed above, we recommend including the following staff-recommended environmental measures in any license issued for the Yale Project:

1. In the event that proposed fish passage facilities are not feasible or appropriate, and the licensees elect to implement measures in lieu of fish passage, prepare, for Commission approval, a report that presents the rationale for how the decision to forego fish passage was made, and a plan that describes the procedures for determining which specific measures in lieu of fish passage would be implemented and how those measures would provide a demonstrated benefit to resources affected by project structures or operations. The licensees would also file annual plans for Commission approval describing all plans and measures in lieu of fish passage proposed for funding in the following year.

2. Include lands acquired with the habitat acquisition and protection/enhancement funds, and all other lands to be managed under the WHMP, within the project boundary.
3. Include the proposed Visitor Information Center in the project boundary for one of the projects (the Yale Project would be in closest proximity).
4. Develop the proposed barrier-free shoreline fishing site within the project boundary (it may also fall within another project boundary if located at another project).

5.1.4 Merwin Project

We evaluate numerous recommendations in the resource sections of this EIS and, given the environmental benefits, we recommend including the following measures that PacifiCorp proposes in any license issued by the Commission for the Merwin Project.

Continue the following measures currently being implemented under the existing license:⁴⁰

1. Set downramping rates to 2 inches/hour, and maintain minimum flow releases below Merwin in accordance with Article 49 of the existing license, with the exceptions as described below under the proposed settlement measures.
2. Maintain flood management storage of 70,000 acre-feet, in conjunction with other Lewis River Projects.
3. Maintain the current high runoff procedure from November 1 to April 1.
4. Follow NMFS and FWS facility and handling guidelines for anadromous fish and bull trout.
5. Operate the upstream adult salmon and steelhead collection trap at Merwin dam.
6. In conjunction with other Lewis River Projects, maintain current salmon and steelhead smolt production levels (3,125,000) to achieve a goal of 92,000 ocean recruits.
7. In conjunction with other Lewis River Projects, maintain current production levels for kokanee and rainbow trout.
8. Support the WDFW annual evaluation of fall Chinook in the lower Lewis River.
9. In conjunction with other Lewis River Projects, annually evaluate bull trout and kokanee populations.
10. Continue implementation of the Merwin WHMP in the MWHMA.⁴¹

⁴⁰ See section 2.1.2 and table 2.1-2 for a further description of these measures.

⁴¹ Future management of the MWHMA would fall under the proposed PacifiCorp WHMP.

11. Buffer sensitive aquatic and terrestrial habitat from ground-disturbing activities (timber harvest, construction, etc.).
12. Maintain road closures through sensitive habitat areas by installing and maintaining gates, and identify additional areas for access control on PacifiCorp lands.
13. Manage PacifiCorp lands to benefit wildlife habitat.
14. Continue annual raptor surveys on PacifiCorp lands.
15. Continue to manage project roads to maintain existing aquatic connectivity and control runoff and erosion.
16. Improve the boat launch at Speelyai Bay Park.
17. Upgrade ADA-accessible facilities when developed recreation sites are improved.
18. Preserve tribal access for traditional uses.
19. In consultation with the Washington SHPO, conduct archeological surveys of areas with high potential for cultural resources proposed for soil disturbances that have not been previously surveyed or disturbed.

The SA includes several new or continuing measures related to protection and enhancement of aquatic and terrestrial habitat, maintenance and restoration of anadromous fish species in the Lewis River Basin, improvements to existing recreational facilities, improved flood protection, and cultural resource and socioeconomic enhancements. We recommend the following new or continuing measures agreed to in the SA be included in any license issued for the Merwin Project, and according to the schedule in the SA:⁴²

1. Develop a Water Quality Management Plan as required by the 401 WQC, to monitor compliance with state water quality criteria.
2. Maintain downramping rates at Merwin of 2 inches/hour except as follows: no downramping from 2/16–6/15 one hour before and after sunrise, and one hour before and after sunset. Limit upramping to 1.5 feet per hour.
3. Follow plateau operation procedures between February 16 and August 15. Changes in flow are to be consistent with ramping restrictions at or below flows of 8,000 cfs, and flow changes limited to no more than one change in any 24-hour period, 4 times in any 7-day period, or 6 times per month.
4. Provide minimum flows below Merwin ranging from 4,200 cfs (November 1 to December 15) to 1,200 cfs (July 31 to October 12), in the 10 seasonal steps described in section 6.2.4 of the SA.
5. In conjunction with other projects, maintain 17 feet of flood management storage, develop and implement a forecast-based high runoff procedure,

⁴² See section 2.1.3 and table 2.1-4 for a further description of these measures.

- reduce flood management season by 2 weeks, and provide funding to authorities responsible for flood notification.
6. Improve efficiency and safety of the existing Merwin trap, and add a new sorting and truck loading facility.
 7. Transport adult spring Chinook, coho, and steelhead from the Merwin sorting facility to Swift Creek reservoir. Transport bull trout to a location in Yale Lake or as directed by FWS.
 8. Install interim barrier nets in Merwin forebay to reduce bull trout entrainment up to and until the modular surface collector is installed.
 9. Construct modular surface collector and transport facilities for salmon and steelhead smolts at Merwin dam.
 10. In conjunction with other projects, construct a smolt release pond downstream of Merwin dam.
 11. Construct a bull trout collection facility if an improved anadromous fish collection facility is not constructed.
 12. In conjunction with other projects, develop and implement a hatchery supplementation plan for spring Chinook, steelhead, and coho; target production to return 12,800 spring Chinook, 13,200 steelhead, and 60,000 coho pre-harvest adult ocean recruits; and reduce production on a 1:1 basis when natural production exceeds settlement threshold levels.
 13. Transport supplementation spring Chinook, steelhead, and coho juveniles to Lake Merwin for 10 years after completion of the Merwin downstream collection facility.
 14. In conjunction with other projects, transport supplementation adult spring Chinook, coho, and steelhead above Swift through the term of the new license and as directed to Yale Lake and Lake Merwin.
 15. In conjunction with other projects, fund upgrades and maintenance to all three Lewis River hatcheries.
 16. Place temporary juvenile acclimation sites in tributaries to Yale Lake and Lake Merwin.
 17. In conjunction with other projects, update the Hatchery and Supplementation Plan.
 18. In conjunction with other projects, fund production of no more than 20,000 pounds of rainbow trout annually for placement in Swift Creek reservoir.
 19. Fund production of no more than 12,500 pounds of kokanee annually for placement in Lake Merwin.
 20. In conjunction with other projects, manage conservation covenants for bull trout.
 21. In conjunction with other projects, implement the Habitat Preparation Plan, releasing hatchery salmonids into each reservoir to prepare habitat for

anadromous fish re-introduction, 4 years prior to anadromous fish collection facilities being constructed.

22. Conduct LWD study downstream of Merwin dam.
23. Conduct a gravel augmentation program downstream of Merwin dam, to include monitoring to determine baseline gravel availability downstream of the dam, with a program for supplementation if monitoring shows levels are decreasing over the current baseline.
24. In conjunction with other projects, implement aquatic resource projection measures to benefit fish recovery, support the reintroduction of anadromous fish, and enhance fish habitat in the Lewis River Basin, with priority given to the North Fork Lewis River (the Aquatic Enhancement Fund). *Measures should provide a demonstrated benefit to resources affected by project structures or operations. To ensure project nexus, the annual report describing proposed resource projects (as required by Section 7.5.3.2 of the SA) should be filed with the Commission for approval, so that approval can be made on a suite of measures for the following year.*
25. Support the WDFW annual evaluation of fall Chinook and chum in lower Lewis River.
26. In conjunction with other projects, develop monitoring and evaluation plans for aquatic measures and monitor performance of upstream and downstream fish passage facilities; monitor adult salmonid migration and spawning below Merwin; subsample and tag outmigrants from the project downstream transport facility; monitor anadromous fish hatchery returns; complete limiting factors analysis for bull trout in Lake Merwin; conduct a stranding study below Merwin dam; evaluate status of ESA-listed anadromous species and bull trout; and conduct a study on effects of predation on introduced salmonids in Lake Merwin.
27. In conjunction with other projects, perform Phase I and Phase II Status Checks, to determine if anadromous fish reintroduction goals are being met, 27 and 37 years after the issuance of all the licenses.
28. Develop and implement the WHMP on project lands using the previous HEP analysis as the baseline.
29. In conjunction with other projects, acquire or enhance wildlife habitat anywhere in the Lewis River Basin in the vicinity of the projects in order to meet the objectives of the Wildlife Habitat Management Plan (the Lewis River Land Acquisition and Habitat Enhancement Fund). *Interests in land should provide a demonstrated benefit to resources affected by project structures or operations. To ensure project nexus, the “annual plan” prepared under section 10.8.3 of the SA, should also be filed with the Commission for approval, after the plan has been approved by the TCC.*
30. Reduce dispersed campsites in shoreline and riparian areas, and post visitor use rules.

