

MCARTHUR SWAMP PLANNING UNIT

Pit-McCloud River Watershed

Existing Conditions & Uses

Overview

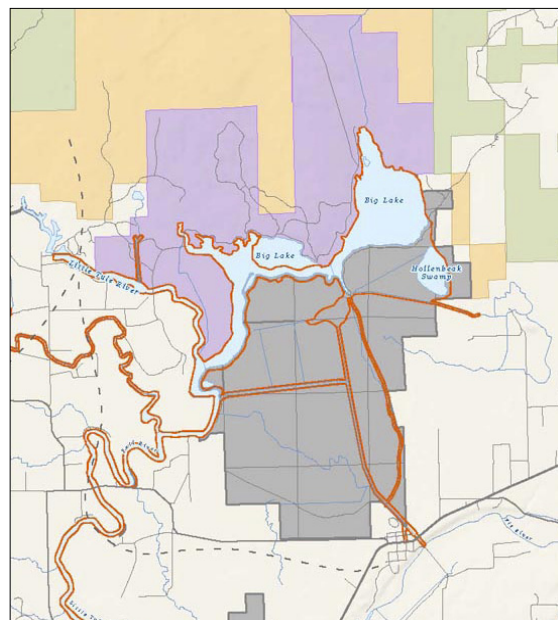
- Spring-fed lake and rivers; valuable grazing lands and important waterfowl area
- Planning unit provides the only public access to Ahjumawi Lava Springs State Park
- 7,596 acres in Shasta County; 5,196 acres outside the FERC boundary and 2,400 acres inside the FERC boundary
- Part of the Pit 1 Project (FERC #2687); new License issued March 2003

As shown in Figure PM-3, the McArthur Swamp Planning Unit is located within the Fall River Valley in Shasta County, just north of the town of McArthur. The site contains the spring-fed Big Lake, the Tule and Little Tule Rivers and part of the Fall River, along with 6,000 acres of grassland and wetland areas. The property is bounded to the south and west by private land, to the east by private and BLM lands, and to the north by Ahjumawi Lava Springs State Park.

In addition to the large contiguous parcels that comprise the majority of the planning unit, there



View toward Mt. Shasta



McArthur Swamp Planning Unit
Shasta County

is a small piece of land within the planning unit, referred to as the Glenburn Dredge site, located along the Fall River downstream of the Tule River and Fall River confluence.¹ This piece is entirely surrounded by private property and does not have road access. The planning unit also includes a small linear piece of land located off of the Little Tule River called the Bowman Ditch. This ditch is surrounded by Ahjumawi Lava Springs State Park and serves to collect spring water and funnel it into the Little Tule River.

McArthur Swamp was once a large, wet meadow-fringed marsh fed by a network of springs. Due to the system of levees and drainage canals that were built beginning in 1903, the area now includes 1,400 acres of open water, which mainly consists of Big Lake, Tule River, and some canals. PG&E purchased the area in 1925 and it became part of the Pit 1 FERC Project. The only hydropower infrastructure within the planning unit is the system of levees and canals.

Fish, Plant, and Wildlife Habitat

McArthur Swamp provides habitat for several special status species, including rough sculpin, bigeye marbled sculpin, and northwestern pond

