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8.6 BOTANICAL AND WILDLIFE RESOURCES ENVIRONMENTAL EFFECTS

This section describes potential impacts to botanical and wildlife resources (including rare, threatened, and endangered terrestrial species) under the Proposed Action for the Middle Fork American River Project (MFP or Project). Section 4.0 – Proposed Action (including Tables 4-4, 4-5, and 4-6) provides a description of routine operation and maintenance activities implemented under the Proposed Action and identifies changes from the No-Action Alternative. Appendix A – Modified or New Facilities Construction Activities and Concept Designs includes a description of facility modification and construction activities, as well as avoidance and protection (AP) measures to protect botanical and wildlife resources during construction.

Potential impacts botanical and wildlife resources have been identified based on changes in Project operations, changes in routine Project maintenance activities, modification of Project facilities and Project recreation facilities, and construction of new Project facilities or recreation facilities (non-routine recreation facility activities). Specifically, impacts on botanical and wildlife include potential loss or degradation of habitat, loss of individuals, and/or disturbance during critical periods.

Impacts on botanical and wildlife resources are evaluated in this analysis based on the resources present in the vicinity of the MFP and activities to be implemented under the Proposed Action. Note that upland special-status plant species including Stebbins' phacelia (*Phacelia stebbinsii* [FSS, CNPS 1B.2]) and bald eagle (*Haliaeetus leucocephalus* [FD, FSS, BCC, SE, CFP]) are each addressed separately (Sections 8.6.1 and 8.6.2) because there are known occurrences of these resources in close proximity to MFP facilities and features where activities under the Proposed Action will be implemented, and because unique evaluation criteria are applicable to these species. Section 8.6.3 provides an analysis of potential impacts of the Proposed Action to all other special-status plant and wildlife species, grouped to include species that use similar habitats or for which impacts are similar.

Impacts on botanical and wildlife resources are evaluated as follows:

- Potential impacts on upland special-status plant species
    - Potential loss of individuals and/or habitat from:
        - Routine maintenance and non-routine recreation facility activities;
        - Modification of existing Project facilities or construction of new facilities; and
        - Changes in flows in the bypass and peaking reaches and modified reservoir water surface elevations.
    - Protection through implementation of additional measures and monitoring programs.

- Potential impacts on bald eagle nests, roosts, and habitat
    - Potential loss of individuals from:
        - Electrocution on Project powerlines or removal of active nests during power line maintenance activities; and
        - Secondary poisoning.
    - Potential disturbance from:
        - Ground disturbing activities and an increased level of human activity associated with changes in routine maintenance activities and implementation of non-routine recreation activities;
        - Ongoing recreation use at Project recreation facilities; and
        - Modification of existing Project facilities or construction of new facilities.
    - Potential loss or degradation of aquatic foraging habitat from:
        - Changes in flows in the bypass and peaking reaches, modified reservoir water surface elevations, and modified diversion pools; and
        - Routine vegetation and noxious weed management (herbicide use).
    - Protection through implementation of additional measures and monitoring programs
- Potential impacts to other special-status plant and wildlife species
    - Potential loss of individuals from:
        - Electrocution of raptors on Project powerlines;
        - Secondary poisoning of scavengers (raptors, mesocarnivores, and game species); and
        - Removal of riparian-nesting songbird nests during development of sediment augmentation sites and modification or construction of new Project facilities.
    - Potential disturbance:
        - Disturbance of raptors during routine maintenance activities, and construction activities associated with modified or new Project facilities and non-routine recreation activities; and

- Disturbance of mule deer and important habitat areas during routine maintenance activities, construction activities associated with modified or new Project facilities and non-routine recreation activities.

- Potential loss or degradation of:

  - Riparian habitat for special-status riparian plants and mosses, riparian nesting songbirds, and riparian mammals from changes in operations, routine maintenance activities, and construction activities associated with modified or new Project facilities;

  - Aquatic foraging habitat for osprey and other aquatic foraging birds and bats from changes in Project operations and construction activities associated with modification of small diversion and Hell Hole Outlet Works; and

  - Forest habitat for forest dwelling birds and mammals during routine maintenance activities, construction activities associated with modified or new Project facilities and non-routine recreation activities.

- Protection through implementation of additional measures and monitoring programs

Potential impacts to rare, threatened, and endangered aquatic species are discussed in Section 8.5 – Fish and Aquatic Resources Environmental Effects. Potential impacts to riparian resources are identified in Section 8.8.

A description of potential impacts to botanical and wildlife resources resulting from implementation of the Proposed Action, considering AP and enhancement measures, by resource topic, is provided below.

8.6.1 Impacts to Upland Plant Species

No federal or State listed plants species have been identified in areas affected by operation and maintenance of the MFP. Therefore, the Proposed Action will have no effect on federal or State listed plant species.

Four FSS plants (Brandegee's clarkia [*Clarkia biloba* ssp. *brandegeeae* (FSS, CNPS 1B.2)], Butte County fritillary [*Fritillaria eastwoodiae* (FSS, CNPS 3.2)], saw-toothed lewisia [*Lewisia serrata* (FSS, CNPS 1B.1)], and Stebbins' phacelia) have been documented within approximately 200 feet of bypass rivers and streams and the peaking reach (CNDDB 2010, USDA-FS 2006). These populations would not be affected by routine maintenance activities, non-routine recreation maintenance activities, modification of existing facilities, or construction of new facilities associated with the Proposed Action. However, these populations may potentially be affected by changes in operation of the MFP. In addition, Stebbins' phacelia, was also documented during TERR 2 special-status plant surveys in the vicinity of Project facilities and features or Project recreation facilities and features where routine maintenance

activities, non-routine recreation maintenance activities, modification of existing facilities, or construction of new facilities will be implemented (TERR 2 – Special-status Plants Technical Study Report [TSR] [TERR 2 – TSR] [PCWA 2011a; Supporting Document (SD) B]). This includes populations at the following locations:

- Two populations at Brushy Canyon;
- One individual at French Meadows Reservoir;
- Two populations in the vicinity of the Rubicon River Gage above Ellicott Bridge; and
- Forty-four populations in the vicinity of Hell Hole Reservoir.

A description of the potential effects associated with the Proposed Action on upland special-status plants and their habitat, including direct effects (i.e., loss of individuals) and indirect effects (i.e., loss or degradation of habitat) is provided in the sections below.

8.6.1.1 Routine Maintenance and Non-Routine Recreation Facility Activities

Under the Proposed Action, implementation of routine maintenance activities and non-routine recreation facility activities could potentially result in loss of Stebbins' phacelia individuals. A summary of routine maintenance activities under the Proposed Action, including changes from the No-Action Alternative, is provided in Section 4.5 and Tables 4-4 through 4-6. Details on maintenance activities are provided in the Sediment Management Plan (SMP) (PCWA 2011b; SD A), the Vegetation and Integrated Pest Management Plan (VIPMP) (PCWA 2011c; SD A), the Recreation Plan (PCWA 2011d; SD A), and the Transportation System Management Plan (TSMP) (PCWA 2011e; SD A). Refer to Table 7.6-4 for a list of MFP facilities and features and MFP recreation facilities and features where Stebbins' phacelia populations occur. A summary of non-routine recreation facility activities is provided in the Recreation Plan (PCWA 2011d; SD A).

Routine maintenance activities that may impact Stebbins' phacelia include vegetation management, noxious weed management, road and trail maintenance, and recreation facility maintenance. Routine vegetation management, which includes trimming of vegetation by hand or with equipment, as well as limited application of herbicides, surfactants, or fungicides, could result in direct loss of Stebbins' phacelia individuals. Similar impacts could result from implementation of noxious weed management, which includes both mechanical (trimming by hand) and chemical (application of herbicides and surfactants) treatment of target noxious weed populations. Routine road and trail maintenance, which consists of annual or periodic maintenance, could result in loss of individuals in or along the shoulder of roads or trails. Routine recreation maintenance includes both annual and heavy maintenance. Implementation of annual maintenance, which includes activities such as garbage clean-up, removal of graffiti, and potable water supply testing, will not affect Stebbins' phacelia. However, implementation of heavy maintenance, which includes activities such as replacement of bathroom

facilities, site leveling, and fuels reduction (i.e., brushing and thinning), could potentially result in the loss Stebbins' phacelia individuals from ground disturbance and use of heavy equipment.

Non-routine recreation facility removal or reduction projects could also potentially impact Stebbins' phacelia. Specifically, reduction of Hell Hole Campground (removal of two campsites) and removal of the Upper Hell Hole Campground (removal of all 13 campsites), to be implemented in the second year following license issuance, could potentially result in loss of Stebbins' phacelia individuals from ground disturbance and use of equipment.

AP measures incorporated into the VIPMP (PCWA 2011c; SD A), the Recreation Plan (PCWA 2011d; SD A), and the TSMP (PCWA 2011e; SD A) will protect Stebbins' phacelia population during the MFP maintenance activities described above. These measures, organized by plan, include:

- VIPMP (PCWA 2011c; SD A)
    - Restrict vegetation trimming by hand or with equipment and manual noxious weed treatments within 50 feet of an existing population;
    - Restrict application of herbicides and surfactants for vegetation and noxious weed management within 100 feet of an existing population;
    - Implement vegetation management activities as soon as practical following snow melt (i.e., prior to seed germination);
    - Implement specific fungicide application methods to avoid non-target species;
    - Implement specific pesticide measures requiring supervision of herbicide application by a licensed pest control advisor (PCA) and restrictive application and disposal methods; and
    - Conduct consultation with resource agencies to develop site-specific protective buffers around any new special-status plant populations identified during inventory surveys.
- Recreation Plan (PCWA 2011d; SD A)
    - Restrict heavy recreation facility maintenance within 50 feet of an existing population; and
    - Implement vegetation and noxious weed management at MFP recreation facilities consistent with the VIPMP (PCWA 2011c; SD A).

- TSMP (PCWA 2011e; SD A)
    - Restrict annual road maintenance and periodic road maintenance (i.e., grading) activities to the road surface and adjacent shoulder within 50 feet of an existing population, or to the smallest area necessary for maintenance of the road or trail; and
    - Implement vegetation and noxious weed management at MFP roads and trails consistent with the VIPMP (PCWA 2011c; SD A).

With implementation of AP measures included in the VIPMP (PCWA 2011c; SD A), Recreation Plan, (PCWA 2011d; SD A) and TSMP (PCWA 2011e; SD A), impacts to Stebbins' phacelia from routine maintenance and non-routine recreation facility maintenance under the Proposed Action would be avoided except at the following three locations:

- Brushy Canyon Adit Road

  Approximately 100 individuals are growing within the gravel surface of the road (populations BC01 and BC02) where routine vegetation management and road maintenance activities will be implemented.