31. Monitor the effectiveness of the WHMP in improving wildlife habitat using the HEP.
32. Maintain existing road closures through sensitive habitat areas by installing and maintaining gates, and identify additional areas for access control on PacifiCorp lands.
33. Implement a timber management program on PacifiCorp lands, if applicable, under the WHMP.
34. Continue to manage roads on project lands to control runoff and erosion; develop a culvert replacement plan and schedule, *for culverts associated with project roads and facilities*, to reduce barriers to wildlife and improve aquatic and riparian habitat connectivity.
35. Monitor dispersed camping and day use on PacifiCorp lands.
36. Implement BMPs to protect sensitive species and habitats during construction activities.
37. Finalize the RRMP as directed by the Commission, and implement the recreation measures described therein.
38. Increase visitor management controls, such as additional signs, barriers, and enforcement.
39. Allow managed recreational access to project lands except where conditions are unsafe.
40. Develop and implement an I&E program, including information about protecting bull trout.
41. Provide earlier public notice that project recreation sites are full.
42. Discourage dispersed upland camping and motorized use on project lands.
43. Prohibit shoreline camping at Lake Merwin.
44. Allow public use of RV holding tank dump sites in PacifiCorp campgrounds for a fee.
45. Maintain existing development and provide one single-vault toilet at the PacifiCorp-owned Merwin Hatchery river access site.
46. Provide two new picnic shelters at Merwin Park.
47. Upgrade restrooms and parking at Speelyai Bay Park (make barrier-free); keep Cresap Bay Park open through September; and provide volleyball courts, horseshoe pits, and children's play structure at Merwin Park.
48. Bring Marble Creek trail up to barrier-free standards, and evaluate feasibility of trail easement to Lake Merwin for Clark County.
49. Improve boat launch facilities at Speelyai Bay, develop a primitive take-out site at Yale Bridge for non-motorized watercraft, and develop river access at the "Switchback" property when use levels reach capacity below Merwin dam.
50. Improve barrier-free accessibility at upgraded facilities.
51. Implement an HPMP.

52. Protect the integrity of properties listed in the National Register.
53. Contribute cultural information to an I&E program.
54. Curate artifacts at a secure location in the basin.
55. In conjunction with other projects, contribute to county-developed installation and maintenance of an emergency phone system for flood notification.
56. In conjunction with the other projects, reimburse NOAA for the installation and maintenance of a weather radio transmitter to notify the public of flood events.
57. In conjunction with other projects, develop the Visitor Information Center near the town of Cougar (total contribution of \$75,000 or enter into maintenance agreement).
58. In conjunction with other projects, conduct a feasibility study and construct a new barrier-free bank fishing facility at one of the following locations: the Lewis River between Merwin dam and the Island River access site, Swift Reservoir, Yale Lake, or Lake Merwin.

In addition to the applicant-proposed project-related environmental measures listed above, we recommend including the following staff-recommended environmental measures in any license issued for the Merwin Project:

1. In the event that proposed fish passage facilities are not feasible or appropriate, and the licensees elect to implement measures in lieu of fish passage, prepare, for Commission approval, a report that presents the rationale for how the decision to forego fish passage was made, and a plan that describes the procedures for determining which specific measures in lieu of fish passage would be implemented and how those measures would provide a demonstrated benefit to resources affected by project structures or operations. The licensees would also file annual plans for Commission approval describing all plans and measures in lieu of fish passage proposed for funding in the following year.
2. Include lands acquired with the habitat acquisition and protection/enhancement funds, and all other lands to be managed under the WHMP, within the project boundary, including the MWHMA.
3. Include the proposed Visitor Information Center in the project boundary for one of the projects (the Yale Project would be in closest proximity).
4. Develop the proposed barrier-free shoreline fishing site within the project boundary (it may also fall within another project boundary if located at another project).

5.1.5 Rationale for Staff Recommendations

This section describes the rationale for some of our recommendations on measures that we conclude should be included as conditions of any licenses issued, as well as any measures that we do not recommend as license conditions. This section is arranged by major resource topic, and within each topic we discuss each of the projects or provide our rationale for recommending or not recommending specific measures. In general, even though we recommend settlement measures with specific dollar limitations (i.e., the Aquatics Fund), it is important for all entities involved to know that we consider the licensees' obligation to be to complete the measures required by license articles, in the absence of authorization from the Commission to the contrary. Dollar figures agreed to by the parties are not absolute limitations.

Anadromous Fish Reintroduction Measures

Summary of the SA Measures for Anadromous Species

The major goal of sections 4 through 9 of the SA⁴³ is the restoration of anadromous salmonids to the Lewis River Basin, “to achieve genetically viable, self-sustaining, naturally reproducing, harvestable populations above Merwin dam greater than minimum viable populations” (section 3.1 of the SA). Section 3 describes the goals of the anadromous fish restoration program and also provides for Phase I and Phase II Status Checks, 27 and 37 years after the licenses are issued, to determine if restoration goals are being met, and to take appropriate actions if goals are not being met. Section 4 includes measures that would provide for upstream and downstream fish passage through the four projects, to be implemented in a phased approach over specific time periods, ranging from 1 to 17 years after issuance of the licenses. Section 5 of the SA has measures related to bull trout enhancement and public information programs for both bull trout and the anadromous fish programs. Section 6 includes provisions for flow releases in the Lewis River bypassed reach below Swift dam, and flow releases, ramping rates, and plateau operations below Merwin dam. Section 7 provides for several aquatic habitat enhancement actions, including a LWD debris program, spawning gravel study and augmentation plan, a predator study, habitat preparation plan, an Aquatics Fund (to support resource protection measures), and an In-Lieu Fund (to be implemented if the agencies determine that fish passage facilities are not required at some projects). Section

⁴³ Sections 4 through 13 of the SA contain the major “action items” of the agreement, with sections 4 through 9 devoted to aquatic resources, section 10 containing measures for terrestrial resources, section 11 for recreation measures, section 12 outlines flood management operations, and section 13 includes measures for cultural resources and socioeconomics. Sections 1 through 3 describe the purposes and goals of the agreement and the regulatory actions required, while sections 14 through 17 include the coordination and decision-making provisions, dispute-resolution procedures, and general provisions regarding the execution of the agreement.

8 is the Hatchery and Supplementation Program, which provides specific hatchery production targets, a program to maintain and upgrade the existing hatcheries, a supplementation program for both juvenile and adult salmonids (these are fish in excess of hatchery production that are released in the upper watershed to spawn and rear naturally), and a resident trout and kokanee hatchery production program. Section 9 of the SA is the Aquatic Monitoring and Evaluation Program, which provides for water quality and flow monitoring and for assessing the results of the upstream and downstream passage measures, the Hatchery and Supplementation Program, the bull trout program, and resident fish programs.

The anadromous fish restoration measures are a major part of the SA and would mitigate for the continuing effects of the Lewis River Projects on anadromous fish resources in the Lewis River Basin. Although mitigation for original project effects was provided, mostly in the form of the construction of the fish hatcheries in the basin, the SA further enhances those mitigation efforts by providing for increased hatchery production and reintroduction of anadromous species into habitat in the upper basin that fish have been unable to access due to the presence of the projects. Although the costs for these measures would be high (see below), the potential benefits of restoring these valuable fisheries (including listed species) also would be considerable. Currently, anadromous species are limited to the lower 19 miles of the Lewis River, and the fishery for these species is concentrated in that reach. The proposed restoration program would provide these species access to about 174 miles of potential habitat within the basin, likely resulting in larger populations and providing fishing opportunities throughout the basin. These measures should be required as conditions of the licenses for the Lewis River Projects.

