Riparian Conservation Objective Analysis
Forest Service Section 4(e) Conditions
For Relicensing of the
El Dorado Hydroelectric Project (FERC Project No. 184)

June 2003

On January 18, 2001, the Regional Forester for the Pacific Southwest Region of the USDA-Forest Service signed the Record of Decision (ROD) for the Sierra Nevada Forest Plan Amendment (SNFPA), commonly known as the Sierra Nevada Framework with an effective date for implementation of February 19, 2001. The SNFPA ROD amended the Forest Land and Resource Management Plans for eleven national forests within or near the Sierra Nevada range, including the Eldorado National Forest and Lake Tahoe Basin Management Unit. The ROD provides management guidance in the form of new standards and guidelines for five main areas of concern (ROD page 1) including the management of aquatic, riparian, and meadow (ARM) resources.

The ARM management direction in the selected alternative, modified alternative eight, is predicated upon the attainment of a set of goals or desired conditions known collectively as the Aquatic Management Strategy (AMS) (ROD page A-6). As described in the ROD on page 42, "the fundamental principle of the AMS is to retain, restore, and protect the processes and landforms that provide habitat for aquatic and riparian dependent organisms, and produce and deliver high-quality waters for which the national forests were established." The nine AMS goals as described on page A-6 of the ROD are not themselves "standards or prescriptions, but endpoints towards which management will move watershed processes and functions, habitats, attributes and populations."

Many of the AMS goals are relevant to hydropower relicensing. Of particular relevance to the El Dorado Hydroelectric Project are the AMS goals pertaining to Water Quality, Species Viability, Plant and Animal Community Diversity, Watershed Connectivity, Floodplains and Water Tables, and Streamflow Patterns and Sediment Regimes. The AMS goals are attained through the implementation of the Riparian Conservation Objectives (RCOs) and the set of standard and guidelines associated with each objective. In particular, Standards and Guidelines associated with RCOs 1, 2, and 6 are the primary objectives that need to be reviewed for consistency.

RIPARIAN CONSERVATION OBJECTIVE #1: *Ensure that identified beneficial uses for the water body are adequately protected. Identify the specific beneficial uses for the project area, water quality goals from the Regional Basin Plan, and the manner in which the standards and guidelines will protect the beneficial uses. (RCO #1 is linked to the following AMS goals: #1:Water Quality; #2: Species Viability; #7: Watershed Condition)*

Beneficial uses related to the El Dorado Hydroelectric Project are contained in the Central Valley Region Basin Plan and the Lahontan Region Basin Plan.

The State Water Resources Control Board (SWRCB) intends to issue a Section 401 water quality certification to the licensee once the FERC license is issued. Condition No. 5, Modification of 4(e) Conditions After Biological Opinion or Water Quality Certification, allows the FS to modify the Section 4(e) conditions, if necessary, to respond to the water quality certification, in the event the Section 4(e) conditions do not adequately address water quality. Conditions No. 31, Minimum Streamflows; 32, Ramping Rates; Condition No. 34, Caples Lake Releases and Flow Limitations; Condition No. 35, Oyster Creek Stabilization; Condition No. 36, Esmeralda Creek Restoration; and Condition No. 39, Mitigation for Entrainment, are specifically designed to protect instream beneficial uses of water, including drinking water, recreation, and aquatic species, within the Project area. For all construction practices concerning project improvements associated with 4(e) conditions, Best Management Pracites (BMPs) approved by the Forest Service will be used, in order to insure the protection of beneficial uses.

Standards and Guidelines Associated with RCO #1:

Implement project appropriate Best Management Practices and monitor their effectiveness following protocols outlined in "Investigating Water Quality in the Pacific Southwest Region: Best Management Practices Evaluation Program" (USDA-FS, PSW Region 1992).

Condition No. 30, Water Quality and Water Pollution, requires the licensee to comply with state water quality standards to ensure compliance with the Clean Water Act, protection of beneficial uses, and adequate protection during utilization of the Forests. This condition also prohibits the discharge of waste or by-product that would result in the violation of water quality standards and requires the licensee to develop a plan approved by the FS and subject to the requirements of other federal and state water quality agencies prior to construction and during operation and maintenance of the Project.