- Hell Hole Dam Spillway Discharge Channel Road

  Approximately 30 individuals are growing within the gravel surface of the road (populations HH01–HH06) where routine vegetation management and road maintenance activities will be implemented.

- Hell Hole Vista

Stebbins' phacelia individuals (population HH 14, with a total of 47,000–94,000 individuals) are growing in and along the path, the viewpoint, and the picnic area where routine vegetation management and heavy recreation facility maintenance activities will be implemented. Vegetation management, road maintenance, and recreation facility maintenance have been ongoing at these locations under the No-Action Alternative These activities will be modified under the Proposed Action to incorporate additional AP measures for the protection of Stebbins' phacelia. Specifically, implementation of AP measures included in the VIPMP (PCWA 2011c; SD A), the Recreation Plan (PCWA 2011d; SD A), and the TSMP (PCWA 2011e; SD A) will reduce the area where routine maintenance activities occurs from 2.2 to 0.4 acres. The AP measures will therefore protect and avoid approximately 1.8 additional acres, and approximately 38,300–76,600 additional individual Stebbins' phacelia (out of a total of 47,000–94,000 individuals in the populations) as compared to the No-Action Alternative.

In addition, a portion of one road, French Meadows Campground Water Supply Facility Access Road, was not included in the TERR-1 special-status plant surveys conducted for the relicensing of the MFP. Therefore, routine maintenance along this road could potentially affect special-status plants, if present. The TSMP (PCWA 2011e; SD A)

includes a measure requiring special-status plant surveys to be conducted at this road prior to implementation of routine maintenance. If any special-status plant populations are identified, PCWA will consult with resource agencies, as appropriate, to develop site-specific measures. Implementation of routine noxious weed management will improve habitat for Stebbins' phacelia during the term of the license. Management of noxious weeds may promote establishment of new special-status plant populations through improved habitat conditions by reducing competition with invasive noxious weeds. Elements of the noxious weed management that improve habitat conditions in the vicinity of the MFP include:

- Manual/chemical treatment of noxious weeds and associated monitoring of treated sites;

- Measures to prevent the introduction or spread of noxious weeds (truck and equipment cleaning, maintenance of stockpiles, inspection of workers clothing and boots, use of weed-free material for erosion control); and

- Educating employees about noxious weed prevention measures.

Because Stebbins' phacelia populations are located outside the campground boundaries of Hell Hole Campground and Upper Hell Hole Campground, implementation of non-routine recreation facility activities at these campgrounds (i.e., the reduction of Hell Hole Campground and the removal of Upper Hell Hole Campground) will not affect existing Stebbins' phacelia populations. If new populations of Stebbins' phacelia or other upland special-status plant populations are identified prior to implementation of non-routine recreation facility activities, PCWA would consult with resource agencies to review the measures included in Recreation Plan for adequacy in protecting special-status plants and develop new site-specific measures, if necessary. PCWA would also obtain all appropriate permits or agreements prior to construction. In addition, the reduction or removal of these facilities would eliminate the need for facility maintenance activities that have been ongoing as part of baseline conditions thereby allowing native vegetation to re-establish within the campground and improving habitat conditions for Stebbins' phacelia or other special-status plants.

8.6.1.2 Existing Facility Modification and Construction of New Facilities

Modification of existing facilities and construction of new facilities could potentially affect upland special-status plants, including Stebbins' phacelia. Potential impacts would include direct loss of plants through trampling, crushing, or removal of individual plants as a result of foot traffic, use of heavy equipment and ground disturbance associated with modification and construction activities. Refer to Section 4.1 and Appendix A for a description of modification and construction activities to be implemented under the Proposed Action.

There are no known populations of upland special-status plants, including Stebbins' phacelia, in the vicinity of construction or staging areas for modification of existing facilities or construction of new MFP facilities. If new upland special-status plant

populations are identified prior to construction, PCWA would consult with resource agencies to review the measures included in Appendix A for adequacy in protecting special-status plants and develop new site-specific measures, if necessary. PCWA would also obtain all appropriate permits or agreements prior to construction. Any measures required by these permits or agreements would be implemented as part of the project.

8.6.1.3 Routine Operations at Hell Hole Reservoir

Routine operations of the MFP modified under the Proposed Action have the potential to impact Stebbins' phacelia through loss of individuals or habitat. Specifically, changes in operations that affect water surface elevation (WSE) at Hell Hole Reservoir (i.e., frequency and duration of inundation within the new maximum normal operating WSE) may result in loss of Stebbins' phacelia individuals or habitat.

Stebbins' phacelia is an herbaceous annual plant, which typically germinates in early spring (April), with seed set occurring in late summer (August). Under existing conditions (No-Action Alternative), Stebbins' phacelia grows along the shoreline of Hell Hole Reservoir, including portions of the shoreline that are inundated for some part of the growing season (i.e., April through August) in wet, above normal, and below normal water year types.

Under the Proposed Action, in years when French Meadows Dam and Hell Hole Dam will spill, operation of the Hell Hole Reservoir Seasonal Storage Increase Improvement (spillway crest gates) will allow storage of up to an additional 7,600 ac-ft of water. The spillway crest gates will result in an increase in the existing maximum normal operating WSE from 4,630 feet above mean sea level (msl) to 4,636 feet msl in the early summer.

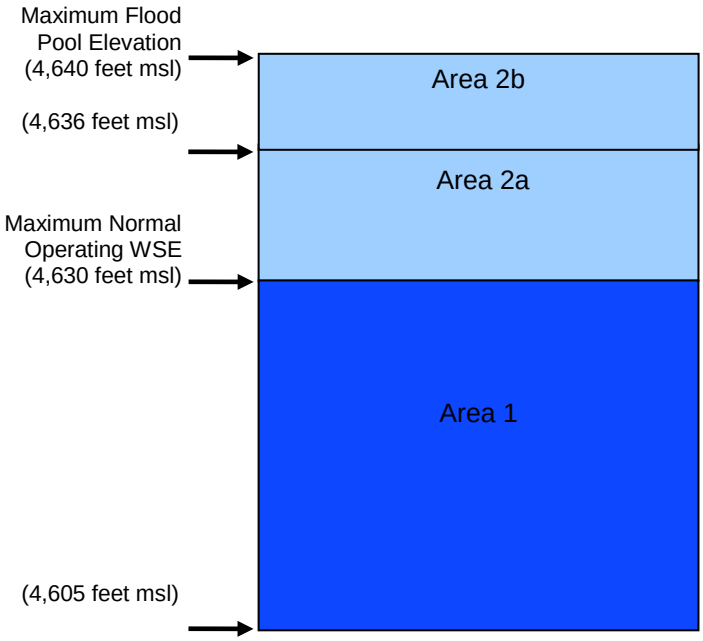
A schematic of specific elevations around Hell Hole Reservoir associated with the No-Action Alternative and Proposed Action is provided below.

Refer to Table 7.6-5 for a list of Stebbins' phacelia populations within different WSE ranges at Hell Hole Reservoir, including the area (in square feet and acres) and estimated number of individuals. The elevation ranges include:

- Area 1 includes those portions of special-status plant populations occurring at or below the current maximum normal operating WSE of 4,630 feet msl down to approximately 4,605 feet msl;

- Area 2a includes those portions of special-status plant populations occurring from the maximum normal operating WSE (4,630 feet msl) to 4,636 feet msl;

- Area 2b includes those portions of special-status plant populations occurring from 4,636 feet msl to the maximum flood pool elevation at 4,640 feet msl;



Refer to Appendix C2c and to Table 8.6-1 for a comparison of the frequency and duration of inundation at different reservoir elevations (areas) during the growing season of Stebbins' phacelia (April through August) under the No-Action Alternative and the Proposed Action. The analysis includes two levels of water demand: (1) current Placer County Water Agency (PCWA) water delivery demand (42,000 acre-feet [ac-ft]/year) and (2) future PCWA water delivery demand (120,000 ac-ft/year). Because the resulting Hell Hole Reservoir water surface elevation differences between the current and future demand are minimal (Appendix C2c) this discussion primarily focuses on reservoir elevation levels at current demand. The following summarizes this information by area:

- **Area 1:** Under current operations, approximately 0.4 acre of habitat that support an estimated 9,000 to 18,000 Stebbins' phacelia individuals are located in Area 1 (between reservoir elevation 4,605 feet msl and 4,630 feet msl). Middle Fork Project Operations Model (Model) results for the Proposed Action indicate that the overall frequency of inundation (i.e., number of years in which inundation occurs) in Area 1 will be similar to the No-Action Alternative. Refer to Appendix C2c and Section 8.5.5.1 for additional analysis.

- **Area 2a:** Under current operations, approximately 2 acres of habitat that support an estimated 53,000 to 106,000 individuals are located in Area 2a (from the current maximum normal operating WSE (4,630 feet msl) to 4,636 feet msl. Model results for the Proposed Action indicate that the overall frequency of inundation in Area 2a during the growing season for Stebbins' phacelia for all water year types combined will increase from 11 to 14 years over the period of record (33 years modeled). This increase in inundation frequency occurs in above normal and below normal water years under the Proposed Action. The average duration of inundation (average days per year) will increase under the Proposed Action by 8 days in wet years, by 9 days

in above normal years, and by 8 days in below normal years. Similar to the No-Action Alternative, Area 2a will not be inundated in dry or critical water years under the Proposed Action.

- **Area 2b:** Under current operations, approximately 5 acres of habitat, supporting an estimated 117,000 to 234,000 individuals, are located in Area 2b (between 4,636 feet msl WSE and the maximum flood pool elevation 4,640 feet msl WSE). Model results for the Proposed Action indicate that portions of Area 2b, which was not inundated in any water year type in the period of record under the No-Action Alternative, will now be inundated in years when Hell Hole Reservoir spills (i.e., in 6 of 10 wet water years and in 1 of 6 above normal water years) during the growing season for Stebbins' phacelia. The average duration of inundation under the Proposed Action will be 22 days per year in wet water years and 15 days in above normal water years. Similar to the No-Action Alternative, Area 2b will not be inundated in below normal, dry, or critical water years under the Proposed Action.

Therefore, changes in operations that affect WSEs in Hell Hole Reservoir will result in only minor changes in the frequency and duration of inundation in areas that support Stebbins' phacelia in areas 1 and 2a. Therefore, conditions in areas 1 and 2a will not change substantially from the No-Action Alternative, it is expected that Stebbins' phacelia populations (and the seed bank) in these areas would continue to persist under the Proposed Action. Small increases in the duration of inundation in some years under the Proposed Action would not result in effects to Stebbins' phacelia populations in areas 1 and 2a. Habitat in Area 2b, which is not inundated under existing conditions, will be inundated under the Proposed Action in years when Hell Hole Reservoir would have spilled. However, the new inundation conditions in Area 2b are similar (but shorter in frequency and duration) to existing inundation conditions in areas 1 and 2a. Therefore, while some changes in the populations (i.e., loss of individuals) may occur, Stebbins' phacelia populations and their seed bank will persist in Area 2b under the Proposed Action. The new inundation resulting from operation of the new Hell Hole Reservoir Spillway Crest Gates would, therefore, result in only negligible impacts to the Stebbins' phacelia populations in Area 2b.

