4.0 DEVELOPMENTAL ANALYSIS

In this section, we look at the Swan Lake North Project's use of environmental resources for hydropower purposes to see what effect various environmental measures would have on the project's costs and power generation. Under the Commission's approach to evaluating the economics of hydropower projects, as articulated in *Mead Corp.*,[85] the Commission compares the current project cost to an estimate of the cost of obtaining the same amount of energy and capacity using the likely alternative source of power for the region (cost of alternative power). In keeping with Commission policy as described in *Mead Corp.*, our economic analysis is based on current electric power cost conditions and does not consider future escalation of fuel prices in valuing the hydropower project's power benefits.

For each of the licensing alternatives, our analysis includes an estimate of: (1) the cost of individual measures considered in the EIS for the protection, mitigation, and enhancement of environmental resources affected by the project; (2) the cost of alternative power; (3) the total project cost (i.e., for construction, operation, maintenance, and environmental measures); and (4) the difference between the cost of alternative power and total project cost. If the difference between the cost of alternative power and total project cost is positive, the project produces power for less than the cost of alternative power. If the difference between the cost of alternative power and total project cost is negative, the project produces power for more than the cost of alternative power. This estimate helps to support an informed decision concerning what is in the public interest with respect to a proposed license. However, project economics is only one of many public interest factors the Commission considers in determining whether, and under what conditions, to issue a license.

4.1 POWER AND DEVELOPMENTAL BENEFITS OF THE PROJECT

Table 4-1 summarizes the assumptions and economic information we use in our analysis. This information was provided by the applicant in its license application as well as by FERC staff. Cost items common to all alternatives include: taxes and insurance costs; net investment (the total investment in power plant facilities remaining to be depreciated); estimated future capital investment required to maintain and extend the life of plant equipment and facilities; licensing costs; normal operation and maintenance cost; and Commission fees.

[85] See *Mead Corporation, Publishing Paper Division*, 72 FERC ¶ 61,027 (July 13, 1995). In most cases, electricity from hydropower would displace some form of fossil-fueled generation, in which fuel cost is the largest component of the cost of electricity production.

Table 4-1. Parameters for the economic analysis of the Swan Lake North Project (Source: Swan Lake North Hydro, 2015, as modified by staff).

Parameter	Value	
Period of analysis (years)	30	
Federal tax rate (%)	21	
Insurance, $[a]	$408,889	
Initial construction cost, $[a]	$715,610,225	
Licensing cost, $	$10,400,000	
Operation and maintenance, $/year[a]	$10,454,000	
	Peak	**Off-peak**
Energy value ($/MWh)[b]	$54.00	$15.00
Capacity value ($/kW-year)[c]	$113.67	
Pumped storage round trip efficiency (%)	77	
Interest rate[d]	7.8	
Discount rate[e]	7.8	

[a] From Tables D-1 and D-3 of final license application, provided in 2015 dollars with a 2.5% inflation rate, as modified by staff.

[b] From Section D-10 of the final license application, with off-peak values corresponding to the pumping electricity value.

[c] From Table 4-4 of appendix D-1 of the final license application, as modified by staff.

[d] Assumed by staff to be same as equity return rate provided in section D-4 of the final license application.

[e] Assumed by staff to be same as interest rate.

A pumped storage generating facility includes an upper reservoir, a lower reservoir, and a reversible pump-turbine unit in between the two reservoirs. In generating mode, water from the upper reservoir flows through the reversible unit to the lower reservoir. The water turns the turbine, which is attached to a generator, producing electricity that is transmitted to the electric grid. In pumping mode, power is drawn from the electric grid to "motor" the unit in reverse to act as a pump, pushing water from the lower reservoir back up to the upper reservoir. Therefore, pumped storage facilities are net energy consumers. The amount of energy produced as water passes from the upper reservoir to the lower reservoir through the turbines is less than the amount of energy required to pump water back up to the upper reservoir and provide station service power.

However, one of the benefits of a pumped storage project is realized when the price of power for pumping is less than the value of generation. Typically, there are projects that can provide power at lower rates during nighttime or low-demand hours, compared to rates during daytime, high-demand hours. Such facilities can include base-load nuclear, coal, and fossil-fueled facilities, as well as renewable resource facilities powered by solar, wind, biomass, and other sources. Base-load units are typically brought online and remain operational through the course of the day because it is inefficient to bring them online and offline due to the lengthy start-up time required, and because they operate at optimum efficiency at higher loads. Therefore, the pumped storage facility can provide higher priced power during the day when energy demands are high and can use lower cost power from other facilities during the night and other periods when energy demand is low. Pumped storage facilities can also be used to store the energy produced by facilities during low-demand periods by pumping water into the upper reservoir during those periods so that it can be used for generation during higher-demand periods.

There are a number of wind and generation facilities planned or proposed throughout Oregon and California that could be integrated with local energy infrastructure to provide power to pump water to the upper reservoir during nighttime (i.e., low demand) periods including weekends. The variability of the output of these facilities can be problematic to the electric grid because they can create system imbalances by themselves. Such facilities typically work best when they are located close to generating facilities that can provide system balancing capabilities, such as those provided by pumped storage facilities and gas-fired combustion turbines installed specifically to work in concert with solar and wind farms to provide system stability. Pumped storage facilities are designed to be able to change modes rapidly and can fill gaps due to wind and solar power variability.

The ability of pumped storage facilities to quickly switch between pumping and generating, as needed, provides unique benefits to the electric grid. Pumped storage facilities can provide a number of ancillary services to the grid and therefore generate additional revenues in the electric market. Among these services are spinning reserve,[86]

[86] Spinning reserve is the extra generating capacity that is available by increasing the power output of generators that are already connected to the power system. Non-spinning reserve or supplemental reserve is the extra generating capacity that is not currently connected to the system but can be brought online after a short delay.

non-spinning reserve, grid frequency regulation,[87] voltage support and regulation,[88] load following capability, peak shaving, and black-start capability.[89]

Pumped storage facilities can operate as base load, load following, or peaking power facilities and change operating modes seasonally and daily. Most hydroelectric facilities have the ability to start within minutes, if not seconds, depending upon available water supply. When in load following mode, the output of the pumped storage facility can be adjusted as necessary to meet widely varying load requirements.

We used a value of $86.00 per kilowatt (kW) per year for ancillary services. This represents the mean value of the revenues that Swan Lake North Hydro estimated it would receive for providing ancillary services to the grid based on the values of various services that the applicant provided in the final license application and three potential market conditions. At the above rate, ancillary services revenues could contribute $7,000,000[90] toward offsetting pumping and other costs of the project during each year of the 30-year period.

4.2 COMPARISON OF ALTERNATIVES

Table 4-2 compares the installed capacity, annual generation, cost of alternative power, estimated total project cost, and difference between the cost of alternative power and total project cost for each of the alternatives considered in this EIS: no action, the applicant's proposal, and the staff alternative.

[87] Grid frequency is a system-wide indicator of overall power imbalance. These imbalances are removed by requesting generators to operate in frequency control mode, altering their output continuously to keep the frequency near the required value.

[88] System voltage levels vary over the course of a day due to a variety of factors, including: (1) the location of the local distribution line, (2) proximity to large electricity consumers, (3) proximity to utility voltage regulating equipment, (4) seasonal variations in overall system voltage levels, and (5) load factor on local transmission and distribution systems.

[89] Black-start is the procedure to recover from a total or partial shutdown of the transmission system, which has caused an extensive loss of supplies. This entails starting isolated power stations individually and gradually reconnecting them with each other to form an interconnected system again.

[90] Provided by the applicant in 2023 dollars.

Table 4-2. Summary of the annual cost of alternative power and annual project cost for the alternatives for the Swan Lake North Project (Source: staff).

	Swan Lake North Hydro LLC's Proposal	Staff Alternative
Installed capacity (MW)	393.3	393.3
Annual generation (MWh)	1,187,000	1,187,000
Dependable capacity (MW)	321	321
Annual cost of alternative power	$128,298,000	$128,298,000
($/MWh)	108.09	108.09
Annual project cost	$114,951,400	$114,968,700
($/MWh)	96.84	96.86
Difference between the cost of alternative power and project cost	$13,346,600	$13,329,300
($/MWh)	11.24	11.23

4.2.1 No-action Alternative

Under the no-action alternative, the project would not be constructed and would not produce any electricity. The only cost associated with this alternative would be the cost to prepare the license application.

4.2.2 Applicant's Proposal

Swan Lake North Hydro proposes numerous environmental measures, as presented in table 4-3. Under Swan Lake North Hydro's proposal, the project would have an installed capacity of 393.3 MW, and generate an average of approximately 1,187,000 MWh of electricity annually. The average annual cost of alternative power would be $128,298,000, or $108.09/MWh. The average annual project cost would be $114,951,400, or $96.84/MWh. Overall, the project would produce power at a cost that is $13,346,600, or $11.24/MWh, less than the cost of alternative power generation.

4.2.3 Staff Alternative

The staff alternative includes the same developmental proposal as Swan Lake North Hydro's and, therefore, would have the same capacity and energy attributes. Table 4-3 shows the staff-recommended additions, deletions, and modifications to Swan Lake North Hydro's proposed environmental protection and enhancement measures and the estimated cost of each.

Based on a total installed capacity of 393.3 MW, a dependable capacity of 321 MW, and an average annual generation of 1,187,000 MWh, the cost of alternative power would be $128,298,000, or $108.09/MWh. The average annual project cost would be $114,968,700, or $96.86/MWh. Overall, the project would produce power at a cost that is $13,329,300, or $11.23/MWh, less than the cost of alternative power generation.

4.3 COST OF ENVIRONMENTAL MEASURES

Table 4-3 gives the cost of each of the environmental enhancement measures considered in our analysis. We convert all costs to equal annual (levelized) values over a 30-year period of analysis to give a uniform basis for comparing the benefits of a measure to its cost.

Table 4-3. Cost of environmental mitigation and enhancement measures considered in assessing the environmental effects of continuing to operate the Swan Lake North Pumped Storage Project (Source: staff).

Enhancement/Mitigation Measures	Entities	Capital (2018$)	Annual Cost(2018$)	Levelized Annual Cost (2018$)
Geology and Soils				
1. Develop and implement a comprehensive soil erosion control plan.	Swan Lake North Hydro, staff	$99,000	$0	$8,200
Water Resources				
2. Develop and implement an adaptive water quality monitoring plan.	Swan Lake North Hydro, staff, Oregon DFW	$31,270	$2,080	$4,670
3. Develop and implement a hazardous substances control plan.	Swan Lake North Hydro, staff, Oregon DFW	$31,270	$0	$2,590
4. Line the reservoirs to prevent seepage of project waters into groundwater.	Swan Lake North Hydro, staff, Oregon DFW	$0[a]	$0	$0

Enhancement/Mitigation Measures	Entities	Capital (2018$)	Annual Cost(2018$)	Levelized Annual Cost (2018$)
5. Construct berms around the project reservoirs to minimize changes to the surface hydrology associated with the Swan Lake drainage area.	Swan Lake North Hydro, staff, Oregon DFW	$0[a]	$0	$0
Terrestrial Resources				
6. Finalize and implement the WHREP, which includes the following: (1) two big game water guzzlers, (2b) administrative access and road improvements for BLM habitat improvement projects, (3) conservation land acquisition, and (4) Bryant Mountain juniper removal. File annual reports during the preconstruction and construction periods, and during the first 5 years of operation as needed.	Swan Lake North Hydro, Oregon DFW	$387,000	$10,000[b]	$36,900

Enhancement/Mitigation Measures	Entities	Capital (2018$)	Annual Cost(2018$)	Levelized Annual Cost (2018$)
7. Finalize and implement the WHREP as proposed except do not provide BLM access and road improvements; and include: (1) 50 acres of additional juniper removal, (2) management plans for acquired conservation lands, (3) a maintenance program for big game water guzzlers, and (4) an implementation and reporting schedule.	Staff	$437,000[c]	$2,130[c,d]	$37,850
8. Finalize and implement a Revegetation and Noxious Weed Management Plan.	Swan Lake North Hydro, Oregon DFW, staff	$927,530	$41,700[e]	$85,380
9. Modify the Revegetation and Noxious Weed Management plan to cover management practices throughout project operation and reporting throughout the license term.	Oregon DFW, staff	$0[c]	$2,750[c,f]	$2,260

Enhancement/Mitigation Measures	Entities	Capital (2018$)	Annual Cost(2018$)	Levelized Annual Cost (2018$)
10. Develop a fire prevention plan.	Interior, staff	$10,000[c]	$0	$830
11. Develop and implement an ungulate protection plan that includes fencing the project reservoirs, covering construction trenches, creating wildlife crossings, avoiding construction within the transmission corridor during wildlife winter range use, and monitoring/reporting throughout the license term.	Swan Lake North Hydro, Oregon DFW, staff	$355,000[c]	$2,650[c,g]	$31,480
12. Include the following additional measures in the proposed ungulate protection plan: (1) two alternative drinking water sources near the reservoirs, and (2) a schedule for repairing damaged fencing.	Oregon DFW, staff	$1,600[c,h]	$1,600[c,i]	$190

Enhancement/Mitigation Measures	Entities	Capital (2018$)	Annual Cost(2018$)	Levelized Annual Cost (2018$)
13. Include in the proposed ungulate protection plan a measure that the reservoir fencing be designed to also exclude small mammals and herptiles.	Oregon DFW	$13,000[c,j]	$0[c]	$1,080
14. Develop and implement an avian protection plan that includes conducting two preconstruction surveys between May 1 and July 31, establishing spatial and temporal restrictions for construction activities, installing and monitoring flight diverters on the transmission line, and avoiding the removal of shrubs, native grasses, and forbs along the transmission line.	Swan Lake North Hydro, Oregon DFW, staff	$85,000[c]	$5,630[k]	$11,490

Enhancement/Mitigation Measures	Entities	Capital (2018$)	Annual Cost(2018$)	Levelized Annual Cost (2018$)
15. Include the following additional measures in the proposed avian protection plan: expand the preconstruction avian survey distance around project features (with no construction blasting) from 0.25 to 0.5 mile and conduct an additional breeding bird survey in February; apply situational-dependent spatial and temporal construction restrictions; install additional flight diverters on the transmission line north of Hopper Hill; develop quantifiable thresholds for addressing high-mortality areas; estimate avian mortality rates; and annual reporting throughout the license term.	Oregon DFW, staff	$53,330[c]	$2,000[c]	$6,000

Enhancement/Mitigation Measures	Entities	Capital (2018$)	Annual Cost(2018$)	Levelized Annual Cost (2018$)
16. Develop and implement an eagle conservation plan that includes conducting preconstruction surveys, establishing spatial and temporal restrictions for construction activities, protecting the historic bald eagle nest tree near the lower reservoir on Grizzly Butte; and developing project and transmission line-specific risk assessment models to determine if an eagle take permit is necessary.	Swan Lake North Hydro, Oregon DFW, staff	$10,000[c,l]	$0[c,l]	$830
17. Include the following additional measures in the eagle conservation plan: preconstruction surveys for winter roosts, and include helicopter flight paths in the survey area.	FWS, staff	$60,000[c]	$0	$4,970
18. Provide additional flight diverters as needed.	Oregon DFW	$38,340[c,m]	$0[c]	$3,170

Enhancement/Mitigation Measures	Entities	Capital (2018$)	Annual Cost(2018$)	Levelized Annual Cost (2018$)
19. Conduct ongoing consultation with agencies during preconstruction and construction periods.	Swan Lake North Hydro, Oregon DFW, staff	$52,000	$6,000[c,n]	$6,040
20. Conduct preconstruction surveys for sensitive plants	Swan Lake North Hydro, staff	$20,000[c]	$0[c]	$1,660
21. For all resource plans, include a description of monitoring implementation strategies, methods, and protocols and provide 60-day notice for relevant stakeholders to comment on draft plans.	Oregon DFW, Staff	$0[c]	$0[c]	$0
22. Establish a fund to implement the WHREP.	Oregon DFW	$0[c]	$0[c]	$0
23. Establish a Terrestrial Resources Working Group.	Oregon DFW	$0[c]	$0[c]	$0

Enhancement/Mitigation Measures	Entities	Capital (2018$)	Annual Cost(2018$)	Levelized Annual Cost (2018$)
24. Develop and implement a cooperative agreement between Swan Lake North Hydro, Oregon DFW, and FWS for managing avian-related transmission line issues.	Oregon DFW	$5,000[c]	$0[c]	$410
25. Implement emergency notification procedures if a project-related wildlife injury or mortality occurs and implement restorative measures that do not produce long-term changes to project operations or facilities.	Oregon DFW, staff	$0[c]	$0[c]	$0
26. Allow regulating agencies access to project lands and facilities for inspections and compliance monitoring.	Oregon DFW	$0[c]	$0[c]	$0

Enhancement/Mitigation Measures	Entities	Capital (2018$)	Annual Cost(2018$)	Levelized Annual Cost (2018$)
27. Complete construction work at intermittent waterbodies during the dry season and follow soil erosion control plan procedures when at or near wetlands/riparian areas.	Swan Lake North Hydro, staff	$0[c]	$0[c]	$0
28. Develop resource management plans for: (1) project operations, (2) wildlife protection, mitigation, and enhancement, (3) avian protection, (4) fish and wildlife habitat restoration, and (5) vegetation and noxious weed management. Update resource management plans every 5 years with consultation and approval from resource agencies.	Oregon DFW	Undetermined[o]	Undetermined[o]	Undetermined[o]
Recreation Resources				
29. Construct and maintain an interpretive facility.	Swan Lake North Hydro, staff	$7,300	$3,100[p]	$790

Enhancement/Mitigation Measures	Entities	Capital (2018$)	Annual Cost(2018$)	Levelized Annual Cost (2018$)
30. Develop and implement a public safety plan.	Swan Lake North Hydro, staff	$20,800	$0	$1,730
Land Use				
31. Develop an agricultural operation coordination plan.	Staff	$10,000[c]	$0	$830
32. Develop a transmission line construction coordination plan that considers operation of Harpold dam and the quarry.	Staff	$10,000[c]	$0	$830
33. Bury the entire transmission line.	Mary Hunnicutt, Dale Marsland, Glenn Lorenz	$120,000,000[c,q]	$65,000	$9,985,020
34. Bury 1 mile of the transmission line.	Mary Hunnicutt	$3,660,000[c,q]	$2,000	$304,560
35. Bury 6.9 miles of the transmission line.	David McLin, Lyle Smith	$25,254,000	$0	$2,178,700

Enhancement/Mitigation Measures	Entities	Capital (2018$)	Annual Cost(2018$)	Levelized Annual Cost (2018$)
36. Bury 0.25 mile of transmission line at the Lost River crossing.	Dale Marsland, Matt Iverson	$915,000	$0	$78,940
37. Realign the transmission line around the west side of Swan Lake and along Swan Lake Road and Highway 140.	Julie Jespersen	$6,000,000[c]	$12,000[c]	$4,060
Visual Resources				
38. Implement proposed visual mitigation measures (design, revegetation, materials, screening, restoration, lighting).	Swan Lake North Hydro, staff	$0[a]	$0	$0
Cultural Resources				
39. Revise the HPMP within 1 year after license issuance.	Swan Lake North Hydro	$250,000[c]	$0	$20,700

Enhancement/Mitigation Measures	Entities	Capital (2018$)	Annual Cost(2018$)	Levelized Annual Cost (2018$)
40. Complete data recovery on archaeological sites that are eligible for the National Register, develop site-specific treatment plans, and complete eligibility determinations.	Staff	$250,000[c]	$0	$20,700
Socioeconomic				
41. Develop and implement a comprehensive traffic safety plan	Swan Lake North Hydro, Staff	$20,800	$0	$1,730
Air Quality and Noise				
42. Develop and implement a fugitive dust control plan that incorporates specific measures (BMPs) to reduce fugitive dust and vehicle emissions during construction.	Staff	$15,000[c]	$0	$1,240

[a] Costs to implement the measure included in the initial construction cost and yearly operations and maintenance estimate.