Effects of SA Anadromous Fish Measures on Project Economics

For the Swift No. 1 Project, the major costs for the anadromous fish program and associated aquatic habitat enhancement measures would be the flow release structure from the Swift No. 2 canal; the side channel habitat enhancement in the Lewis River bypassed reach; the Aquatic Enhancement Fund; the modular floating surface collector in the forebay; the smolt release pond downstream of Merwin dam; the trap and transport facility to be constructed in year 17 of the license; and the hatchery upgrades. These measures would have a total annualized capital cost of about \$10.0 million (see table 4.2-2) and would reduce the net benefits of the project by that amount.

For the Swift No. 2 Project, the major costs for the anadromous fish program and associated aquatic habitat enhancement measures would be the side channel habitat enhancement in the Lewis River bypassed reach; the trap and transport facility to be constructed in year 17 of the license; and the hatchery upgrades. These measures would have a total annualized capital cost (Cowlitz PUD's share of the cost for these measures) of about \$196,500 (see table 4.2-5) and would reduce the net benefits of the project by that amount.

For the Yale Project, the major costs for the anadromous fish program and associated aquatic habitat enhancement measures would be modifying the Yale spillway to improve downstream fish passage survival; installing interim barrier nets to reduce fish entrainment into the powerhouse; the Aquatic Enhancement Fund; the modular floating surface collector and fish transport facility; the adult trap and transport facility to be constructed in year 17 of the license; and the hatchery upgrades. These measures would have a total annualized capital cost of about \$4.0 million (see table 4.2-3) and would reduce the net benefits of the project by that amount.

For the Merwin Project, the major costs for the anadromous fish program and associated aquatic habitat enhancement measures would be installing interim barrier nets to reduce fish entrainment into the powerhouse; the Aquatic Enhancement Fund; the modular floating surface collector and fish transport facility to be constructed in year 17 of the license; the improvements to the existing adult trap and transport facility; and the hatchery upgrades. These measures would have a total annualized capital cost of about \$3.4 million (see table 4.2-4), and would reduce the net benefits of the project by that amount.

Although these costs for the four projects are relatively high, we conclude, in section 3.3.3.2, *Aquatic Resources*, that the Lewis River Basin upstream of Swift would have about 67 percent of the potentially available anadromous fish habitat in the basin, and could produce up to 76 percent of the potential salmon and steelhead production in the basin upstream of Merwin dam. Including the four projects in the anadromous fish restoration efforts, including providing fish passage, would appear to be essential to the potential success of the program. The additional hatchery production would also act to “jump start” the restoration efforts.

Aquatic Habitat Enhancement Measures

Aquatics Fund

One component of section 7 of the SA, however, that must be further qualified is the Aquatics Fund. Section 7.5.3.1 states that the fund may be used for projects that would benefit fish recovery throughout the North Fork Lewis River, with priority to federal ESA-listed species; support the reintroduction of anadromous fish throughout the basin; and enhance fish habitat in the Lewis River Basin, with priority given to the North Fork Lewis River. While it is likely that many programs under this fund may be tied directly to project effects, if this fund is to be made a condition of the license, it should only be used for measures that provide a demonstrated benefit to resources affected by project structures and operations, and any measures to be supported by the fund must be approved by the Commission. Many of the commenters on the draft EIS were concerned that Commission approval of every project will significantly impede the effectiveness of the fund, and would be a cumbersome process. We agree and therefore now recommend that the strategic plan and the annual report describing proposed resource projects (as required by section 7.5.3.2 of the SA) be filed with the Commission for approval, so that

approval can be made on a suite of projects for the following year, instead of individually.

Therefore, we recommend the implementation of resource projects under the Aquatics Fund with the clarifications above. Aquatic habitat enhancement measures with the objectives stated in the SA are appropriate. Furthermore, the dollar amounts outlined in the SA seem reasonable, and we expect that the implementation of the necessary resource projects may cost approximately \$5.2 million, as outlined in the SA. Specific projects earmarked for the fund include a total of \$600,000 for bull trout enhancement measures; \$20,000 per year for maintenance of the constructed habitat channel in the Lewis River bypassed reach; a total of \$400,000 to address reservoir survival of juvenile anadromous fish if monitoring indicates that survival is not adequate; and \$10,000 annually for lower river projects to benefit anadromous species. Additional funding would be available for projects to assist in the recovery of federally listed species, support the reintroduction of anadromous species, and enhance fish habitat in the North Fork Lewis River. The total funding to be made available by this measure would be a reasonable amount for the stated objectives and the projects identified for support.

In Lieu Fund

Similarly, section 7.6 of the SA includes the In Lieu Fund, which is to be provided in the future only if NMFS and FWS determine that anadromous species need not be released into Lake Merwin or Yale Lake via fish passage facilities, and the funds would be used to support other anadromous fish mitigation measures in lieu of providing fish passage facilities. Because this is a contingency fund that may or may not occur, we are unable to determine what measures would be supported by this fund or whether they would be directly tied to effects of the projects or their operations. Furthermore, it is unclear what circumstances would be the basis for the fund's implementation. Therefore, we are not recommending that the In Lieu Fund be made a condition of the licenses.

Commenters on the draft EIS, in response to our recommendation on the In Lieu Fund, clarified that section 4.1.9 of the SA (Review of New Information provision) provides the process for making the decision to implement the Fund. Under that section the licensees would inform the Commission of any determination by the Services that one or more of the fish passage facilities would not be built, and that PacifiCorp would provide funds for projects in lieu of fish passage. Based on that clarification, we conclude that section 4.19 could also provide the mechanism for the Commission to approve the decision to forego fish passage and implement measures in lieu of fish passage. That would alleviate our concern that implementation of measures in lieu of fish passage would not have a clear nexus to the projects or proceed without Commission approval.

Therefore, if monitoring indicates that proposed fish passage facilities are not feasible or appropriate, and the licensees are proposing measures in lieu of fish passage, we are recommending that the licensees file, for Commission approval, a report that

presents the rationale for how the decision to forego fish passage was made, and a plan that describes the procedures for determining which specific measures in lieu of fish passage would be implemented. The plan should describe how those measures would provide a demonstrated benefit to resources affected by project structures or operations and how they would meet the objective of achieving benefits to anadromous fish populations equivalent to or greater than benefits that would have occurred if passage had been provided. We also recommend Commission approval of all plans and measures in lieu of fish passage that are proposed, before they are implemented, and that all proposed measures demonstrate a clear nexus to the projects or project effects. The licensees should annually develop and submit for Commission approval a plan that describes all plans and measures proposed for funding in the following year. This plan could be prepared as part of the annual report required by section 7.6 of the SA. Thus, while we are recommending the intent of the In Lieu Fund, that is, implementation of measures necessary to protect and enhance Lewis River salmonid populations in lieu of fish passage, we are not recommending that the \$30 million earmarked for the Fund by the SA be included as a license condition, because of the unknown nature of what measures would be implemented, or their costs.

Spawning Gravel Monitoring and Augmentation

Section 7 of the SA provides for a spawning gravel study, annual monitoring, and gravel augmentation (if determined to be necessary) for the river reaches below Merwin dam. In the draft EIS, we did not recommend that the spawning gravel study, annual monitoring, and the augmentation plan be made a condition of the license. However, this measure was the subject of a section 10(j) teleconference held with the agencies on December 7, 2005. During that teleconference we received further clarification of what information is available regarding this issue, as well as more information on the scope and intent of the gravel study and monitoring proposed in the SA. We are satisfied that the information to be collected is necessary to first establish the baseline conditions on spawning gravels, then monitor the potential effects of project operations on gravels below Merwin dam, and potentially implement actions to maintain existing spawning habitat by augmentation, if adverse effects are documented. We now recommend that the gravel monitoring and augmentation program be included in any new license terms. The total annualized capital cost for this measure would be about \$54,600 (see table 4.2-1).

The draft 401 WQC conditions require a gravel augmentation program within the Lewis River bypassed reach, but provide no basis for the program. This, however, may be a worthwhile program, if a need for gravel enhancement can be established. We recommend that this program be considered under the Aquatics Fund, which would be established to fund habitat enhancement measures related to project effects. Any costs for this program would be covered by the Fund.