The analysis provided in this section was developed based on best available information, including the known presence of Stebbins' phacelia populations along the Hell Hole Reservoir shoreline and modeled Hell Hole Reservoir water surface elevation fluctuations. During the term of the license, PCWA will conduct surveys for Stebbins' phacelia populations along the perimeter of Hell Hole Reservoir, in conjunction with special-status plant inventory surveys. Results of these surveys will be provided to resources agencies for review and comment. If requested, PCWA will schedule a meeting with resource agencies to discuss results.

8.6.1.4 Routine Operations along Bypass Reaches and the Peaking Reach

Changes in operation of the MFP include increased minimum instream flows, pulse flows with recession rates (in the bypass reaches only), and down-ramping of spills below French Meadows and Hell Hole reservoirs. These changes could potentially

affect special-status plants, including Brandegee's clarkia, Butte County fritillary, saw-toothed lewisia, and Stebbins' phacelia. Populations of these species are located within 200 feet of bypass peaking reaches (Map 7.6-1). However, a review of CNDDB records (CNDDB 2010) indicates that these populations grow primarily in rocky areas on the steep river canyon walls and in upland canyon live oak woodlands, both of which are elevated above the wetted perimeter of the bypass and peaking reaches. Some of these populations may experience inundation during infrequent, high-magnitude flows under the No-Action. However, because the frequency and magnitude of high-magnitude flows will not change under the Proposed Action, the Proposed Action will not result in effects to these populations.

8.6.1.5 Additional Measures for the Protection of Upland Special Status Plants

The VIPMP (PCWA 2011c; SD A) contains the following additional measures to protect Stebbins' phacelia and other upland-special status plants that may be identified during the term of the license. These measures include:

- Conducting special-status plant inventory surveys in the vicinity of the MFP every five years following license issuance to identify any new populations of special-status plants;

- Consulting annually with resource agencies to: (1) discuss the effectiveness of AP measures to protect special-status plants;(2) modify or develop new AP measures as needed; and (3) develop site-specific protective measures for any new special-status plant populations identified during inventory surveys;

- Reviewing resource agency special-status species lists annually; and

- Educating employees and contractors about the presence of upland special-status plants and measures to protect them (i.e., Employee Training Program [ETP]).

8.6.1.6 Conclusion—Upland Special-Status Plants

Impacts of the Proposed Action on upland special-status plants (including Stebbins' phacelia) would be considered negligible for the following reasons:

- Patterns of inundation of Stebbins' phacelia at Hell Hole Reservoir are similar to those under the No-Action Alternative where populations currently persist;

- AP measures will reduce effects on Stebbins' phacelia by reducing the area and number of individuals affected by ongoing maintenance activities;

- Periodic special-status plant inventory surveys, consultation with resource agencies, and the ETP implemented under the Proposed Action will further protect Stebbins' phacelia or other upland special-status plants identified during the license term (both existing and new populations that may be identified during the term of the license); and

- Consulting with resource agencies, following site-specific engineering, to review the measures included in the TSMP (PCWA 2011e; SD A), Recreation Plan (PCWA 2011d; SD A), and associated with modification of existing or construction of new facilities (Appendix A) to verify their adequacy and development of new measures, if appropriate, will protect any new populations of special-status plants that may be identified.

In addition, the Proposed Project will have no effect on special-status plants (i.e., Brandegee's clarkia, Butte County fritillary, saw-toothed lewisia, and Stebbins' phacelia) occurring in rocky, upland areas along the bypass and peaking reaches.

8.6.2 Impacts to Bald Eagle Nests, Roosts, and Habitat

One active bald eagle nest and three winter roosts were identified in the vicinity of Hell Hole Reservoir. Bald eagles are known to forage in Hell Hole and French Meadows reservoirs, as well as stream reaches along the Middle Fork American River and the Rubicon River. Provided below is a description of potential direct and indirect impacts to bald eagles under the Proposed Action. Potential direct effects include loss of individuals or disturbance of nesting or roosting eagles, and potential indirect effects include loss or degradation of aquatic foraging habitat.

8.6.2.1 Electrocution on Project Powerlines or Removal of Nests

Under existing conditions (No-Action Alternative), several MFP power poles and powerlines have design elements that may pose a potential risk for raptor electrocution (TERR 4 – Special Status Wildlife TSR [TERR 4 – TSR]) (PCWA 2011f; SD B). However, there are no known mortalities resulting from electrocution of bald eagles or other raptors on MFP power poles and powerlines. Refer to the Bald Eagle Management Plan (BEMP) (PCWA 2011g, SD A) for a description of MFP power poles and powerlines, potential risk for electrocution, and measures to enhance the protection of bald eagles and other raptors in the vicinity of power poles and powerlines.

Under the No-Action Alternative, existing power poles and powerlines are replaced as necessary (i.e., when they are damaged or have exceeded their useable lifespan) using traditional design configurations. Under the Proposed Action, all MFP power poles and powerlines that have one or more elements that pose a risk of avian electrocution will be replaced/retrofitted pursuant to Avian Power Line Interaction Committee (APLIC) guidelines within 15 years of license issuance. The BEMP (PCWA 2011g; SD A) provides a detailed schedule for retrofitting or replacement of MFP power poles and powerlines. Raptor-safe design configurations as described in the APLIC guidelines (APLIC 2006) will be used for any new power poles and powerlines or when replacement of existing poles, phase conductors, and associated equipment is required. Specifically, the new Hell Hole Dam Spillway Crest Gates Control Building Communication Line/Powerline to be constructed as part of the Hell Hole Reservoir Seasonal Storage Increase Improvement will be designed to conform to APLIC guidelines.

Additional AP measures included in the BEMP (PCWA 2011g; SD A) associated with bald eagle management in the vicinity of MFP power poles and powerlines during the license term include:

- Restrictions on the removal of bald eagle nests or other raptor nests from powerline poles;
- Evaluation and replacement/retrofitting of any power pole/powerline involved in an electrocution; and
- Annual agency consultation to discuss powerline replacement or retrofit activity.

In addition, while electrocution of bald eagles or other raptors on MFP power poles/powerlines is considered unlikely, replacement/retrofitting and construction of new power poles and powerlines using APLIC design configurations, and implementation of other measures included in the BEMP (PCWA 2011g; SD A) will protect bald eagles and their nests, as well as other raptor species, during the term of the license.

8.6.2.2 Secondary Poisoning

Under the Proposed Action, metal phosphide fumigants (i.e., gas cartridges) will be used in rodent burrows on earthen dams (i.e., French Meadows and Hell Hole dams) to control rodents at the request of Division of Safety of Dams (DSOD). Potential impacts to bald eagles could occur from secondary poisoning if eagles consume rodents that have been killed by the metal phosphide fumigants.

The VIPMP (PCWA 2011c; SD A) includes specific application methods to be used on earthen dams to protect bald eagles or other scavengers from secondary poisoning. These methods include:

- Requiring metal phosphide fumigants to be administered by a PCA;
- Restriction of the use of fumigants to active rodent burrows; and
- Conducting follow-up monitoring of the application area, and collecting and disposing of rodent carcasses.

Implementation of the methods described above during the application of rodenticides will protect bald eagles in the vicinity of French Meadows and Hell Hole dams from secondary poisoning.

8.6.2.3 Routine Maintenance and Non-Routine Recreation Facility Activities

Implementation of routine maintenance activities and non-routine recreation facility activities under the Proposed Action could potentially disturb breeding or roosting bald eagles at Hell Hole Reservoir, or new bald eagle nests or winter roosts that may be identified during the term of the license. Section 4.1 and applicable management plans (i.e., the VIPMP [PCWA 2011c; SD A], the Recreation Plan [PCWA 2011d; SD A], the

TSMP [PCWA 2011e; SD A], and the SMP [PCWA 2011b; SD A]) and Tables 4-4 through 4-6 provide a summary of these activities under the Proposed Action, as well as changes from the No-Action Alternative.

United States Fish and Wildlife Service (USFWS) National Bald Eagle Management Guidelines (Guidelines) (USFWS 2007) recommend that activities be restricted within 660 feet of bald eagle nests, and also provide general guidelines for modifying activities in the vicinity of bald eagle roosts. In addition, during the development of the BEMP (PCWA 2011g; SD A), resource agencies requested that a 0.25-mile (1,320-foot) activity buffer around the bald eagle nest be used for MFP impact analyses. Therefore, potential disturbance of bald eagles would result if equipment noise and/or increased human presence during these activities occurred within 0.25 mile of an active nest or roost, particularly during the sensitive period for breeding bald eagles (e.g., nest building and courtship through the nesting period, January through July) (Section 7.6 Biological Resources Affected Environment, Figure 7.6-1).

Under the Proposed Action, no routine maintenance activities or non-routine recreation facility activities will be implemented within 0.25 mile of the bald eagle nest at Hell Hole Reservoir. The closest MFP facility is Upper Hell Hole Campground (located approximately 0.5 mile from the nest). This recreation facility will be removed as part of the Proposed Action. Therefore, noise or increased human activity during implementation of routine and non-routine activities will not result in disturbance of the bald eagle nest. In addition, because the three winter roosts are also located more than 0.25 mile from MFP facilities and recreation facilities where activities are implemented, and no activities are implemented at Hell Hole Reservoir during the winter months, implementation of the Proposed Action will not result in disturbance of bald eagle winter roosts.

If new bald eagle nests or winter roosts are identified within 0.25 miles of the locations where non-routine recreation facility activities would be implemented, PCWA would consult with resource agencies to review the measures included in BEMP (PCWA 2011g; SD A) and the Recreation Plan for adequacy in avoiding disturbance of these nests and roosts. PCWA would also obtain all appropriate permits or agreements prior to construction.

8.6.2.4 Recreation Use

Section 3.1 and the Recreation Plan provide a description of recreation use at MFP recreation facilities and features. Ongoing recreation facility use at MFP reservoirs and surrounding MFP recreation facilities could result in disturbance of breeding bald eagles at Hell Hole Reservoir, or new bald eagle nests that may be identified during the term of the license. MFP reservoirs and surrounding lands provide recreation opportunities such as fishing, boating, hiking, and camping. Hell Hole Reservoir supports a number of MFP-related recreation activities including developed and dispersed camping, boating, fishing, and hiking. There are no restrictions on the type or size of boats used on the reservoir, and no speed limits. Developed recreation facilities are typically open from May 15 to November 1, depending on snow conditions. The peak recreation

period is between Memorial Day and Labor Day. Bald eagles forage, roost, and nest at Hell Hole Reservoir under existing recreational use.