[b] Cost incurred in year 1 through 11 of the license term.

[c] Cost estimated by staff.

[d] Costs of $2,000 incurred throughout license term and $5,000 incurred once every 10 years, starting in year 16 of the license term. This does not include the costs for habitat management on conservation lands because we cannot estimate that cost until specific land parcels are known and acquired for conservation.

[e] Cost incurred in years 7 through 11 of the license term.

[f] Costs of $2,000 incurred throughout license term and $20,000 in years 16 and 26 of the license term.

[g] Costs of $2,000 incurred throughout license term and an additional $1,000 starting in year 7 of the license term.

[h] We assumed $1,600 for two small rainwater collection systems.

[i] Cost incurred once every 10 years, starting in year 16 of the license term.

[j] We assumed $13,000 for 16,000 feet of hardware cloth fencing.

[k] Costs of $80,000 in year 7 and $2,000 in years 8 through 30 of the license term.

[l] We assume that the same or similar measures proposed for the avian protection plan would benefit eagles and would be included in the eagle conservation plan, but to avoid duplication of costs, we represent the capital and annual costs only in items 12 and 13.

[m] We assumed that flight diverters would be placed on the remaining 23 miles of the transmission line at a cost of $1,667 per mile, using Swan Lake North Hydro's estimate of $15,000 for 9 miles of flight diverters.

[n] Cost incurred in years 2 through 6 of the license term.

[o] We cannot determine a cost for three of the recommended plans (project operations, wildlife protection, mitigation, and enhancement, and fish and wildlife habitat restoration) because there is no plan description by which to estimate a cost. The cost to develop the other two plans (vegetation and noxious weed management and avian protection) are included in items 8 and 12, respectively.

[p] Cost incurred once every 10 years.

[q] Staff estimate developed using the per-mile transmission line construction cost provided by the applicant and increased to account for added cost of burial based on standard industry estimates. Actual cost of construction for line burial may vary considerably depending on location and construction method (i.e., boring to pass the transmission line under a river).

5.0 CONCLUSIONS AND RECOMMENDATIONS

5.1 COMPREHENSIVE DEVELOPMENT AND RECOMMENDED ALTERNATIVE

Sections 4(e) and 10(a)(1) of the FPA require the Commission to give equal consideration to the power development purposes and to the purposes of energy conservation; the protection of, mitigation of damage to, and enhancement of fish and wildlife; the protection of recreational opportunities; and the preservation of other aspects of environmental quality. Any license issued shall be in the Commission's judgment 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 for licensing the Swan Lake North Pumped Storage Project. We weigh the costs and benefits of our recommended alternative against other proposed measures.

Based on our independent review of agency and public comments filed on this project and our review of the environmental and economic effects of the proposed project and its alternatives, we selected the staff alternative as the preferred option. We recommend this option because: (1) issuance of a hydropower license by the Commission would allow Swan Lake North Hydro to construct and operate the project as an economically beneficial and dependable source of electrical energy for its customers; and (2) the recommended measures would protect wildlife and wildlife habitat, land uses, and visual resources. Many of the existing cultural resources could not be protected; however, data recovery would partially mitigate these losses.

In the following section, we explain which environmental measures proposed by Swan Lake North Hydro or recommended by agencies and other entities should be included in any license issued for the project. In addition to Swan Lake North Hydro's proposed environmental measures, we recommend additional staff-recommended environmental measures to be included in any license issued for the project.

5.1.1 Measures Proposed by Swan Lake North Hydro

Based on our environmental analysis of Swan Lake North Hydro's proposal discussed in section 3 and the costs discussed in section 4, we recommend including the following environmental measures proposed by Swan Lake North Hydro in any license issued for the project.

Geology and Soils

- Develop a soil erosion control plan that includes site-specific BMPs to control erosion during project construction.
- Construct the portions of the upper reservoir access road that cross intermittent waterbodies in the dry season to minimize erosion and sediment deposition.

Water Resources

- Construct berms around the project reservoirs to minimize the capture of surface water runoff by the project reservoirs and to minimize changes to the surface hydrology associated with the Swan Lake drainage area.
- Line the reservoirs to prevent seepage of project water into groundwater.
- Develop a hazardous substances spill prevention and cleanup plan that includes BMPs to prevent and contain the release of contaminants during all phases of construction and operation.
- Develop an adaptive water quality monitoring and management program to ensure levels of dissolved solids, nutrients, and heavy metals in the proposed reservoirs do not rise to levels that impair project operations or affect wildlife that may incidentally come in contact with project waters.

Terrestrial Resources

- Finalize the Revegetation and Noxious Weed Management Plan filed with the license application that outlines the procedures for revegetation and control of noxious weeds and invasive plants disturbed by construction.
- Conduct preconstruction surveys for sensitive plants, including slender Orcutt grass and Greene's tuctoria, and, if found, enact protection measures (e.g., flagging and fencing or translocating individual plants) after consulting with the appropriate federal agency.
- Finalize the WHREP filed on July 26, 2016, to mitigate for lost and long-term disturbance of habitat by: installing/repairing two water guzzlers for big game; acquiring or obtaining a long-term lease of 585 acres of land for big game and other wildlife habitat conservation; and thinning 282 acres of western juniper and mixed conifer forest to improve the value of sagebrush habitat on Bryant Mountain.
- Develop an eagle conservation plan that includes: conducting two preconstruction surveys between May 1 and July 31 for two breeding seasons; prohibiting blasting and helicopter use within 0.5 mile of an active eagle nest between January 1 and August 15 and consulting with resource agencies before conducting other high-decibel activities; protecting the historic bald eagle nest tree near the lower reservoir on Grizzly Butte; constructing transmission structures to prevent eagle electrocution and collision to the extent practicable; and developing project and transmission line-specific risk assessment models to determine if an eagle take permit is necessary.
- Develop an avian protection plan that includes: conducting two preconstruction surveys between May 1 and July 31 for raptors (two breeding seasons) and birds of conservation concern (one breeding season); prohibiting

blasting and helicopter use within 0.5 mile of an active raptor nest between January 1 and August 15 and consulting with resource agencies before conducting other high-decibel activities; prohibiting ground-disturbing and vegetation-clearing activities in the reservoir areas between April 1 and July 15 to protect nesting songbirds; constructing transmission structures to prevent avian electrocution and collision to the extent practicable; installing flight diverters in five areas with a high risk of avian collisions; adjusting lighting systems to minimize disruption of nighttime foraging; avoiding the removal of shrubs, native grasses, and forbs along the transmission line; marking the project reservoir fencing with vinyl strips and/or reflective tape to prevent avian collisions; and monitoring of the transmission line and reservoir fencing for bird collisions.

- Develop an ungulate protection plan that includes: fencing the project reservoirs to prevent drownings; daily monitoring of reservoir fencing; applying dust palliatives to ungraded or new roads to reduce dust clouds and minimize degrading the quality of adjacent habitats; decommissioning access roads that are unnecessary for long-term project operation and maintenance to reduce disturbance to wildlife and their habitats; designing trenches to reduce potential entrapment hazards to wildlife; creating wildlife crossings under the penstock to minimize impediments to wildlife movement; avoiding construction within the transmission corridor during wildlife winter range use to minimize disturbance; and managing portions of the transmission line ROW for wildlife benefits.

Recreation

- Develop an interpretive facility in consultation with stakeholders that includes educational and historical signage and a staging area for periodic guided tours of the hydroelectric facility to enhance recreational opportunities in the project area.
- Develop a public safety plan, in coordination with state, federal, and county agencies, which would include measures to protect the public during construction and operation of project facilities (e.g., safe operation of reservoirs, emergency vehicle access, preventing and monitoring access to reservoirs, and working with Oregon PRD to ensure safety of those using the OC&E Trail during construction).
- Cooperate with BLM to support future efforts to design and construct BLM's proposed Swan Lake Rim Trail.

Aesthetics

- Use locally quarried rock, preferably dark basalt, for the outer berm faces of the proposed reservoirs, to match the colors of the surrounding landscape and vegetation to minimize visibility of the reservoirs. Paint the powerhouse,

maintenance structures, and appurtenant facilities with colors that match the surrounding landscape, and dull the surfaces that cannot be painted; use BLM-approved paint colors; screen project facilities with vegetation; and keep facility yards clean of debris and unused materials to minimize the appearance of those structures.

- Use special lamps, covers, timers, or motion sensors, and use fully shielded lighting on outdoor fixtures to minimize light pollution to the extent possible.
- Install mono-pole-type transmission line structures instead of lattice-type structures; use weathering COR-TEN-type steel that would form a stable, rust-like appearance over time; and use conductors with non-specular materials, where possible, to minimize the contrast of transmission line structures with the surrounding landscape.
- Reduce the prominence of land scarring and vegetation changes from the construction or modification of access and service roads, to the extent possible by: (1) using low-impact construction techniques such as helicopters to place and maintain transmission poles in sensitive or difficult to access locations to avoid the need for new road construction; (2) using locally quarried aggregate to match colors of the surrounding landscape; (3) modifying road surface color to match the surrounding landscape and reduce contrast; (4) minimizing the widening and grading of roads; (5) employing dust-suppression measures during construction; and (6) replanting all disturbed areas with permanent vegetation consistent with the Revegetation and Noxious Weed Management Plan.

Cultural Resources

- Revise the HPMP filed with the license application to mitigate, minimize, or avoid project-related adverse effects on those cultural resources eligible for the National Register.

Socioeconomics

- Develop a comprehensive traffic safety plan in cooperation with federal, state, and county agencies that includes measures for traffic control, notifying and directing the public around traffic pattern changes, public safety, and control of recreational OHV use of public lands within the project's ROW during construction.

5.1.2 Additional Measures Recommended by Staff

In addition to Swan Lake North Hydro's proposed measures, we recommend including the following staff-recommended measures in any license issued for the project:

Water Resources

- Modify the proposed operational adaptive water quality monitoring plan to include: (1) specific methods to be used to monitor water quality in the project reservoirs; (2) threshold criteria and measures that would be taken if water quality in the project reservoirs deteriorates to below the threshold criteria; and (3) reporting measures.

Terrestrial Resources

- Modify the Revegetation and Noxious Weed Management Plan to specify the seed mixes and plant species to be used, including wild celery and other plants important in tribal customs if practicable (i.e., seeds are available and site conditions would support their use); planting densities and methods, fertilization and irrigation requirements, monitoring protocols, and criteria for measuring the success of revegetation efforts, and expand the plan to cover vegetation management during project operation
- Modify the proposed avian protection as follows: (1) include an additional preconstruction survey in February to ensure that early nesting raptors are identified; (2) expand the preconstruction survey area from 0.25 mile to 0.5 mile around project features where no blasting would occur; (3) adjust the proposed spatial and temporal restrictions on construction activities as needed, based on site-specific environmental conditions and nesting status; (4) install flight diverters on the section of transmission line between Hopper Hill and the temporary access road in Swan Lake Valley; (5) include quantifiable thresholds for determining when additional measures would be needed to address high-mortality areas based on the proposed transmission line monitoring; and (6) include procedures to document and report bird fatalities and injuries.
- Include in the proposed eagle conservation plan the following additional measures: (1) conduct two, preconstruction winter roost surveys for two winter seasons, and (2) include helicopter flight paths in preconstruction surveys for eagle nests and winter roosts.
- Modify the proposed WHREP to include: (1) a maintenance program for the proposed big game water guzzlers; (2) a management plan for conservation lands that identifies the parcels to be acquired, the criteria used to select the parcels, and habitat improvements that would be implemented on each parcel; (3) replacing the applicant's proposed road access easement mitigation measure with 50 acres of additional juniper removal to improve wildlife habitat; (4) an implementation schedule; and (5) a provision to bring the acquired lands into the project boundary.
- Modify the ungulate protection plan to include: (1) a big game water guzzler near the upper reservoir and one near the lower reservoir; and (2) a schedule

for inspecting and making any necessary fence repairs that is developed in consultation with Oregon DFW.

- In the event of emergencies or unanticipated circumstance in which large numbers of wildlife are being endangered, harmed, or killed by the project or its operation, notify Oregon DFW within 24 hours (six hours for state or federal listed species); comply with restorative measures required by the agencies to the extent the measures don't conflict with license requirements; and inform the Commission within 10 days after each occurrence and specify the nature of the occurrence and restorative measures taken.
- Develop a fire prevention plan that describes the measures and protocols the licensee would follow to prevent wildfires during construction and operation, including the removal of slash by means other than burning within 1 year of its creation.

Recreation Resources

- File for Commission approval conceptual drawings of the proposed interpretive facility, a map showing the location of facility features, and revised Exhibit G drawings, if revision of the project boundary is necessary to include the facility.
- Include in the proposed public safety plan specific measures to protect hikers and minimize disrupting use of the OC&E Trail during construction, including notification procedures, signage, and establishing a temporary alternative route around the construction area.

Land Use

- Develop a Harpold Dam and quarry coordination plan in consultation with the Klamath Irrigation District and the Horsefly Irrigation District, to coordinate the timing of installation and placement of the proposed transmission line to avoid or minimize disrupting their operations.
- Develop an agricultural operations coordination plan, in consultation with owners of agricultural lands that would be crossed by the transmission line, which considers pole spacing and installation timing in such a way that minimizes adverse effects on area farming practices.

Cultural Resources

- Revise the HPMP to include: (1) a culture-historic background section to give context to National Register eligibility determinations; (2) a revised map showing the direct and indirect APE established in consultation with the Oregon SHPO, BLM, Reclamation, and the Klamath Tribes; (3) National Register eligibility determinations (assessing for Criteria A, B, C, and D) on all cultural resources located within the project's direct APE, including a

determination of the eligibility of Horton Rim, Harpold Dam, and Bryant Mountain Traditional Areas as TCPs or archaeological districts and any new sites discovered on lands that could not be surveyed because of access limitations; (4) procedures to evaluate project-related effects on cultural resources, and for consideration and treatment of adverse effects, as appropriate, in consultation with the SHPO, BLM, Reclamation, and the Klamath Tribes; (5) specific proposed measures for avoiding, reducing, or mitigating project-related adverse effects on the individual National Register-eligible cultural resources within the project's direct and indirect APE, including site-specific data recovery plans (including schedules to complete the work) for those pre-contact archaeological sites where direct project-related adverse effects cannot be avoided and scheduling construction to avoid traditional cultural practices as practicable; (6) a description of future construction and operation activities that would be subject to review by the Oregon SHPO, BLM, and the Klamath Tribes (i.e., exempt, little effect, and case-by-case) and how the review would be conducted and adverse effects resolved; (7) detailed monitoring procedures during construction; and (8) detailed provisions for addressing any newly discovered cultural resources.

Socioeconomics

- Include in the traffic safety plan details on how: work shifts would be scheduled; traffic and access would be controlled; the public notified of traffic pattern changes; disruptions of KCPW roadway and drainage facility maintenance and operations would be minimized; and bridge weight restrictions followed.

Air Quality

- Develop an air quality control plan to control fugitive dust and vehicle emissions during construction.

The following section discusses the basis for our recommendations.

Modifications to the Adaptive Water Quality Monitoring and Management Plan

The applicant proposes and Oregon DFW recommends (10(j) recommendation 3(G)) an adaptive water quality monitoring and management plan because the concentrations of TDS, nutrients, and heavy metals could over time become concentrated in the water exchanged between the project reservoirs. The applicant would monitor water quality to ensure that concentrations do not affect operations and wildlife that may incidentally encounter project waters. Based on our analysis in section 3.3.2.2, it is unlikely that concentrations would rise to harmful levels. However, monitoring of the constituents as proposed would confirm staff's analysis and if incorrect, help identify corrective actions. To be effective, the adaptive management plan would need to include monitoring methods, measures that would be taken in case water quality in the project reservoirs deteriorates to specified action levels agreed upon by the applicant and

resource agencies, and proposed reporting procedures with appropriate resource agencies and the Commission. The plan should be developed in consultation with Oregon DEQ and filed with the Commission for approval. No additional cost would be associated with this staff measure.

Modifications to the Revegetation and Noxious Weed Management Plan

To promote the quick recovery of disturbed areas and prevent the establishment of noxious weeds, the applicant proposes to finalize its Revegetation and Noxious Weed Plan in consultation with Oregon DFW and other resource agencies. Oregon DFW supports the plan, but recommends (10(j) recommendation 3(H)) that the plan be modified to address vegetation management throughout the term of the license such that it becomes a comprehensive vegetation and noxious weed management plan.

The applicant's draft plan lacks detail. Details that still need to be finalized include seed mixes and plant species to be used for revegetation, planting densities and methods, fertilization and irrigation requirements, specific monitoring protocols, criteria for measuring the success of revegetation efforts, and specific procedures to be followed if revegetation is not successful. Including these details would improve the likelihood of success and implementation. We also recommend that the seed mixtures include culturally important plant species (e.g., wild celery), if available. We do not expect this to add any additional cost, and it would help to restore those plant species that Native Americans have historically and, in some cases, still currently gather.

In addition, the plan focuses on revegetation and control of noxious weeds during and immediately following construction of the project. While these periods are likely to be the most important in reestablishing native communities and controlling weeds, the plan does not describe what protocols and measures would be followed during routine vegetation management actions during project operation to achieve these objectives. Applying the measures described in the plan throughout project operation would not be difficult and would help ensure that periodic vegetation practices continue to promote native vegetation establishment that would benefit wildlife and improve wildlife habitat. Addressing project operations would add little cost to the applicant's proposed efforts to develop the plan, but would increase annual costs somewhat because the plan would address activities conducted throughout the license term. We estimate that developing and implementing a comprehensive vegetation and noxious weed management plan as recommended by staff would increase costs slightly (levelized annual cost of $2,260). The benefits to wildlife and wildlife habitat warrant the added cost.

Development of a Fire Prevention Plan

Vegetation clearing to construct the project and to periodically maintain the transmission line corridor would create slash that could build up concentrations of combustible fuels that could fuel wildfires. Interior recommends that the following measures be incorporated into the project construction and operation to prevent buildup of combustible fuels: (a) all fire restrictions must be followed in accordance with the

jurisdictional land management agency; and (b) any vegetation slash created on BLM lands must be removed, within one year of creation, by means other than burning. Given the dry climate of the proposed project area, developing protocols for preventing wildfires including promptly removing slash would help protect people, wildlife, and wildlife habitats. The benefits to the public and wildlife to be worth the minor cost of developing the fire prevention plan in consultation with BLM and Klamath County ($830).