McArthur Swamp Planning Unit Existing Conditions

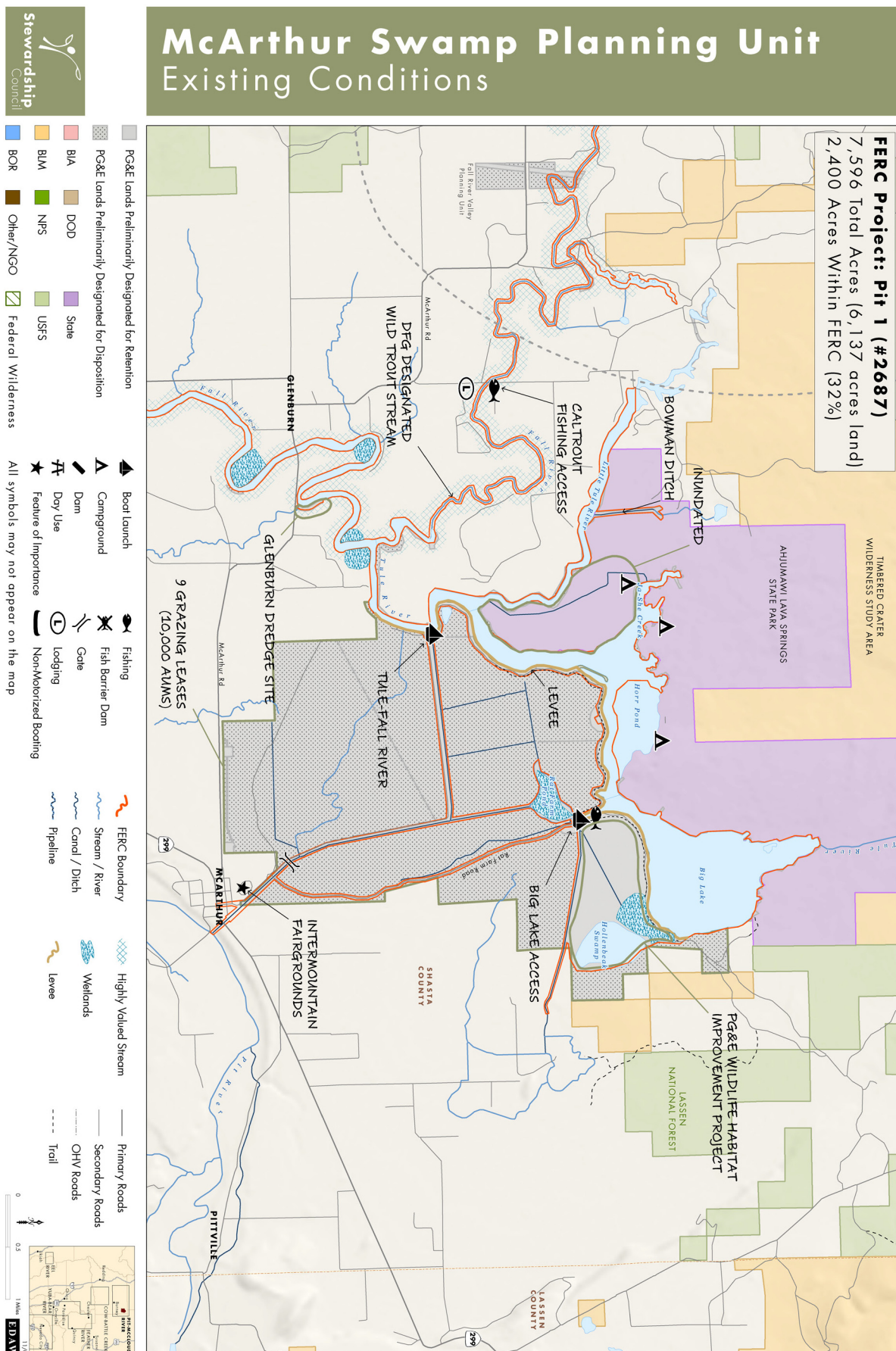


Figure PM-3

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turtle. The endangered Shasta crayfish² is also found in the lava substrate and springs within the area, particularly in Big Lake, Ja-She Creek, and along the Tule River Levee System. The Fall River, adjacent to the Glenburn Dredge site, is a DFG-designated Wild Trout stream that is well known for large rainbow trout. Three rare plants and two special status snails have also been identified within the planning unit.

The multitude of bird species that reside or migrate through the area makes the McArthur Swamp site special. Tens of thousands of birds use this site during their migration; one USFWS bird count recorded over 500,000 during a single year. Fall River Valley, where McArthur Swamp is located, is Shasta County's most important waterfowl nesting area and has been designated by the Audubon Society as an Important Bird Area.³ McArthur Swamp supports wintering waterfowl, such as mallard, wigeon, gadwall, and geese, including large numbers of cackling Canada geese, a small rare subspecies. The grassland areas provide excellent foraging for at least 10 wintering and resident crane and raptor species, including many special status species (such as greater sandhill crane, bald and golden eagle, short-eared owl, northern harrier, and prairie falcon).

Despite the valuable habitat and grazing lands found at McArthur Swamp, noxious weeds are evident and a growing concern. Noxious weeds within the planning unit including bull, musk, and Scotch thistle; spotted and squarrose knapweed; and perennial pepperweed. In addition, Eurasian watermilfoil, an aquatic invasive plant, has become a significant issue within the Tule River and surrounding waterways.

The 2003 McArthur Swamp Management Plan (MSMP) proposed the creation of additional habitat for wildlife within the 675-acre Wildlife Habitat Improvement Program (WHIP) area (see Figure PM-3). The MSMP includes levee repair, seasonal flooding, fencing, vegetation management and construction of a water control structure at Rat Farm Pond, as well as a topographic survey, pipe installation, vegetation

management, and fencing at Hollenbeak Field, a 700-acre area that includes the 675-acre WHIP area. Additional fencing is proposed for several areas around drains and canals not currently fenced from cattle. The MSMP is modeled on a similar plan developed by the Technical Review Team from 1998-2000, however it does not address properties or issues located outside of the FERC Project boundaries.

Open Space

The Shasta County General Plan recognizes that rivers, creeks, associated riparian corridors, and floodplains within the county are major open space resources. The General Plan also recognizes that agricultural lands provide privately maintained open space, which contributes to both the rural character of the county and its open, natural landscape. Lands along the southern portion of the planning unit and the Glenburn Dredge site provide scenic views for McArthur Road, an important thoroughfare. The open grassland area also provides excellent views of Mt. Shasta, a regional landmark.

Outdoor Recreation

Boating, fishing, wildlife viewing, and hunting are popular recreational activities at McArthur Swamp. An existing boat launch is located at Big Lake Access, and fishing and boating are



Meadow habitat

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Cattle within grazing lease area

common on the Fall River and at Big Lake. This boat launch also provides the only access to Ahjumawi Lava Springs State Park—where primitive campsites are available only by boat access. There is only one other public boat launch to the Fall River, a car-top boat launch installed by CalTrout farther upstream.