Minimum Flows

Lewis River Bypassed Reach

Minimum flows would be provided to the Lewis River bypassed reach, which currently only receives leakage flow and minimal local inflow totaling about 21 cfs. Flows would be released from two points in the bypassed reach: at an upper release point to be constructed in the vicinity of the Swift No. 1 powerhouse, to release flows into the upper bypassed reach, and at the canal drain, which would release flows into the constructed habitat channel. PacifiCorp and Cowlitz PUD would share both the costs of constructing these facilities and the lost energy as a result of releasing the minimum flows from the Swift No. 2 power canal. Although this would be the case, commenters on the draft EIS clarified that the proposed upper release outlet structure would be located within the Swift No. 1 Project boundary, while the canal drain would be located within the Swift No. 2 Project boundary. Thus, we now recommend that operational responsibility for the upper release structure be with PacifiCorp, while operational responsibility for the canal drain be assigned to Cowlitz PUD. Because both utilities are taking on operational responsibility for bypass flows, we reassign the costs for those flows in the final EIS, to reflect the agreement on the cost sharing for energy losses that was included in the SA. Regardless of external voluntary cost sharing agreements, however, each licensee would be solely responsible for measures within their respective project boundaries or appurtenant to their project facilities, for the purpose of compliance or enforcement. For our economic analysis, we are now assigning the capital costs for the upper release structure to PacifiCorp, and the associated energy losses to both PacifiCorp and Cowlitz PUD. The annualized capital costs for the upper release structure would be \$261,600, and the seasonal minimum flow releases (which would range from 60 to 100 cfs), would result in a total of 5,235 MWh of power production foregone. As we describe in section 3.3.3, *Aquatic Resources*, these minimum flows would result in improved aquatic habitat in the bypassed reach, which has only received minimal leakage and local inflow for decades (except for infrequent spillage events). These flows would enhance fishery resources in the reach, which could include the listed bull trout, and anadromous salmonids, once they are reintroduced to the reach as part of the Lewis River restoration efforts.

As we describe in section 3.3.2.2, *Water Resources*, the draft 401 WQC conditions recently published by WDOE, require a specific flow release regime for the bypassed reach that is more detailed than the approach in the SA, which requires an interim flow, and then development of a permanent flow regime in consultation with the ACC. The flow regime included in the draft 401 conditions is within the bounds of the flows included in the SA, and also results in the same total volume of flow released on an annual basis. We are unable, however, to determine any differing effects on habitat between the two flow regimes, but expect that effects would be similar, with an overall enhancement of aquatic habitat compared to existing conditions with no minimum flows. Because we are unable to determine the basis for the 401 condition flows, we believe that

the SA interim flow regime, with the ability to design (and later modify) a final flow regime for the bypassed reach would be a more reasonable and scientific approach to setting minimum flows, and thus we are recommending the SA approach.

Downstream of Merwin Project

A revised minimum flow regime, ramping rates, and plateau operations would be provided downstream of the Merwin Project. The existing minimum flow regime, as required by Article 49 of the current license, would be modified/refined for the purpose of maintaining and enhancing anadromous species downstream of Merwin dam, including native fall Chinook. The new minimum flows would range from 1,200 to 4,200 cfs, according to 10 seasonal adjustments. Ramping rates would be limited to no more than 2 inches per hour for downramping and 1.5 feet per hour for upramping. Plateau operations (periods of near steady discharge) would be established, with plateau steps and changes to the plateau levels specified. A Flow Coordination Committee, comprised of representatives from PacifiCorp, NMFS, FWS, WDFW, the Cowlitz Indian Tribe, and the Yakama Nation, would be established to determine appropriate minimum flow levels during low-flow periods. While this appears to be an adequate procedure for adjusting minimum flows based on flow availability, the procedure should also include notification of the Commission regarding any deviations from required minimum flows. None of these operational changes are anticipated to affect either dependable capacity or energy production at Merwin significantly, because the Merwin Project already has a minimum flow regime similar to that currently proposed. The proposed minimum flows, ramping rate restrictions, and plateau operations would protect and enhance the existing fishery downstream of Merwin, including the natural spawning of several of the anadromous salmonid species.

PacifiCorp proposes, in accordance with the SA, to include a Monitoring & Evaluation Plan to monitor flows and ramping rates designed for fish and other aquatic and terrestrial species. Consolidating all flow-related measures into a single plan would ensure efficient planning for releasing and measuring flows. Elements that could be incorporated into a single plan include plans for releasing minimum flows into the Swift bypassed reach, plans for ramping rates and minimum flow releases below Merwin dam, any conceptual designs for any structural changes needed to implement the proposed flows and ramping rates, and monitoring procedures for required minimum flows and ramping rates.

Terrestrial Resource Measures

Wildlife Habitat Management Plans and Land Acquisition and Protection Funds

Section 10 of the SA includes measures for protection and enhancement of terrestrial resources, including conservation easements, separate PacifiCorp and Cowlitz PUD WHMPs, and three funds: the Yale Land Acquisition and Habitat Protection Fund,

the Swift No. 1 and Swift No. 2 Land Acquisition and Habitat Protection Fund, and the Lewis River Land Acquisition and Habitat Enhancement Fund. All three funds would be used to acquire and protect wildlife habitat in the vicinity of the Yale and Swift projects, and elsewhere within the Lewis River Basin. Additionally, any lands acquired with these funds, as well as lands currently owned or controlled by PacifiCorp and Cowlitz PUD adjacent to the projects would be managed under integrated WHMPs developed by PacifiCorp and Cowlitz PUD. The WHMPs would provide management direction for a broad range of habitat types and wildlife species, including elk winter and foraging habitat, elk movement corridors between winter and summer ranges, bald eagle and northern spotted owl habitat, and riparian and wetland habitat. Reservoir fluctuations, timber harvesting, recreation, and development, have caused a cumulative loss of habitat availability and connectivity in the vicinity of the projects.

We include the land acquisition funds and the integrated WHMPs as part of our recommended alternative because they would enhance wildlife habitat in the project areas by acquiring and managing lands to increase connectivity between project lands and other valuable habitat, increase and protect rare habitat types, and decrease disturbance to wildlife and associated habitats. Additionally, although reservoir fluctuations would continue to affect riparian and wetland habitat and impede wildlife access to the reservoirs, the recommended alternative would improve current conditions and mitigate for ongoing project effects by acquiring, protecting, and enhancing wetland and riparian habitat. The proposed measures would help achieve management goals for the Mount St. Helen's herd and ensure its long-term sustainability through protection of critical winter-summer migration routes around the Yale Project, winter range in the vicinity of the Swift No. 1 Project, and help ensure future availability of critical winter range, forage and migration corridors. This is an important benefit given that according to a 1996 national hunting expenditure survey, approximately \$30.4 million is generated by hunters in the area encompassed by the Mount St. Helens herd (Forest Service, 2005; WDFW, 2005). In addition, the proposed measures would contribute to habitat restoration for anadromous fish re-introduction (Forest Service, 2005).

Lands that are acquired through the funds would best serve project purposes if they are connected to existing project lands or the MWHMA, or would facilitate the goals of the WHMPs; therefore, we recommend that land acquisitions be limited to lands that provide connectivity to, and between, land that is within the project boundaries or the MWHMA. Connectivity allows species to move between habitat areas and to benefit from increased habitat availability. The acquired lands would then be managed under the appropriate WHMP. Once lands are acquired and included in the WHMPs, they should also be included in the appropriate project boundary. Additionally, all of the other lands to be included in the WHMPs, including the MWHMA, Devil's Backbone, and additional PacifiCorp and Cowlitz PUD-owned and managed lands in the immediate project vicinities, as identified in section 3.3.4.2, *Terrestrial Resources*, should be included in the appropriate project boundary.