Modifications to the Wildlife Habitat Restoration and Enhancement Plan

Mule deer, elk, pronghorn antelope, and other wildlife use habitat associated with the project, and all lands within the proposed project boundary are considered important big game winter range. As discussed in section 3.3.4.2, project construction and operation would result in the permanent or long-term disturbance to 305.7 acres of wildlife habitat. To mitigate for the permanent loss of wildlife habitat, Swan Lake North Hydro proposes and Oregon DFW recommends (10(j) recommendations 3(B) and 3(C)) that it finalize its WHREP, in consultation with resource agencies. The draft plan focuses on improving 917 acres of habitat for ungulates by: (1) providing/repairing two water guzzlers (50 acre mitigation value); (2) protecting existing habitat from future development through the acquisition of 585 of conservation lands; and (3) funding BLM to thin 232 acres of juniper and mixed conifer-dominated habitat on Bryant Mountain.

As discussed in section 3.3.4.2, improving habitat on 917 acres would replace three times the amount of habitat lost to project construction and operation. Providing water guzzlers and thinning juniper and mixed-confer habitats would improve wintering habitat conditions for mule deer populations, which are presently below Oregon DFW desired management levels. Regular maintenance would be required to ensure that the water guzzlers continue to function properly and benefit wildlife; therefore, we recommend that the WHREP be revised to define maintenance and operation procedures.

However, acquiring and preserving 585 acres of conservation lands alone would not likely provide the intended benefits because we have not identified any development threats to existing habitats. To adequately mitigate project effects and achieve the intended benefits, the lands would need to be improved and managed for mule deer and other wildlife. Only 127 acres of conservation lands have been identified. The lands identified thus far are located near the reservoirs and transmission line and would benefit species directly affected by the project if appropriately managed. The remaining lands to be acquired and managed should be located near the project facilities to benefit wildlife directly affected by the project. Therefore, we recommend that Swan Lake North Hydro acquire and manage 585 aces that are near the project, and that contain similar habitat values as the habitat being lost or disturbed due to project construction, to benefit mule deer and other wildlife. To do so effectively would require that the WHREP be revised to identify the lands to be acquired, explain how they were selected, and include management plans for the parcels. Developing the management plans for the acquired parcels would increase the capital cost of the plan by $50,000. Implementation costs for

the conservation land management plans cannot be determined because they would depend on the site-specific needs and goals. Because these lands would be needed to achieve project purposes, they would have to be brought into the project boundary.

As described in section 3.3.4.2, as part of the WHREP the applicant proposes to: (1) try to secure and transfer to BLM administrative access rights to an existing road across private lands, and (2) retain and convert a 0.9-mile-long segment of new transmission line construction access road into a permanent road for exclusive use by BLM personnel and the applicant. BLM would use this 0.9-mile segment to access BLM lands and implement habitat improvement projects. A steel gate and lock box would be installed to block public access, and a 50-foot-wide and 50-foot-long parking lot and turn around spot would be constructed for BLM's use. The improved road would be turned over to BLM after construction, and any maintenance costs associated with the road or future improvements would be borne by BLM. While we expect that BLM would implement wildlife habitat improvement projects once administrative access rights are granted and a permanent road is constructed, it is difficult to assess the benefits because: (1) it is unclear what wildlife habitat improvements would be taken on these lands; (2) how such improvements would mitigate project effects on wildlife; and (3) if and when the habitat improvements would take place. While the improved access may make it easier for BLM to carry out wildlife habitat improvements on its lands, there is no indication that these habitat improvements would not, or could not, be implemented outside of the license. The road would not serve any project need following construction. Therefore, we do not recommend this measure. Instead, we recommend that Swan Lake North Hydro implement an additional 50 acres of juniper and mixed conifer forest thinning in areas near the reservoirs or along the transmission line. The capital cost of improving the road, or undertaking the juniper and mixed conifer thinning would be the same ($20,000), such that staff's recommended measure would not increase the cost of implementing the WHREP.

As for funding BLM to implement juniper and conifer thinning on its lands on Bryant Mountain, we do not recommend this as a funding measure. While these habitat improvements would directly benefit wildlife affected by the project and would be consistent with the Commission-approved comprehensive plan and state management goals, the Commission could not be assured of when or if the measures would be undertaken by BLM. This is because the Commission only has authority over its licensees. Therefore, we recommend that Swan Lake North Hydro implement the habitat improvements. It would be up to Swan Lake North Hydro to fulfill the obligation of the license in a manner it sees fit, which could mean contracting with BLM to undertake the work.

We estimate that modifying the WHREP as described above would increase the cost of the proposed WHREP slightly (levelized annual cost of $950). The benefits to wildlife and wildlife habitat would warrant the cost.

Modifications to the Ungulate Protection Plan

Oregon DFW recommends (10(j) recommendation 3(F)) in part that the ungulate protection plan include the following additional measures: (1) alternative water sources be constructed near the reservoirs to attract wildlife away from the reservoirs, and (2) that Swan Lake North monitor reservoir fences monthly and during/following all major rainstorm events and repair any damage to the fencing immediately with a temporary fix, followed by a permanent repair within one week.

In the draft EIS, staff did not recommend the additional water sources because it was unclear if the guzzlers would function as Oregon DFW described and the proposed fencing would be sufficient protection for big game. However, during a section 10(j) teleconference, Oregon DFW clarified that the purpose of the waters was to minimize the amount of time and energy expended by wildlife in attempting to access the reservoirs for water, particularly if the guzzlers were strategically located along a migratory route where ungulates are more likely to encounter and use the guzzlers. During the teleconference, Swan Lake North Hydro agreed to install two additional guzzlers, one near the upper and one near the lower reservoir that are easy to maintain. Placement and type of guzzler would be determined in consultation with the Oregon DFW and BLM. Given the relatively arid environment, the new information provided by Oregon DFW and Swan Lake North Hydro's willingness to install the guzzlers, the benefits of constructing the guzzlers to big game would be worth the minor levelized cost of $190.

Staff also did not agree with Oregon DFW's schedule for making reservoir fencing repairs because Oregon DFW's schedule was unduly restrictive and did not allow sufficient flexibility based on site conditions (e.g., inclement weather conditions). During the 10(j) teleconference, Oregon DFW explained that while it understood staff's reasoning, it wanted assurances that needed repairs would not languish indefinitely. Swan Lake North Hydro agreed to work with Oregon DFW to develop a schedule for making repairs that considered site conditions, which adequately addresses staff's concern. Therefore, we recommend Swan Lake North Hydro include a fence inspection and repair schedule in the final ungulate protection plan. This measure would not increase the cost of the plan.

Modifications to the Avian and Eagle Protection Plans

The project area supports nesting raptors, including bald and golden eagles, and receives high use by waterfowl and other migratory birds. It also supports habitat used by several sensitive bird species such as the olive-sided flycatcher and white-headed woodpecker. Project construction would require blasting and the use of heavy construction equipment that could disturb nesting raptors and other birds. The project transmission line could pose a collision or electrocution hazard to birds.

To minimize adverse effects to birds, the applicant proposes to develop an avian protection plan and eagle conservation plan that includes, among other measures, conducting two preconstruction surveys between May 1 and July 31 for raptors (two

breeding seasons) and birds of conservation concern (one breeding season) and prohibiting blasting and helicopter use within 0.5 mile of an active raptor nest between January 1 and August 15 and consulting with resource agencies before conducting other high-decibel activities. The survey area would encompass all areas within 1 mile of locations where blasting may occur and within 0.25 mile of all other proposed project features. To minimize electrocution and collision hazards, the applicant would design the transmission line in accordance with Avian Power Line Interaction Committee guidelines to the extent practicable; install bird flight diverters in five high-risk collision areas along the transmission line, for a total of 9 miles; and monitor transmission lines quarterly for the first year of operation, with a subsequent monitoring schedule established through consultation with resource agencies.

Oregon DFW recommends (10(j) recommendations 3(D) and 3(E)) that Swan Lake North Hydro develop the bald eagle and avian protection plans as proposed, but also recommends that Swan Lake North Hydro conduct a preconstruction survey during February to capture early nesting raptors, that the preconstruction survey area around all project areas be extended to 0.5 mile, and that the proposed January 1 through August 15 restrictions on construction activities around identified nests be extended until raptor nests have been shown to have either failed or fledged to accommodate late nesting raptors. In addition to those proposed by Swan Lake North Hydro, Oregon DFW recommends that flight diverters also be placed on the approximately 2-mile-long section between Hopper Hill and the temporary transmission line access road in Swan Lake Valley. Oregon DFW also states that the applicant should provide additional flight diverters if a need becomes apparent during project operation and recommends Swan Lake North Hydro enter into an agreement for managing bird-transmission line issues. FWS recommends that the preconstruction surveys for eagles include the helicopter flight paths, and Interior recommends that the eagle conservation plan include BLM's management direction for bald and golden eagles from the 2016 Southwestern Oregon Record of Decision/RMP.

Construction Timing and Preconstruction Surveys

The applicant's proposed preconstruction surveys should be sufficient to capture the nesting of most raptors and special-status bird species that may occur in the area. However, conducting a preconstruction survey in February would be necessary to capture any early-nesting raptors, such as bald eagles and great horned owls. Bald eagles and most raptors have a strong site fidelity to their nesting sites. Extending the preconstruction survey area around project facilities not subject to blasting or helicopter use by 0.25 mile beyond that proposed by the applicant would include areas with previously documented raptor nests or nesting territories that may still be active, would improve the chances of identifying nesting raptors that maybe subjected to disturbance, and would assist in identifying factors such intervening vegetation and topography that could attenuate noise and disturbance thereby influencing the appropriate timing constraints around construction activities. Since the fledging period for some raptor species (e.g., bald eagles) may not end until after August 15, onset of certain construction

activities may need to be delayed to minimize potential effects on fledging success. Such decisions should be determined in consultation with Oregon DFW and based on site-specific conditions.

BLM's management direction for bald and golden eagles contains measures that are either not applicable or are generally already included in the applicant's proposed eagle conservation plan; however, it also prohibits activities that might disturb winter roosts. Swan Lake North's proposed eagle conservation plan does not include any measures to protect eagle winter roosts. According to National Eagle Roost Registry data (Center for Conservation Biology, 2018), there may be five communal roosts on BLM land close to the proposed transmission line (ranging from about 0.3 to 5.5 miles away). While most of the sites are far enough way that eagles should not experience adverse effects, roost sites may change before construction begins. Preconstruction surveys for winter roosts, in addition to nests, would help to identify those roosting sites, if present, that are important for eagle survival through the winter months (e.g., provide hiding cover and thermal protection), and allow for the incorporation of any additional protective measures that might be needed to protect these areas in the finalizing of the avian protection and eagle conservation plans. Conducting preconstruction winter roost surveys would have an annual levelized cost of $4,970. The benefits to bald and golden eagles would be worth the cost.

Helicopters can also disturb nesting eagles. Including the helicopter flight path at the construction sites would prevent disturbing nesting eagles by ensuring that there are no active nests within the 0.5 mile radius of helicopter use, as proposed by the applicant. Adding the helicopter flight paths at the construction site, would add little cost to Swan Lake North Hydro's proposed survey efforts. Therefore, we recommend including the helicopter flight paths in the nesting and winter roost survey areas. However, flight paths from the airstrip to the project site should not be included in the survey, since these paths may change depending on weather conditions or other unforeseen factors.

Avian Collision Mitigation Measures

In consultation with the resource agencies, the applicant identified five areas that exhibit characteristics that suggest the transmission line may pose a high hazard for avian collisions (e.g., crossing high migration corridors, etc.). The 2-mile long section of the transmission line north of the Hopper Hill is characterized by a sharp transition in topography from the low elevation of Swan Lake meadow to the high elevations of Swan Lake Rim; thus it may also be an area that would be a hazard to birds flying between foraging areas on Swan Lake and nesting and roosting on the higher elevations. Adding bird flight diverters along this section of the transmission line would reduce this collision risk.

While the above areas likely pose the greatest risk of bird collisions, other areas may become apparent once the transmission line infrastructure is in-place. The applicant's proposed monitoring efforts would help detect these areas, but lacks the detail needed to effectively implement the plan, including monitoring methods, criteria for

determining when additional protective measures would be needed, and reporting procedures. One year of monitoring is not likely to be sufficient to fully identify and address problem areas. Defining the monitoring methods and a strategy for addressing problem areas in the plan would allow for a quicker and more effective response to situations as they arise during project operation. A strategy could include triggers for when fatality rates for raptors and sensitive species become excessive and additional measures are warranted. Deriving basic fatality rates from the transmission line monitoring data, as recommended by Oregon DFW, could be useful in identifying problem areas and establishing criteria for when to implement corrective measures.

However, Oregon DFW's recommendation (10(j) recommendation 4(B)) for agencies to enter into an agreement for managing bird-transmission line issues would be unenforceable, as the Commission only has jurisdiction over the actions of the licensee and not any other agency.

For the reasons discussed above we recommend modifying the avian protection plan and eagle conservation plan to include the following additional provisions: preconstruction breeding bird surveys in February; preconstruction winter roost surveys; include helicopter flight paths in preconstruction surveys; expand the survey area to 0.5 mile around areas where no blasting would occur; adjust temporal and spatial construction restrictions based on site-specific environmental and nesting and roosting status conditions; install bird flight diverters on the 2-mile-long segment north of Hopper Hill, and develop an monitoring program with specific criteria for installing additional protection measures and estimating mortality levels. We estimate the additional measures recommended by staff would have an annual levelized cost of $10,970 and concluded that the benefits of reducing disturbance and potential mortality to bald eagles and other birds to be worth the cost.

Comment Period and Monitoring Requirements for Resource Management Plans

Oregon DFW recommends (10(j) recommendations 3(I) and 2(A)) that the final WHREP and resource management plans include a description of monitoring implementation strategies, methods, and protocols, and that the applicant provide relevant stakeholders a 60-day period to comment on any draft plans. We agree that monitoring of implementation strategies is needed to ensure that they achieve the intended objectives. Such details are typically included in all plans required by the Commission. The Commission typically requires applicants to develop plans in consultation with agencies, tribes and other interested parties and requires the applicant to provide a draft of plans to these entities for comments before filing it with the Commission for approval. However, we see no reason why 30 days should not be sufficient for the various plans recommended by staff. This cost of this consultation is already factored into the applicant's proposal, so there should be no added cost.

Annual Reports

The applicant proposes filing annual WHREP reports through the preconstruction and construction periods, and for the first 5 years of operation, as needed to report any resource issues. The applicant also proposes annual reports for the Revegetation and Noxious Weed Management Plan, but we presume the applicant only proposes to file reports through the expected 3- to 5-year vegetation regrowth and establishment period following construction. Oregon DFW recommends (10(j) recommendations 1(A), 1(C), 1(D), and 1(E)) that the applicant file annual reports for all implementation plans throughout the term of the license and that it be provided 30 days to review the draft reports before filing final reports with the agencies and the Commission. The Commission includes reporting requirements where needed to document compliance with the terms of the license and notify the Commission of any needed modifications to the license. Here we recommend reporting requirements be developed in consultation with the agencies. Including this effort in the development of the plans would not increase the cost of the various plans.

Inspection of Facilities and Records

Oregon DFW recommends (10(j) recommendation 5(A)) that Swan Lake North Hydro be required to allow state and federal regulatory agencies, including Oregon DFW, access to and across project lands and works for the purpose of inspecting facilities and records, including monitoring data, to monitor compliance with the license. Oregon DFW recommends that Swan Lake North Hydro allow such inspections upon the entity requesting the inspection providing the licensee with reasonable notice of such inspections and agreeing to follow the licensee's standard safety and security procedures when engaged in such inspections.

If the Commission were to issue a license, it would include a standard license condition that already grants federal agency access to project lands in the performance of their employment duties. Granting similar access for state officials with sufficient notice as suggested by Oregon DFW is reasonable and would assist the Commission in monitoring compliance with the various resource plans recommended by staff (e.g., revegetation and noxious weed management, avian protection, etc.). We recommend that the license include a provision to provide Oregon DFW with monitoring data, for information purposes, within 15 days of the agency's written request for the data. In most cases, data should be readily available. For example, construction site personnel should be able to document the status of nesting raptors during construction to demonstrate adherence to construction limits. Other data may need to be verified, such as the reservoir water quality; thus, should be viewed as informational purposes only. We anticipate Oregon DFW making such requests on a periodic basis.

Emergency Notification Procedures

Oregon DFW recommends (10(j) recommendation 4(A2)) that in emergency situations where there is a wildlife injury or mortality, the applicant notify Oregon DFW

within 24 hours (6 hours for threatened and endangered species) and the Commission within 10 days. Notifying Oregon DFW would take little effort and would allow local experts to advise the applicant in how to appropriately respond to the situation to prevent further injury or mortality. We recommend that Swan Lake North Hydro provide the recommended notifications and implement corrective actions as needed, but note that any corrective actions that the applicant would take at the recommendation of the agencies and that would result in long-term changes to project facilities or operations would require prior Commission approval. Notifying the Commission would also take little effort and would be an additional precaution to ensure that actions to be taken are in compliance with license conditions.

Interpretive Facility

The applicant proposes build an interpretive facility at the lower reservoir that includes educational and historical signage and a staging area for periodic guided tours of the hydroelectric facility to enhance recreational opportunities in the project area. Doing so would provide the public a way to enjoy the scenic quality of the area, learn more about the history of the area, and understand the function and operation of a pumped-storage hydropower project. As we discuss in section 3.3.6.2, it is not clear exactly where the facility would be located, what it would look like, or what stakeholders would be consulted in the development of the facility. Therefore we recommend that, prior to construction of the facility and within 1 year of license issuance, conceptual design drawings of the proposed facility be filed with the Commission for approval, along with its proposed content and a map showing the location of facility and documentation of consultation with Oregon PRD, BLM, and Oregon DFW since these agencies manage recreational resources at or adjacent to the project site. To ensure that the interpretive facility continues to provide the intended benefit, it must be adequately maintained and should be included within the project boundary. Therefore, if appropriate, revised Exhibit G drawings should also be filed that show the facility within the project boundary. Providing this information would not result in any additional cost and would ensure that the facility is built to appropriate standards, properly managed as a project facility, and takes into consideration agency comments.

Public Safety Plan

Users of the OC&E Trail could be disrupted during project construction in two areas – where it crosses an existing access road that would be upgraded to serve as a construction access road and where it would be crossed by the transmission line near Highway 140. The applicant proposes to develop a public safety plan in consultation with agencies to maintain recreational user safety during the project construction period; however, Swan Lake North Hydro does not define what specific measures would be incorporated into the public safety plan to achieve this objective. To minimize disruption of trail use and ensure user safety, we recommend the public safety plan include provisions of advanced public notification, signage, and establishment of trail closings or alternate routes around the construction area. Developing these measures in consultation

with the BLM, Oregon PRD, and Oregon DFW would ensure that the plan adequately addresses agency concerns. Developing the plan in this manner would not result in any additional cost and would ensure that the safety of OC&E Trail users is maintained during project construction.