Due to the abundance of bird species, bird watching opportunities are tremendous. The Big Lake area is part of the nationwide Watchable Wildlife Program and is included within the California Wildlife Viewing Guide. Wildlife viewing is currently possible from the levee tops and main access road. Hunting is a prominent use of the site, as McArthur Swamp is the most popular waterfowl hunting location in the intermountain area. Though hunting is allowed at the Swamp at no fee, there are also no specific hunting facilities on the property.

Under the new Pit 1 Project FERC License, PG&E will construct a new boat launch at the termination of McArthur Canal into the Tule River on the western edge of the planning unit. This new boat launch (called the Tule-Fall River Boat Launch) will provide car-top boat access to the Tule, Little Tule, and Fall Rivers. The Pit 1 Project Recreation Plan also includes provisions for signage on levee tops, at boat launches, and along Highway 299 to draw attention to recreational opportunities and wildlife viewing at McArthur Swamp.

Forest Resources

There are no forest resources within the planning unit.

Agricultural Uses

The open grasslands of McArthur Swamp provide excellent forage for livestock grazing. Also an historic use, grazing has occurred at the Swamp for about 70 years. The property currently provides leased grazing opportunities for nine to twelve ranchers on 6,000 acres of land for approximately 1,200 to 2,000 head of cattle. Perimeter and cross-fencing have created 16 fields where 19 stock pond watering systems can support 10,000 animal unit months (AUMs) from April to November. Fields are grazed at various times throughout the grazing season, but these properties are particularly important in providing high elevation grazing in the summer months—when temperatures in the Central Valley soar and cattle are moved to cooler pastures. In recognition of seasonal wetland habitat and avian usage of the area, the WHIP area is only grazed for one month in late summer. Additionally, grazing activities carried out within McArthur Swamp are carefully managed to encourage waterfowl use and have specifically enhanced winter use by migrating waterfowl.

Historic Resources

McArthur Swamp is located within the ancestral territory of Ajumawi Band of the Pit River Tribe. PG&E conducted cultural resource studies within the Pit 1 Project cultural resource study area, which is generally the area within the Pit 1 Project FERC boundary (see Figure PM-3). While cultural resource information for the planning unit is relatively limited, there are six recorded archaeological sites at McArthur Swamp within the Pit 1 Project cultural resource study area, five of which are located along Rat Farm Road. These sites include prehistoric lithic scatter sites and a multi-component site. Additionally, the historic Rat Farm, which was the site of a PG&E muskrat farm built in 1924, is

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located within this planning unit. There are at least six other sites outside the cultural resource study area, including an ethnographic village site.

The recent License Order for the Pit 1 Project implemented the Pit 1 Project Programmatic Agreement. The Programmatic Agreement required PG&E to develop the Pit 1 Historic Properties Management Plan (HPMP) to manage cultural resources per Section 106 of the National Historic Preservation Act.

Stewardship Council Recommendations

The Stewardship Council recommends that the land and land uses at McArthur Swamp be preserved and enhanced by focusing on the importance of the planning unit for local ranching, the excellent habitat values and protected species found within the planning unit, the importance of public access and recreation to the region, and the presence of cultural resources. In presenting the Recommended Concept provided here, our objective is to preserve and enhance habitat, open space, recreation, and cultural resources while also protecting and preserving important grazing activities.

Objective: Preserve and enhance biological, cultural, and agricultural resources and enhance education and recreation opportunities.

As shown on Table PM-2, the Stewardship Council has identified a number of preservation and/or enhancement measures that may contribute to the conservation management program for McArthur Swamp. Additional detail and background regarding these potential measures can be found in the Supporting Analysis for Recommendations, provided under separate cover. These measures are intended to be illustrative in nature, not prescriptive, and



Historic Rat Farm building

will be amended, deleted, or augmented over time in coordination with future land owners and managers to best meet the objective for this planning unit.

Fish, Plant, and Wildlife Habitat

Objective: Preserve and enhance habitat in order to protect and restore special biological resources.

McArthur Swamp is an important wildlife area, particularly for migrating raptors and birds. To preserve and enhance the habitat and resources found here, the Stewardship Council recommends that baseline studies and plans be developed to gain a clear understanding of the



View from levee toward Rat Farm Pond

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resources. These studies will likely be followed by management plans to ensure implementation of preservation and enhancement measures for specific resources. Management of the property to preserve and enhance habitat will also include heightened management of noxious weeds specifically bringing agency and resource interests on board to assist PG&E and future potential landowners or easement holders in the fight against Eurasian watermilfoil.

The Stewardship Council also recommends assessing the potential to restore Bowman Ditch to enhance habitat connectivity as well as assessing the potential to enhance habitat for Shasta crayfish in addition to supporting Shasta crayfish recovery efforts. We recognize that McArthur Swamp is an important resource in a regional setting and strongly encourage close coordination with local entities and other resource experts in implementing all biological resource protection measures. All planning should be considered in conjunction with the rangeland management plan, relevant Pit 1 Project plans, and other onsite improvements that PG&E will be undertaking as part of the MSMP.