In addition, to ensure that the habitat acquisition and enhancement funds and related WHMPs focus on acquisition and management activities that would mitigate for project-related effects, we also recommend that the licensees, as part of their “Annual Plan” under section 10.8.3 of the SA, file that plan with the Commission for approval, after the plan has been approved by the TCC. The Annual Plan would describe how the funds are proposed to be used in the following year. The dollar amounts outlined in the SA seem reasonable, based upon estimates of land values and the amount of lands needed to meet wildlife habitat objectives for the area. Therefore, we expect that the acquisition, protection, and enhancement of the necessary wildlife habitat areas may cost approximately \$12.2 million, as outlined in the SA.

For the Swift No. 1 Project, the terrestrial resource measures, primarily the Swift No. 1 and Swift No. 2 Land Acquisition and Habitat Protection Fund and the Lewis River Land Acquisition and Habitat Enhancement Fund, would have a total annualized capital cost of about \$1.1 million (see table 4.2-2). For the Swift No. 2 Project, the terrestrial resource measures, primarily the Devil’s Backbone land acquisition and management, and other wildlife habitat management would have an annualized capital cost of \$94,000. There also would be an annual O&M cost of \$20,800 associated with implementing the WHMP. Cowlitz PUD’s costs associated with the Swift No. 1 and Swift No. 2 Land Acquisition and Habitat Protection Fund are not reported as a capital cost, but as a credit from PacifiCorp (see section 10.2 of the SA). For the Yale Project, the terrestrial resource measures, primarily the Yale Land Acquisition and Habitat Protection Fund, the Lewis River Land Acquisition and Habitat Enhancement Fund, and implementation of the WHMP, would have a total annualized capital cost of about \$500,000 (see table 4.2-3). For the Merwin Project, the terrestrial resource measures, primarily the implementation of the WHMP and other habitat protection measures, would have a total annualized capital cost of about \$33,000 (see table 4.2-4). Although these programs would be a relatively high cost item for the projects, in section 3.3.4.2, *Terrestrial Resources*, we conclude that the habitat acquisition and enhancement funds along with the WHMPs would result in benefits to a wide range of terrestrial resources in the project area and would offset ongoing project effects.

Recreation

Effects of Recreational Measures on Project Economics

Section 11 of the SA provides for a wide range of recreational enhancements at the Lewis River Projects, although measures proposed at the Swift No. 2 Project are limited (power canal fishing access site) because the project does not have a reservoir and only limited lands. Enhancements are proposed at existing facilities on Swift reservoir, Yale Lake, and Lake Merwin. For Swift No. 1, the primary enhancements are hardening dispersed camping sites along Swift reservoir, expanding Swift Camp when the need arises, providing a new group picnic area, renovating Eagle Cliff Park, developing a trail from Eagle Cliff Park to the Forest Service boundary, and providing a barrier-free fishing

access site. The total annualized capital cost for these and other recreational improvements at Swift No. 1 is about \$125,000 (see table 4.2-2), but they would provide significant enhancement of recreational opportunities in the project area. Finally, we note that any new barrier-free fishing access site established in the area should have a clear nexus with project recreational opportunities and should be included within the project boundary.

For Swift No. 2, Cowlitz PUD proposes to provide funding for some of the measures to be implemented by PacifiCorp on Swift reservoir, including expanding Swift Camp when the need arises, and renovating Eagle Cliff Park. The total annualized capital cost for these measures is about \$13,100 (see table 4.2-5). Cowlitz PUD does not provide a capital cost for the power canal fishing access site (we assume the costs may be included within the costs for the ongoing power canal reconstruction); therefore, we estimate that the annual O&M costs for the facility would be \$4,800.

For the Yale Project, the primary enhancements would be hardening dispersed camping sites along Yale Lake, expanding Cougar Camp when the need arises, renovating Cougar Campground, re-designing Beaver Bay Campground, providing a new group picnic area at Swift Park, parking and trail improvements at Saddle Dam Park, developing a trail from Cougar Campground to Beaver Bay Campground, developing and implementing an interpretation and education program, improving the Yale-IP road as a non-motorized trail, improving boat launch facilities at Yale Park and Beaver Bay, and providing a barrier-free fishing access site. The total annualized capital cost for these measures is about \$640,000 (see table 4.2-3), but they would provide significant enhancement of recreational opportunities in the project area. As noted above, any new barrier-free fishing access site established in the area should have a clear nexus with project recreational opportunities and should be included within the project boundary.

For the Merwin Project, the primary enhancements would be implementing an I&E program, prohibiting dispersed camping along Lake Merwin, upgrading restrooms and parking areas and the boat launch at Speelyai Bay Park, upgrading recreational facilities at Merwin Park, upgrading Marble Creek Trail to barrier-free standards, developing a takeout for non-motorized boats at Yale bridge, and providing a barrier-free fishing access site. The total annualized capital cost for these and other recreational improvements is about \$219,000 (see table 4.2-4), but they would provide significant enhancement of recreational opportunities in the project area. Again, any new barrier-free fishing access site established in the area should have a clear nexus with project recreational opportunities and should be included within the project boundary.

Lower River Access Sites

PacifiCorp propose to make improvements to five lower river access sites and to the proposed new river access site downstream of Merwin dam (Switchback property). With the exception of the Merwin access site, the five lower river access sites are located outside the project boundary. The proposed measures at the five lower river sites would

include new toilet facilities and O&M, and would improve public access to the Lewis River downstream of the Merwin Project. However, there is no physical nexus between most of these sites and the project. The proposed measures would be located at sites approximately 5 miles downstream of the project. Recreational use of these areas is typically associated with floating, swimming and angling along the lower Lewis River, and recreational use would not be associated with displaced recreational use from the project. Therefore, we do not recommend that the proposed improvements to the five lower river sites be made a condition of any license issued.

Dispersed Camping Sites

The applicants propose to provide annual funding to the Forest Service to maintain dispersed camping sites on Forest Service lands outside the project boundaries, to address camping demand during peak use periods. In section 3.3.7.2, we note that the proposed campground improvements at the projects and updated provisions of the proposed RRMP (i.e., construction of additional camping facilities in the future, if needed) would be sufficient to address camping use during peak-use periods. Specifically, we conclude the proposed campground facilities, along with the provisions of the RRMP that would allow for additional campground facilities or improvements in the future, as needed, would be adequate to address increased camping use during peak-use periods. Although there could be some short-term shortages in available campsites in the interim period before the future facilities are built, there is no need to mitigate for all shortages that may occur during this period. For that reason, we find that the proposed funding contribution to the Forest Service for dispersed camping use would be unnecessary. In its comments on the draft EIS, the Forest Service makes an argument for establishing a nexus with the projects, for the dispersed campsites. However, that nexus is not strong enough for us to recommend that the licensee provide funding to the Forest Service for the dispersed camping. Although it may be appropriate to fund any such sites that may be within the project boundary, there is insufficient information in the record to indicate where the sites are located, and by their nature as being “dispersed,” there may not be a total accounting of where many of the sites are located. If funding is required, any dispersed sites covered by the funding should be included in the project boundary, because these sites would be considered part of the project purposes. However, because many of these sites may not be well known or mapped in any way, or can be tied directly to the projects, we do not recommend funding for the dispersed sites at this time.

Flood Management

Section 12 of the SA provides for flood protection in the Lewis River Basin by dedicating flood control storage in the project reservoirs, as well as providing funding and procedures for emergency notifications, a NOAA weather radio transmitter, USGS flow information dissemination, and high runoff procedures. For the Swift No. 1 Project, this would not result in any capital costs, but there would be operational costs totaling about \$66,000 on an annualized basis (see table 4.2-1). Because the Swift No. 2 Project

does not have a reservoir and only utilizes flow discharged from the Swift No. 1 powerhouse, it would be minimally affected by flood management operations, and there would be no identified costs to the project. For the Yale Project, this would not result in any capital costs, but there would be operational costs totaling about \$37,000 on an annualized basis (see table 4.2-1). For the Merwin Project, this would result in an annualized capital cost of about \$28,000 (see table 4.2-4), and operational costs totaling about \$37,000 on an annualized basis (see table 4.2-1). These measures would provide improved flood control and notification procedures and would likely reduce damage from floods in the basin.