Under the Proposed Action, recreational use at Hell Hole will be similar to the No-Action Alternative, and peak recreational use will continue to occur between Memorial Day and Labor Day, overlapping with the bald eagle breeding season. However, Upper Hell Hole Campground (located approximately 0.5 mile from the nest) will be removed under the Proposed Action. This will result in decreased recreational activity in the vicinity of the nest, including decreased foot traffic along the Hell Hole Trail, which provides access to the Upper Hell Hole Campground and passes within 70 feet of the bald eagle nest. Decreased recreational use at Upper Hell Hole Campground and along Hell Hole Trail is considered an enhancement for bald eagles at Hell Hole Reservoir.

8.6.2.5 Existing Facility Modification and Construction of New Facilities

Modification of existing MFP facilities and construction of new facilities could potentially disturb breeding bald eagles at Hell Hole Reservoir. Potential disturbance of bald eagles would result if equipment noise and/or increased human presence during these activities occurred within 0.25 mile of an active nest or roost, particularly during the sensitive period for breeding bald eagles.

Modification and construction projects under the Proposed Action will include implementation of the Hell Hole Reservoir Seasonal Storage Increase Improvement, outlet works modifications, small diversion modifications, and installation of new stream gages and weirs. Refer to Section 4.1 and Appendix A for a description of these modification and construction projects. Three of these projects (i.e., Hell Hole Reservoir Seasonal Storage Increase Improvements, Hell Hole Dam Outlet Works Modification, and installation of the Rubicon River Gages at Hell Hole Dam Outlet Works) will occur near Hell Hole Reservoir. However, all construction activities will be located more than 4 miles from the active nest. This greatly exceeds the 660-foot activity buffer recommended by USFWS, as well as the 0.25 mile buffer analyzed at the request of California Department of Fish and Game (CDFG), for prevention of disturbance of bald eagles during construction activities.

If new bald eagle nests or winter roosts are identified within 0.25 mile of the locations where modification of existing MFP facilities and construction of new facilities will occur, PCWA would consult with resource agencies to review the measures included in Appendix A and the BEMP (PCWA 2011g; SD A) for adequacy in avoiding disturbance of these nests and roosts. PCWA would also obtain all appropriate permits or agreements prior to construction.

8.6.2.6 Routine Operations

Modifications in routine MFP operations under the Proposed Action could potentially affect aquatic foraging habitat and fish populations that form the prey base for bald eagles. Refer to Section 4.3 for a description of routine operations under the Proposed Action. Section 8.5 – Fish and Aquatic Resources Environmental Effects provides a

detailed analysis of the affects of the Proposed Action on fish populations in the bypass and peaking reaches and large and medium reservoirs.

As described in Section 8.5 – Fish and Aquatic Resources Environmental Effects, increased minimum instream flows in the bypass and peaking reaches, as well as reduced flow fluctuations in the peaking reach, will increase habitat and food production (aquatic macroinvertebrates) and will likely increase fish abundance. Minimum pool requirements and other changes in reservoir WSEs from implementation of measures under the Proposed Action will result in little or no changes in reservoir volume, water temperature, dissolved oxygen levels or other parameters that could potentially affect reservoir fish populations. In addition, as described in the Recreation Plan (PCWA 2011d; SD A), PCWA will stock fish in Hell Hole and French Meadows reservoirs on an annual basis during the term of the license equivalent to 50% of CDFG's annual management target or 50% of the historical average stocking into the reservoir (2001–2009), whichever is less. Fish species and size class stocking targets will be determined in consultation with the CDFG but are expected to be similar to historic stocking efforts. Therefore, changes in routine operations under the Proposed Action will maintain or enhance aquatic habitats and fish populations during the license term. Maintenance or enhancement of fish populations in bypass streams and rivers, as well as MFP reservoirs, will potentially enhance bald eagles by increasing their prey base.

8.6.2.7 Routine Vegetation and Noxious Weed Management

The use of herbicides, surfactants, and fungicides as part of routine vegetation and noxious weed management at MFP facilities and features located adjacent to bypass streams or large and medium reservoirs could potentially degrade water quality and aquatic habitats where bald eagles forage. Refer to the Section 4.5 and the VIPMP (PCWA 2011c; SD A) for a description of vegetation and noxious weed management under the Proposed Action. Tables 4-4 through 4-6 provide a summary of vegetation and noxious weed management activities, including changes from the No-Action Alternative.

The VIPMP (PCWA 2011c; SD A) includes AP measures to protect water quality and aquatic habitats by preventing the entry of potentially harmful chemicals into water bodies. These measures include:

- Restrictions on the use of herbicides, surfactants, and fungicides within protective buffers around bypass and peaking reaches and Special Aquatic Features (i.e., reservoir);

- Use of herbicide formulations that are considered by the Environmental Protection Agency (EPA) to be safe for aquatic areas;

- Supervision of herbicide application by a licensed PCA and restrictive application and disposal methods; and

- Implementation of a Water Quality Monitoring Program to evaluate the effectiveness of protective measures included in the VIPMP (PCWA 2011c; SD A).

Implementation of these measures will protect water quality and aquatic habitats where bald eagles are known to forage. Potential impacts associated with routine vegetation and noxious weed management are considered negligible.

8.6.2.8 Additional Measures for the Protection of Bald Eagles

The BEMP (PCWA 2011g; SD A) also includes measures to further protect the bald eagle nest and winter roosts at Hell Hole Reservoir and any new nests or roosts identified in the vicinity of the MFP during the license term. These include:

- Conducting five-year bald eagle wintering and nesting surveys in the vicinity of MFP reservoirs and bypass and peaking reaches;

- Coordinating with resource agencies annually to monitor the status of known nests in the vicinity of the MFP;

- Obtaining a permit from USFWS pursuant to the Bald and Golden Eagle Protection Act, if required, and consulting with CDFG regarding any pending activity under the federal permit;

- Consulting annually with agencies to discuss annual and five-year nest monitoring and reporting results, mortality monitoring results, identification of any new nests in the vicinity of the MFP and the appropriateness of AP measures, and power pole retrofit or replacement activities; and

- Implementing the ETP to increase awareness and sensitivity to bald eagle protection requirements and reporting procedures for bald eagle or other raptor mortalities.

Implementation of these measures will protect bald eagles by providing an opportunity to evaluate the location of nests and roosts and modify AP measures, as necessary, and ensure PCWA employees and contractors understand and implement AP measures.

8.6.2.9 Conclusion–Bald Eagle

Implementation of the Proposed Action will protect bald eagles and their roosts and nests for the following reasons:

- Rodenticide application methods will reduce the potential for secondary poisoning of bald eagles;

- Retrofitting and replacement of existing power poles/powerlines or construction of new powerlines consistent with APLIC design configurations will further reduce the risk of electrocution and protect bald eagles;

- Removal of the Upper Hell Hole Campground will reduce recreational use and potential disturbance in the vicinity of the Hell Hole Reservoir bald eagle nest;

- Implementation of the Proposed Action will maintain or enhance the prey base for bald eagles in the bypass and peaking reaches and Project reservoirs;

- AP measures for vegetation and noxious weed management and implementation of a Water Quality Management Program will protect water quality in aquatic habitats where bald eagles forage;

- Periodic bald eagle wintering and nesting surveys, consultation with resource agencies, and the ETP implemented under the Proposed Action will further protect bald eagles at Hell Hole Reservoir or new nests and roosts identified during the license term; and

- Consulting with resource agencies, following site-specific engineering for non-routine recreation facility activities, modification of existing facilities and roads, or construction of new facilities and roads, to review the measures included in the Recreation Plan (PCWA 2011d; SD A); Appendix A; BEMP (PCWA 2011g; SD A); and TSMP (PCWA 2011e; SD A) to verify their adequacy and develop new measures, if appropriate, will protect any new nests or roosts identified within 0.25 mile of these activities.

8.6.3 Impacts to Other Special-Status Plant and Wildlife Species

This section provides an analysis of potential impacts of the Proposed Action on all other special-status plant and wildlife species, grouped to include species that use similar habitats or for which impacts are similar. Refer to Tables 7.6-2 and 7.6-5 for a list of plant and wildlife species known to occur or potentially occurring in the vicinity of the MFP, and their status and habitat requirements. Potential direct effects include:

- Loss of raptors on MFP power poles or powerlines;

- Loss of scavengers from secondary poisoning (e.g., raptors, mesocarnivores, and game mammals);

- Loss of riparian-nesting songbirds or nests;

- Disturbance of raptor nests; and

- Disturbance of mule deer in critical habitat areas.

Potential indirect effects include:

- Loss or degradation of riparian habitat for special-status riparian plants, riparian-nesting songbirds, and riparian mammals;

- Loss or degradation of aquatic foraging habitat for osprey and other aquatic-foraging birds and bats; and

- Loss or degradation of forest habitats for forest-dwelling birds and mammals.

The section also identifies additional measures provided in the Proposed Action for the protection of these species. Overall impacts conclusions are provided at the end of this section for each species or group of species.

8.6.3.1 Electrocution of Raptors on MFP Powerlines

Under existing conditions (No-Action Alternative), several MFP power poles and powerlines have design elements that may pose a potential risk for raptor electrocution. Special-status raptors (bald eagles are addressed in Section 8.6.2.1) that could potentially occur in the vicinity of MFP powerlines include northern goshawk (*Accipiter gentilis* [FSS, CSC]), golden eagle (*Aquila chrysaetos* [CFP]), osprey (*Pandion haliaetus*), California spotted owl (*Strix occidentalis occidentalis* [FSS, MIS, BCC, CSC]), flammulated owl (*Otus flammeolus* [BCC]), great gray owl (*Strix nebulosa* [FSS, SE]), and American peregrine falcon (*Falco peregrinus anatum* [FD, FSS, BCC, SE]).

Refer to the Section 8.6.2.1 for a discussion of measures included in the BEMP (PCWA 2011g; SD A) (i.e., replacement/retrofitting and construction of new power poles and powerlines using APLIC design configurations, and implementation of other measures, such as annual consultation with resource agencies) that will protect all special-status raptor species during the license term.

8.6.3.2 Secondary Poisoning of Scavengers (Raptors, Mesocarnivores, and Game Mammals)

Under the Proposed Action, metal phosphide fumigants (i.e., gas cartridges) will be used in rodent burrows on earthen dams (i.e., French Meadows and Hell Hole dams) to control rodent populations and meet DSOD requirements. Secondary poisoning of scavengers could occur if they consume rodents that have been killed by the metal phosphide fumigants.