Open Space

Objective: Preserve open space in order to protect natural and cultural resources, viewsheds, and agricultural land uses.



Boat launch at Big Lake

This concept would preserve open space by limiting new construction to signage and minor additional recreation facilities, as well as through permanent conservation easements. Conservation easements would describe all prohibited uses to maintain open space values, including the level of uses allowed and the requirement to maintain scenic qualities.

Outdoor Recreation

Objective: Enhance recreational facilities in order to provide additional education and recreation opportunities and enhance the recreation experience.

McArthur Swamp is an important recreational area offering boating, fishing, hunting, bird watching. Additionally, the planning unit provides the primary access to the unique boat-in only primitive experience of Ahjumawi Lava Springs State Park. The Stewardship Council looks to enhance these opportunities by recommending modest enhancements to recreational facilities on the properties (Figure PM-4). We recommend enhancements focused on providing interpretive signage to promote natural and cultural resource awareness and assessing the potential for hunting blinds and wildlife viewing facilities. In addition, we recommend increasing opportunities for youth education and recreation as well as providing a dock and day use facilities at the Big Lake Access site.

Agricultural Uses

Objective: Preserve and enhance grazing in order to support associated economic benefits, as well as to protect open space and habitat resources.

The McArthur Swamp Planning Unit provides significant cattle forage and has long been an important component of the regional ranching economy. The Stewardship Council looks to preserve this resource and important economic use as part of the long-term management of

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McArthur Swamp. To support this effort, we anticipate that a baseline conditions report will be required to describe current agricultural, physical, and overall biological conditions of the area. From this, specific determinations can be made to identify and manage grazing practices in balance with other uses and values of the property.

Preservation of Historic Values

Objective: Identify and manage cultural resources in order to ensure their protection, as well as to support opportunities for public education.

McArthur Swamp is rich with Native American history, as well as the history of use of the Fall River Valley. The Stewardship Council aims to support an increased understanding of these resources and ensure they are appropriately protected. To meet this objective, we recommend that cultural resource studies be conducted to understand the resources found at McArthur Swamp (particularly outside the FERC cultural resource study area where little information is available), that appropriate management plans be developed and implemented, and that opportunities to support public education regarding cultural resources be considered. Throughout this effort, the Stewardship Council recommends close coordination with Native American entities. Development of the cultural resources management plan should be consistent with the Pit 1 Project Programmatic Agreement.



View of Mt. Shasta from McArthur Swamp

³ The Fall River Valley has been designated by the Audubon Society as an Important Bird Area based on the approximately 17 species of sensitive bird species that breed in the valley and the significant numbers (over 4,000) of migratory and wintering birds that use the valley. This designation by Audubon highlights areas that are biologically exceptional and is intended to heighten the awareness of the State's avifauna, their habitat, and the potential threats to the stability of bird populations.

Endnotes

¹ The Glenburn Dredge site has traditionally been the mooring site of the PG&E commissioned dredge Francis.

² The recent Pit 1 Project License Order requires monitoring of Shasta crayfish (and bald eagles), as well as development of a Shasta Crayfish Technical Review Committee and a Shasta crayfish management plan.