Cultural Resources and Socioeconomics

Cultural Resources

Section 13 of the SA provides for measures for the continued protection of cultural resources through finalization of the HPMP, by providing curation facilities for any artifacts recovered in the project area, by planning any changes to eligible properties in the Swift No. 1 and Ariel Historic Districts to be compatible with the districts' historic value, by providing the Tribes access to project lands for traditional cultural practices, by monitoring for and protecting cultural resources in the reservoir drawdown zones, by designating a cultural resources coordinator for PacifiCorp's projects, and by providing annual training for PacifiCorp employees who may affect cultural resources in the project areas. There would be no capital costs for these measures, but there would be an annualized O&M cost of about \$28,900 for the Swift No. 1 Project, \$1,600 for the Swift No. 2 Project, \$16,200 for the Yale Project, and \$16,400 for the Merwin Project. These measures would be important for the protection of cultural resources in the project area.

Socioeconomic Measures

Socioeconomic measures provided for under SA section 13 include funding law enforcement, assisting the Forest Service in maintaining FR 90, support for the Forest Service radio-telephone link between Swift dam and the Pine Creek Work Center, and supporting the construction of a visitor's center (by others) near the town of Cougar. PacifiCorp proposes to fund law enforcement by funding three additional marine and land based FTE law enforcement officers. In section 3.3.7.2, we acknowledge that increasing enforcement in the project area could help to alleviate some recreational user conflicts that may arise as a result of increased recreational usage. However, we note that law enforcement in the project area is the responsibility of county and state agencies. We also find that, as proposed, law enforcement would not necessarily be directed at project-related recreational use. Therefore, we do not recommend including funding for law enforcement in any license issued for the projects.

We also are not recommending funding to the Forest Service for maintenance of FR 90. In the draft EIS, we found that the road has a direct nexus to the project because

it provides the sole access to project recreational facilities along Swift Creek reservoir and is used by the licensee to access project works for O&M purposes. We concluded that the road should be included within the project boundary and that the applicants should provide funding support for maintenance. However, based on the comments filed on the draft EIS, arguing against including FR 90 within the project boundary, it is now apparent that FR 90 is primarily a multi-purpose road with many more uses than just to access the project facilities. Therefore, we are no longer recommending that portions of the road be included within the project boundaries. Based on the decision that the road should not be considered a project facility, we are also no longer recommending that the applicants provide funding for maintenance of the road, as a condition of the license. We, however, do agree that the applicants should provide a funding contribution to the Forest Service for the reconstruction of the Canal Bridge, which spans the Swift No. 2 power canal. The Canal Bridge has a direct nexus to the Swift No. 2 Project and is located within the project boundary for the Swift No. 2 Project. The bridge provides passage over the Swift No. 2 power canal, which would not be possible without the bridge. The one-time contribution would total \$10,500, to be divided between the two applicants, for an annualized cost of \$900 for the Swift No. 1 Project and \$200 for the Swift No. 2 Project.

The potential visitor's center in Cougar would allow the applicants to provide general information on the projects to tourists and more specific information on recreational opportunities or safety and security. For the four projects, the annualized capital cost for funding support for the visitor's center would be \$4,500 for the Swift No. 1 Project, \$500 for the Swift No. 2 Project, \$2,500 for the Yale Project, and \$2,500 for the Merwin Project. Including the Cougar visitor information facility in the project boundary, either as an "island" or as an extension of the existing project boundary, would help ensure that the proposed facility would be used for project purposes for the term of the new license. The project area in closest proximity to Cougar is the Yale Project.

5.1.6 Summary of Economic Effects on the Projects

Swift No. 1 Project

We estimate that the annual costs to the Swift No. 1 Project for the proposed action would be \$25,191,000 (38.54 mills/kWh), compared to an annual cost of \$12,707,000 (19.33 mills/kWh) for the no-action alternative, resulting in a significant reduction in annual net benefits from \$12,304,800 (18.71 mills/kWh) to \$-324,300 (-0.50 mills/kWh). There would be a small loss in energy generation of 3,874 MWh (see table 4.3-1); most of the increased costs relate to the construction and operation of the proposed fish passage facilities and improvements to recreational facilities. Although this would be a significant increase in costs for the project, it would result in the restoration of important anadromous fishery resources to the basin, improved recreational facilities to meet increasing demand for such facilities, and other environmental enhancements. For the proposed action with staff modifications, the annual cost would

decrease slightly to \$25,107,700 (38.41 mills/kWh), resulting in a net benefit of \$-241,000 (-0.37 mills/kWh).

Swift No. 2 Project

We estimate that the annual costs to the Swift No. 2 Project for the proposed action would be \$6,631,400 (30.71 mills/kWh), compared to an annual cost of \$6,073,300 (27.95 mills/kWh) for the no-action alternative, resulting in a reduction in annual net benefits from \$2,192,800 (10.09 mills/kWh) to \$1,583,700 (7.33 mills/kWh). There would be a loss of 1,361 MWh in energy generation (see table 4.3-4), but most of the increased costs relate to the construction and operation of the proposed fish passage facilities and support of the hatchery programs. Although this would be a significant increase in costs for the project, it would result in the restoration of important anadromous fishery resources to the basin and other environmental enhancements. Additional staff recommendations for the Swift No. 2 Project would result in small changes in project costs and net benefits. Annual costs would be reduced to \$6,623,300 (30.67 mills/kWh), while annual net benefits would increase to \$1,591,800 (7.37 mills/kWh).

Yale Project

We estimate that the annual costs to the Yale Project for the proposed action would be \$13,481,700 (24.46 mills/kWh), compared to an annual cost of \$7,612,900 (13.81 mills/kWh) for the no-action alternative, resulting in a significant reduction in annual net benefits from \$13,356,700 (24.23 mills/kWh) to \$7,487,900 (13.58 mills/kWh). There would be no loss in energy generation (see table 4.3-2); most of the increased costs relate to the construction and operation of the proposed fish passage facilities and improvements to recreational facilities. Although this would be a significant increase in costs for the project, it would result in the restoration of important anadromous fishery resources to the basin, improved recreational facilities to meet increasing demand for such facilities, and other environmental enhancements. For the proposed action with staff modifications, the annual cost would decrease slightly to \$13,435,100 (24.37 mills/kWh), resulting in a net benefit of \$7,534,500 (13.67 mills/kWh).

Merwin Project

We estimate that the annual costs to the Merwin Project for the proposed action would be \$14,484,100 (28.59 mills/kWh), compared to an annual cost of \$10,068,800 (19.87 mills/kWh) for the no-action alternative, resulting in a significant reduction in annual net benefits from \$9,203,900 (18.17 mills/kWh) to \$4,788,600 (9.45 mills/kWh). There would be no loss in energy generation (see table 4.3-3); most of the increased costs relate to the construction and operation of the proposed fish passage facilities and improvements to recreational facilities. Although this would be a significant increase in costs for the project, it would result in the restoration of important anadromous fishery

resources to the basin, improved recreational facilities to meet increasing demand for such facilities, and other environmental enhancements. For the proposed action with staff modifications, the annual cost would decrease slightly to \$14,385,400 (28.39 mills/kWh), resulting in a net benefit of \$4,887,300 (9.65 mills/kWh).

5.2 CUMULATIVE EFFECTS SUMMARY

Erosion associated with past and continued timber harvest and development in the Lewis River Basin delivers sediment to streams in the watershed. Ongoing erosion of reservoir shorelines and erosion associated with potential new project facilities also could contribute to the sediment load in area streams and reservoirs. The combined effects of project and non-project erosion, as well as sediment input from the 1980 eruption of Mount St. Helens (a natural event), would result in sediment accumulation in project reservoirs, a minor loss of reservoir storage capacity, minor loss of upland habitat, and moderate adverse effects on turbidity and sediment supply. It is expected that changes in timber harvest practices, natural stabilization of Mount St. Helens deposits, and erosion control practices at any potential new project facilities would decrease quantities of sediment contributed to project streams over time, resulting in reduced cumulative effects on geology and soils resources in the future.

Prevention of the transfer of MDN to upstream reaches by the project dams, combined with the natural geochemistry of the Lewis River watershed, has been an ongoing moderate cumulative effect of the Lewis River Projects on water quality. Introduction of anadromous fish under the proposed action would offset project effects on MDN, and in turn decrease the cumulative effect of the projects on water quality. Other water quality parameters have not been significantly affected by the projects, and water quality standards are generally met. One effect of the projects has been a shifting in the timing of the thermal regime downstream of Merwin dam due to the presence of the reservoirs, although this has not had a significant effect on aquatic resources below the dam.