Species potentially impacted include special-status raptors, mesocarnivores, or other game mammals. Refer to Section 8.6.3.1 for a list of raptor species potentially occurring in the vicinity of the MFP. Two federal or state listed mesocarnivores, Pacific fisher (*Martes pennanti [pacifica]* [FC, FSS]), and California wolverine (*Gulo gulo luteus* [FSS, ST, CFP]), as well as one other special-status mesocarnivore, American marten (*Martes americana [sierrae*] [FSS, MIS]) may potentially occur in forested habitats in the vicinity of the MFP. Pacific fisher and American marten are known to occur within 5 miles of Duncan Creek Diversion and French Meadows Reservoir (but outside of Federal Energy Regulatory Commission's [FERC] Project boundaries). In addition, a number of game species (e.g., coyote *[Canis latrans]* or black bear *[Ursus americanus]*) could potentially scavenge in the vicinity of French Meadows and Hell Hole reservoirs

are known to occur or have the potential to occur in the vicinity of the MFP. Refer to Table 7.6-8 for a list of game species potentially occurring in the vicinity of the MFP.

Section 8.6.2.2 describes the specific application methods to be used on earthen dams to protect scavengers from secondary poisoning. These include requiring metal phosphide fumigants to be administered by a PCA; restriction of the use of fumigants to active rodent burrows; and conducting follow-up monitoring of the application area, and collecting and disposing of rodent carcasses. Implementation of these application methods will protect special-status species and game mammals scavenging in the vicinity of French Meadows and Hell Hole dams from secondary poisoning.

8.6.3.3 Riparian-Nesting Songbirds and Nests

Riparian habitats along diversion pools, reservoirs, and bypass and peaking reaches associated with the MFP provide potential breeding habitat for special-status riparian-nesting songbirds including yellow warbler (*Dendroica petechia brewsteri* [MIS, CSC]) and yellow-breasted chat (*Icteria virens* [CSC]). Yellow warbler and yellow-breasted chat were detected in the vicinity of the MFP at Ralston Afterbay, French Meadows Reservoir, and Hell Hole Reservoir during surveys conducted for the relicensing. Provided below is a discussion of potential loss of yellow warbler or yellow breasted chat or their nests from routine maintenance activities, modification of existing facilities, or construction of new facilities under the Proposed Action.

ROUTINE MAINTENANCE ACTIVITIES

Under the Proposed Action, removal of riparian vegetation associated with routine maintenance activities could potentially result in loss of riparian-nesting songbirds or their nests. This includes:

- Removal of approximately 0.04 acre of riparian habitat from Junction Bar (0.01 acre), Indian Bar (0.01 acre), and Willow Bar (0.02 acre) for the placement of the temporary bridge necessary to provide access to Junction Bar during sediment augmentation activities. This vegetation will continue to be removed periodically for installation of the temporary bridge during sediment augmentation activities over the term of the license.

- Removal of approximately 0.87 acre of riparian vegetation that is established along the channel margins of Junction and Indian bars to maximize the potential for sediment transport during high-flow events and to prevent berm formation (0.34 acre at Junction Bar and 0.53 acre at Indian Bar). At Indian Bar, this vegetation has established since the last sediment augmentation activity in 2002 (Jones and Stokes 2002). Routine annual vegetation management at the sediment augmentation areas will prevent future establishment of riparian vegetation. Vegetation removal will be completed as described in the VIPMP.

- Potential loss of riparian vegetation during contingency sediment management activities to be implemented at Duncan Creek Diversion, and South Fork Long Canyon Diversion, and North Fork Long Canyon Diversion.

Removal of riparian vegetation during the breeding season (May 15 through July 15 for yellow-breasted chat and April 1 through July 31 for yellow warbler) could result in the destruction of nests and potential loss of individual eggs or nestlings. Measures incorporated in the VIPMP (PCWA 2011c; SD A) and SMP (PCWA 2011b; SD A) require removal of riparian vegetation resulting from the above-listed activities to be implemented between August and March, outside the breeding season for yellow-breasted chat and yellow warbler. This prevents any direct impacts to these birds and nests. Implementation of this measure will avoid any loss of riparian-nesting songbirds during vegetation removal associated with sediment management activities.

In addition, prior to implementation of sediment management activities, PCWA will consult with resource agencies and obtain appropriate permits. This may include a CDFG Streambed Alteration Agreement, USACE Section 404 Permit, RWQCB 401 Certification, or a USDA-FS Special Use Authorization. Measures required in these permits will also be implemented.

MODIFICATION OF EXISTING FACILITIES AND CONSTRUCTION OF NEW FACILITIES

Removal of riparian vegetation associated with modification of existing facilities and construction of new facilities could also potentially result in loss of riparian-nesting songbirds or their nests. Refer to Section 4.1 and Appendix A for a description of modification and construction activities to be implemented under the Proposed Action.

The Duncan Creek Diversion Dam Modification will result in loss of 0.03 acre of willow-alder riparian habitat, the South Fork Long Canyon Diversion Dam Modification will result in loss of approximately 0.01 acre of willow-alder riparian habitat, and the Hell Hole Dam Outlet Works Modification will result in loss of up to 0.24 acre of white alder riparian habitat (Modification of the North Fork Long Canyon Diversion Dam will not require removal of riparian vegetation). Refer to Section 8.8 Riparian Resources Environmental Effects for a more detailed description of impacts to riparian habitats under the Proposed Action.

Measures incorporated into Appendix A require removal of riparian vegetation outside of the nesting season (one year prior to implementation of construction). Implementation of this measure will avoid direct impacts to riparian-nesting songbirds or their nests during modification or construction of MFP facilities. PCWA will also obtain all appropriate permits prior to implementation of construction activities. Measures included in these permits will be implemented.

8.6.3.4 Raptor Nests

Routine maintenance activities and non-routine recreation facility activities could potentially result in disturbance of special-status raptors and nests known to occur in the

vicinity of the MFP, including northern goshawk, golden eagle, osprey, and California spotted owl. Special-status raptors potentially occurring in the vicinity of the MFP include flammulated owl, great gray owl, and American peregrine falcon.

There are eight osprey nests documented in the vicinity of the MFP, including five in the vicinity of French Meadows Reservoir, and three in the vicinity of Hell Hole Reservoir. Refer to Table 7.6-7 and Map 7.6-3 for the location of osprey nests in relation to MFP facilities where routine maintenance activities are implemented. In addition, USDA-FS data show a number of California spotted owl and northern goshawk nest areas and PACs present near MFP facilities. Refer to Table 7.6-7 and Maps 7.6-4 and 7.6-5 for the location of California spotted owl and northern goshawk nest areas PACs in relation to Project facilities.

Because there are known nest locations for osprey, California spotted owl, and northern goshawk in the vicinity of the MFP, this discussion is focused primarily on potential impacts to these three raptor species. However, AP measures described for osprey, California spotted owl, and northern goshawk will also protect other special-status raptors during the term of the license.

Refer to Section 4.3 and to applicable management plans (i.e., the SMP [PCWA 2011b; SD A], VIPMP [PCWA 2011c; SD A], Recreation Plan [PCWA 2011d; SD A], and TSMP [PCWA 2011e; SD A]) for a description of routine maintenance activities and non-routine recreation facility activities under the Proposed Action. Tables 4-4 through 4-6 provide a summary of changes from the No-Action Alternative.

There are currently no known raptor nests or PACs located in the vicinity of proposed non-routine recreation activities. However, under the Proposed Action, implementation of routine maintenance activities could result in disturbance of breeding raptors from equipment noise and increased human activity. In consultation with resource agencies, it was decided that a 500-foot-activity buffer would be sufficient to avoid disturbance of raptor nests. Therefore, disturbance would occur if maintenance activities are conducted within 500 feet of a nest during the breeding season (i.e., March 1 through August 31 for osprey, California spotted owl, and other special-status raptors; February 15 through September 15 for northern goshawk). There are currently no known northern goshawk nests within 500 feet of facilities where routine maintenance activities and non-routine recreation facility activities will be implemented. Therefore, the Proposed Action will not result in impacts to northern goshawk.

Vegetation management (i.e., trimming by hand and with equipment, and use of herbicides and surfactants) and annual and periodic road maintenance activities occurring within 500 feet of an osprey nest will continue to be implemented under the Proposed Action (Table 7.6-7) at the following facilities:

- Duncan Creek – Middle Fork Tunnel Portal; French Meadows – Hell Hole Tunnel Gatehouse;

- Radio Communication Tower near French Meadows – Hell Hole Tunnel Gatehouse; and

- Duncan Creek – Middle Fork Tunnel Portal Road; French Meadows – Hell Hole Tunnel Gatehouse Road; and French Meadows Powerhouse Road..

Similarly, vegetation management and annual and periodic road maintenance activities will continue to be implemented at the Middle Fork Interbay Dam Road, which is within 500 feet of a California spotted owl nest. Under the Proposed Action, noxious weed management will also be conducted at these locations.

Measures incorporated into the TSMP (PCWA 2011e; SD A) and the VIPMP (PCWA 2011c; SD A) will protect osprey and California spotted owl nests during implementation of routine vegetation and noxious weed management and annual and periodic road maintenance by limiting the duration and extent of activities and by establishing limited operating periods. These measures will also apply to any new raptor nests that may be identified during the term of the license. These measures include:

- VIPMP
    - If routine vegetation or noxious weed management activities are implemented within 500 feet of a known nest, locate staging areas away from and limit the duration and extent of activities within the nest buffer;
    - Vegetation supporting nests will not be trimmed, unless approved by the appropriate state or federal agencies; and
    - Pesticides will be applied using methods that will avoid impacts to nests.
- TSMP
    - If annual road or trail maintenance activities are implemented within 500 feet of a known nest, staging areas will be located away from and the duration and extent of activities within the nest buffer will be limited;
    - Periodic and special project activities will be implemented outside the breeding season to the extent possible; and
    - Pre-construction clearance surveys will be required prior to implementation of periodic road or trail maintenance implemented during the breeding season. If active nests are found, activities requiring the use of heavy equipment will not be implemented within 500 feet of the nest during the applicable nesting season.

In addition, although no raptor nest has been identified within 500 feet of routine sediment management or non-routine recreation facility activities requiring ground disturbing activities or use of heavy equipment, the Recreation Plan (PCWA 2011d;

SD A) and the SMP (PCWA 2011b; SD A) include measures to protect raptor nests. These measures include:

- SMP
    - All sediment management activities will be conducted from September 15 to February 15, outside the raptor nesting season.
- Recreation Plan
    - Pre-construction clearance surveys will be required prior to implementation of ground disturbing and construction activities implemented during the breeding season. If active nests are found, activities requiring the use of heavy equipment will not be implemented within 500 feet of the nest during the nesting season.