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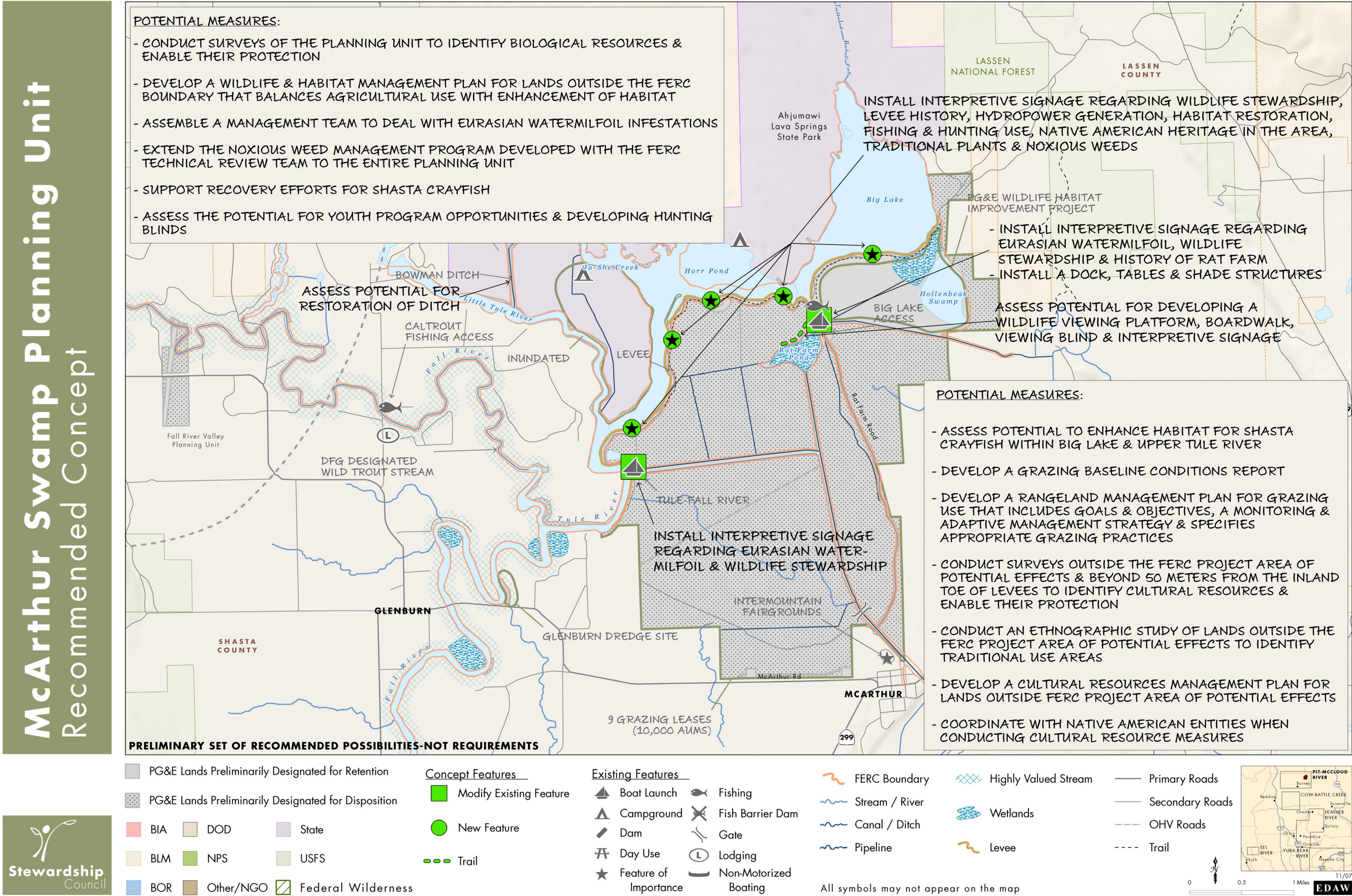
Table PM-2 Objectives to Preserve and/or Enhance – Recommended Concept

Planning Unit Objective: Preserve and enhance biological, cultural, and agricultural resources and enhance education and recreation opportunities.		
Beneficial Public Value	Objective	Potential Measures to Preserve and/or Enhance BPVs – Not Requirements*
Protection of the Natural Habitat of Fish, Wildlife, and Plants	Preserve and enhance habitat in order to protect and restore special biological resources.	<ul style="list-style-type: none">• Conduct surveys of the planning unit to identify biological resources and enable their protection.• Develop a wildlife and habitat management plan for lands outside the FERC boundary that balances agricultural use with protection and enhancement of habitat.• Assemble a management team to deal with Eurasian watermilfoil infestations.• At both boat launches, install interpretive signage regarding Eurasian watermilfoil.• Extend the Noxious Weed Management Program developed with the FERC Technical Review Team under the 2003 McArthur Swamp Management Plan to the entire planning unit.• Assess the potential for restoration of Bowman Ditch to enhance habitat and connectivity.**• Support recovery efforts for Shasta crayfish.• Assess the potential to enhance habitat for Shasta crayfish within Big Lake and upper Tule River.
Preservation of Open Space	Preserve open space in order to protect natural and cultural resources, viewsheds, and agricultural land uses.	<ul style="list-style-type: none">• Apply permanent conservation easements to ensure a higher level of open space protection.
Outdoor Recreation by the General Public	Enhance recreational facilities in order to provide additional education and recreation opportunities and enhance the recreation experience.	<ul style="list-style-type: none">• Assess the potential for developing a wildlife viewing platform, boardwalk, and viewing blind with interpretive signage regarding wildlife stewardship at the Rat Farm Pond area.• Install interpretive signage regarding wildlife stewardship along levee tops and at both public accesses.**• Install interpretive signage at the Rat Farm building describing the history of the muskrat farm.**• Install interpretive signage regarding levee history, hydropower generation, habitat restoration, fishing and hunting use, Native American heritage in the area, traditional plants, and noxious weeds to levee tops.**• Install a dock at the Big Lake Access boat launch.**• Install tables and shade structures at Big Lake Access.**• Assess the potential for youth program opportunities.• Assess the potential for developing hunting blinds within the land portion of the planning unit.**
Sustainable Forestry		None proposed.
Agricultural Uses	Preserve and enhance grazing in order to support associated economic benefits, as well as to protect open space and habitat resources.	<ul style="list-style-type: none">• Develop a baseline conditions report that describes current agricultural, physical, and overall biological conditions of the area, including current uses and state of improvement.• Develop a rangeland management plan for grazing use that includes goals and objectives, a monitoring and adaptive management strategy, and specifies grazing practices that address soil and water conservation, erosion control, pest management, nutrient management, vegetation management, habitat protection, and cultural resources management.
Preservation of Historic Values	Identify and manage cultural resources in order to ensure their protection, as well as to support opportunities for public education.	<ul style="list-style-type: none">• Conduct surveys outside the FERC Project APE and beyond 50 meters from the inland toe of levees to identify cultural resources and enable their protection.• Conduct an ethnographic study of lands outside the FERC Project APE to identify traditional use areas.• Develop a cultural resources management plan for lands outside the FERC Project APE consistent with the Pit 1 Project Programmatic Agreement.• Coordinate with Native American entities when conducting cultural resource measures.