Condition No. 13, Hazardous Substances Plan, requires the licensee to complete a Hazardous Substances Plan that addresses oil and hazardous substances storage and spill prevention and cleanup. Conditions No. 28, Erosion Control Plan for New Construction and Measures for Project Maintenance and Operations, and 29, Solid Waste and Waste Water Plan, New Construction and Project Operation and Maintenance, require the licensee to complete an Erosion Control Plan and a Solid Waste and Waste Water Plan, respectively, during planning and prior to any new construction or maintenance, if the FS determines the plan is necessary.

Condition No. 41, Preferred Canal Drainage Structure and Release Point Plan requires the licensee to develop a plan to designate preferred canal drainage structures and release points that will minimize adverse impacts to water quality.

Condition No. 57, Transportation System Management Plan, requires the licensee to complete a Transportation System Management Plan that addresses measures to control erosion related to Project facilities, including dams, roads, penstocks, powerlines, transformer sites, reservoirs, and reaches.

Condition No. 37, Monitoring Program, requires the licensee to complete water temperature and general water quality monitoring for the Project.

For waters designated as "Water Quality Limited" (Clean Water Act Section 303(d)), implement appropriate State mandates for the water body, such as Total Maximum Daily Load (TMDL) protocols.

There are no 303(d) designated waters listed as water quality impaired streams within the Project-affected area.

Conduct project-specific cumulative watershed effects analysis following Regional procedures or other appropriate scientific methodology to meet NEPA requirements.

The Project has been evaluated for cumulative effects to water quality due to changes in runoff from ground disturbing activities. There are few acres proposed for ground disturbing activities in association with the Project. The majority of the proposed work in campgrounds and recreational areas is intended to minimize the impacts from uncontrolled, dispersed recreational vehicle access. Areas that are proposed for treatment of surface materials have been previously impacted and are currently contributing sediment to water resources. The proposed treatments will have a positive effect on water quality, and it is expected that the treatments will reduce the potential for expansion of impacts to riparian and lake shore areas from undirected vehicular use.

There are no proposed measurable changes to land use associated with upgrades or changes to operational facilities associated with this relicensing effort.

Implement soil quality standards for soil loss, detrimental soil compaction, and organic matter retention to minimize the risk of sediment delivery to aquatic systems from management activities.

Condition Nos. 28, Erosion Control Plan for New Construction and Measures for Project Maintenance and Operations; 29, Solid Waste and Waste Water Plan, New Construction and Project Operation and Maintenance; 30, Water Quality and Water Pollution; and Condition No. 57, Transportation System Management Plan, provide for the implementation of soil quality standards.

Ensure that management-related activities, including roads, skid trails, landings, trails, or other activities, do not result in detrimental soil compaction on more than 5 percent of the RCA or 10 percent of the area in CARs. Measure compaction using the procedures outlined in Appendix F of the FEIS.

Condition No. 57, Transportation System Management Plan, addresses potential effects from soil compaction. There are no CARs in the project effected area.

Identify existing and potential sources of sediment delivery to aquatic systems. Implement preventive and restoration measures, such as modifying management activities, increasing ground cover, reducing the extent of compacted surfaces, or revegetating disturbed sites to reduce or eliminate sediment delivery from these sources to aquatic systems.

Condition Nos. 28, Erosion Control Plan for New Construction and Measures for Project Maintenance and Operations; 29, Solid Waste and Waste Water Plan, New Construction and Project Operation and Maintenance; 30, Water Quality and Water Pollution address potential sources of sediment. In addition, Condition No. 34, Caples Lake Flow Releases and Limitations, includes (1) pulse flows that are meant to initiate the transport of bedload material, which would assist in improving habitat conditions for aquatic species and (2) maximum flow releases and channel stabilization measures that are meant to prevent channel degradation and encourage the growth and establishment of woody and herbaceous riparian species.

Evaluate new proposed management activities within CARs and RCAs during environmental analysis to determine consistency with the riparian conservation objectives at the project level and the AMS goals for the landscape. Ensure that appropriate mitigation measures are implemented to (1) minimize the risk of activity-related sediment entering aquatic systems, and (2) minimize impacts to habitat for aquatic- or riparian-dependent plant and animal species.