Implementing these measures under the Proposed Action will protect osprey, California spotted owl, and northern goshawk, as well as other special-status raptors, during the term of the license.

MODIFICATION OF EXISTING FACILITIES AND CONSTRUCTION OF NEW FACILITIES

Modification of existing facilities and construction of new facilities could also potentially disturb osprey, California spotted owl, northern goshawk, or other special-status raptors if construction activities were implemented within 500 feet of a nest during the breeding season. Refer to Section 4.1 and Appendix A for a description of modification and construction activities to be implemented under the Proposed Action.

No osprey, California spotted owl, or northern goshawk nests occur within 500 feet of any construction or staging areas for the small diversion and outlet works modifications, new gages and weirs, or new facilities associated with the Hell Hole Reservoir Seasonal Storage Increase Improvement. Therefore, facility modification and construction activities will not result in impacts to known nests. Measures incorporated into the Proposed Action (Section 4.0) will protect any new special-status raptor nests potentially identified in the vicinity of the facility modification and construction projects. These include:

- Implementing construction activities outside the breeding season to the extent possible; and
- Conducting preconstruction clearance surveys prior to implementing facility modification or construction activities. If active nests are found, construction activities will not be implemented within 500 feet of the nest during the applicable nesting season.

Implementation of these measures will minimize the disturbance of any special-status raptor nests.

8.6.3.5 Mule Deer in Important Habitat Areas

ROUTINE MAINTENANCE ACTIVITIES AND NON-ROUTINE RECREATION FACILITY ACTIVITIES

Under the Proposed Action, implementation of routine maintenance activities and non-routine recreation facility activities could potentially result in disturbance to mule deer (*Odocoileus hemionus* [MIS]) from equipment noise, ground disturbance, or increased human activity if implemented in important mule deer habitat areas (i.e., deer fawning areas, holding areas, and critical ranges).

Mule deer are one of the most widespread game species in the vicinity of the MFP. A State Game Refuge, intended primarily to protect habitat used by the Blue Canyon mule deer herd, extends from the west end of French Meadows Reservoir to the northwest portion of the Granite Chief Wilderness. Refer to Table 7.6-6 and Maps 7.6-6a and 7.6 6b for the location of mule deer fawning areas, holding areas, critical ranges, and migration routes in relation to MFP facilities and features and MFP recreation facilities and features. Refer to Section 4.3 and to applicable land and resource management plans (i.e., the SMP [PCWA 2011b; SD A], VIPMP [PCWA 2011c; SD A], Recreation Plan [PCWA 2011d; SD A], and TSMP [PCWA 2011e; SD A]) for a description of routine maintenance activities and non-routine recreation facility activities under the Proposed Action. Tables 4-4 through 4-6 provide a summary of changes from the No-Action Alternative.

In relation to the MFP, important mule deer habitats occur primarily in the following areas:

- **Hell Hole Area:** There are mule deer intermediate holding areas (i.e., areas where deer gather in late summer prior to migration) in the vicinity of Hell Hole Reservoir facilities where routine maintenance activities (i.e., routine vegetation management, annual and periodic road maintenance, and annual and heavy recreation facility maintenance) are ongoing.

- **French Meadows Area:** There are critical summer ranges (i.e., areas critical to the breeding cycle of mule deer) in the vicinity of the State Game Refuge at French Meadows Reservoir. This includes portions of recreation facilities where annual and heavy recreation facility maintenance are ongoing. Non-routine recreation facility activities will also be implemented under the Proposed Action at Ahart Campground, Poppy Campground, McGuire Group Campground, and McGuire Boat Ramp and Associated Parking Area.

- **Middle Fork Interbay Area:** There are critical winter ranges (i.e., areas critical to the life cycle of deer during winter months) in the vicinity of Middle Fork Interbay where routine road maintenance activities are ongoing.

With the exception of non-routine recreation facility activities, these activities have been ongoing under the No-Action Alternative and will not change significantly under the Proposed Action. Noxious weed management will also be implemented in conjunction

with vegetation management at facilities where target noxious weed populations have been identified.

Mule deer have tolerated routine maintenance activities under existing conditions (No-Action Alternative), as well as other ongoing human activities, such as recreational use and hunting. In addition, all routine maintenance activities or other non-routine recreation facility activities under the Proposed Action will be restricted to the area necessary to complete the work within the existing facility footprint. Any disturbance of mule deer in forested habitat surrounding MFP facilities and features or MFP recreation facilities and features will be minimal under the Proposed Action and will not represent a significant change from the level of Project activities under the No-Action Alternative. Therefore, impacts are considered negligible.

MODIFICATION OF EXISTING FACILITIES AND CONSTRUCTION OF NEW FACILITIES

Modification of existing facilities and construction of new facilities could also potentially disturb mule deer. Refer to Section 4.1 and Appendix A for a description of modification and construction activities to be implemented under the Proposed Action.

There are no important mule deer habitats in the vicinity of any construction and staging areas for the small diversion or outlet works modifications, or the construction of new gages and weirs or facilities associated with the Hell Hole Reservoir Seasonal Storage Increase Improvement. Therefore, facility modification and construction activities will not result in disturbance to mule deer in important habitat areas.

8.6.3.6 Habitat for Special-Status Riparian Plants and Mosses, Riparian Nesting Songbirds, and Riparian Mammals

Changes in operation of the MFP and implementation of routine sediment, vegetation, and noxious weed management activities, as well as modification of existing facilities (e.g., diversion dams and outlet works) or construction of new MFP facilities under the Proposed Action, may affect riparian areas that support special-status riparian plants and mosses or that represent foraging and/or breeding habitat for riparian nesting songbirds and riparian mammals.

No special-status riparian plants or mosses were identified in the vicinity of diversion pools, reservoirs, and bypass and peaking reaches. However, special-status riparian plants or mosses may be identified during special-status plant inventory surveys conducted over the license term.

Yellow warbler and yellow-breasted chat were detected in the vicinity of the MFP at Ralston Afterbay, French Meadows Reservoir, and Hell Hole Reservoir during surveys conducted for the relicensing (Section 8.6.3.3). In addition, two special-status mammals, Sierra Nevada mountain beaver or sewellel (*Aplodontia rufa californica* [CSC]) and ringtail (*Bassariscus astutus* [CFP]) may breed and forage in riparian habitats in the vicinity of the MFP.

Refer to Sections 4.3 and 4.5 for a description of routine operations and maintenance under the Proposed Action and to Section 4.1 and Appendix A for a description modification of existing Project facilities and construction of new facilities. Tables 4-4 through 4-6 provide a summary of changes from the No-Action Alternative. Refer to Section 8.8 Riparian Resources Environmental Effects for a detailed description of the effects of the Proposed Action on riparian habitats. These effects are summarized below.

- Changes in operation of the MFP include increased minimum instream flows, pulse flows with recession rates (in the bypass reaches only), and down-ramping of spills below French Meadows and Hell Hole reservoirs. Implementation of these measures will enhance riparian resources along 79 miles of bypass river reaches and will maintain riparian resources along 28 miles along the peaking reach. In addition, implementation of minimum reservoir pool requirements, installation of the Hell Hole Spillway Gates, and small diversion modifications will maintain riparian resources at MFP reservoirs and diversion pools.

- Routine maintenance activities will result in loss of riparian vegetation. This includes removal of approximately 0.04 acre of riparian habitat for the placement of the temporary bridge necessary to provide access to Junction Bar during sediment augmentation activities; removal of approximately 0.87 acre of riparian vegetation that is established along the channel margins of Junction and Indian bars; and potential removal of vegetation that may become established in the diversion pool during contingency sediment management activities to be implemented at Duncan Creek Diversion, South Fork Long Canyon Diversion, and North Fork Long Canyon Diversion.

- Construction activities associated with the modification of existing facilities and construction of new facilities will result in a permanent loss of approximately 0.28 acre of riparian at Duncan Creek Diversion Pool, South Fork Long Canyon Creek Diversion Pool, and Hell Hole Dam Outlet Works

Although the Proposed Action would result in the loss of approximately 1.19 acres of riparian habitat, and removal of vegetation that may become established in the diversion pool as part of contingency sediment management, the Proposed Action includes measures that will avoid, protect, and enhance riparian habitat along approximately 107 miles of rivers and streams associated with the MFP. In addition, riparian vegetation will be re-planted following completion of the re-contouring of the Rubicon River reach. The specifics of revegetation (i.e., planting plan species, number of plants, extent of area, etc.) will be developed through a permitting process with CDFG and USACE (Section 4.0, Proposed Action, Appendix A). This will more than adequately mitigate for the loss of 1.19 acres of riparian habitat and will protect species dependent on riparian habitats including special-status riparian plants and mosses, riparian-nesting songbirds, and riparian mammals.

8.6.3.7 Aquatic Foraging Habitat for Osprey and Other Aquatic Foraging Birds and Bats

OSPREY AND OTHER AQUATIC FORAGING BIRDS

Changes in routine operation of the MFP, as well as implementation of vegetation and noxious weed management under the Proposed Action could potentially affect aquatic foraging habitat, as well as aquatic macroinvertebrates or fish populations that represent a prey base for several special-status birds in the vicinity of the MFP. In addition to bald eagle (discussed in Section 8.6.2), other special-status bird species potentially foraging in aquatic habitats in the vicinity of the MFP (i.e., large and medium reservoirs and/or MFP bypass and peaking reaches) include osprey, American white pelican (*Pelecanus erythrorhynchos* [CSC]), harlequin duck (*Histrionicus histrionicus* [CSC]), and Vaux's swift (*Chaetura vauxi* [CSC]). Osprey are known to forage at the medium and large MFP reservoirs (i.e., Middle Fork Interbay, Ralston Afterbay, Hell Hole Reservoir, and French Meadows Reservoir). American white pelicans, which are a migrant species, were documented foraging in the vicinity of Hell Hole Reservoir. A flock of Vaux's swifts were seen foraging over French Meadows Reservoir. Harlequin ducks breed along swift, shallow rivers of the Sierra Nevada and could potentially occur in the vicinity of MFP; however, there are no current records for this species in the vicinity of the MFP.

Refer to Section 4.5 for a description of changes in operations, and to Section 4.3 and the VIPMP (PCWA 2011c; SD A) for a description of vegetation and noxious weed management under the Proposed Action. Tables 4-4 through 4-6 provide a summary of changes from the No-Action Alternative. Section 8.5 – Fish and Aquatic Resources Environmental Effects provides a detailed analysis of the affects of the Proposed Action on fish populations in the bypass and peaking reaches and large and medium reservoirs.