Historic Properties Management Plan

As discussed in section 3.3.8, the project would directly or indirectly adversely affect pre-contact archaeological sites in the Swan Lake Rim TCP that are eligible or considered eligible for the National Register. Additional sites along the 32.8-mile-long transmission line would also be directly or indirectly affected, but their National Register eligibility has not been determined. The applicant proposes to finalize its draft HPMP, which would specify the project's adverse effects on all National Register-eligible sites and describe mitigation measures.

The draft HPMP does not reflect all available information from recent studies, lacks detail, does not fully address all eligibility criterion for all sites directly and indirectly affected by the project, and does not define measures needed to address the pre-contact archaeological sites pursuant to section 106. Therefore, staff recommends that the HPMP be revised to include: (1) a culture-historic background section to give context to National Register eligibility determinations; (2) a revised map showing the direct and indirect APE established in consultation with the Oregon SHPO, BLM, Reclamation, and Klamath Tribes; (3) complete National Register eligibility determinations (assessing for Criteria A, B, C, and D) on all cultural resources located within the direct APE including a determination of the eligibility of Horton Rim, Harpold Dam, and Bryant Mountain Traditional Areas as TCPs or archaeological districts; (4) determinations of project-related effects on each of the significant archaeological resources that occur in the direct and indirect APE; (5) detailed measures to avoid, reduce, or mitigate project-related adverse effects on all individual National Register-eligible cultural resources within the project's direct and indirect APE, including site-specific data recovery plans (including schedules to complete the work) for those pre-contact archaeological sites where direct project-related adverse effects cannot be avoided and scheduling construction to avoid traditional cultural practices as practicable; (6) a description of future construction and operation activities that would be subject to review by the Oregon SHPO, BLM, Bureau of Reclamation, and Klamath Tribes; and (7) detailed monitoring procedures during construction; and (8) detailed provisions for addressing any newly discovered cultural resources.

Staff further recommends that the revised HPMP be implemented prior to any ground-disturbing actions that would destroy the sites. Revising the HPMP as staff recommends would entail further data recovery and recordation than that proposed by the applicant. We estimate that this recommended additional field testing would have a levelized annual cost of $20,700 and find that these efforts would be needed to mitigate for adverse effects to the archaeological sites eligible for the National Register.

Traffic Safety Plan

During the construction period, and to a lesser extent during project operation, traffic is expected to increase on local roads and delays may occur along Swan Lake Road and Highway 140. Delays may also occur on Harpold, North Poe Valley, and Burgdorf Roads near the transmission line crossing of the Lost River where Harpold Dam and the rock quarry are located. The applicant proposes to develop a traffic safety plan to minimize these adverse effects. The plan would include provisions to stagger workforce hours, set speed limits for construction personnel and deliveries onsite, provide public information on traffic changes, and control OHV use of public lands within the project boundary. These efforts would minimize traffic impacts on local roads and address concerns by Oregon DFW about increased traffic in areas where it could disturb wildlife. To be effective, staff recommends that the plan describe how: (1) work shifts would be scheduled; (2) traffic and access would be controlled; (3) the public notified of traffic changes; (4) construction traffic would be coordinated to minimize interference with KCPW roadway and drainage facility maintenance and operations, including snow removal and dust control; and (5) bridge restrictions would be followed Further, while including speed limits in the plan would help promote public safety, the Commission would not be able to enforce such requirements. At most the applicant might post speed limit signs, but local law enforcement would need to enforce the speed limits. Developing the plan in consultation with the Oregon Department of Transportation, KCPW, Klamath Irrigation District, Horsefly Irrigation District, BLM, the Oregon DFW, and the Oregon PRD would ensure that all stakeholder concerns are addressed. Developing the traffic safety plan in this manner and filing it for Commission approval would not result in any additional cost and would ensure that traffic impacts during project construction and operation are kept to a minimum.

Harpold Dam and Rock Quarry Coordination Plan

The proposed project transmission line would be constructed directly over two 4-acre parcels of Reclamation land on either side of the Lost River. The parcel on the north bank of the river is used by the Klamath Irrigation District to quarry rock for use in irrigation systems, while the other parcel includes Harpold Dam, which is operated by the Horsefly Irrigation District for flood control. To ensure that the operation of either facility is not adversely affected by the construction or the presence of the proposed transmission line, Interior recommends that placement of the line be coordinated with the two irrigation districts. As we discuss in section 3.3.6.2, it is important that the transmission line be placed, and that construction activities be timed and conducted, in such a way as to avoid interfering with the operation of either facility. To ensure that such interference is avoided as much as possible, a plan to coordinate project construction and maintenance activities with the Klamath Irrigation District and the Klamath Irrigation District should be developed during the final design of the transmission line. Preparing the coordination plan and filing it for Commission approval prior to the start of project construction would be worth the estimated annual levelized cost of $830.

Agricultural Operation Coordination Plan

The proposed project transmission line would cross some parcels of agricultural land and, depending on where the poles are placed, could impair agricultural operations such as irrigation, planting, and harvesting. As we discuss in section 3.3.6.2, while irrigation operations may need to be modified where the proposed Swan Lake North transmission crosses irrigated fields, farming operations may not necessarily be prevented. Other agricultural operations, such as cattle grazing would be able to continue unimpeded. Swan Lake North indicates that there is some flexibility in where to place poles within the proposed transmission line ROW and that final placement of transmission line poles might require adjusting the location of some farm facilities. Identifying the construction timing, and placement of the transmission poles in consultation with landowners of agricultural land crossed by the transmission line would minimize any adverse effects on agricultural operations. The benefits of preparing a plan that describes the consultation procedures in establishing installation timing and pole spacing would be worth the estimated annual levelized cost of $830.

Air Quality

Construction of the project would cause sporadic emissions of criteria pollutants through fugitive dust and vehicle missions that would adversely affect air quality in the immediate project area for short periods. Air quality impacts during construction could be minimized by implementing standard construction dust control and vehicle emission BMPs. Although the applicant commits to controlling erosion associated with all aspects of project construction through a soil erosion control plan, it does not propose any BMPs to ensure air quality impacts are minimized during project construction. Therefore, staff recommends the applicant address reduction of dust and vehicle emissions by developing an air quality control plan and ensure that contractors abide by BMPs outlined in the plan. Elements of such a plan would include a description of the measures to monitor for and suppress fugitive dust and vehicle emissions during project construction as discussed in section 3.3.10.2, *Environmental Effects, Air Quality*. Developing an air quality control plan would minimize adverse effects of fugitive dust and vehicle emissions on air quality during project construction. We estimate that developing the plan would have a levelized annual cost of $1,240 which would be worth the cost.

5.1.3 Measures Not Recommended by Staff

Some of the measures recommended by other interested parties would be unnecessary, cause impacts not offset by the measures' benefits, or do not exhibit sufficient nexus to project environmental effects. The following discusses the basis for staff's conclusion not to recommend such measures.

Establish a Terrestrial Resources Working Group

Oregon DFW recommends (10 (j) recommendation 4(A1)) that the applicant form a Terrestrial Resources Working Group to assist in the coordination and the

implementation of the WHREP and other resource management plans. Although consultation with the agencies throughout the license term would likely improve implementation of the various plans and we have no objection with Swan Lake North Hydro forming the work group, we do not recommend that the license include a requirement to form the work group because the Commission cannot compel agency participation in the work groups. Consultation requirements built into typical license requirements would achieve the intended purpose.

Additional Resource Management Plans

Oregon DFW recommends (10(j) recommendation 1(B)) without elaboration that the applicant develop the following additional resource management plans: (1) project operations; (2) wildlife protection, mitigation, and enhancement; (3) avian protection; (4) fish and wildlife habitat restoration; and (5) vegetation and noxious weed management. However, Oregon DFW does not describe the resource management plans or the basis for the plans. For conventional hydroelectric projects, an operating plan is often requested to establish procedures to document compliance with certain aspects of operations, such as minimum instream flow releases, limits on reservoir fluctuations, etc. Here, there is no need for a project operation plan because as a closed-looped pumped storage project there would be no need for similar environmental limits on its operations. The other plans listed by Oregon DFW appear to be duplicative with the development of proposed plans already recommended by Oregon DFW and staff (e.g., WHREP, vegetation and noxious weed management, and avian protection plans); therefore, they would serve no purpose.

Establish a WHREP Fund

Oregon DFW recommends (10(j) recommendation 3(B)) that the applicant establish a fund to implement the WHREP. Establishing a fund would ensure that resources are readily available to implement the measures required by the license. However, this is not necessary because the Commission's regulations provide it with sufficient authority to require licensees to timely implement the provisions of its license.

Establish a Cooperative Agreement for Addressing Avian-related Transmission Line Issues

Oregon DFW recommends (10(j) recommendation 4(B)) that the licensee enter into an agreement with Oregon DFW and FWS to promote cooperation between the entities in addressing avian-related transmission line issues. As we discussed in section 3.3.4.2, we do not recommend this measure because it would be unenforceable, in that the Commission cannot compel any entity other than the licensee (e.g., Oregon DFW and FWS) to take any action, such as entering into any agreement. Nor is it necessary because the avian protection plan recommended by staff could be appropriately crafted to ensure future collaboration with Oregon DFW and FWS to address these issues.

Fencing to Exclude Small Animals

Oregon DFW recommends (10(j) recommendation 3(F)) that the ungulate protection plan include reservoir fencing designed to exclude small animals. In its December 26, 2018, filing, Oregon DFW clarified that the lower two to three feet of fencing should be of a sufficient mesh size (one quarter to one half inch) to exclude smaller animals, and should extend underground and outward a couple of feet to discourage burrowing animals such as badgers from accessing the reservoir area. Oregon DFW further clarified that the intent of the fencing was to prevent large and small animals (e.g., amphibians) from having access to "a water quality compromised water source," and a potential entrapment and drowning site.

Although the applicant has not described the type of fencing to be used around the project reservoirs, installing the small animal fencing as recommended by Oregon DFW would increase the cost of fencing by approximately $13,000 as well as create additional maintenance costs. However, the additional small animal fencing is not needed. Should small animals pass through the proposed fence, animal drownings would be unlikely because the interior slopes of the reservoir would not be extremely steep, and the interior surface of the reservoirs would be composed of riprap material, which wildlife could easily climb. Further, it is unknown if the water quality of the project reservoirs would degrade to the point that could be harmful to wildlife. The proposed water quality monitoring program would determine if additional measures, such as adding small animal fencing, might be needed to prevent wildlife access to the reservoirs. Therefore, the benefits to small wildlife would not be worth the cost.

Alternative Alignment of Transmission Line around Swan Lake Road

To minimize impacts to agricultural land and visual resources, landowner Julie Jespersen recommends that the proposed transmission line route be rerouted along the east side of Swan Lake and follow the existing ROWs of Swan Lake Road and Highway 140. As we discuss in our analysis of land use effects in section 3.3.6.2, rerouting the line in this manner would go through environmentally and culturally sensitive areas and add 6 additional miles of transmission line. The estimated annual levelized cost of $4,060 of constructing 6 additional miles of transmission line would not be justified because it would likely result in additional impacts to visual, agricultural, cultural, and wildlife resources that would not be offset by any benefit to agricultural or visual resources of aligning the power line along these two ROWs. We therefore, do not recommend Ms. Jespersen's suggested realignment of the proposed transmission line.

Burying the Transmission Line

Several members of the public recommended burying the project transmission line for a variety of lengths and reasons. Mary Hunnicutt and other residents living near the Lost River and south of Harpold Dam recommend either burying the entire line or at least the one-mile-long segment that crosses close to their homes to reduce visual effects, prevent losses in property values, and reduce exposure to EMF radiation and electrical

interference. They also recommend burying the line under the Lost River (about a 0.25-mile segment) to prevent further bird injuries and losses from collisions in an area that is already experiencing collisions with existing lines. David McLin and Lyle Smith recommend burying about 6.9 miles of the transmission line to prevent interfering or eliminating agricultural operations, which includes irrigated crop lands.

It is unknown whether the topographic and soil conditions would make burying all or a portion of the transmission line possible. Assuming that the line or a portion of the transmission line could be buried along its route, burial would reduce or eliminate EMF and electrical interference, eliminate the long-term visual effects on the landscape, and likely prevent any associated losses in property values. Burying the transmission line across the agricultural properties would prevent long-term interference with existing agricultural operations, such as irrigation, but would temporarily disturb a greater portion of the agricultural fields from trenching. Mitigation measures proposed by Swan Lake North Hydro would return soils and fields to their original productive use. Burying the transmission line would also reduce if not eliminate indirect effects of the transmission line on cultural sites important to the Klamath Tribes; however burying the line would result in additional ground disturbance that could directly affect sites found within the corridor. Finally, burying the transmission line, particularly under the Lost River, would eliminate any collision and electrocution risk to birds, and would eliminate the need to monitor for bird injuries or mortalities along any buried segments of the line. Burying the line under the Lost River would also benefit visual resources by preserving the scenic upstream view from the bridge crossing below Harpold Dam and from residences in the immediate area. However, land-disturbance associated with burying the line at this location could adversely affect riparian habitat and an archaeological site.

The proposed transmission line would come as close as 600 feet to residences near the Lost River. As we discuss in our analysis of EMFs and electrical interference in section 3.3.6.2, the health effects of EMF on residents, or the possibility of electrical interference on cell phone, TVs, or radios in this area, is not likely. EMF levels of a 230-KV line are expected to be reduced by 99 percent at 300 feet (0.8 mG) (NIEHS, 2002). Such levels are less than those associated with common appliances in homes. While residents would be able to see all or parts of the transmission line, Swan Lake North Hydro's proposed revegetation efforts, use of COR-TEN-type steel and non-reflective materials for transmission line conductors, and installation of mono-poles would minimize the contrast of the new line with the surrounding landscape to the extent practicable.

The proposed transmission line either crosses or, for the most part, abuts at least 18 irrigation pivots. As discussed in section 3.3.6.2, irrigation operations may need to be modified where the transmission line crosses irrigated fields; however, irrigated farming may not necessarily be prevented. Other agricultural operations, such as cattle grazing, would not be affected after installation of the line. Swan Lake North Hydro indicates that there is some flexibility in where to place poles within the proposed transmission line ROW and that final placement of transmission line poles might require adjusting the

location of some farm facilities. Coordinating with local agricultural landowners during final design and placement of the transmission line would allow Swan Lake North Hydro to consider individual operations and minimize adverse effects on agricultural operations.

Although using bird flight diverters as proposed by Swan Lake North Hydro would not likely eliminate all bird collisions, most studies have shown a reduction in collisions and/or increase in avoidance behavior at marked lines compared to unmarked lines (APLIC, 2012). Several recent studies indicate that marking lines can lower collision incidents by 50 to 80 percent (APLIC, 2012; Barrientos et al., 2011, Jenkins et al., 2010), although others have shown reduction rates of less than 50 percent (Barrientos et al., 2012; Sporer et al., 2013). Efficacy can vary with location, type of line marking devices, and bird species (APLIC, 2012). Swan Lake North Hydro's proposed monitoring efforts would determine if additional measures might be needed in the future to reduce collision hazards to acceptable levels.

Burying the transmission line would increase project costs because it would require additional construction and provisions to cool the line. For example, since air cools overhead electric lines, other systems would need to be used to cool underground lines, such as an oil system that employs pumps to circulate oil. Because the cooling systems are expensive and because it is costly to dig trenches, it is more expensive to bury power lines than to string them overhead. Although underground lines are away from weather, vegetation, vehicles, and irrigation equipment, they are also more difficult to access and locate a fault in the line or cooling system.

Swan Lake North Hydro estimates it would cost $33,530,000 to construct the overhead transmission line. Assuming the line could be buried without any unusual or extensive effort, staff estimates burying the entire line would cost $120,000,000 (a levelized annual cost of $9,985,020), about 3.5 times more than constructing the overhead line. This cost would be slightly offset by eliminating the need to install bird flight diverters and transmission line monitoring (an annual levelized cost of $11,490[91]). Burying 6.9 miles of the transmission to avoid interfering with agricultural operations would cost about $25,254,000 (levelized cost of $2,178,700). This would increase the cost of the project transmission line by $18,200,042 (levelized cost of $1,570,176). Burying one mile of the transmission line to avoid EMF and visual effects would cost $3,660,000 (a levelized cost of $304,560). This would increase cost of constructing the line by $2,637,743 (levelized cost of $216,370). The unlikely risk to residents from EMF's or electrical interference and potential adverse effects of the overhead transmission line on agricultural operations, do not justify the high costs of burying all or part of the transmission line. Therefore, we do not recommend burying the transmission line to avoid these effects.

[91] This is the levelized cost of the entire avian protection plan as proposed by the applicant. The cost for just the bird flight diverters and transmission line monitoring would be less.

Burying the line under the Lost River (a 0.25-mile-long segment) to avoid bird collision risks and adverse visual effects, however, would cost $915,000 (a levelized cost of $78,940). This would increase the cost of the transmission line by $659,000 (levelized $56,890). However, installing flight diverters and transmission line monitoring would be a more cost-effective way for reducing avian collision risk (levelized cost of $11,490), although, depending on the effectiveness of the flight diverters, additional measures could be needed in the future. The high cost of burying the line outweighs the benefits to avian and visual resources. Therefore we do not recommend burying the line under the Lost River.

5.2 UNAVOIDABLE ADVERSE EFFECTS

Project construction would disturb soils in the project area, resulting in temporary adverse erosional effects on soil resources. The applicant would incorporate BMPs into a soil erosion plan that would minimize erosion and sedimentation. Fugitive dust and vehicle emissions would be emitted during project construction. Implementing BMPs, such as applying dust palliatives to disturbed areas; covering haul trucks transporting soil, sand, or other loose material on the site; minimizing idling time by either shutting equipment off when not in use or reducing idling time to 5 minutes; establishing protocols for equipment inspection and maintenance programs to ensure work and fuel efficiencies, would minimize emissions and ensure no long-term adverse effects to air quality.

Project facilities would result in the permanent loss of 210.5 acres of wildlife habitat and the temporary disturbance of 266.9 acres of habitat. Soil disturbance would facilitate the spread of noxious weeds, displacing native plant species and altering wildlife habitat characteristics. Implementing the measures proposed in the Revegetation and Noxious Weed Management Plan would quickly revegetate temporarily disturbed land and control noxious weeds, mitigating adverse effects of project construction. Wildlife would be disturbed by noise and human presence during the construction period and, to a lesser extent, project operation and maintenance. Improving habitat on about 917 acres and implementing actions to reduce disturbances to mule deer, bald eagles, and other sensitive species as described in the WHREP, ungulate protection plan, eagle protection plan and avian protection plan would minimize the effects of lost habitat, impediments to animal movements and potential sources of disturbance and mortality to the extent practicable. The overhead transmission line could result in bird and bat collisions or electrocutions which could cause direct injury or mortality of individual animals. Designing the overhead line consistent with practices outlined by the Avian Power Line Interaction Committee, including marking to increase visibility, would minimize this potential to the greatest extent practicable.