The relicensing process is not a new activity but an on-going activity. Condition Nos. 28, Erosion Control Plan for New Construction and Measures for Project Maintenance and Operations; 29, Solid Waste and Waste Water Plan, New Construction and Project Operation and Maintenance; 30, Water Quality and Water Pollution; and 57, Transportation System Management Plan require the submission of plans to meet this standard for any new activity proposed by the licensee.

The new planned flow regime below Kyburz Diversion Dam has protection measures in place to prevent pulse flows during foothill yellow-legged frog reproductive periods.

Identify existing uses and activities in CARs and RCAs during landscape analysis. Evaluate existing management activities to determine consistency with RCOs during project-level analysis. Develop and implement actions needed for consistency with RCOs.

This RCO analysis is meant to determine whether the actions implemented by the Section 4(e) conditions are consistent with RCOs. RCAs have been evaluated for condition during the stream condition, riparian condition, and aquatic species surveys during relicensing. Activities needed to improve existing condition of RCAs have been identified and have been incorporated into the Section 4(e) conditions.

The pools and ponds immediately downstream of the Auxiliary Dams 1-7 have breeding populations of mountain yellow-legged frogs and do not have self-sustaining populations of fish. It has been identified that spills may be allowing trout in Lake Aloha to enter

pools below the auxiliary dams and enter these pools and ponds. Condition No. 33, Operation and Maintenance of Lake Aloha, requires trout to be removed from the pools and ponds in a timely manner, which would help reduce impacts to these sensitive frog populations.

Ensure that management activities do not adversely affect water temperatures necessary for local aquatic-and riparian-dependent species assemblages.

The SWRCB intends to issue a Section 401 water quality certification to the licensee once the FERC license is issued. Condition No. 5, Modification of 4(e) Conditions After Biological Opinion or Water Quality Certification, allows the FS to modify the Section 4(e) conditions, if necessary, to respond to the water quality certification, in the event the Section 4(e) conditions do not adequately address water quality.

Condition No. 42, Water Temperature, requires the licensee to develop a Water Temperature Monitoring Plan that is approved by the SWRCB. Condition No. 37, Monitoring Program, requires water temperature monitoring at existing or selected gaging sites or stream segments affected by Project operations.

The streamflow regime described in Condition Nos. 31, Minimum Streamflows, and Condition No. 34, Caples Lake Releases and Flow Limitations, is patterned after the natural hydrograph in many months of the year, which is expected to create water temperatures reflective of natural flow conditions. These are the temperature conditions in which the native species evolved, and these conditions are expected to provide benefits to these species.

Limit pesticide applications to cases where project level analysis indicates that pesticide applications are consistent with riparian conservation objectives.

Condition No. 15, Pesticide Use Restrictions, requires the licensee to obtain prior written approval from the FS before using pesticides on National Forest System lands. Only pesticides registered with the U.S. Environmental Protection Agency may be used.

Prohibit application of pesticides to livestock in RCAs and CARs.

Not applicable.

Avoid pesticide applications within 500 feet of known occupied sites for the California red-legged frog Cascade frog, Yosemite toad, foothill yellow-legged frog, mountain yellow-legged frog, and northern leopard frog unless environmental analysis documents that pesticides are needed to restore or enhance habitat for these amphibian species.

This requirement will be implemented by the FS under Condition No. 15, Pesticide Use Restrictions, which requires the licensee to obtain written approval from the FS for all pesticide application.

Prohibit storage of fuels and other toxic materials within RCAs and CARs except at designated administrative sites. Prohibit refueling within RCAs and CARs unless there are no other alternatives. Ensure that spill plans are reviewed and up-to-date.

Condition No. 13, Hazardous Substances Plan, requires the licensee to prepare a Hazardous Substances Plan for FS approval that includes a plan for oil and hazardous substance storage.