The introduction of anadromous salmonids into the upper Lewis River Basin and the development of fish passage facilities would likely increase the distribution and abundance of resident and anadromous salmonids. These actions, combined with improved timber harvest regulations, improved hatchery management, ongoing habitat restoration measures, and increased enforcement, would likely increase the chances of meeting fish restoration goals.

Existing and future ESA recovery efforts in the Columbia River Basin, including those being developed and recommended by the Lower Columbia River Fish Recovery Board and Bull Trout Draft Recovery Plan, also would work in conjunction with project-related enhancement measures to improve conditions for ESA-listed stocks. Although these actions likely would benefit resident and anadromous salmonids, ongoing effects associated with trapping of sediment and LWD in project reservoirs, urban and rural development, increased recreation, future road construction, population growth, and past

timber harvest practices would continue to affect aquatic habitat in the watershed. The proposed action, however, would offset some of the negative cumulative effects on aquatic resources in the Lewis River Basin and should result in an overall beneficial effect on fisheries in the basin.

For terrestrial resources, timber harvest would continue in the Lewis River Basin on both project and non-project lands. However, the WHMPs to be implemented under the proposed action would protect some forest land, particularly old-growth stands, which would result in the additional protection and enhancement of wildlife habitat over existing management measures. Residential, road, and recreational development would also continue in the basin, including on some project lands, resulting in continuing effects on vegetation and wildlife. However, the land management and protective measures proposed by the applicants, including the limitation on the amount of dispersed camping, would limit these effects and result in an overall net benefit to terrestrial resources on much of the land owned by the applicants. Listed wildlife species also would benefit from the proposed WHMPs and other land management measures.

The proposed recreational measures would result in an overall beneficial effect on recreational resources within the Lewis River Basin. A primary goal of the proposed measures is to improve the recreational experience and manage recreational resources without significantly increasing the number of recreational facilities or the number of visitors. The improvements to facilities and the management measures would achieve these goals by reducing user conflicts, distributing recreational visitors more evenly throughout the project areas, improving the quality of the recreational facilities, and increasing the number of recreational opportunities over time. However, as recreational demand for boating and camping opportunities at the projects increases over time, some recreational visitors may be displaced to dispersed sites adjacent to the projects. Although individually minor, the cumulative effects of increased use of the dispersed sites may be adverse for wildlife and recreational values at these sites. The site stabilization measures, development of new campsites, and closures of dispersed recreational areas should help preserve the recreational and wildlife attributes of these sites as demand increases. Overall, the site improvements and improved management strategies within and adjacent to the projects would offset any cumulative adverse effects from increased dispersed recreational use.

5.3 FISH AND WILDLIFE AGENCY RECOMMENDATIONS

Under the provisions of section 10(j) of the FPA, each hydroelectric license issued by the Commission shall include conditions based on recommendations provided by federal and state fish and wildlife agencies for the protection, mitigation, and enhancement of fish and wildlife resources affected by the project.

Section 10(j) of the FPA states that, whenever the Commission believes that any fish and wildlife agency recommendation is inconsistent with the purposes and the requirements of the FPA or other applicable law, the Commission and the agency shall

attempt to resolve any such inconsistency, giving due weight to the recommendations, expertise, and statutory responsibilities of the agency.

In response to the Commission's REA notice dated December 9, 2004, NMFS, Interior, and WDFW filed letters of comment that included section 10(j) recommendations.⁴⁴ These agencies are also parties to the SA.⁴⁵ In their letters containing their 10(j) recommendations, NMFS, Interior, and WDFW recommend that the Commission approve the SA and all the provisions thereof. Commission staff is also recommending that most of the provisions of the SA be included as terms of any new licenses.

However, we determined in the draft EIS that one of the recommendations that is within the scope of section 10(j) may be inconsistent with the purposes and requirements of the FPA. We concluded that gravel monitoring and augmentation downstream of Merwin dam was not warranted and therefore inconsistent with the substantial evidence standard of section 313(b) of the FPA.⁴⁶

On December 7, 2005, representatives from Commission staff, WDFW, FWS, and NMFS participated in a section 10(j) meeting via teleconference, to discuss and resolve the one inconsistency - gravel monitoring and augmentation below Merwin dam. As a result of clarifications and information provided by the agencies at that meeting, we are now accepting the recommendation for a gravel monitoring and augmentation program. Implementing the gravel monitoring would confirm and characterize the existing levels of spawning gravels below Merwin dam (the baseline), and monitoring thereafter would inform managers whether adverse effects have occurred due to project operations, and that gravel augmentation would be necessary to maintain baseline levels.

We also do not recommend four measures contained in the SA that are outside the scope of section 10(j). These include:

- Certain measures to be funded by the Aquatics Fund;
- Funding for three additional marine and land based FTE law enforcement officers;
- Improvements to five river access sites outside of the Merwin Project boundary along the lower Lewis River; and

⁴⁴ These letters were dated February 3, 2005; February 4, 2005; and February 7, 2005, respectively.

⁴⁵ The SA was filed with the Commission on December 3, 2004.

⁴⁶ The SA provides for a two-step process for a gravel augmentation program below Merwin dam, which would include a study of existing gravel, and then a monitoring and augmentation program, depending on the results of the study. We concluded that the study would be outside the scope of section 10(j), while the monitoring and augmentation program would be within the scope of section 10(j).

- Funding to the Forest Service for management of dispersed camping sites outside the project boundaries.

Recommendations that we consider outside of the scope of section 10(j) have been considered under section 10(a) of the FPA and are addressed in the specific resources section of this document. The Aquatics Fund is not within the scope of section 10(j), in that it is not a specific measure for fishery resources. The Aquatics Fund would be appropriate for funding mitigative/enhancement measures within the project boundary or associated with project effects, but some of the measures listed for funding would not meet these criteria. Funding law enforcement, improvements to five lower-river access sites, and funding for management of non-project dispersed camping sites are not within the scope of section 10(j) in that they are not recommendations related to fish and wildlife resources.

5.4 CONSISTENCY WITH COMPREHENSIVE PLANS

Section 10 (a)(2)(A) of the FPA requires the Commission to consider the extent to which a project is consistent with federal and state comprehensive plans for improving, developing, or conserving waterways affected by a project. We reviewed 73 plans for the state of Washington that have been filed with the Commission and determined that the following 11 are relevant to the Lewis River Projects and that there are no conflicts with the proposed projects:

1. Northwest Conservation and Electric Power Plan. Northwest Power Planning Council. 1998. Portland, OR.
2. Columbia River Basin Fish and Wildlife Program. Northwest Power Planning Council. 2000. Portland, OR.
3. 1987 Strategies for Washington's Wildlife. Washington State Department of Game. 1986. Olympia, WA.
4. Hydroelectric Project Assessment Guidelines. Washington State Department of Fisheries. 1987. Olympia, WA.
5. Hydroelectric Project Assessment Guidelines. Washington State Department of Fisheries. 1995. Olympia, WA.
6. A Resource Protection Planning Process Identification of Prehistoric Archaeological Resources in the Lower Columbia Study Unit. Washington State Department of Community Development, Office of Archaeology and Historic Preservation. 1987. Olympia, WA.
7. Resource Protection Planning Process Study Unit—Transportation. Washington State Department of Community Development, Office of Archaeology and Historic Preservation. 1989.
8. Washington State Trails Plan: Policy and Action Document. Washington State Interagency Committee for Outdoor Recreation. 1991. Tumwater, WA.

9. State of Washington Natural Heritage Plan. Washington State Department of Natural Resources. 2003. Olympia, WA.
10. Washington Outdoors: Assessment and Policy Plan, 1995-2001. Washington State Interagency Committee for Outdoor Recreation. 1995. Tumwater, WA.
11. Application of Shoreline Management to Hydroelectric Developments. Washington State Department of Ecology, Shorelands and Coastal Zone Management Program. 1986. Olympia, WA.