Recreational use in the immediate project area, primarily hunting and hiking on of the OC&E Trail, would be temporarily disrupted during the construction. Construction activities could affect access and would increase levels of noise and dust that may degrade recreation experiences. A total of 195 acres of agricultural land would be

permanently removed from production due to the presence of project facilities. During construction, 268 acres of agricultural land would be removed temporarily from production. Construction activities would result in increased traffic on area roads, leading to delays and changes in traffic patterns. Implementing public safety and traffic control measures, restoring and revegetating disturbed areas, following BMPs for dust control, and compensating agricultural landowners for lost production of their land would minimize these impacts.

Project construction activities would create temporary visual impacts to recreation visitors, motorists, and residents in the project area from the presence of construction equipment, land disturbance, and increased dust levels. Constructed project features, even after proposed visual mitigation measures are in place, would be permanently visible to varying degrees on an otherwise natural or agrarian landscape, and the project transmission line would contribute an additional unnatural linear element within the Lost River Basin.

Construction of the proposed project would adversely affect part of the Swan Lake Rim TCP, which as a TCP has been determined eligible for the National Register. The Swan Lake Rim TCP has great traditional, cultural, and religious importance to the Klamath Tribes, who have used the area for thousands of years and continue to access the TCP today. Of the 63 contributing elements to the TCP, consisting of pre-contact archaeological sites, 16 would be removed by construction of the proposed project. The physical presence of the proposed project within the TCP would also have permanent indirect adverse effects on other contributing elements to the TCP. These direct (mostly related to project construction) and indirect (mostly related to siting and continued operation of the project) adverse effects on the TCP would be irreversible and would cumulatively add to the adverse effects on the TCP that have already occurred due to deforestation and agricultural practices. Full data recovery and recordation of those archaeological sites determined eligible for the National Register would partially mitigate the unavoidable adverse effects to the individual sites. There are an additional 22 National Register-eligible pre-contact archaeological sites along the 32.8-mile transmission line corridor outside the Swan Lake Rim TCP that could also be directly adversely affected by project. Another 27 pre-contact archaeological sites could also be indirectly affected by the project. All of these sites are located in the Horton Rim, Harpold Dam, Bryant Mountain Traditional Area that are of traditional, cultural, and religious importance to the Klamath Tribes, and to which they believe is all within a larger traditional cultural landscape encompassing the Swan Lake Rim TCP and these other traditional areas to the south. As noted for the Swan Lake TCP, data recovery and recordation of the sites directly affected by the construction of the transmission line along Horton Rim, Harpold Dam, Bryant Mountain Traditional Area would partially mitigate the adverse effects.

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

In response to our REA notice, Oregon DFW (letter filed February 20, 2018) submitted 18 recommendations under section 10(j) of the FPA. In the draft EIS, we found that 8 of the 18 recommendations made by Oregon DFW fell within the scope of section 10(j).[92] Of those recommendations within the scope of 10(j), we determined that parts of 3 recommendations may be inconsistent with the purpose and requirement of the FPA or other applicable law.[93] Table 5-1 (at the end of the following discussion) lists each of these recommendations and whether they are adopted in the staff alternative. Environmental recommendations that we consider outside the scope of section 10(j) are considered under section 10(a) and addressed in the specific resource sections and section 5.1, *Comprehensive Development and Recommended Alternative*, of this document.

We sent a letter to Oregon DFW on August 24, 2018, informing it of our preliminary determination of inconsistencies for its recommendations, and requested concurrence, comments, or alternative recommendations. By letter filed October 31, 2018, Oregon DFW requested a meeting to attempt to resolve inconsistencies.

Commission staff conducted a 10(j) meeting with Oregon DFW on December 6, 2018, via teleconference.[94] Below, we provide a summary of the meeting discussions. During the meeting, we resolved all but one of the inconsistencies. On December 26,

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[92] In the draft EIS, we mistakenly stated that 10 recommendations were within the scope of 10(j); this should have been 8.

[93] In the draft EIS, we mistakenly stated that we partially adopted 6 recommendations, this should have been 3. Specifically, the 3 recommendations that we found to be partially inconsistent with section 10(j) are: Wildlife Restoration and Enhancement Plan (recommendation #3B), Mitigation for Permanently Displaced Wildlife Habitat (recommendation #3C), and Ungulate Protection Plan (recommendation #3F). Each of these has multiple components.

[94] BLM staff and Rye Development (representative for Swan Lake North Hydro) also participated in the section 10(j) meeting. A meeting summary was filed on December 12, 2018.

2018, Oregon DFW filed additional comments in support of the one unresolved inconsistency.

Retaining a Project Construction Road for BLM's Perpetual Access to its Lands

In the draft EIS, we did not adopt one component of Oregon DFW's recommendation for implementing the applicant's proposed WHREP; specifically, we did not adopt retaining a project construction road (i.e., creating a permanent access road) and obtaining an administrative access easement for BLM's perpetual access to that agency's wildlife habitat projects. Although we believed that the permanent road and access easement would be for BLM's land management purposes to enhance wildlife habitat, the WHREP lacked information describing those enhancement activities and how they might relate to the project (e.g., where they would be implemented, measurable management goals for evaluating their effectiveness, an implementation schedule).

During the 10(j) teleconference, Oregon DFW stated that this particular component of the WHREP was developed during prior pre-filing discussions regarding appropriate forms of mitigation, and that its recommendation was, in part, to lend support to BLM interests. Oregon DFW further commented that, in its view, it would be better to have fewer permanent project roads constructed, and that it preferred that the 50 acres of mitigation value for this measure be replaced by 50 acres of additional wildlife conservation lands, but it would also agree to the habitat enhancement measures recommended by staff. BLM commented that it can no longer require this measure due to its current policy direction on compensatory mitigation (BLM Permanent Instruction Memorandum (IM) 2018-093, July 2018). Therefore, the inconsistency is resolved.

Additional Guzzlers for Ungulates

In the draft EIS, we did not adopt the component of Oregon DFW's recommended ungulate plan that included providing alternative drinking water sources as a means of attracting wildlife away from the proposed reservoirs. We did not adopt this because installation of at least 8-foot-tall fencing should be a sufficient deterrent to most wildlife attempting to access the reservoirs for drinking water. Also, we were not convinced that the guzzlers would function as intended given their small sizes relative to the reservoir.

During the 10(j) teleconference, Oregon DFW stated that major water sources such as reservoirs, fenced or otherwise, naturally attract wildlife and cause them to approach and investigate the structures. Oregon DFW believes that by providing water guzzlers in proximity to the reservoirs, wildlife would have the ability to access water and satisfy their thirst. Once that need was met, wildlife would then be more likely to resume foraging or moving along their migratory pathway instead of continuing to wander around the reservoirs looking for access to water. Swan Lake North Hydro agreed that the additional guzzlers would be a low cost item it would be willing to provide two, low-maintenance guzzlers; one near each of the reservoirs. Oregon DFW

and Swan Lake North Hydro agreed to work together to determine the type and location of the guzzlers.

Based on the new, clarifying information, we find that installing two additional guzzlers near the proposed project reservoirs might help minimize the amount of time and energy expended by wildlife in attempting to access the reservoirs, particularly if the guzzlers were strategically located along a migratory route where ungulates are more likely to encounter and use the guzzlers. Given the low cost and willingness of Swan Lake North Hydro to install them, we now adopt this measure and consider this inconsistency resolved.

Reservoir Fencing to Exclude Small Animals

In the draft EIS, we did not adopt the component of Oregon DFW's ungulate plan that recommended that reservoir security fences be designed to also exclude small animals (e.g., reptiles, amphibians, small mammals). In our view, if small animals were to pass through a fence and enter the reservoirs, they should be able to climb back out without difficulty because of the gradual interior slope of the reservoirs and the rough surface composition (rip-rap). Therefore, the benefits did not justify the additional cost of installing and maintaining the small animal fencing.

In the 10(j) teleconference, Oregon DFW stated that it had recommended this measure out of concern that small animals would be exposed to reservoir water treated with algaecides or other toxic chemicals. Oregon DFW also had concerns that small animals may drown in the reservoirs or be at higher risk for predation as they congregate and pass through the reservoir fences. Commission staff pointed out that there are no federally threatened or endangered small animal species or other sensitive species in the project vicinity that might warrant the extra protection. Oregon DFW agreed and indicated that it had not recommended the measure for the protection of any particular species of concern. Staff also stated that Oregon DFW has not provided evidence that this is a problem at other existing projects.

After the 10(j) meeting, Oregon DFW filed comments stating that it was unable to find any examples of projects where smaller mesh fencing was installed for the protection of small animals except for the federally threatened desert tortoise at the Eagle Mountain Pumped Storage Hydroelectric Project (P-13123). Regardless, Oregon DFW still recommends that the lower two to three feet of the fence be of a mesh size sufficient to exclude smaller animals (e.g., one quarter inch to one half inch), and that.it should extend underground and outward to discourage burrowing animals.

As discussed in section 5.1.3, we continue to find that there are limited benefits for designing the reservoir fencing to exclude small animals, and that the costs outweigh the benefits. Therefore, the inconsistency remains unresolved.

Scheduling of Reservoir Fencing Repairs

In the draft EIS, we did not adopt the component of Oregon DFW's recommended ungulate plan that specifies that permanent reservoir fencing repairs be completed within

one week. Staff's view is that this timeline would be too restrictive and inflexible, especially since it is not possible to predict every given circumstance that could arise (e.g. emergency situations such as inclement weather). Instead, staff supported Swan Lake North Hydro's proposal to make temporary repairs immediately to address issues and final repairs as soon as practicable.

In the 10(j) teleconference, Oregon DFW expressed concern about situations of prolonged wildlife entrapment, and stated that it was not comfortable with the open-endedness of Swan Lake North Hydro's approach for permanent repairs to be completed 'as soon as practicable.' Swan Lake North Hydro noted that it was also not in their best interest to have a prolonged period for completing repairs and agreed to work with Oregon DFW to develop alternative phrasing for scheduling fence repair work when finalizing the ungulate protection plan. They also agreed that, should there be an emergency incident (e.g. breach in the fencing with injuries to wildlife), scheduling of fencing repair work could be discussed when agencies are notified of the incident. Therefore, the inconsistency is resolved.

Table 5-1. Recommendations of fish and wildlife agencies for the Swan Lake North Hydroelectric Project (Source: staff).

Recommendation	Agency	Within the Scope of Section 10(j)	Annual Levelized Cost	Adopted?
1(E) and 3(G) Develop and implement a reservoir water quality plan and file an annual water quality report.	Oregon DFW	Yes, for development and implementation of a plan. No, for filing of an annual report as it is an administrative matter and not a specific fish and wildlife measure.	$4,670	Yes
1(A) File annual reports throughout the license term for the WHREP and other required resource reports to the Terrestrial Resources Working Group and Commission. File reports by March 31 with a 30-day period to review and comment on draft reports.	Oregon DFW	No, filing of annual reports is an administrative matter, not a specific fish and wildlife measure.	$0[b]	Yes, in part. We recommend a 30-day period for resource agencies to review and comment on draft reports. We also recommend developing and filing reporting requirements with resource agencies, not a Terrestrial Resources Working Group the Commission.

Recommendation	Agency	Within the Scope of Section 10(j)	Annual Levelized Cost	Adopted?
1(B) Develop resource management plans for: (1) project operations, (2) wildlife protection, mitigation, and enhancement, (3) avian protection, (4) fish and wildlife habitat restoration, and (5) vegetation and noxious weed management. Update the resource management plans every 5 years in consultation with, and approval from, resource agencies.	Oregon DFW	No. As described the plans are too vague to define and the consultation requirements are an administrative matter, not a specific fish and wildlife measure.	$ undetermined[c]	Yes, in part. We recommend development of resource management plans for WHREP, avian protection and vegetation and noxious weed management.
2(A) Provide a minimum 60-day notice for stakeholders to review and comment on draft plans and actions.	Oregon DFW	No, consultation is an administrative matter, not a specific fish and wildlife measure.	$0	Yes, but we recommend a 30-day period for review and comment on draft plans.
1(C), 3(B), and 3(C) Finalize a WHREP in consultation with	Oregon DFW	Yes, for finalizing and implementing a plan.	$36,900	Yes, in part. We recommend finalizing the WHREP, filing

Recommendation	Agency	Within the Scope of Section 10(j)	Annual Levelized Cost	Adopted?
resource agencies and tribes. Implement the mitigation measures outlined in the draft WHREP. File annual reports throughout the license term. Establish a fund to implement the WHREP throughout the license term.		No, for consultation, filing annual reports, and establishing a fund. These are not specific measures to protect, mitigate, or enhance fish and wildlife resources.		annual reports, and implementing the mitigation measures except the BLM administrative access and road improvements. We also do not recommend a WHREP fund.
3(D) Develop and implement an eagle conservation plan in consultation with FWS and Oregon DFW.	Oregon DFW	Yes, for developing and implementing a plan. No, for consultation requirements as they are an administrative matter, not a specific fish and wildlife measure.	$5,800[b]	Yes
(3E) Develop and implement an avian protection plan in consultation with FWS and Oregon DFW.	Oregon DFW	Yes, for developing and implementing a plan. No, for consultation requirements as they are an administrative matter, not a specific	$17,490	Yes

Recommendation	Agency	Within the Scope of Section 10(j)	Annual Levelized Cost	Adopted?
		fish and wildlife measure.		
(3F) Develop an ungulate protection plan as proposed, but include the following additional measures: (1) alternative drinking water sources near the reservoirs, (2) fencing around the reservoirs to exclude small animals, and (3) permanent repair of any fencing within one week of damage.	Oregon DFW	Yes, for developing and implementing a plan.	$32,750	Yes, in part. We recommend the plan and the additional guzzlers, but not the small animal fencing. We also do not recommend Oregon DFW's timing for fencing repairs, but instead recommend that the applicant and Oregon DFW work to develop a schedule as agreed to by Oregon DFW during 10(j) meeting.
1(D) and 3(H) Develop and implement a vegetation and noxious weed management plan in consultation with resource agencies, and file annual reports	Oregon DFW	Yes, for developing and implementing a plan. No, for consultation requirements and filing annual reports as they are an administrative matter,	$87,640	Yes

Recommendation	Agency	Within the Scope of Section 10(j)	Annual Levelized Cost	Adopted?
throughout the license term.		not a specific fish and wildlife measure.		
3(I) Include monitoring strategies and protocols for all resource plans.	Oregon DFW	Yes	$0	Yes
4(A1)[a] Establish a Terrestrial Resources Working Group composed of Swan Lake North Hydro's environmental staff and resource agencies.	Oregon DFW	No, consultation requirements are an administrative matter, not a specific fish and wildlife measure.	$0	No; unenforceable; agency consultation requirements would serve a similar purpose.
4(B) Develop and implement a cooperative agreement between Swan Lake North Hydro, Oregon DFW, and FWS for managing avian-related transmission line issues.	Oregon DFW	No, not a specific fish and wildlife measure.	$410	No; unenforceable; avian protection plan includes sufficient mechanism for collaborating with the agencies on avian-transmission line conflicts.
4(A2)[a] Notify Oregon DFW if wildlife injury or mortality occurs (within 24-hours of the event or 6 hours	Oregon DFW	No, not a specific fish and wildlife measure	$0	Yes, for notification procedures.

Recommendation	Agency	Within the Scope of Section 10(j)	Annual Levelized Cost	Adopted?
for state or federal ESA-listed species), and comply with restorative measures required by resource agencies. Notify the Commission no later than 10 days after the occurrence.				No, for future implementation of restorative measures.
5(A) Allow state and federal regulatory agencies access to project lands and facilities for inspections and compliance monitoring.	Oregon DFW	No, not a specific fish and wildlife measure.	$0	Yes

[a] Because there were two separate recommendations that were both labeled "4(A)," we denote the first as "4(A1)" and the second as "4(A2)."

[b] Annual reporting costs are represented in the corresponding cost for each individual resource plan.

[c] We cannot determine an annual cost for three of the recommended plans (project operations, wildlife protection, mitigation, and enhancement, and fish and wildlife habitat restoration) because there is no plan description by which to estimate a cost. The annual cost for the other two plans (vegetation and noxious weed management and avian protection) are represented in the corresponding cost for each individual plan.

5.4 CONSISTENCY WITH COMPREHENSIVE PLANS

Section 10(a)(2)(A) of the FPA, 16 U.S.C.§803(a)(2)(A), requires the Commission to consider the extent to which a project is consistent with the federal or state comprehensive plans for improving, developing, or conserving a waterway or waterways affected by the project. We reviewed 34 comprehensive plans that are applicable to the Swan Lake North Project, located in Oregon. No inconsistencies were found. The following plans were reviewed:

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7.0 LIST OF PREPARERS

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Klamath County

Klamath Tribes

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Modoc Tribe of Oklahoma

National Park Service

Natural Resource Conservation Service

Oregon Department of Environmental Quality

Oregon Department of Fish and Wildlife

Oregon Office of the Governor

Oregon State Extension Services

Oregon Water Resources Department

PacifiCorp

Public Utility Commission of Oregon

U.S. Army Corps of Engineers

U.S. Coast Guard

U.S. Department of the Interior

U.S. Environmental Protection Agency

U.S. Fish and Wildlife Service

U.S. Senate

Dave Wirth

APPENDIX A

Comments on Draft Environmental Impact Statement

COMMENTS ON THE DRAFT ENVIRONMENTAL IMPACT STATEMENT FOR THE SWAN LAKE NORTH PUMPED STORAGE PROJECT

Swan Lake North Pumped Storage Project—FERC Project No. 13318-003–Oregon

The Federal Energy Regulatory Commission (Commission or FERC) issued its draft environmental impact statement (EIS) for the licensing of Swan Lake North Pumped Storage Hydroelectric Project (project) on August 22, 2018. Comments were due by October 30, 2018. In addition, oral testimony on the draft EIS was received during a public meeting held in Klamath Falls, Oregon, on September 26, 2018. Statements made at the meetings were recorded by a court reporter and incorporated into the Commission's public record for the proceeding.