RIPARIAN CONSERVATION OBJECTIVE #2: *Maintain or restore: (1) the geomorphic and biological characteristics of special aquatic features, including lakes, meadows, bogs, fens, wetlands, vernal pools, springs; (2) streams, including in stream flows; and (3) hydrologic connectivity both within and between watersheds to provide for the habitat needs of aquatic-dependent species. (RCO #2 is linked to the following AMS Goals: #2: Species Viability; #3: Plant and Animal Community Diversity; #4: Special Habitats; #5: Watershed Connectivity; #6: Floodplains and Water Tables; #8:Streamflow Patterns and Sediment Regimes; #9: Streambanks and Shorelines)*

Standards and Guidelines Associated with RCO #2:

Maintain and restore the hydrologic connectivity of streams, meadows, wetlands, and other special aquatic features by identifying roads and trails that intercept, divert, or disrupt natural surface and subsurface water flow paths. Implement corrective actions where necessary to restore connectivity.

Condition No. 57, Transportation System Management Plan, requires the licensee to complete a Transportation System Management Plan that identifies maintenance and reconstruction needs for roads associated with the Project. All road maintenance and construction shall meet FS specifications and best management practices. Condition No. 58, Trails System Management Plan, requires the licensee to complete a Trails System Management Plan that identifies maintenance and reconstruction needs for trails required for Project operations.

Ensure that culverts or other stream crossings do not create barriers to upstream or downstream passage for aquatic-dependent species. Locate water drafting sites to avoid adverse effects to in stream flows and depletion of pool habitat.

Condition No. 57, Transportation System Management Plan, requires the licensee to complete a Transportation System Management Plan that identifies maintenance and reconstruction needs for roads associated with the Project. All road maintenance and construction shall meet FS specifications and best management practices. Condition No. 58, Trails System Management Plan, requires the licensee to complete a Trails System Management Plan that identifies maintenance and reconstruction needs for trails required for Project operations.

Where possible, maintain and restore the timing, variability, and duration of floodplain inundation and water table elevation in meadows, wetlands, and other special aquatic features.

Condition No. 34, Caples Lake Releases and Flow Limitations, requires pulse flows from Caples Creek Dam into the Caples Creek natural channel and limits streamflows in the Caples Creek spillway channel. Historically, uncontrolled spills into the Caples Creek spillway channel have resulted in a high level of instability and incision. Unstable stream banks in highly erosive soils contribute a potential high amount of sediment into the Caples Creek natural channel and into the meadow area below. The natural Caples Creek channel, in contrast, has a highly attenuated spring peak runoff, and has a high level of fine stream bed material, little movement of the material with spring runoff events, and an affected stream channel profile with a suggestion of aggradation of stream bed material. This stream channel, which is relatively low in gradient, and is dependent on streamflow and healthy riparian vegetation to maintain channel dimensions, flows through a meadow area. A lack of willow recruitment has been identified, in addition to the imbalance of sediment input to stream transport capacity. The intent of introducing pulse flow events to the main channel is to: (a) more closely mimic the timing and duration of peak flows that would occur under an unimpaired hydrograph; (b) initiate transport of bedload material, which would assist in improving habitat conditions for aquatic species; (c) facilitate flooding of the stream side riparian community at the appropriate time of the year; and (d) aide in control of spills into the spillway channel. Stabilization of the Caples spillway channel is not only intended to reduce the sediment released during spring runoff events, it is also intended to reduce the process of incision and destabilization of Caples Meadow, thereby preserving the ground water table.

The streamflow regime described in Condition Nos. 31, Minimum Streamflows, and Condition No. 34, Caples Lake Releases and Flow Limitations, is intended to restore annual and seasonal variation, timing, and magnitude to Project-affected stream channels.

Prior to activities that could affect streams, determine if relevant geomorphic characteristics, including bank angle, channel bank stability, bank full width-to-depth ratio, embeddedness, channel-floodplain connectivity, residual pool depth, or channel substrate, are within the range of natural variability for the reference stream type as described in the Pacific Southwest Region Stream Condition Inventory protocol. If properties are outside the range of natural variability, implement restoration actions that will result in an upward trend.

A geomorphology study was conducted as part of the relicensing studies for the Project (see discussion of this study in the Rationale Report). Information from the study as well as the unimpaired and regulated hydrology information was used to determine whether relevant geomorphic characteristics were within the range of variability. Conditions No. 34, Caples Lake Releases and Flow Limitations; 35, Oyster Creek Restoration; and 36, Esmeralda Creek Restoration, include measures that address geomorphic problems in specific stream channels.