* This is a set of recommended possibilities for the preservation and enhancement of BPV’s, and is not intended to be a set of requirements for future land management.

** Denotes site specific measure.

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Fish, Plant, and Wildlife Habitat

Potential Measure:

- *Conduct surveys of the planning unit to identify biological resources and enable their protection.*

Most of the McArthur Swamp land acreage is outside the FERC boundary and therefore was not studied during relicensing efforts. Surveys were conducted from 1991 to 1992 regarding threatened, endangered, and sensitive species within the Pit 1 Project area. Surveys for rare plants were undertaken in 1995 within the Pit 1 Project area. Though studies on waterfowl usage of the swamp were undertaken in 1991 and 1992, there appears to be a lack of data on other avian usage of the planning unit. Therefore, the Stewardship Council recommends conducting surveys of the planning unit (particularly for lands outside the FERC boundary) to identify biological resources and enable their protection.

Potential Measure:

- *Develop a wildlife and habitat management plan for lands outside the FERC boundary that balances agricultural use with protection and enhancement of habitat.*

McArthur Swamp is an important wildlife area, particularly for migrating raptors and migrating birds. PG&E has developed the McArthur Swamp Management Plan (MSMP), which proposes many improvements to canals, drains, the Wildlife Habitat Improvement Program (WHIP), and Rat Farm Pond. These improvements will enhance riparian habitat and provide waterfowl and upland bird nesting, brood, and escape habitat, as well as winter waterfowl feeding and resting areas. However, these improvements are only proposed for lands within the FERC boundary. To maximize the potential for habitat enhancement throughout the rest of the planning unit, the Stewardship Council recommends developing a wildlife and habitat management plan for lands outside the FERC boundary. The plan would focus on protecting and enhancing habitat for raptors and migratory/nesting birds, as the improvements already proposed in the MSMP focus on waterfowl habitat. Development of habitat enhancements would have to be balanced with continuing to allow agricultural use throughout the planning unit that is similar to current levels. The plan would also identify the feasibility of enhancements with the limited water supply available (seasonal rainfall). Once biological resource surveys are completed, potential habitat enhancements and restoration opportunities can be identified and developed into a comprehensive plan describing goals and objectives for habitat and species, as well as measures to enhance and protect habitat. Monitoring of species and/or habitats would also be developed as a component of the plan. The plan should be developed to be complementary and not in conflict with the existing MSMP and should be developed in coordination with the Noxious Weed Management Program and development of the rangeland management plan.

Potential Measure:

- *Extend the Noxious Weed Management Program developed with the FERC Technical Review Team under the 2003 McArthur Swamp Management Plan to the entire planning unit.*

The existing MSMP also addresses noxious weed management, including the use of best management practices and development of a weed management program in consultation with the FERC Technical Review Team, an advisory group composed of members representing several entities. As noxious weeds have been a problem at McArthur Swamp, the Stewardship Council recommends extending the Noxious Weed Management Program developed with the FERC Technical Review Team to the entire planning unit, beyond the FERC boundary (which is the limit of the MSMP). This would reduce noxious weeds and enhance habitat for native species. Extending the Noxious Weed Management Program should also be coordinated with the Pit River Tribe and the Fall River Resource Conservation District, as well as development of the rangeland and wildlife and habitat management plans.

Potential Measures:

- *Assemble a management team to deal with Eurasian watermilfoil infestations.*
- *At both boat launches, install interpretive signage regarding Eurasian watermilfoil.*

One particular non-native invasive plant that has become a problem in recent years at McArthur Swamp is Eurasian watermilfoil. This aquatic plant has grown so much in the Tule River that it has restricted the flow of the Fall and Tule Rivers and is putting increased pressure on the McArthur Swamp levees. To reduce growth of this plant, reduce the potential for additional levee breaches, and educate the public on the spread of this plant, the Stewardship Council recommends assembling a management team to deal with Eurasian watermilfoil infestations and installing interpretive signage at both boat launches regarding Eurasian watermilfoil. The many uses and species present in the planning unit would be taken into account by the management team when dealing with Eurasian watermilfoil infestations.

Potential Measure:

- *Assess the potential for restoration of Bowman Ditch to enhance habitat and connectivity.*

Surrounded on three sides by Ahjumawi Lava Springs State Park, Bowman Ditch functions to collect spring water and funnel it into the Little Tule River. The ditch is surrounded by grass and wetlands. PG&E has stated that the ditch is no longer needed for Project operations and has proposed that it be removed from the FERC boundary; however, FERC denied PG&E's request. When there was a PG&E house camp located nearby, PG&E employees used water from the ditch for domestic and irrigation purposes. Further investigation is needed to determine if this manmade ditch could be restored to a natural state without reducing water flow into the Little Tule River and thereby infringing on water rights. The Stewardship Council recommends assessing the potential for restoration of the ditch, which could provide not only additional habitat, but a greater landscape and habitat continuity to Ahjumawi Lava Springs State Park.