Modifications in routine MFP operations under the Proposed Action could potentially affect aquatic foraging habitat, as well as aquatic macroinvertebrate and fish populations that form the prey base for these species. As described in Section 8.5 – Fish and Aquatic Resources Environmental Effects, increased minimum instream flows in the bypass and peaking reaches, as well as reduced flow fluctuations in the peaking reach, will increase habitat and aquatic macroinvertebrates productivity, which will in turn increase fish abundance.

Minimum pool requirements and other changes in reservoir WSEs from implementation of measures under the Proposed Action will result in little or no changes in reservoir volume, water temperature, dissolved oxygen levels or other parameters that could potentially affect macroinvertebrate or reservoir fish populations. In addition, fish in French Meadows and Hell Hole reservoirs will continue to be stocked by PCWA and CDFG as described in the Recreation Plan. Therefore, changes in routine operations under the Proposed Action will maintain or enhance aquatic habitats, aquatic macroinvertebrate productivity, and fish populations during the license term. Maintenance or enhancement of aquatic macroinvertebrate and fish populations in

bypass streams and rivers, as well as MFP reservoir, will enhance aquatic-foraging birds by increasing their prey base.

In addition, as described in Section 8.6.1.2, the use of herbicides, surfactants, and fungicides as part of routine vegetation and noxious weed management in the vicinity of bypass and peaking reaches and reservoirs could potentially degrade water quality and aquatic habitats in the vicinity of the MFP. Refer to Section 8.6.1.2 for a summary of AP measures incorporated into the VIPMP (PCWA 2011c; SD A) to protect aquatic habitats by preventing the entry of chemicals into water bodies. Implementation of these measures will protect aquatic foraging habitats during implementation of vegetation and noxious weed management.

Therefore, with implementation of measures to protect aquatic habitats during implementation of routine vegetation and noxious weed management, modification of routine operations will not affect special-status birds potentially foraging in bypass rivers and streams and in MFP reservoirs.

BATS

Under the Proposed Action, implementation of instream flow measures, minimum pool requirements, and sediment management activities could potentially affect aquatic foraging habitat for special-status bats by affecting their prey base (aquatic macroinvertebrates) or through temporary loss of aquatic foraging habitat during implementation of sediment management activities. In addition, small diversion modifications at Duncan Creek, North Fork Long Canyon, and South Fork Long Canyon creeks could result in changes in aquatic foraging habitat for special-status bats.

No federal or state-listed bat species were identified utilizing (e.g., roosting in) any MFP facilities or features during MFP relicensing studies. Several bat species considered sensitive by USDA-FS and CDFG, including pallid bat (*Antrozous pallidus* [FSS, CSC]), Townsend's big-eared bat (*Corynorhinus townsendii* [FSS, CSC]), and western red bat (*Lasiurus blossevillii* [FSS, CSC]) were detected foraging at the small diversion pools and medium and large reservoirs (TERR 6 Special-Status Bats TSR [TERR 6 – TSR]) (PCWA 2011h; SD B). In addition, spotted bat (*Euderma maculatum* [CSC]) and greater western mastiff bat (*Eumops perotis californicus* [CSC]) may potentially occur in the MFP vicinity.

Refer to Section 4.3 and 4.5 and to the SMP (PCWA 2011b; SD A) for a description of changes in operations and sediment management to be implemented under the Proposed Action, and to Tables 4-4 through 4-6 for a summary of changes from the No-Action Alternative. Section 4.1 and Appendix A provide a description of the construction of the modified diversion dams. Section 8.5 – Fish and Aquatic Resources Environmental Effects provides a detailed analysis of the affects of the Proposed Action on aquatic macroinvertebrate productivity in the bypass and peaking reaches, as well as large and medium reservoirs and small diversion pools.

As described previously, enhanced minimum instream flows, modified pulse flows, and down-ramping of spills below French Meadows and Hell Hole reservoirs under the Proposed Action will increase the wetted perimeter of bypass rivers and streams. These conditions would maintain or enhance macroinvertebrate productivity in bypass reaches. Therefore, special-status bats foraging in these locations would be maintained or enhanced.

Small diversion modifications (Duncan Creek, North Fork Long Canyon, and South Fork Long Canyon creeks) will result in a temporary, short-term dewatering of the diversions pools where special-status bats are known to forage. Specifically, the modifications will require one-time dewatering of the diversions between July and November. Western red bat and spotted bat typically are not present in the vicinity of the MFP in the fall. However, pallid bat, Townsend's big-eared bat, and greater western mastiff bat are year-round residents that would be present in the MFP during the months when dewatering will occur. Therefore, dewatering associated with initial modification of the diversion pools would result in temporary impacts to aquatic foraging habitat for pallid bat, Townsend's big-eared bat, and greater western mastiff bat.

However, under the No-Action Alternative, these diversions are routinely dewatered to conduct sediment management activities. Prior to diversion modification, sediment management activities will continue under the Proposed Action, but will be reduced (duration, extent of equipment needed, volume of sediment removed and disposal areas). After diversion modification the need for future sediment management is considered to be unlikely. Therefore, while implementation of the Proposed Action would result in a temporary loss of habitat during the fall for pallid bat, Townsend's big-eared bat, and greater western mastiff bat during modification of the diversions, the resulting diversion improvements will reduce the frequency and need for dewatering of the small diversion pools over the term of the license, as compared to the No-Action Alternative.

As described in Section 8.5 – Fish and Aquatic Resources Environmental Effects, following construction of the modified small diversions, the existing diversion pools will aggrade with sediment to near the top of the wedge-wire screen, resulting in new diversion pools becoming shallower. The footprint of the new diversion pools will remain approximately similar to the existing diversion pools. These changes in the depth of the diversion pool are expected to maintain, or potentially enhance, aquatic macroinvertebrate populations that form a prey base for special-status bats.

Although diversion modification will result in short-term, temporary loss of special-status bat foraging habitat, the diversion modifications will substantially reduce the need to conduct future routine sediment management, which requires dewatering of the diversions. Therefore, special-status bat foraging habitat will be maintained or enhanced under the Proposed Action. Therefore, impacts to special-status bats are considered neglible. In addition, implementation of instream flow measures and minimum reservoir pool requirements under the Proposed Action will maintain or enhance aquatic macroinvertebrate populations that form a prey base for special-status bats.

8.6.3.8 Forest Habitat for Forest Dwelling Birds and Mammals

Implementation of routine vegetation management, recreation facility maintenance, non-routine recreation facility activities, as well as modification of existing facilities and construction of new facilities, could potentially result in the loss or degradation of forested areas that represent habitat for a number of special-status species. These include birds that forage and/or breed in forested habitats in the vicinity of the MFP, as well as mammals such as mesocarnivores, game mammals (including mule deer), and other special-status mammals including ringtail and northern flying squirrel.

Special-status birds that breed and forage in forested habitats include special-status raptors such as northern goshawk and California spotted owl (Section 8.6.3.4); and other special-status birds including sooty (blue) grouse (*Dendragapus obscurus* [MIS]), mountain quail (*Oreortyx pictus* [MIS]), calliope hummingbird (*Stellula calliope* [BCC]), Lewis' woodpecker (*Melanerpes lewis* [BCC]), Williamson's sapsucker (*Sphyrapicus thyroideus* [BCC]), hairy woodpecker (*Picoides villosus* [MIS]), black-backed woodpecker (*Picoides arcticus* [MIS]), olive-sided flycatcher (*Contopus cooperi* [BCC, CSC]), fox sparrow (*Passerella iliaca* [MIS]), and Cassin's finch (*Carpodacus cassinii* [BCC]). Of these, sooty (blue) grouse, mountain quail, hairy woodpecker, olive-sided flycatcher, and Cassin's finch, were documented during surveys conducted for the MFP relicensing.

American marten, pacific fisher, and California wolverine may potentially occur in forested habitats in the vicinity of the MFP. Pacific fisher and American marten are known to occur within 5 miles of Duncan Creek Diversion and French Meadows Reservoir (but outside of FERC Project boundaries). However, there are no known denning areas for Pacific fisher or American marten and there are no recorded wolverine occurrences or dens in the vicinity of the MFP.

A number of game species are known to occur or have the potential to occur in the vicinity of the MFP. Refer to Table 7.6-8 for a list of game species potentially occurring in the vicinity of the MFP. Mule deer are one of the most widespread game species in the vicinity of the MFP. Refer to Table 7.6-6 and Maps 7.6-6 a and b for the location of mule deer fawning areas, holding areas, critical ranges, and migration routes in relation to MFP facilities and features, MFP roads and trails, and MFP recreation facilities and features.

In addition to mesocarnivores and game species, several other special-status mammals may potentially occur in forested habitats in the vicinity of the MFP. These include ringtail and northern flying squirrel (*Glaucomys sabrinus* [MIS]). These species were not documented during MFP relicensing studies, but are likely to occur in appropriate habitat in the vicinity of the MFP.

Refer to Section 4.3 and to the VIPMP (PCWA 2011c; SD A) and Recreation Plan (PCWA 2011d; SD A) for a description of vegetation and noxious weed management and recreation maintenance under the Proposed Action. Tables 4-4 through 4-6 provide a summary of changes from the No-Action Alternative. Section 4.1 and

Appendix A provide a description of modification of existing facilities or construction of new facilities under the Proposed Action.

Vegetation management at MFP facilities and features and MFP recreation facilities and features is limited to trimming of shrubs and herbaceous vegetation and cutting of overhanging limbs to provide safe access and maintain efficient operation of MFP facilities and features. In addition, hazard tree removal and fuels reduction (brushing and thinning) conducted as part of heavy recreation facility maintenance will be limited to removal of vegetation necessary to provide safe recreation opportunities and reduce fire risk. These activities are restricted to the perimeter of the Project facilities and features and recreation facilities and features. Implementation of these activities will not result in loss or degradation of habitat for forest-dwelling birds and mammals. Similarly, construction and staging areas for modification of existing facilities or construction of new facilities are located in disturbed, graveled or paved areas to avoid impacts to forest habitats or other natural vegetation. Forest habitats and their associated birds and mammals surrounding MFP facilities and features and MFP recreation facilities and features will therefore not be affected by the Proposed Action.

8.6.3.9 Additional Measures for the Protection of Other Special-Status Plant and Wildlife Species

The management plans for the MFP included in the Proposed Action contain additional measures to protect special-status plants and wildlife, including new plant populations, raptor nests, or other resources (e.g., bat roosts or mesocarnivore dens) identified during the term of the license. These include:

- Conducting periodic special-status plant inventory surveys, as described in the VIPMP;

- Requiring annual agency consultation to discuss appropriate measures to protect new special-status plant populations; new nest, roost, or den sites; or other resources to be protected during implementation of routine maintenance activities; and

- Implementation of the ETP for PCWA employees and contractors regarding special-status plants and wildlife of the MFP and associated AP measures and specific work methods to be implemented for their protection.