Prevent disturbance to meadow-associated streambanks and natural lake and pond shorelines caused by resource activities (for example, livestock, off-highway vehicles, and dispersed recreation) from exceeding 20 percent of stream reach or 20 percent of natural lake and pond shorelines. Disturbance includes bank sloughing, chiseling, trampling, and other means of exposing bare soil or cutting plant roots. This standard does not apply to developed recreation sites and designated off-highway vehicle routes.

Condition No. 34, Caples Lake Releases and Flow Limitations requires pulse flows from Caples Creek Dam into the Caples Creek natural channel and limits streamflows in the Caples Creek spillway channel. Historically, uncontrolled spills into the Caples Creek spillway channel have resulted in a high level of instability and incision. Unstable stream banks in highly erosive soils contribute a potential high amount of sediment into the Caples Creek natural channel and into the meadow area below. The natural Caples Creek channel, in contrast, has a highly attenuated spring peak runoff, and has a high level of fine stream bed material, little movement of the material with spring runoff events, and an affected stream channel profile with a suggestion of aggradation of stream bed material. This stream channel, which is relatively low in gradient, and is dependent on streamflow and healthy riparian vegetation to maintain channel dimensions, flows through a meadow area. A lack of willow recruitment has been identified, in addition to the imbalance of sediment input to stream transport capacity. The intent of introducing pulse flow events to the main channel is to: (a) more closely mimic the timing and duration of peak flows that would occur under an unimpaired hydrograph; (b) initiate transport of bedload material, which would assist in improving habitat conditions for aquatic species; (c) facilitate flooding of the stream side riparian community at the appropriate time of the year; and (d) aide in control of spills into the spillway channel.

In stream reaches occupied by, or identified as "essential habitat" in the conservation assessment for, the Lahonton and Paiute cutthroat trout and the Little Kern golden trout, limit streambank disturbance from livestock to 10 percent of the occupied or "essential habitat" stream reach. (Conservation assessments are described in the record of decision.) Cooperate with State and Federal agencies to develop streambank disturbance standards for threatened, endangered, and sensitive species. Use the regional streambank assessment protocol. Implement corrective action where disturbance limits have been exceeded.

Not applicable.

Determine if the age class, structural diversity, composition, and cover of riparian vegetation are within the range of natural variability for the vegetative community. If outside the range of natural variability, implement restoration actions that will result in an upward trend. Actions could include restoration of aspen or other riparian vegetation where conifer encroachment is identified as a problem.

Condition Nos. 31, Minimum Streamflows, and 34, Caples Lake Releases and Flow Limitations are expected to maintain or improve riparian habitat and natural vegetative species composition in the Project area. Condition No. 37, Monitoring Program, includes

riparian vegetation species composition and riparian vegetation recruitment monitoring that will be used to determine if riparian resource needs have been addressed as anticipated, and additional streamflows available through adaptive management provide the ability to adjust streamflows to address riparian resources if necessary.

Cooperate with Federal, Tribal, State and local governments to secure in stream flows needed to maintain, recover, and restore riparian resources, channel conditions, and aquatic habitat. Maintain in stream flows to protect aquatic systems to which species are uniquely adapted. Minimize the effects of stream diversions or other flow modifications from hydroelectric projects on threatened, endangered, and sensitive species and essential habitat as identified in conservation assessments. (Conservation assessments are described in the record of decision.)

The FS coordinated with other federal, state, and local agencies and developed the El Dorado Relicensing Settlement Agreement with these agencies during the relicensing process. The measures from the Settlement Agreement that are within FS jurisdiction have been submitted to FERC as preliminary Section 4(e) conditions.

Condition No. 31, Minimum Streamflows, provides improvement for Lahontan cutthroat trout in Echo Creek by restoring annual and seasonal variation, timing, and magnitude. Potential flow fluctuations that may affect reproducing foothill yellow-legged frogs downstream of Kyburz Diversion Dam have been addressed through Condition No. 38, Ecological Resources Adaptive Management Program, which includes monitoring and a reservation to make modifications.am, has been eliminated by precaution measures. The streamflow regime is intended to restore annual and seasonal variation, timing, and magnitude to Project-affected stream channels and helps restore as much as possible the natural aquatic condition for native species.