Potential Measure:

- *Support recovery efforts for Shasta crayfish.*

The Shasta crayfish is found within the waters of the planning unit at Ja-She Creek, upper Big Lake, and in the Tule River Levee System. These subpopulations have two major threats: further invasion by signal crayfish and absence of lava substrate. Currently, the Shasta Crayfish Technical Review Committee, formed by the Pit 1 Project and Hat Creek Project License Orders, is reviewing potential locations for barriers that would stop signal crayfish from invading populations of Shasta crayfish. Potential barrier locations include Bowman Ditch and Ja-She

Creek, likely on property adjacent to the planning unit. To help maintain and enhance habitat for the endangered Shasta crayfish, the Stewardship Council recommends supporting recovery efforts in any manner needed, such as access to planning unit lands or waters or removal of invasive signal crayfish.

Potential Measure:

- *Assess the potential to enhance habitat for Shasta crayfish within Big Lake and upper Tule River.*

In regard to the absence of lava substrate, substrate could be added to planning unit waters to create additional habitat or restore habitat that has been covered up by sediment. The Recovery Plan for Shasta Crayfish states that protection of the Big Lake and Ja-She Creek headwater subpopulations of Shasta crayfish is essential to the recovery effort, and that habitat could be enhanced in Big Lake and along the upper Tule River by adding appropriate substrate. However, addition of substrate in the Tule River could negatively affect the ability of PG&E to maintain levees. Therefore, the Stewardship Council recommends assessing the potential to enhance habitat for Shasta crayfish within Big Lake and upper Tule River to determine appropriate locations and details based on feasibility and effect on Project operations.

Open Space

Potential Measure:

- *Apply permanent conservation easements to ensure a higher level of open space protection.*

The Stewardship Council recommends preserving open space values through permanent conservation easements. Conservation easements would describe all prohibited uses to maintain open space values, including the level of uses allowed. Recommendations include only minor additions of recreation facilities and are not expected to decrease the scenic quality of the viewsheds.

Outdoor Recreation

Potential Measure:

- *Assess the potential for developing a wildlife viewing platform, boardwalk, and viewing blind with interpretive signage regarding wildlife stewardship at the Rat Farm Pond area.*

McArthur Swamp is home to many species of wildlife, most notably a large variety of birds that live or migrate through the planning unit. Due to the tremendous opportunities for wildlife viewing over the expansive grassland and wetland areas within the planning unit, the Stewardship Council recommends assessing the potential for developing a wildlife viewing platform, boardwalk, and viewing blind in the Rat Farm Pond area. These facilities would provide visitors with a chance to view wildlife over less distance than what is generally visible from levee tops, the other primary wildlife viewing locations within the planning unit. There are no other known facilities provided for wildlife viewing activities in the local area. The MSMP proposes several enhancements for the Rat Farm Pond, and development of wildlife viewing facilities could be coordinated with these enhancements. Location of the facilities could also be planned to provide minimal intrusion on wildlife. If the facilities are found to be feasible, the existing Pit 1 Project

Recreation Plan should be updated as necessary to include the recommended wildlife viewing facilities to ensure long-term management, maintenance, and monitoring of use of the facilities.

Potential Measure:

- *Install interpretive signage regarding wildlife stewardship along levee tops and at both public accesses.*

The Stewardship Council also recommends installing interpretive signage regarding wildlife stewardship along levee tops, at both public accesses, and at the recommended wildlife viewing platform; such signage would complement already proposed signage about endangered species and wildlife viewing opportunities. Wildlife stewardship signage would describe efforts that the general public can take to protect wildlife, the excellent wildlife habitat available at McArthur Swamp and in the greater Fall River Valley area, as well as some of the “birds of the swamp,” the presence of which makes McArthur Swamp unique and an important migratory stop on the Pacific Flyway.

Potential Measures:

- *Install interpretive signage at the Rat Farm building describing the history of the muskrat farm.*
- *Install interpretive signage regarding levee history, hydropower generation, habitat restoration, fishing and hunting use, Native American heritage in the area, traditional plants, and noxious weeds to levee tops.*

To enhance the recreation experience and educate visitors on historic use of the planning unit, the Stewardship Council recommends installing interpretive signage at the Rat Farm building and on levee tops. Signage at the Rat Farm building could describe the history of the building and how the Rat Farm was the site of one of the first introductions of muskrats to California in the early 1930s. Location of signage at the building would need to be carefully placed so as not to disturb the site. Signage along the levee tops could describe the history of the levees and history and functioning of the Pit 1 Hydroelectric Project, as well as the role the levees play in the Project system. Signage could also describe habitat restoration efforts, fishing and hunting use within the planning unit, Native American heritage in the area, as well as plants traditionally used by Native Americans. In conjunction with information on traditional plants, signage could also describe noxious weeds and their effects on native plants. Development of signage should be coordinated with the Pit River Tribe.

Potential Measure:

- *Install a dock at the Big Lake Access boat launch.*

As the boating speed limit is five miles per hour on Big Lake, much of the use is by boaters in non-motorized or trolling boats. The existing car-top boat launch at Big Lake Access is dirt and can be very muddy for boaters trying to get into their boats. Therefore, to enhance the recreation experience for boaters, the Stewardship Council recommends installing a dock at the boat launch at Big Lake Access to facilitate boat loading and unloading.