These measures will protect other plant and wildlife populations and ensure the protection of any new populations, nests, or roosts identified during the license term.

8.6.3.10 Impact Conclusions—Other Special-Status Plant and Wildlife Species

As described above, implementation of the Proposed Action, including operation of the MFP, routine maintenance activities, and non-routine recreation facility maintenance, as well as modification of existing facilities and construction of new facilities, could potentially result in impacts to other special-status plant and wildlife species including

other raptors, riparian songbirds, riparian plants and mosses, aquatic foraging birds, bats, riparian mammals, forest-dwelling species (i.e., birds, mesocarnivores, game mammals, and other mammal species), and mule deer. This section provides an overall impact conclusion by species or group of species associated with implementation of the Proposed Action.

SPECIAL-STATUS RIPARIAN PLANTS AND MOSSES

The Proposed Action will protect and enhance riparian areas that represent habitat for special-status riparian plants and mosses through changes in operation of the MFP, and will protect special-status riparian plants and mosses through implementation of measures included in the proposed management plans. A summary of Proposed Action components that enhance or protect riparian special-status plants is provided below:

- Implementation of measures included in the Proposed Action (e.g., increased minimum instream flows, pulse flows with recession rates, and down-ramping of spills) will protect and enhance riparian resources along approximately 107 miles of rivers and streams associated with the MFP;

- Measures included in the SMP (PCWA 2011b; SD A) and the VIPMP (PCWA 2011c; SD A) will ensure protection of riparian habitats during implementation of routine vegetation, noxious weed, and sediment management activities; and

- Periodic special-status plant surveys and annual consultation with agencies to develop appropriate measures to protect special-status plant populations or mosses, as well as implementation of the ETP, will protect any new special-status riparian plants or moss populations identified during the license term.

OTHER RAPTORS

The Proposed Action will protect northern goshawk, California spotted owl, and osprey, and other special-status raptors including golden eagle, flammulated owl, great gray owl, or American peregrine falcon, through implementation of measures included in management plans. A summary of measures that will protect raptors is provided below:

- Retrofitting and replacement of existing power poles/powerlines or construction of new powerlines consistent with APLIC design configurations will reduce the risk of electrocution and thereby protect other special-status raptors;

- Rodenticide application methods will reduce the potential for secondary poisoning of other special-status raptors;

- Measures included in the TSMP (PCWA 2011e; SD A) and VIPMP (PCWA 2011c; SD A) will prevent disturbance of raptor nests by limiting the duration and extent of routine maintenance activities within 500 feet of known nests, as well as prohibiting trimming of vegetation from trees supporting nests and requiring application methods to avoid nests during pesticide applications;

- Measures included in the SMP (PCWA 2011b; SD A), the Recreation Plan (PCWA 2011d; SD A), and the TSMP (PCWA 2011e; SD A) will prevent disturbance of raptor nests during ground disturbing activities or use of heavy equipment; and

- Annual consultation with resource agencies to discuss the effectiveness of AP measures, as well as implementation of the ETP, will further protect special-status raptors.

AQUATIC-FORAGING BIRDS

The Proposed Action will protect aquatic-foraging bird species (including American white pelican, harlequin duck, osprey, and Vaux's swift) and their habitats through changes in operations of the MFP and through measures included in the management plans. A summary of measures that will protect aquatic-foraging birds is provided below:

- The Proposed Action will maintain the existing distribution of fish species and maintain or increase fish abundance in the Project bypass and peaking reaches and reservoirs;

- AP measures for vegetation and noxious weed management and implementation of a Water Quality Management Program will protect water quality in aquatic habitats; and

- Annual resource agency consultation to ensure the appropriateness of AP measures, as well as implementation of the ETP, will further protect aquatic-foraging birds.

OTHER FOREST-DWELLING BIRDS

Implementation of the Proposed Action would not affect other forest-dwelling birds for the following reasons:

- Routine vegetation removal (i.e., hazard tree removal or fuels reduction) is limited to that necessary for safe and efficient operation of the MFP, safe recreation, or reduction of fire risk and will not impact forested habitats outside the perimeter of Project facilities and features;

- Forested habitats will not be affected by modification of existing facilities or construction of new facilities; and

- Annual resource agency consultation, as well as implementation of the ETP, will further protect forest-dwelling species.

RIPARIAN-NESTING SONGBIRDS

The Proposed Action will enhance riparian areas that represent habitat for riparian-nesting songbirds through changes in operation of the MFP, and will protect riparian-nesting songbirds through AP measures included in the management plans. A

summary of these measures that enhance or protect riparian-nesting songbirds is provided below:

- Implementation of measures included in the Proposed Action (e.g., increased minimum instream flows, pulse flows with recession rates, and down-ramping of spills) will protect and enhance riparian resources along approximately 107 miles of rivers and streams associated with the MFP;

- Measures included in the VIPMP (PCWA 2011c; SD A) will protect riparian habitats during implementation of routine vegetation and noxious weed management activities;

- Removal of riparian vegetation necessary for implementation of sediment management activities and modification of existing facilities, or construction of new facilities will occur between August and March, outside the breeding season for riparian-nesting songbirds, to avoid impacts to individuals or nests; and

- Annual consultation with resource agencies to discuss the effectiveness of AP measures, as well as implementation of the ETP, will further protect riparian-nesting songbirds.

BATS

The Proposed Action will maintain and protect special-status bat populations for the following reasons:

- Changes in operation of the MFP under the Proposed Action will maintain or enhance the prey base for special-status bats foraging in aquatic habitats;

- Implementation of routine sediment management and modification of small diversions will reduce the need for dewatering of diversions and reservoirs that represent appropriate foraging habitat over the license term; and

- Annual resource agency consultation, as well as implementation of the ETP, will further protect special-status bats.

RIPARIAN MAMMALS

The Proposed Action will enhance riparian areas that represent habitat for riparian mammals through changes in operation of the MFP, and will protect riparian mammals through protective measures included in the management plans. A summary of measures that enhance or protect riparian mammals is provided below:

- Implementation of measures included in the Proposed Action (e.g., increased minimum instream flows, pulse flows with recession rates, and down-ramping of spills) will protect and enhance riparian resources along approximately 107 miles of rivers and streams associated with the MFP;

- Measures included in the VIPMP (PCWA 2011c; SD A) will protect riparian habitats during implementation of routine vegetation, and noxious weed management activities; and

- Annual consultation with resource agencies to discuss the effectiveness of AP measures, as well as implementation of the ETP, will further protect riparian mammals.

MESOCARNIVORES, GAME MAMMALS, AND OTHER SPECIAL-STATUS MAMMALS

The Proposed Action will protect mesocarnivores, game mammals, or other forest-dwelling special-status mammals through implementation of measures included in the management plans. A summary of measures that would protect mesocarnivores, game mammals, or other forest-dwelling special-status mammals is provided below:

- Rodenticide application methods will reduce the potential for secondary poisoning of mesocarrnivores and game mammals such as black bear and coyote;

- Routine vegetation removal (i.e., hazard tree removal or fuels reduction) is limited to that necessary for safe and efficient operation of the MFP, safe recreation, or reduction of fire risk, and will not impact forested habitats outside the perimeter of Project facilities and features;

- Forested habitats will not be affected by modification of existing facilities or construction of new facilities; and

- Annual resource agency consultation, as well as implementation of the ETP, will further protect forest-dwelling species.

MULE DEER

Implementation of the Proposed Action will not affect mule deer for the following reasons:

- Routine vegetation removal (i.e., hazard tree removal or fuels reduction) is limited to that necessary for safe and efficient operation of the MFP, safe recreation, or reduction of fire risk, and will not impact forested habitats outside the perimeter of Project facilities and features;

- Forested habitats will not be affected by modification of existing facilities or construction of new facilities;

- Routine maintenance activities have been ongoing under existing conditions at important mule deer habitats in the vicinity of French Meadows Reservoir, Hell Hole Reservoir, and Middle Fork Interbay; and these activities will not change significantly under the Proposed Action; and

- Annual resource agency consultation, as well as implementation of the ETP, will further protect mule deer.

8.6.4 Unavoidable Adverse Effects

There are no unavoidable adverse effects to botanical and wildlife resources under the Proposed Action.

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TABLE

Table 8.6-1. Comparison of the Frequency and Duration of Inundation of Hell Hole Reservoir Areas 2a and 2b at Various Reservoir Elevation Levels.

Inundation Frequency and Duration of Area 2a[1].

Alternatives	Water Year Type	Number of Years	Minimum Number of Day	Maximum Number of Day	Average Number of Days
Proposed Action Existing Demand	Wet (n=10)	7	16	80	46
	Above Normal (n=6)	3	28	39	33
	Below Normal (n=6)	4	10	19	15
	Dry (n=5)	0	0	0	0
	Critical[3] (n=6)	0	0	0	0
Proposed Action Future Demand	Wet (n=10)	7	16	80	46
	Above Normal (n=6)	2	33	39	36
	Below Normal (n=6)	3	10	19	16
	Dry (n=5)	0	0	0	0
	Critical [3] (n=6)	0	0	0	0
No-Action Alternative Existing License Conditions	Wet (n=10)	7	27	72	43
	Above Normal (n=6)	3	5	27	14
	Below Normal (n=6)	1	7	7	7
	Dry (n=5)	0	0	0	0
	Critical[3] (n=6)	0	0	0	0

Inundation Frequency and Duration of Area 2b[2].

Alternatives	Water Year Type	Number of Years	Minimum Number of Day	Maximum Number of Day	Average Number of Days
Proposed Action Existing Demand	Wet (n=10)	6	1	40	22
	Above Normal (n=6)	1	15	15	15
	Below Normal (n=6)	0	0	0	0
	Dry (n=5)	0	0	0	0
	Critical[3] (n=6)	0	0	0	0
Proposed Action Future Demand	Wet (n=10)	6	1	40	21
	Above Normal (n=6)	1	15	15	15
	Below Normal (n=6)	0	0	0	0
	Dry (n=5)	0	0	0	0
	Critical[3] (n=6)	0	0	0	0
No-Action Alternative Existing License Conditions	Wet (n=10)	0	0	0	0
	Above Normal (n=6)	0	0	0	0
	Below Normal (n=6)	0	0	0	0
	Dry (n=5)	0	0	0	0
	Critical[3] (n=6)	0	0	0	0

[1]Area 2a: 4,630-4,636 ft msl.

[2]Area 2b: 4,636-4,640 ft msl.

[3]Includes 1977 extreme critical year.