In this appendix, we summarize the comments received on the draft EIS that pertain to our analysis; respond to those comments; and indicate, where appropriate, how we modified the final EIS. The comment summaries and responses are grouped by topic for convenience. Although we do not summarize comments that point out minor revisions to the draft EIS in this appendix, we made those revisions in the final EIS. We also do not summarize and respond to comments that request legal determinations, only express opinions either for or against the proposed project or the staff alternative, or simply reiterate a stakeholder position or recommendation previously provided. The following entities filed comments on the draft EIS:

Commenting Entity	Filing Date
Neal Eberlein	August 31, 2018
Amanda Cory	September 17, 2018
U.S. Fish and Wildlife Service	September 18, 2018
Klamath County Commissioners	September 19, 2018
The Klamath Tribes	September 28, 2018
Jon Hobbs	October 1, 2018
David McLin	October 2, 2018
Klamath County Public Works (Michael J. Zarosinski)	October 4, 2018
Melanie O'Meara (U.S. Army Corps of Engineers)	October 5, 2018
Edwin and Alta Cochran	October 9, 2018
Department of the Interior	October 10, 2018
Economic Development for Central Oregon	October 12, 2018
The Klamath Tribes	October 15, 2018
Environmental Protection Agency	October 15, 2018
Oregon Wild	October 15, 2018
The Klamath Tribes	October 22, 2018
Bureau of Reclamation	October 22, 2018
Matt Hurley	October 22, 2018
Dale A. Marsland	October 22, 2018
Rod Neterer	October 29, 2018

Commenting Entity	Filing Date
Swan Lake North Hydro LLC, Rye Development	October 29, 2018
Glenn Lorenz	October 29, 2018
Matthew Iversen	October 29, 2018
Klamath County Economic Development Association	October 29, 2018
Jacelle Neils	October 29, 2018
Mary Hunnicutt	October 29, 2018
Dan R. Cohan	October 29, 2018
Citizens to Protect the Swan Lake Community	October 30, 2018
Tom Mahon	October 30, 2018
Dan R. Cohan	October 30, 2018
Darcy R. Hill	October 30, 2018
Martin Garza	October 30, 2018
The Klamath Tribes	October 30, 2018
Bonnie Smith	October 30, 2018
Cheryl L. Madsen	October 30, 2018
Jon Hobbs	October 30, 2018
Lyle R. Smith	October 30, 2018
Lauren Hobbs	October 30, 2018
Kendra Johnson	October 30, 2018
Dave Wirth	October 30, 2018
Windy Ridge Farm	October 30, 2018
Lauren M. Jespersen	October 30, 2018
Oregon Department of Fish and Wildlife	October 31, 2018
Zachary Mittge	October 31, 2018
DeLanie	October 31, 2018

GEOLOGIC AND SOIL RESOURCES

Comment GS1: Interior requests that the final EIS include information describing how the water used to supply the project will be conveyed and where spilled water will be directed, to determine whether it will cause erosion on BLM lands.

Response: Section 2.2.1, *Project Facilities*, states that the groundwater needed to initially fill the reservoirs and annually to make up for evaporative losses would be supplied by the local groundwater agricultural pumping system and delivered to the lower reservoir via an existing agricultural irrigation network. Section 3.3.1.2, *Geology and Soil Resources*, includes an analysis of the effects of reservoir spills and emergency de-watering on soils, and concludes that the potential for such outflows and associated flooding should be minimal, but if outflows were to occur, the effects on soils would be temporary, most damaging close to the spillways, and would diminish with distance from the spillway. In section 3.3.2.2, *Water Quantity Effects on Surface Water*, we explain that the berms to be constructed around the reservoirs would direct all runoff from the slopes of the Swan Lake escarpment and Grizzly Butte into Swan Lake as it presently

occurs. Precise flow channels and their land ownership would depend on final design of the reservoirs.

WATER RESOURCES

Comment WR1: Interior requests the statement on page 196 regarding surface hydrology be corrected to state that "the surface hydrology will not be preserved if water is being rerouted by the berms around the reservoirs."

Response: We revised sections 2.2.4, *Environmental Measures, Water Resources,* 3.3.3.2, *Environmental Effects, Fisheries Resources,* 3.3.5.2, *Environmental Effects, Terrestrial Species, table 4-3,* and 5.1.1, *Measures Proposed by Swan Lake North Hydro,* as well as the *Executive Summary*, to clarify that routing of water by the berms would reduce capture of surface-water runoff by the project reservoirs and minimize changes to the surface-water hydrology associated with the Swan Lake drainage area. Regardless, the point is that the project would not appreciably change the amount of surface flow entering Swan Lake.

Comment WR2: The Klamath Tribes request that cumulative impacts be evaluated for water resources, including groundwater, water quantity (surface and groundwater), and water quality.

Response: No one raised concerns with cumulative effects on water quantity or quality during the scoping process for the project. We do not examine cumulative effects of the project on surface and ground water resources because as explained in section 3.3.2, *Water Resources,* the project would not affect surface-water or ground water quantity. Any effects on surface water quantity would be limited to the capture of precipitation in the reservoirs, which would be negligible relative to precipitation received in the remainder of the watershed. Similarly, the project would not affect groundwater quantity because the initial fill and make-up water would come from existing permitted irrigation groundwater wells under a transfer of water rights. This approach is supported by Oregon Water Resources Department (Oregon WRD), which has determined that project-related water withdrawals would not interfere with existing water rights or adversely affect existing groundwater and surface-water conditions in the project area[95]. Our analysis found that the project would not create additional or excessive stress on groundwater resources because water deliveries to the project would be constrained by the conditions of the existing groundwater well network and by established, permitted pumping rates and volumes. The proposed initial reservoir-fill volume of 3,001 acre-feet would be spread over 4 to 12 months, which is about two-thirds of the combined allowable annual duty of 4,818.9 acre-feet of the three existing wells, based on their individual water rights. The annual re-fill amount of 420 acre-feet is less than one-tenth of the combined permitted volume. Therefore, the project would use far less

[95] See Oregon WRD Memorandum dated November 18, 2011, filed in Appendix E-20 of the final license application.

groundwater than permitted by the water rights in any given year. Thus, the project would not have any cumulative impact on surface-water or groundwater quantity.

Similarly, measures are proposed to prevent adverse effects to surface water quality of streams and other waterbodies (e.g., erosion control) in the project area and we are not aware of any other projects that would add to the project's effects on surface and ground water quality in the basin.

Comment WR3: Several local property owners and residents expressed concerns about water supply in the basin and the potential for an insufficient supply to support project operations.

Response: See our response to Comment WR2.

Comment WR4: The U.S. Environmental Protection Agency (EPA) recommends that the final EIS describe the specific methods to monitor water quality in the project reservoirs, threshold criteria and measures that would be taken if water quality in the project reservoirs deteriorates to below the threshold criteria, and any reporting procedures.

Response: The monitoring details sought by EPA have not yet been established. However, this information is not needed for an analysis of environmental effects caused by project construction and operation. Swan Lake North Hydro proposes to develop an adaptive water quality monitoring and management plan to ensure levels of dissolved solids, nutrients, and heavy metals in the proposed reservoirs do not rise to levels that impair project operations or affect wildlife that may incidentally come in contact with project waters. In section 5.1.2, *Additional Measures Recommended by Staff*, Commission staff recommends that this monitoring and management plan contain the details requested by EPA. This information would be developed in consultation with resource agencies and would be a part of any final adaptive water quality monitoring and management plan that would be filed for Commission approval.

Comment WR5: EPA recommends that the final EIS include information about compliance with existing water quality restoration plans for waterbodies in the project area and how water quality would be maintained or improved in accordance with the State of Oregon's anti-degradation policies.

Response: We are not aware of any water quality restoration plans applicable to the project area. However, as explained in section 3.3.2, *Water Resources*, the project is not expected to affect surface-water or ground water quantity or quality.

TERRESTRIAL RESOURCES

Comment T1: The U.S. Fish and Wildlife Service (FWS) recommends that the period of prohibition for blasting and helicopter use within 0.5 mile of an active eagle nest (January 1 through August 15) be extended to August 31 because the 2007 National Bald Eagle

Guidelines for the Pacific Region include the entire month of August for the fledging period (FWS, 2007).

Response: Under the staff alternative, we recommend prohibiting blasting and helicopter use from January 1 through August 31 within 0.5-mile of an active bald eagle nest unless there is site-specific evidence to indicate that the eagles have fledged and concurrence to proceed with construction activities has been received from FWS and Oregon DFW. Therefore, no revision to the EIS is needed.

Comment T2: FWS comments that preconstruction surveys between May 1 and July 31 within 1 mile of blasting activity have the potential to miss early raptor nesting activity that begins in late February or early March. Therefore, FWS recommends conducting an additional preconstruction survey in early spring.

Response: Under the staff alternative, we recommend an additional preconstruction survey in late-February to help ensure that early nesting raptors are identified.

Comment T3: FWS recommends that the preconstruction surveys for eagles include the helicopter flight paths, because helicopters can inadvertently disturb active eagle nests.

Response: We agree to the extent the flight path is limited to the construction area and not inclusive of the flight path from the airstrip to the project site because this would likely vary daily given weather conditions and other unknown factors. We modified the staff alternative to include this measure.

Comment T4: Klamath County Public Works (KCPW) states that the draft EIS is deficient in regard to noxious weed control and recommends including the following: (1) construction materials for embankments, road construction, retaining structures and similar improvements should be certified weed-free material; (2) construction equipment should be thoroughly cleaned of seed containing soils and plant material (Oregon Revised Statute [ORS] 569.445) prior to entering the project site and cleaned at the end of each week; (3) mitigation requirements should include a warranty condition that, after the first year of construction activity, no noxious weeds should be allowed to produce seed; and (4) state statute requirements should be added to the mitigation requirements as follows: (a) noxious weed control will be required during and after project completion as required under (ORS 569.390); (b) continuous control of noxious weeds under transmission lines (ORS 569.395); and (c) Klamath County weed control supervisor will inspect the site for any noxious weeds after project completion (ORS 569.380).

Response: The draft Revegetation and Noxious Weed Management Plan includes several measures meant to minimize the introduction and spread of noxious and invasive weeds, including ensuring that: (1) gravel and fill materials, natural materials used in erosion control, and seed stock used in revegetation will originate from inspected, weed-free sources, (2) all vehicles and equipment will arrive at the work site clean and weed-

free, and will be washed to remove weeds prior to transfer off-site, and (3) treatment of weeds within the project boundary would be done prior to construction, during construction (on a monthly basis at a minimum), and post-construction, in accordance with local guidelines and standards. However, as this is a draft plan, there are details that would still need to be finalized in consultation with resource agencies, including KCPW, prior to filing a final plan with the Commission. Therefore, most of the measures sought by the KCPW are already contemplated by the proposed plan.

Comment T5: Mary Hunnicutt comments that project construction will cause establishment of noxious weeds, including on nearby residential properties. She emphasizes the importance of construction crews adequately cleaning equipment prior to construction, and that noxious weed management must continue for the life of the project.

Response: No revision to the EIS is needed because, as stated above, the applicant's draft Revegetation and Noxious Weed Management Plan already proposes to establish protocols to help ensure that all vehicles and equipment would arrive at the work site clean and weed-free and would be washed to remove weeds prior to transfer off-site. Further, the applicant proposes to work with landowners to manage the transmission corridor for wildlife benefits, which could include weed control. We also recommend that those measures incorporated into a final revegetation and noxious weed management plan be applied throughout project operation.

Comment T6: The U.S. Army Corps of Engineers (Corps) requests a wetland delineation report for any waters proposed to be impacted by the upper reservoir access road, as well as a discussion regarding any downstream connectivity of those waters to the Lost River to assist in its determination as to whether or not a permit pursuant to CWA section 404 is required for access road work. Additionally, EPA comments that, if a section 404 permit is required, then the final EIS should include information on the permit application process and recommended measures to protect aquatic resources from project impacts.

Response: In a November 20, 2018, filing, the applicant confirmed it would work with the Corps to provide the wetland delineation report following license issuance. Based on existing data, we do not anticipate any adverse effects on wetlands (see section 3.3.4.2, *Effects of Project Construction on Wetlands*). CWA section 404 permitting is administered by the Corps; therefore, the final EIS does not discuss the Corps' permit process or make recommendations for environmental measures to be included as conditions of the Corps' permit.

Comment T7: Interior requests that the following measures be incorporated into the project's construction and operation: (a) All fire restrictions must be followed in accordance with the jurisdictional land management agency; (b) Any vegetation slash created on U.S. Bureau of Land Management (BLM) lands must be removed by means other than burning to avoid concentrations of hazardous fuels in within the project area.

This should be completed within 1 year of the creating of slash; (c) Only native plant materials will be used on BLM-managed lands, no non-native species will be used in revegetation efforts; and (d) All herbicides and treatment methods for noxious and invasive weeds must have a signed Pesticide Use Proposal authorizing treatments.

Response: We have revised section 3.3.4.2 of the final EIS to address Interior's fire prevention measures, and are now recommending that a fire prevention plan be developed that describes the measures and protocols the licensee would follow to prevent wildfires, including the removal of slash. As to the use of native plant materials and control of noxious weeds, the applicant's proposed draft Revegetation and Noxious Weed Management Plan already incorporates Interior's recommendations. The draft Revegetation and Noxious Weed Management Plan states that: (1) revegetation plantings would consist of native species; (2) seed mixes would be modified in consultation with the Oregon DFW, BLM, and FWS to account for site-specific communities, desired future conditions within each site, grazing and other management pressures; and (3) the licensee or its contractors would submit a Pesticide Use Proposal prior to herbicide application on federally administered lands.

Comment T8: Interior comments that the discussion of greater sage-grouse management should include the more recent BLM Sage Grouse Plan Amendment.

Response: We revised section 3.3.4.1 of the final EIS to acknowledge BLM's recent amendment, but we do not discuss it in detail since the amendment's planning area is outside of the proposed project boundary.

Comment T9: Interior comments that the eagle conservation plan must incorporate BLM management direction on page 116 of the Southwestern Oregon Record of Decision/Resource Management Plan (2016) for activities on BLM-administered lands.

Response: We revised section 3.3.4.2 of the final EIS to include an analysis and discussion of the five measures within BLM's management direction to minimize disturbing eagles during breeding and winter roost periods and revised our recommendations to include a winter roost survey to ensure winter roosts sites are identified and protected during construction.

Comment T10: Interior comments that the proposed Wildlife Habitat Restoration and Enhancement Plan (WHREP) should not include thinning 232 acres of western juniper and mixed conifer forest on Bryant Mountain because this proposal is not in accordance with BLM's current policy direction on Compensatory Mitigation (BLM Permanent Instruction Memorandum (IM) 2018-093, July 2018). Interior states that, according to the IM, BLM-administered lands may "host" mitigation projects; however, BLM may no longer "require compensatory mitigation from public land users."

Response: During a November 2, 2018, teleconference between Commission staff and BLM (see the telephone memo filed to the project on November 5, 2018), BLM clarified that the Bryant Mountain thinning project could still be implemented; however, another entity besides BLM would have to recommend it as an environmental mitigation measure. Because both the applicant and Oregon DFW have recommended this project, we have retained it in the final EIS as a proposed mitigation measure.

Comment T11: Interior requests that table 3-9 (Permanent and Temporary Impacts on Vegetation on Proposed Project Lands) include land ownership information.

Response: Table 3-9 classifies vegetation habitat type by acres of permanent or temporary vegetation disturbance. We do not have the data to classify vegetation acreage by land ownership, nor do we need it for our environmental analysis of project effects on botanical or wildlife resources. Therefore, we have not revised table 3-9.

Comment T12: Interior requests that the EIS specify whether the "access road" to the upper reservoir is an existing road or is proposed for construction.

Response: As stated on page 63 of the draft EIS in section 3.3.4.2, *Effects of Project Construction on Wetlands*, the applicant proposes to construct the access road for the upper reservoir.

Comment T13: Interior comments that figure 3-4 displays several roads (in light blue) that are erroneously labeled as "Existing BLM Owned/Managed Roads. Interior states that none of these roads are located on BLM lands and are not managed by the BLM, and asks that this be corrected.

Response: We replaced figure 3-4 with a new figure that no longer shows these roads as BLM-managed roads.

Comment T14: Interior requests that the EIS include text ensuring that decommissioning temporary roads will include blocking them to permanently prevent illegal off-highway vehicle (OHV) use.

Response: No revision is needed. As stated in the EIS, the applicant plans to decommission access roads that are unnecessary for long-term project operation and maintenance to reduce disturbance to wildlife and their habitats. The applicant also proposes to develop a comprehensive traffic safety plan in cooperation with the appropriate federal, state, and county agencies that would help to control OHV traffic on public lands within the project boundary. Under the staff alternative, we recommend that the traffic safety plan provide the details for implementing the plan, including how traffic and access would be controlled and access roads would be closed.

Comment T15: EPA comments that only 127 of the 585 acres of the conservation lands to be acquired for mitigation have been identified, and that the final EIS should identify the location of the remaining lands.

Response: The information sought by EPA is not available. Acquisition or long-term lease of 585 acres as mitigation for wildlife habitat impacts is part of the applicant's proposed draft WHREP. Although not all of the mitigation lands have been formally negotiated with private landowners at this time (e.g., landowners may be unwilling to enter into a contract agreement until the applicant is granted a license for the project), staff recommends that the remaining land parcels be close to the project and contain similar habitat values as the habitat being lost or disturbed due to project construction. Under the staff alternative, we recommend that the final WHREP identify the lands to be acquired, explain how they were selected, and include management plans for each of the parcels.

Comment T16: EPA comments that vegetation removal along waterways could result in streambank scouring, erosion, poor drainage, loss of soil, and adverse effects to wildlife habitat, particularly for federally listed threatened and endangered species. It recommends that these areas be targeted for active restoration to increase vegetation cover and improve thermal conditions in stream channels. It also recommends that the final EIS include any additional information or recommended measures to protect species and habitat developed through additional consultation with FWS or Oregon DFW.

Response: As stated in the EIS, the project's features would be constructed in upland areas, and would have only minor effects to local wetland, riparian, or littoral habitats due to project construction and operation. No in-water work or riparian vegetation disturbance is expected to occur during construction of the transmission line because direct impacts to waterways would be prevented by spanning intermittent streams and the Lost River. Proposed soil erosion control and revegetation efforts would be sufficient to prevent erosion and loss of wildlife habitats. Staff concluded that project construction and operation would not affect any federally listed species typically associated with wetland and riparian habitats.

Comment T17: EPA recommends that the final EIS describe a monitoring program designed to assess both the impacts from the project and the effectiveness of the proposed mitigation measures. The EIS should also indicate how the program would use an effective feedback mechanism to assure that environmental objectives would be met throughout the project lifespan.

Response: As discussed in the EIS, a monitoring and reporting component would be included in the resource plans/programs proposed by the applicant and recommended by staff (e.g., water quality program, revegetation and noxious weed management plan, avian protection plan, ungulate protection plan, WHREP). The Commission typically requires that such monitoring programs include a means to measure successful

implementation and propose additional measures if unsuccessful. Thus, EPA's recommendation should be adequately addressed.

Comment T18: Dale Marsland expresses concern regarding "the degradation of the wetland on the property where the reservoirs for this project will be constructed and for Alkali Lake," and recommends that the applicant either bury the transmission line or purchase land to mitigate project effects on these wetlands.

Response: We assume that Mr. Marsland is referring to Swan Lake, in addition to Alkali Lake. As stated in the EIS, there would be no direct impacts to Swan Lake or Alkali Lake from project construction, because no project feature would be located in these wetlands and all precipitation flowing to these lakes would continue unabated by the project except for the small amount directly captured by the project reservoirs. Soil erosion control measures would prevent degradation of lake water quality. Therefore we do not recommend any additional measures on this issue.

Comment T19: Matt Iverson states that, during the spring and summer, he has observed numerous western pond turtles using upland areas near the Harpold Dam area (e.g., within 450 feet north of the dam), and expresses concern that construction of the transmission line will disturb turtle nesting habitat.