5.5 RELATIONSHIP OF LICENSE PROCESS TO LAWS AND POLICIES

5.5.1 Water Quality Certification

Pursuant to 401(a)(1) of the Federal Water Pollution Control Act (Clean Water Act) and Commission regulations, PacifiCorp and Cowlitz PUD are required to file as part of their license application a copy of the water quality certificate provided by the state of Washington or proof that such a certificate has been applied for or the requirements waived. The applicants applied for section 401 Water Quality Certification for their projects on February 3, 2005, after issuance of the Commission's REA notice on December 9, 2004. The applicants withdrew their applications and filed new applications for 401 Certification on December 2, 2005. In February 2006, WDOE published draft 401 Certifications for the four Lewis River projects for public comment. We summarize and analyze these conditions in section 3.3.2.2, *Water Resources – Environmental Effects*.

5.5.2 Essential Fish Habitat

Section 305(b)(2) of the Magnuson-Stevens Fishery Conservation and Management Act requires federal agencies to consult with the Secretary of Commerce on all actions or proposed actions that are authorized, funded, or undertaken by the agency and that may adversely affect EFH.

The Pacific Fisheries Management Council has designated EFH for the following federally managed Pacific salmon: Chinook, coho, and Puget Sound pink salmon. Freshwater EFH for these Pacific salmon includes all streams, lakes, ponds, wetlands, and other water bodies currently or historically accessible to salmon in Washington, Oregon, Idaho, and California, except areas upstream of certain impassable artificial (man-made) barriers, and longstanding naturally impassable barriers. The Lewis River Basin comprises EFH for Chinook and coho salmon.

The proposed action would result in improved conditions for TDG and adult upstream passage and would improve downstream passage over existing conditions. Additionally, available Chinook and coho riverine habitat would be increased by 174 miles through the reintroduction program. Regulated flows would continue to have some adverse effects on aquatic habitat, but these effects would be offset by measures proposed by the applicants to improve habitat, such as the LWD stockpile and funding program.

Therefore, we conclude that relicensing the projects as proposed by the applicants would continue to have an adverse effect on Chinook and coho EFH, but that elements of the proposed action would reduce these effects over current conditions.

5.5.3 Columbia River Fish and Wildlife Program

Under section 4(h) of the Pacific Northwest Power Planning and Conservation Act, the Northwest Power Planning Council (NPPC) developed the Columbia River Basin Fish and Wildlife Program (Program) to protect, mitigate, and enhance the fish and wildlife resources associated with development and operation of hydroelectric projects in the Columbia River Basin. Section 4(h) states that responsible federal and state agencies should provide equitable treatment for fish and wildlife resources, in addition to other purposes for which hydropower is developed, and that these agencies should take the Program into account to the fullest practical extent.

The Program directs agencies to consult with fish and wildlife managers and the NPPC during the study, design, construction, and operation of any hydroelectric development in the basin [sections 12.1A. through 12.1A.2]. Commission regulations require applicants to initiate pre-filing consultation with state and federal fish and wildlife agencies and tribes and to provide these groups with opportunities to review and comment on the application. This consultation has been ongoing under the ALP approved by the Commission for use on these projects on April 1, 1999.

Although the Lewis River Projects are not located within a protected area designated by this Program, it is recommended that hydroelectric projects include measures to mitigate their effects on fish and wildlife resources [sections 12.1A.1 through 12.1A.2]. The measures described in the proposed action contribute to this goal; therefore, the projects are consistent with the objectives of this Program.

5.5.4 Endangered Species Act

Section 7 of the ESA requires federal agencies to ensure that their actions are not likely to jeopardize the continued existence of endangered or threatened species or cause the destruction or adverse modification of the critical habitat of such species.

Protected salmonid ESUs and DPSs that occur in the basin include lower Columbia River spring and fall Chinook salmon, lower Columbia River coho, lower Columbia River winter steelhead, Columbia River chum salmon, and Columbia River bull trout. These species are not present above the projects (except for bull trout); however, project facilities and operations have the potential to affect these listed salmonid species that are present downstream.

The FWS lists two wildlife species potentially occurring in vicinity of the Lewis River Projects that are federally designated as threatened and therefore protected under the ESA (letter from K. Berg, Manager, Western Washington Field Office, FWS, June 24, 2003). These species include the bald eagle (*Haliaeetus leucocephalus*) and the

northern spotted owl (*Strix occidentalis*). There are no federally listed plant species in the project areas.

Our analyses of project effects on these species are presented in section 3.3.5, *Threatened and Endangered Species*, and our final recommendations are presented in section 5.1, *Comprehensive Development and Recommended Alternative*.

We conclude that relicensing the projects with the fish and wildlife habitat protection and enhancement measures proposed in the SA would likely have a beneficial effect on lower Columbia River spring and fall Chinook salmon, lower Columbia River coho, lower Columbia River winter steelhead, Columbia River chum salmon, Columbia River bull trout, bald eagles, and the northern spotted owl. Construction of new project facilities such as fish passage facilities and recreation areas and project-related recreation-based human disturbance could disturb bald eagles. However, overall, we conclude that the minor effects would be offset by the benefits from the reintroduction of salmonids, a decrease in dispersed recreation, and increased habitat protection and wildlife habitat management. Therefore, issuance of a new license is not likely to adversely affect the bald eagle or northern spotted owl.

For the listed fish species, although the proposed action would have an overall net benefit compared to current conditions, project operations under the proposed action are likely to adversely affect listed lower Columbia River Chinook, lower Columbia River coho, lower Columbia River steelhead, Columbia River chum salmon, and bull trout. These effects would be associated with handling in the proposed fish passage facilities, continued exposure to some level of entrainment mortality, and effects associated with flow fluctuations downstream of Merwin dam.

5.5.5 National Historic Preservation Act

The NHPA (16 U.S.C. 470 et seq.) (as amended) requires federal agencies to manage cultural resources under their jurisdiction and authorizes the Secretary of the Interior to maintain a National Register. The law also provides for the creation of SHPOs to facilitate the implementation of federal cultural resource policy at the state level, and for the responsible federal agency (i.e., agency official) to consult with Native American tribes who attach religious or cultural importance to cultural resources under their jurisdiction. Section 106 of the Act requires federal agencies to take into account the effect of any proposed undertaking on properties listed in, or eligible for listing in the National Register. If the agency official determines that the undertaking may have adverse effects on properties listed in or eligible for listing in the National Register, the agency official must afford an opportunity for the Advisory Council to comment on the undertaking. The relicensing of the Lewis River Projects is considered an undertaking, and the Commission acts as the agency official.

PacifiCorp and Cowlitz PUD, under the authority of the Commission, have conducted section 106 consultation with the OAHP, Cowlitz Tribe, Yakama Nation, the GPNF, and other interested parties since 1999. This consultation included scheduled

collaborative cultural resource workgroup meetings, as well as individual meetings conducted by the applicants. Commission staff will be continuing Section 106 consultations. Under the proposed action, PacifiCorp would continue to finalize its HPMP. The HPMP would provide specific guidance to applicant personnel about the treatment of historic, archaeological, and traditional cultural resources during the terms of the new licenses.

On November 17, 2005, the Commission sent the final programmatic agreement (PA) and HPMP to the SHPO, PacifiCorp, the Cowlitz Tribe, the Yakama Nation, and Forest Service. The Advisory Council, after reviewing the draft PA and HPMP has elected not to participate. On November 24, 2005, the SHPO signed the final PA, followed by PacifiCorp on December 15, 2005, and the Forest Service on December 16, 2005.

Cowlitz PUD would not be preparing a HPMP for the Swift No. 2 Project because no archaeological sites were recorded during the surveys, no traditional cultural properties have been identified, and there are no buildings or historic structures eligible for listing under the National Register within the project boundary. Cowlitz PUD would train field and supervisory staff in appropriate procedures to follow in the event of unanticipated discoveries of cultural resource material.

5.5.6 Americans with Disabilities Act

Public recreation facilities must comply with the Americans with Disabilities Act of 1990 (Public Law 101-336) to the extent possible. The Commission, however, has no statutory role in implementing or enforcing the ADA as it applies to its licenses. A licensee's obligation to comply with the ADA exists independent of its project license. As recreation facilities are updated, expanded, or newly developed, PacifiCorp and Cowlitz PUD propose to ensure that access needs of the disabled are addressed and comply with ADA standards. The proposed recreational measures included are consistent with this Act.