During relicensing of Federal Energy Regulatory Commission (FERC) hydroelectric projects, evaluate modifications by the project to the natural hydrograph. Determine and recommend in stream flow requirements and habitat conditions that maintain, enhance, or restore all life stages of native aquatic species, and that maintain or restore riparian resources, channel integrity, and fish passage. Provide written and timely license conditions to FERC. Coordinate relicensing projects with the appropriate State and Federal agencies.

Unimpaired and regulated hydrology information was used to evaluate modifications by the Project to the natural hydrograph. Conditions No. 31, Minimum Streamflows; 32, Ramping Rates; and 34, Caples Lake Releases and Flow Limitations; 35, Oyster Creek Stabilization; 36, Esmeralda Creek Restoration; and 39, Mitigation for Entrainment, are expected to maintain, enhance or restore all life stages of native aquatic species, riparian resources, channel integrity, and fish passage while addressing other beneficial uses. The Rationale Report details the information and process used to develop these conditions. Condition No. 37, Monitoring Program, includes monitoring to determine if applicable resource objectives are being met. Condition No. 38, Ecological Resources Adaptive

Management, provides the ability to make specified adjustments if resource objectives are not met, based on monitoring and other scientific information.

The FS coordinated with other federal, state, and local agencies and developed the El Dorado Relicensing Settlement Agreement with these agencies during the relicensing process. The measures from the Settlement Agreement that are within FS jurisdiction have been submitted to FERC as preliminary Section 4(e) conditions in a timely manner.

For exempt hydroelectric facilities on national forest lands, ensure that special use permit language provides adequate in stream flow requirements to maintain, restore, or recover favorable ecological conditions for local riparian- and aquatic-dependent species.

Not applicable

RIPARIAN CONSERVATION OBJECTIVE #6: *Identify and implement restoration actions to maintain, restore, or enhance water quality and maintain, restore, or enhance habitat for riparian and aquatic species. (REC #6 is linked to all AMS goals.)*

Standards and Guidelines Associated with RCO #6:

Recommend and establish priorities for restoration practices in: (1) areas with compaction in excess of soil quality standards, (2) areas with lowered water tables, or (3) areas that are either actively down cutting or have historic gullies. Identify other management practices, for example, road building, recreational use, grazing, and timber harvests, that may be contributing to the observed degradation.

Conditions No. 31, Minimum Streamflows; 32, Ramping Rates; and 34, Caples Lake Releases and Flow Limitations; 35, Oyster Creek Stabilization; 36, Esmeralda Creek Restoration; and 39, Mitigation for Entrainment, are expected to maintain, enhance or restore all life stages of native aquatic species, riparian resources, channel integrity, and fish passage while addressing other beneficial uses. The Rationale Report details the information and process used to develop these conditions. Condition No. 37, Monitoring Program, includes monitoring to determine if applicable resource objectives are being met. Condition No. 38, Ecological Resources Adaptive Management, provides the ability to make specified adjustments if resource objectives are not met, based on monitoring and other scientific information.

Condition Nos. 28, Erosion Control Plan for New Construction and Measures for Project Maintenance and Operations; 29, Solid Waste and Waste Water Plan, New Construction and Project Operation and Maintenance; 30, Water Quality and Water Pollution; and Condition No. 57, Transportation System Management Plan, provide for the implementation of soil quality standards.

Condition No. 41, Preferred Canal Drainage Structure and Release Point Plan requires the licensee to develop a plan to designate preferred canal drainage structures and release points that will minimize adverse impacts to water quality.

Reclaim abandoned mine sites that are degrading aquatic riparian and meadow ecosystems. First priority is to reclaim sites with hazardous or toxic substances located within CARs and RCAs.

Not applicable.

Conclusion

The Forest Service submitted 4(e) conditions that directly address and meet the intent of the standards and guidelines included under RCOs #1, #2, and #6. These include conditions that require the implementation and evaluation of best management practices, the implementation of preventive and restorative measures to limit sediment delivery to aquatic ecosystems, implementation of streamflows that more closely follow the unimpaired hydrograph to maintain or improve habitat for aquatic and riparian species, an extensive monitoring program, adaptive management measures, and the management of pesticides, fuels, and toxic materials within Riparian Conservation Areas.