Response: Placement of transmission line poles and soil disturbance that would occur during the transmission line construction would occur outside the boundaries of wetlands or riparian areas. At Harpold Dam, the transmission line would span the width of the Lost River, with the estimated placement of poles well to the north and south of the dam (e.g., 800 and 500 feet, respectively). Given that the construction areas would be several hundred feet from the Lost River, habitat impacts due to soil excavation and equipment placement would occur outside of the preferred turtle nesting habitat; thus any disturbances to turtles during the nesting season would be minor and for a short duration.

Comment T20: Matt Iverson expresses concern that the transmission line will affect bats that use riparian and rocky areas near Harpold Dam.

Response: As explained in the EIS, we are not aware of any documented problems of bats colliding with transmission lines. Although we agree that bats would likely be present in the Harpold Dam area as they would be attracted to the foraging opportunities provided by the Lost River, bats' echolocation abilities are likely sufficient to detect and avoid transmission lines. Since construction would be conducted during daytime hours, we would expect that bats' early evening and nighttime foraging would not be affected.

Comment T21: Jon Hobbs asks whether the 32.8-mile, 300-foot-wide transmission line right-of-way (ROW) is part of the 477.4 acres that will be disturbed either permanently or temporarily. He states that there should be more information regarding the specific vegetation changes to be made along the transmission line route, and whether they will be

permanent or temporary. He asks what efforts will be made to mitigate erosion and other soil degradation on these affected lands.

Response: Section 3.3.4.2, *Effects of Project Construction and Operation on Vegetation,* discusses temporary and permanent loss/change of vegetation. Regarding the vegetation disturbance resulting from the transmission line construction, table 3-9 includes 5.5 acres of permanent habitat loss due to installation of power poles and 21.2 acres of temporary habitat loss due to the transmission line access road. However, portions of the transmission line corridor will require tree removal and maintaining vegetation in earlier serial stages than exist today to ensure reliability of the line. These changes in the serial community are not included in table 3-9, because they are not considered permanent habitat losses. We include staff's estimate of these changes, which would likely be confined to the ponderosa pine forest and juniper woodland habitat types. Further, vegetation management within the transmission line corridor will depend on the final WHREP, which could include juniper removal and weed control. As to erosion control, the applicant proposes and we recommend the development of detailed soil erosion control measures based on site-specific conditions. In addition, the applicant's draft Revegetation and Noxious Weed Management Plan contains measures to replant areas disturbed by project-related activities with permanent vegetation to protect soils, reduce erosion, and minimize the colonization of weeds.

Comment T22: Jon Hobbs asks why the ROW for this project is nearly four times wider than the standard ROW for these kinds of projects.

Response: It is not clear what other kinds of projects Mr. Hobbs considered in making his comparison of ROW widths. The widths of ROWs can vary generally between 25 to 300 feet, depending on voltage and tower configuration. Larger ROWs (e.g., 150 to 200 feet) are typically used for higher voltage lines (e.g., over 100 kilovolts [kV]), because of clearance needs to ensure reliability. The proposed ROW allows some flexibility in siting and constructing the transmission line to accommodate land use and topography.

Comment T23: The Klamath Tribes state that the project will impact birds through its transmission line. The Tribes recommend that, given the other proposed projects in the region, the Commission consider the cumulative impacts on birds, including migratory birds, waterfowl, and raptors (e.g., bald eagles).

Response: No one raised concerns with cumulative effects on birds during the scoping process for the project and the Klamath Tribes do not identify which proposed projects it believes could cumulatively affect avian resources or how. The only other proposed project we are aware of in the vicinity of the Swan Lake North Pumped Storage Project is the Pacific Connector Gas Pipeline LP (Pacific Connector). The Pacific Connector's Klamath compressor station is about 1.9 miles southeast of the project transmission line where it interconnects with the Malin substation. From the Klamath compressor station, the pipeline heads north about a mile and then east to the coast. Where the Pacific

Connector is in the vicinity of the Swan Lake North Pumped Storage Hydroelectric Project, construction of the pipeline would occur in agricultural lands, and thus would have minimal effects on migratory birds, waterfowl, and raptors. The EIS acknowledges that there are existing distribution lines at the Lost River that are experiencing some level of bird collisions, and that the project transmission line could add to those effects. The EIS recommends measures to reduce avian collisions with the transmission line, including requiring the applicant to install bird flight diverters, monitor the transmission line, and develop a strategy for addressing problem areas. These measures would minimize adverse effects of the project transmission line on birds. Therefore, we do not consider further the cumulative effects of the project on birds.

Comment T24: Several commenters express general concerns regarding the project's adverse effects to birds (e.g., migrating waterfowl, waterbirds, and eagles), particularly the possibility of collisions with the transmission line near Swan Lake, Alkali Lake, and the Lost River/Harpold Gap areas. Several commenters note that the Lost River draws large numbers of migratory birds in the winter and early spring due partly to available open water habitats provided by warm water springs that keep the water from freezing. Some commenters express concerns over the effectiveness of flight diverters, with Matt Iverson noting that he has witnessed bird strikes still occurring at an existing utility power line that has installed flight diverters. Other commenters recommend that part or all of the transmission line be buried.

Response: Section 4.3.4.1 describes available information on bird use in the project area and 4.3.4.2 addresses the project's effects to birds, and the staff recommended measures to minimize those effects, including installing flight diverters on the transmission line in areas where there is a high risk for bird strikes (e.g., where the transmission line corridor passes near Swan Lake and Alkali Lake and crosses over the Lost River). While the efficiency of flight diverters can vary depending on surrounding environment and environmental conditions, target bird species, and device characteristics, flight diverters are the most common mitigation measure employed to reduce bird collisions with power lines. Staff also recommends monitoring the transmission line with specific requirements for follow-up reporting of injury/mortality data so that the applicant and resource agencies are better able to assess whether the flight diverters are effective and if additional protection measures are needed. Lastly, staff has revised section 4.3.4.2 to assess the benefits of burying the transmission line.

Comment T25: David Wirth expresses concern that, during winter months, an ice layer would rapidly form at the surface of the reservoirs, and potentially trap waterfowl that may be using the reservoirs as habitat.

Response: This type of situation would not be likely to occur. A thin layer of ice might form on the reservoir surface, but it would not form rapidly, allowing any birds on the reservoirs to move to other habitats. Further the heat exchange that would occur as water moves mechanically through the system (i.e., through the pump and turbines located

within the powerhouse) would result in nearly continuous water movement and provide a heat source to keep water from freezing.

Comment T26: Dan Cohan recommends that the applicant conduct a bird population study that evaluates bird flight paths and seasonal abundance levels to help predict injuries/mortalities related to avian-transmission line interactions. He comments that the study should also include recommendations to mitigate potential effects.

Response: While additional data on bird populations and flight paths in the area would better define the number of birds subject to collision, it would not necessarily predict the number of injuries/mortalities because a large number of factors influence collisions (weather, species, etc.). Potential effects of power lines on birds and measures to mitigate those effects are well known and fully considered in this EIS. Staff recommends measures to mitigate those effects, including monitoring to determine if additional measures may be warranted.

Comment T27: Oregon DFW requests clarification as to staff's decision regarding consultation requirements for the avian protection and eagle conservation plans, and the decisions to not recommend a Terrestrial Resource Working Group, Inter-agency Agreement for Managing Avian-Transmission Line Interactions, specific measures for an ungulate protection plan, and complying with agencies' recommended restorative measures during wildlife emergency incidents.

Response: On December 6, 2018, staff and Oregon DFW participated in a section 10(j) meeting in an attempt to resolve these and other concerns (see the section 10(j) meeting summary filed on December 12, 2018). We have revised section 3.3.4.2 to reflect those discussions and the resolutions reached during the discussion. In sum, based on new information provided in the meetings, staff agreed to include two wildlife watering devices near the project reservoirs, and include a schedule for making repairs to the project fences that provide some flexibility given seasonal site conditions. As to consultation requirements for resource plans, Oregon DFW appears to misunderstand staff's decision regarding whether or not this type of recommendation is considered within the scope of section 10(j) of the FPA. Since consultation is not considered a measure that *specifically* provides for the protection, mitigation, or enhancement of fish and wildlife resources, consultation recommendations were not considered under section 10(j), but instead under section 10(a) of the FPA. Under that provision, staff does recommend that all resource plans include consultation with resource agencies. As to restorative measures taken during wildlife emergency situations, in section 3.3.4.2 we state that the applicant should comply with any restorative measures required by a resource agency, but only to the extent such measures do not conflict with the conditions of any license.

THREATENED AND ENDANGERED SPECIES

Comment TE1: Oregon Wild commented that the draft EIS does not disclose the effects to the endangered Lost River and shortnose suckers during the period that the reservoirs would be initially filled.

Response: We clarified the analysis in section *3.3.5, Threatened and Endangered Species* to explain that the groundwater withdrawals would not affect the Lost River and shortnose suckers.

RECREATION AND LAND USE

Comment RL1: Interior states that the location, access routes, and footprint of the proposed interpretive facility are unclear and recommends that the facility be located on private lands because it would be incompatible with BLM's mission.

Response: Staff acknowledges in sections 3.3.6.2 and 5.1.2 of the draft EIS that it is unclear where the proposed interpretive facility would be located and recommends that the applicant file for Commission approval, conceptual drawings that show the proposed facility's location. We also recommend that Swan Lake North Hydro consult with BLM on its location and content, which should ensure that the facility is appropriately sited.

Comment RL2: Interior recommends that staff delete the measure for the applicant to cooperate with BLM to support future efforts to design and construct BLM's proposed Swan Lake Rim Trail. Instead, Interior recommends that staff conduct additional analysis in the final EIS to show that the proposed project would not prevent future non-motorized linear access routes on the BLM-administered Swan Lake Rim Extensive Recreation Management Area (ERMA), which is a designated ROW Avoidance Area. Interior also recommends that the final EIS include updated references that reflect the 2016 Southwestern Oregon Resource Management Plan (RMP) that designates the entire Swan Lake Rim as an ERMA.

Response: The measure to cooperate with BLM in future efforts to design and construct the Swan Lake Rim Trail is not a staff-recommended measure but rather a measure proposed by the applicant. While we acknowledge in section 3.3.6.2 that such cooperation would be beneficial, we do not recommend requiring it because future plans involving the trail did not appear to be certain. We have revised section 3.3.6.2 in the final EIS to analyze the project's effects on non-motorized uses in the ERMA. The 2016 Southwestern Oregon RMP is already listed in our references.

Comment RL3: BLM recommends that the final EIS analyze impacts of the project in relation to the values for which the Bryant Mountain ERMA was established and specifically address whether the proposed project is consistent with existing recreation objectives for the area.

Response: We have revised section 3.3.6.2 to address the project's effects on the Bryant Mountain ERMA.

Comment RL4: The Citizens to Protect the Swan Lake Community express concern that the transmission line will remove property from agricultural production and increase costs of irrigation and farming. Individual members, by separate letter, detail these impacts.

Hutchison Cox, attorneys representing Jespersen Swan Lake, Inc. and Julie Jespersen, an owner of Jespersen Swan Lake, Inc. (Jespersens), state that the draft EIS does not adequately address impacts of the transmission line on agricultural operations of the Jespersen's land that includes irrigated organic alfalfa, Timothy grass, orchard, and hay production; native pasture, homesteads, and shop and farm facilities. Hutchison Cox states that placing the transmission line across the Jespersen's property would interrupt the operation of irrigation equipment and practices; reduce crop yields; interfere with equipment movement; fragment cropland; compact soil; and alter planting, harvesting and fieldwork patterns. Hutchison Cox states that the draft EIS does not adequately acknowledge or propose mitigation to the long-term interruption of irrigated agricultural operations; therefore, the project should not be built.

Similarly, David McLin, owner and operator of 3MC Ranches, LLC, states that the transmission line would adversely affect his farm operations because it would cross about two miles of his farm property and bisect property owned by Patrick Colahan and Alta Cochran across the street from his farm, which he leases. Mr. McLin indicates that he relies heavily on irrigation to raise Timothy and orchard grass and that the placement of the towers on his land and the land he leases would interfere with his ability to irrigate these crops. He points out that placing the transmission line towers over a buried irrigation mainline and six wheel lines that are moved twice a day would destroy his farm's ability to raise these crops. He further points out that placing the towers down the center of a north-south access road on his 3MC Ranches property would destroy improvements (roads, tail ditches) that are "crucial" to his farm operation and would make his fields "unfarmable." He recommends burying the portion of transmission line that runs through his farm land and that an independent study be conducted that addresses the impacts of the transmission line on the "hundred or so" affected families.

Response: Section 3.3.6.2 explains how some agricultural property would be removed from production and where such impacts cannot be avoided, the applicant would compensate farmers for any losses. Placement of the transmission towers would depend on final project design; therefore, a detailed analysis on specific individual parcels and farm operations is not possible. However, we have revised our analysis in section 3.3.6.2 to recommend that the applicant work with existing land owners to locate the towers and time construction activities to minimize effects on their operations. An independent study is not needed as there is sufficient information to identify the potential effects and mitigation measures.

Comment RL 5: To minimize impacts of the project on farmland as provided for in the Farmland Protection Policy Act, EPA recommends that FERC and the applicant coordinate with the Natural Resources Conservation Service (NRCS) and/or the U.S. Department of Agriculture Service Center and the Farm Service Agency in assessing project impacts to farmlands, including the loss of Conservation Reserve Program lands and determining measures to avoid or minimize any significant impacts to farmlands. EPA recommends that the final EIS include information on the analysis and the rating of potential impacts as well as how farmland would be restored and farmers compensated for losses due to the project.

Response: See response to comment RL 4.

Comment RL 6: Interior advises that the area of each parcel of Bureau of Reclamation land that the transmission line would cross in the area of Harpold Dam and the nearby quarry are 40 acres each rather than 4 acres as indicated in the draft EIS. Also Interior advises that the draft EIS erroneously lists Klamath Irrigation District twice regarding the development of the transmission line coordination plan and that this should be corrected to include both Klamath Irrigation District and Horsefly Irrigation District. KCPW recommends that the final EIS indicate that it owns two parcels of land at the Harpold Rock Quarry and that it operates under an aggregate production permit.

Response: We revised the EIS accordingly.

Comment RL 7: Mary Hunnicutt, Amanda Cory, Ken Masten, Matt Iversen, Jon Hobbs, and Windy Ridge Farm, all Bonanza residents and/or businesses near the proposed transmission line corridor, and Richard and Terry Sacchi, Malin residents, raise concerns about the adverse effects of exposure to electromagnetic fields (EMFs) on the health of people and livestock.

Response: We revised section 3.3.6.2 of the final EIS to provide additional analysis of potential project effects on human and livestock health. Although some studies and controlled experiments indicate a possible link between prolonged exposure to strong EMF and health effects in humans and animals, the levels of exposure of these studies were considerably higher than levels expected from electrical transmission from the proposed Swan Lake North Project. As explained in section 3.3.6.2, we do not anticipate adverse effects from EMF from the proposed transmission line because humans temporarily situated under and animals grazing or passing in the vicinity of the power transmission lines would not experience prolonged exposure at levels suspected of causing health effects to humans or animals.

Comment RL 8: Mary Hunnicutt is concerned with the effect of possible interference from the proposed transmission line on television, radio, and cell phone reception and recommends burying the proposed transmission line for all or portions of the route.

Response: The final EIS addresses the issue of transmission line effects on appliance and network interference in section 3.3.6.2.

AESTHETIC RESOURCES

Comment A1: Citizens to Protect the Swan Lake Community as well as many adjacent land owners, express concern that the above-ground transmission line will degrade the viewshed in their community and recommend that the Commission consider options to mitigate this impact.

Lyle and Bonnie Smith, landowners who live near the proposed Lost River crossing of the transmission line, recommend several alternatives for burying the transmission line in order to preserve visual quality: (1) bury the first 20 miles of the line from the powerhouse to where it would join other transmission lines on Bryant Mountain and (2) bury the upper 7 to 10 miles of the line that would run through farmland and also along the mile before and after the Lost River crossing. Lyle Smith estimates that burying the first 20 miles of line would increase the overall project cost by about 15 percent while burying a 7- to- 10-mile-long portion of the line would increase project costs by about 10 percent. He believes the extra cost would be worth the preservation of visual quality in the area.

Ms. Marsland also recommends burying the line. To support her recommendation she cites an article published in the June 2010 Vol. 65 No. 6 Underground Construction magazine that reports that many 230-kV, 44-kV, and 500-kV transmission lines have been installed underground in Europe and Asia. She also included an attachment of a publication by the Responsible Electricity Transmission of Alberta that lists the benefits of buried high-voltage transmission lines.

Dan Cohan, a resident of the Harpold Gap area, recommends that Commission staff conduct a Geographic Information System (GIS) viewshed analysis to determine the best locations to bury the transmission line along its route so that it is not visible to landowners and the visiting public; however, he indicates that burying the entire transmission line is likely the only way to completely mitigate visual effects.

Response: The EIS assesses the benefits and costs of burying the transmission to mitigate visual as well as other adverse effects. Given the various recommendations, we considered four measures to minimize adverse effects on the visual resources, agricultural operations, bird interactions, and exposure to EMF. These include burying the entire line, burying a 1-mile segment in the Lost River/Harpold Dam area to reduce visual effects and EMF exposure, burying 9.6 miles to minimize effects on agricultural practices, and burying 0.25 mile segment below the Lost River to avoid avian collision hazards. The analysis considered existing information, GIS data, and Google Earth images. In section 5.2, we explain why we do not recommend any of these measures.

Comment A2: Matthew Iverson, a landowner who lives just upstream of Harpold Dam, states that the Key Observation Points (KOPs) used in the applicant's visual resources study do not accurately depict how the transmission line would appear in relation to the background scenery. He points out that the photo-simulation in Figure 3-12 on page 114 of the draft EIS misrepresents the area it depicts and that Figure 3-15, which is a photo-simulation of the transmission line crossing the Lost River at Harpold Gap, does not show the panoramic view of the area and so does not illustrate the true impact of the project on the visual quality of the area. Interior also comments that the photo-simulation of the transmission line as seen from KOP 16 (at the Lost River crossing at Harpold Dam) does not provide an adequate view because it does not show the transmission line towers.

Lyle Smith, a resident of the Harpold Gap area, echoes Mr. Iverson's concern about the KOPs, as does another resident, Lauren Hobbs, who indicates that the poor representation of the transmission line at KOP 16 made it impossible for FERC to accurately assess visual effects. Mr. Smith states that many of the KOP photo-simulations are deceptive because they do not show the proper perspective for viewing the area affected by the transmission line. He refers specifically to Figure 3-15 as the most obvious example of a non-representative view of the line, but also indicates that KOPs 12 through 20 are inadequate in this regard. He indicates that a simple rotation of the camera's angle would provide a better representation and recommends that staff use Google Earth to examine these KOP sites in order to gain a new perspective.

Dan Cohan and Mary Hunnicutt, residents of Philpott Lane in the Harpold Gap area, are also concerned about the quality of the KOPs used in the visual resources study. Mary Hunnicutt states that the KOP 16 photo-simulation does not adequately show how the transmission line towers would diminish the scenic quality of the area and comments that KOPs should have been established that show views of the transmission line from private properties and farms along the route. Dan Cohan recommends that staff minimize reliance on the KOP analysis because it is too "subjective." Dan Cohan and Mary Hunnicutt recommend that staff conduct a GIS viewshed analysis of the entire transmission line route.

Response: Figure 3-12 is not intended to be a photo-simulation of the transmission line but rather is a representation of typical scenery near the Lost River and in the Tule River Valley, near Malin. Figure 3-15 is the only photograph available to staff that represents the Lost River crossing (KOP 16) and was chosen to be included in the EIS because it represents the best information available to staff. The analysis in section 3.3.7.2, however, acknowledges that the proposed transmission line would contrast with the background scenery at the Lost River crossing.

We revised section 3.3.7.2 of the final EIS to explain in more detail, how much of the line and towers would be likely be visible to residents. Based on our review of Google Earth images and on the applicant's visual resources study, we conclude that the

line would create a moderate contrast with the scenery in areas where the line is less than 2 miles away (KOPs 13, 15, 16) and a weak contrast where it is more distant (KOPs 12, 14, 17-20).

Comment A3: Mary Hunnicutt, recommends staff clarify where exactly the transmission line poles would be placed and whether they would have lights on top that would impair views of the night sky.

Response: Placement of the transmission towers would depend on the final design considerations, including agricultural operations, topography, and geological conditions. Therefore, additional details cannot be provided. There is no indication that lights would need to be added to the transmission towers, which are typically only required for aviation safety and at heights far greater than the proposed towers.

Comment A4: Lyle Smith questions why the penstock, which would dominate the scene at KOP 26, is not buried since the previous project design called for a buried penstock.

Response: The penstock was originally proposed to be buried; however, the applicant proposes an above-ground penstock so that it can be easily inspected and maintained.

Comment A5: Mary Hunnicutt states that the rating of visual quality for the Harpold Gap area in the draft EIS is too low and is concerned that FERC staff was not able to accurately assess the visual effects of the transmission line in this area because they have never been to the site.

Response: Staff was able to visit the area in question on September 26, 2018, and found it to be consistent with the above-average "B" rating for diversity of interest indicated in the draft EIS.

Comment A6: Jon Hobbs, a Harpold Gap resident, contends that the applicant incorrectly defined the visual resource management (VRM) class designation for KOP 16 and therefore the assessment of visual impacts at this location is incorrect. He refers to KOP 16 as having a designation of "Class II" on page 128 of the draft EIS and states that the applicant, in its visual resource study, incorrectly stated that this classification allows for moderate level of change to the landscape. He also indicates that the "moderate" contrast rating for the site is incorrect and believes the contrast should be rated as "strong" because BLM guidelines determine that a strong contrast occurs when "the element of contrast demands attention, will not be overlooked, and is dominant in the landscape." He believes that the KOP-16 photo-simulation does not show the true contrast of the transmission line against the background scenery because only a portion of the lines are shown rather than the true expanse and the towers that will be located on either side of the River crossing. He recommends that the Commission direct the applicant re-do the class designation of KOP-16 and then review the applicant's re-designation carefully, reanalyze section 3.3.7.1 of the draft EIS, and provide the re-

designation and new analysis to all interested parties for review and comment prior to the finalization of the EIS.

Response: The "Class II" designation in the table on page 128 is a typographic error and has been corrected. All of the "Class II" designations in the table should have read "Class III." The description of guidelines for these KOPs according to BLM's VRM guidelines are correct for a Class III designation. Section 3.3.7.2 has been revised to explain in more detail, visual impacts of the transmission line in the area of KOP 16.

Comment A7: Matthew Iversen states that the scoring and ranking of the KOPs are not accurate and that these ratings should have been agreed upon by the landowners and residents in the area.

Response: Staff relied on BLM's criteria for ranking and scoring visual quality, which is an established and tested method.

Comment A8: As an alternative to burying the transmission line, Lyle and Bonnie Smith recommend moving the entire project closer to the Malin Substation so the above-ground transmission line would be much shorter. They indicate that if obtaining a water source in this location is not possible, then water could be pumped to the site from the original source via an underground pipeline. They assert that this would be less expensive than burying the transmission line and would involve less disturbance because the pipeline would only require a 30- to 60-foot-wide ROW rather than the 300-foot ROW that would be required of the proposed transmission line. They also question why the penstock, which would dominate the scene at KOP 26, would not be buried since previous designs of the project included a buried penstock.

Response: The Commission analyzes the effects of the proposed action to determine if it can be licensed in a fashion that would be in the public interest. Thus, staff considers the proposed action, no action, and various mitigation possibilities that fall within the scope of the proposed action. Prior to filing its application for license, the applicant considered moving the project closer to the Malin interconnection but rejected it because it was unable to obtain a water source to operate the project in this area. Examining whether or not it would be feasible to build a water pipeline to pump water to a site closer to Malin is beyond the scope of this analysis.

Comment A9: Interior requests that the final EIS provide supporting information for its determination that four other transmission line alternatives identified in the draft EIS were impractical, not cost-effective and had greater environmental impacts that the alternative analyzed.

Response: We revised section 3.4 to explain the applicant's basis for eliminating the alternative transmission line routes.

Comment A10: Ron Neterer, who lives on Philpott Lane, recommends that any license for the project include a requirement to remove the project once it reaches the end of its useful life, especially in the Harpold Dam area, so future generations do not have to see it.

Response: The Commission does not include a requirement in its licenses to remove a project at the end of its useful life because it is not known when that might occur. The Commission considers a number of factors when a license is surrendered, including environmental needs at the time of surrender and public and agency concerns.

Comment A11: Interior recommends that the final EIS include a more detailed analysis of the transmission line's visual impacts, specifically in regard to the Swan Lake Rim and Bryant Mountain ERMAs as well as along the transmission line route on BLM lands outside the ERMAs to ensure that the setting characteristics of the ERMAs are maintained and meet BLM objectives for the area.

Response: We revised section 3.3.7.2 to provide a more detailed analysis of project consistency with the ERMAs.

CULTURAL RESOURCES

Comment C1: The Oregon State Historic Preservation Officer (SHPO) states that the outdated draft HPMP does not accurately reflect all National Register eligibility determinations and does not include eligibility determinations for all affected sites under Criterion A, B, C or D. The Oregon SHPO recommends revising the HPMP to include an assessment of indirect effects on historic properties, and a maps and an explanation as to how the indirect area of potential effects (APE) was defined. They add that until it receives more information regarding the majority of sites' eligibility based on all four criteria, it cannot agree with the proposed area to avoid, nor areas to be affected (directly or indirectly). The Oregon SHPO states that the eligibility determination must address the six sites containing rock stack features that the BLM believes represents archaeological sites while HRA believes them to be natural or modern in manufacture. The determinations and assessment of effects must also address those sites that have not been surveyed in over 20 years and those lands within the direct APE that have not been assessed because of access restrictions. The Oregon SHPO recommends that HPMP include a schedule for completing the surveys and reporting the results before ground-disturbing activities move forward.

The Oregon SHPO adds that the HPMP needs to clarify the activities that would be subject to review by the Oregon SHPO, BLM, and the Klamath Tribes (i.e., exempt, little effect, and case-by-case) and how the review would be conducted. They state that the document fails to cover what Oregon state laws applies when inadvertent discoveries of archaeological resources or human remains are made during project construction.

The Oregon SHPO states that the section on resolution of adverse effects needs to incorporate tribal consultation in order to determine how, when and if project work can be mitigated. They add that avoidance activities may need to consider timing of traditional practices which can only be determined through consultation with the Klamath tribe.

The Oregon SHPO states that the proposed annual report must be linked to each type of activity (exempt, little impact, case-by-case).

The Klamath Tribes also state that the draft HPMP is inadequate and does not meet the joint Commission and Advisory Council on Historic Preservation (Advisory Council) guidelines for crafting HPMPs involving Commission hydropower projects. They state that the draft HPMP does not provide a basic description of importance of the Swan Lake Rim as a cultural resource, lacks a complete breakdown of archaeological and tribal resources which could be impacted by the proposed project, fails to integrate the various archaeological sites and traditional resources into a larger area of total significance, and does not provide a strategy of preservation and mitigation though implementation of specific management measures

Response: The EIS recommends revising the HPMP in consultation with the SHPO, BLM, and Klamath Tribe to address the above concerns, with the exception of determining edibility of sites within the indirect APE as discussed further below in C8. While the draft HPMP does not clearly and accurately define the indirect APE as noted by the Oregon SHPO, the indirect APE has clearly been defined as 1-mile-wide radius at either end of the project and a 2-mile-wide corridor centered on the transmission line and considered in the EIS. As noted in the EIS, the Oregon SHPO concurred with both the direct and indirect APE in a letter dated, April 26, 2016. This letter was filed with the Commission on February 27, 2017 (see Bowden and Deur 2017, Appendix A).

Comment C2: Interior and BLM recommend that the EIS include a discussion of the project's cumulative effects on cultural resources.

Response: We revised the final EIS to address cumulative effects in section 3.3.8.

Comment C3: Interior states that the National Park Service does not manage the California National Historic Trail, and that the segment of the trail crossing the project area no longer exists; therefore, the project would not have any adverse effects on the trail.

Response: We revised the final EIS accordingly.

Comment C4: BLM states that the draft HPMP is years out of date, does not contain the results of the 2018 Historical Research Associates (HRA) cultural resources report, does not account for all the remaining National Register evaluations and determinations of

effects that need to be accomplished, and lacks the full range of resolutions and mitigation measures involving a wide range of potential project-related adverse effects on historic properties. Reclamation also states that the document does not sufficiently include Reclamation as a consulting party, nor does it address the three cultural resource sites on their lands that could be affected by the proposed project.

Response: We recommend revising the HPMP to address these concerns.

Comment C5: BLM recommends that the final EIS describe the consultation efforts with the tribes and a summary of the results.

Response: We revised the EIS to include a summary of the consultation efforts thus far, which included consultation with both the Modoc and Klamath Tribes that began October 2010 and is documented in the Commission's public record (see letters and memos issued on October 26, 2010; August 22, 2016; and April 25, 2017).

Comment C6: BLM states that the draft EIS incorrectly implies that all individual cultural resource sites are located within the Swan Lake Rim Traditional Cultural Property (TCP) and asks that the cultural resources section address the sites located outside the TCP.

Response: The EIS has been revised to clarify that there are more cultural resources beyond the Swan Lake Rim TCP, and that the applicant will need to determine if these sites could comprise additional TCPs within the Horton Rim, Harpold Dam, and Bryant Mountain areas.

Comment C7: The Klamath Tribes state that they disagree with the conclusion in the EIS because the proposed project would not only physically destroy many spiritual sites but would negatively affect the area as a whole by degrading visual, aesthetic, and traditional values important to them. They argue that retaining such values involving Swan Lake Rim are ultimately protected under the American Indian Religious Freedom Act. The Klamath Tribes state that data recovery as a means for mitigating some of the project-related effects on pre-contact archaeological sites is not adequate because these sites possess special significance to the Tribes and is counter to Advisory Council guidance recommendations for sites slated for data recovery.

Response: The EIS already explains the Tribes' position; therefore, no modifications are needed to the EIS.

Comment: The Klamath Tribes state that the draft EIS fails to analyze the adverse environmental justice impacts of the project on many cultural resources and sacred sites of long-term traditional importance to the Tribes. They state that federal agencies must include environmental justice analysis in their NEPA reviews.

Response: It is current Commission practice to address environmental justice in its NEPA document when raised. Therefore, we have included this discussion in the final EIS in section 3.3.10, *Environmental Justice*.

Comment C8: Swan Lake North Hydro requests that the EIS clarify the expected scope of work specific to additional post-license investigations that would be necessary to determine resource eligibility and project effects in the indirect APE. Swan Lake Hydro states that, in its opinion, determining eligibility and project effects for resources in the indirect APE would require further field investigations in areas outside of the project boundary. Furthermore, for some resources, subsurface testing would be necessary to determine eligibility (for example, determining eligibility of lithic scatters under Criterion D). After additional consultation with Historical Research Associates, Swan Lake Hydro suggests that this type of analysis, while routine within the project boundary and direct APE, would be highly unusual and unnecessary in the indirect APE, particularly with regards to conducting subsurface investigations at resources that will experience only viewshed changes from the project. In addition, Swan Lake North Hydro states it would have little nexus to request access to private properties to complete such investigations as they are outside of the project boundary.

Response: Swan Lake North Hydro does not need to conduct further field investigations in the indirect APE to assess site eligibility because these sites would experience only viewshed changes. However, to accurately describe the affected significant archaeological resources that would be directly and indirectly affected by the project and addressed by the HPMP, we recommend that Swan Lake North Hydro revise the HPMP to document all of the pre-contact stacked rock features in the direct and indirect APE, identify potential project-related adverse effects, and identify measures to avoid, reduce, or mitigate direct effects and indirect effects where possible.

Comment C9: DeLanie states that Leonard and Jacen Jesperson own approximately 6 miles of the lands crossed by the proposed transmission line and that no ground surveys for cultural resources have been conducted on that property.

Response: Most of the lands subject to disturbance have been surveyed and cultural resources within these lands have been identified and evaluated for National Register significance. However, some private lands were not accessible during the various studies. Therefore, additional survey work would need to be conducted on these private lands following license issuance. It is very likely that additional investigations involving recordation and data recovery of sites would also have to be done in these areas, especially for those sites that would be adversely affected during site construction. All site investigations would be conducted after a license has been issued, but before construction of the proposed project would begin.

Comment C10: Dan Cohan states that the draft EIS fails to adequately address the impacts of the project on cultural resources. He recommends that the EIS clearly state

that the project would have an adverse impact to those resources and recommends that the Commission continue to consult with the Klamath Tribes.

Response: The EIS contains a detailed analysis of project construction effects on cultural resources. Commission staff has consulted with the Klamath Tribes, and would continue to consult with them, as necessary.

SOCIOECONOMICS

Comment G1: Interior recommends that the final EIS include a table to display approximate mileage of existing roads, new permanent roads, and temporary roads by jurisdiction. For new permanent roads, Interior recommends that the final EIS identify the level of access that will be requested or authorized. Interior also requests that the final EIS specify whether the access road to the upper reservoir is an existing road or is proposed for construction and clarify that decommissioning of temporary roads will include blocking them to permanently prevent illegal OHV use.

Response: Section 3.3.9.1 has been revised to include table 3-13, which incorporates the information on roads requested by Interior.

Comment G2: The Citizens to Protect the Swan Lake Community are concerned with the adverse economic effects the proposed project would have on their homes, farms, and ranches. They indicate that the location of the proposed powerline and the properties that it crosses are "incorrect" and that a "number of property owners have never been consulted regarding the adverse effects" the project would have on their property. They believe that the visual, economic, and environmental effects of the proposed placement of the transmission line poles will decrease property values. They indicate that the draft EIS fails to compare the economic costs to landowners "dispossessed" by the proposed project and urge the Commission to consider options to mitigate project effects.

Response: The Citizens to Protect the Swan Lake Community do not explain why they believe that the EIS does not accurately depict the proposed transmission line route. The figures in the EIS are not of a scale that would allow identification of individual landowner properties; however, the Exhibit G drawings filed on October 28, 2015, provide a much more detailed review of the transmission line route. Nonetheless, to ensure that impacts to all landowners are accurately reflected, staff reexamined the powerline route in relation to individual properties using Klamath County tax plats superimposed on the transmission line route using GIS technology. Section 3.3.9.2 has been revised to reflect this analysis. As far as notifying affected landowners, the applicant certified that it filed copies of the license application upon all affected landowners pursuant to the Commission's regulations and Commission staff has followed all of the required procedures in notifying the public of public meetings and issuances.

Comment G3: Hutchison Cox, the law firm representing the Jespersens, comments that the draft EIS does not access the effects of constructing the proposed transmission line

and access road on their clients' property value. It cites various studies that indicate overhead high voltage lines such as the one proposed by the applicant can significantly reduce property values. As an example, they cite a 2006 study conducted by Kielisch that found a 15- to 34-percent drop in appraised values for property affected by a high voltage transmission line, and a 2012 study by James A. Chalmers that found a decrease in selling prices (up to 50 percent for some lots abutting high voltage lines) and longer holding times (between 20 to 103 percent longer depending on lot size and location in relation to the line) for properties encumbered by existing lines. The Jespersens believe that the draft EIS' conclusion regarding property value impacts is "faulty" because it does not account for the potential 10- to 50-percent loss of values of the Jespersens' approximately 200 acres that would be directly impacted by the transmission line ROW, the doubling of holding time that their property will need to be on the market before it sells, or the diminished value of leases.

Edwin and Alta Cochran, who live just north of Highway 140, are also concerned about the transmission line's effect on property values. They contend that powerline poles placed down the center of their farm field will "ruin" the land and therefore decrease the value of their ranch.

Cheryl Madsen, who owns an undeveloped lot just south of Harpold Dam, wants the Commission staff to consider in the final EIS how the project transmission line would preclude opportunities for future building on her lot and decrease the value of her property. Matthew Iversen states that the draft EIS did not adequately address transmission line impacts on property values, especially in regard to the many homes along Philpott, Harpold, and Burgdorf Roads that are on small acreages that he believes derive most of their value from the location and view. He indicates that the interruption of the view from these homes by the transmission line would lower property values. In addition, Martin Garza, who recently bought a home in Bonanza, and Tom Mahon, a Dairy resident, both indicate that they would never have purchased their homes if they had known the transmission line would be located nearby.

Jon Hobbs, Dan Cohan, and Mary Hunnicutt assert that staff did not rely on adequate studies in addressing project effects on property values because the studies are outdated and not necessarily applicable to the project area because some were conducted for urban areas. They recommend that staff consider more recent studies such as the one by Kielisch (2006), which indicates significant losses in agricultural property values near transmission lines. Mr. Hobbs recommends that staff revise the *Private and Agricultural Property Value* section of the draft EIS and use more recent and relevant studies in doing so. He states that it is important that the studies used track property value losses over a period of time such as 5 to 10 years and that the reduction in property values be compared to the values of properties not affected by transmission lines. Once this section is revised, Mr. Hobbs recommends that it be made available to all interested parties for review and comment before the final EIS is completed.

Response: As indicated in section 3.3.9.2, we do not speculate on the degree that the visibility of the power line might affect property values because property values can be influenced by many other factors. However, the EIS does state that some studies have shown that property values can be negatively affected by powerlines.

Staff did review the Kielisch (2006) study cited by the commenters; however, while it was listed in the references section, it was not directly referenced in the text. This oversight is corrected in the final EIS.

Comment G7: KCPW states that the draft EIS fails to account for project impacts to KCPW facilities during construction and should be revised to include (1) mitigation of accelerated deterioration on KCPW roads due to construction traffic; (2) crossing of KCPW ROWs with transmission lines; and (3) coordination with KCPW to minimize disruption in operation and maintenance of KCPW roadway and drainage facilities during construction, including but not limited to, construction haul routes and interference with scheduled road preventive and rehabilitation maintenance activities, weight restricted bridges, traffic control, winter snow removal and dust control.

Response: In sections 3.3.9.2 and 5.5.1, we discuss and recommend that the applicant develop its proposed traffic safety plan in consultation with KCPW to minimize impacts on its operations.