Potential Measure:

- *Install tables and shade structures at Big Lake Access.*

Currently, there are no day use facilities at McArthur Swamp. The Stewardship Council recommends installing day use facilities consisting of tables and shade structures at Big Lake Access to provide users a convenient place to picnic, rest, or use as a gathering place. As this site is currently the only public access point to the Ahjumawi Lava Springs State Park, day use facilities would provide State Park visitors a staging area to organize gear and prepare for their visit. It would need to be determined if such facilities could be reasonably maintained given the area's history of unauthorized use. Development of additional facilities at Big Lake Access would need to be consistent with the Pit 1 Historic Properties Management Plan (HPMP).

Potential Measure:

- *Assess the potential for youth program opportunities.*

McArthur Swamp provides great opportunities for youth to learn about birds of prey, waterfowl, migration, northwestern pond turtles, Shasta crayfish, native fishes, water quality monitoring and water management, and grazing. Therefore, the Stewardship Council recommends assessing the potential for youth program opportunities within the planning unit. The recommended tables and shade structures at Big Lake Access could serve youth programs by providing a meeting, launching, and gathering site for program activities.

Potential Measure:

- *Assess the potential for developing hunting blinds within the land portion of the planning unit.*

McArthur Swamp is the most popular waterfowl hunting location in the area and is one of the few free hunting areas in the Fall River Valley. Though hunting is allowed, there are no specific hunting facilities within the planning unit. There is potential to develop hunting blinds within the land portion of the planning unit to enhance the hunting experience. Development of blinds would require gated access into grazing areas, and this would need to be assessed for safety and effects on grazing. Therefore, the Stewardship Council recommends assessing the potential for developing hunting blinds within the planning unit to determine their compatibility with grazing, identify management controls that would be required for implementation, as well as identify appropriate locations and construction.

Sustainable Forestry

None recommended.

Agricultural Uses

Potential Measure:

- *Develop a baseline conditions report that describes current agricultural, physical, and overall biological conditions of the area, including current uses and state of improvement.*

The McArthur Swamp Planning Unit provides significant cattle forage for nine local ranchers. It is unknown if range assessments have been conducted for the planning unit. Thus, the Stewardship Council recommends developing a baseline conditions report that describes current agricultural, physical, and overall biological conditions of the area, including current uses and

state of improvement. This report would help determine appropriate grazing practices, regime, and management.

Potential Measure:

- *Develop a rangeland management plan for grazing use that includes goals and objectives and a monitoring and adaptive management strategy, as well as specifies grazing practices that address soil and water conservation, erosion control, pest management, nutrient management, vegetation management and habitat protection.*

Once the recommended baseline conditions report is completed, the Stewardship Council recommends developing a rangeland management plan for grazing use that includes goals and objectives and a monitoring and adaptive management strategy, as well as specifies grazing practices that may address topics including soil and water conservation, erosion control, pest management, nutrient management, vegetation management, habitat protection, and cultural resources management. This plan would ensure that grazing use within the planning unit meets Stewardship Council policy for agricultural uses on Watershed Lands. Development of the rangeland management plan should be coordinated with the wildlife and habitat management plan, existing Noxious Weed Management Program, and development of recommended recreation facilities within the planning unit to ensure consistency and complementary measures.

Preservation of Historic Values

Potential Measures:

- *Conduct surveys outside the FERC Project APE and beyond 50 meters from the inland toe of levees to identify cultural resources and enable their protection.*
- *Coordinate with Native American entities when conducting cultural resource measures.*

As part of the relicensing process, cultural resources were surveyed within the Pit 1 Project Area of Potential Effects (APE), which generally coincides with the FERC boundary. The Pit 1 Levee Maintenance Plan proposes undertaking additional surveys of lands adjacent to levees within the planning unit out to 50 meters from the inland toe of the levees. This still leaves much of the planning unit unsurveyed. The Stewardship Council recommends conducting surveys outside the Pit 1 Project APE and beyond 50 meters from the inland toe of the levees to identify cultural resources and enable their protection. Documentation of cultural sites should be coordinated with Native American entities.

Potential Measures:

- *Conduct an ethnographic study of lands outside the FERC Project APE to identify traditional use areas.*
- *Coordinate with Native American entities when conducting cultural resource measures.*

The planning unit may also include traditional use areas, including ethnobotanical sites. An ethnographic study was conducted as part of the relicensing process for the Pit 1 Project; however, this study focused only on lands within the Pit 1 Project APE, and thus most of the planning unit was not studied. Therefore, the Stewardship Council recommends conducting an ethnographic study of lands outside the Pit 1 Project APE to identify traditional use areas. The ethnographic study should be coordinated with Native American entities.

Potential Measures:

- *Develop a cultural resources management plan for lands outside the FERC Project APE consistent with the Pit 1 Project Programmatic Agreement.*
- *Coordinate with Native American entities when conducting cultural resource measures.*

Assuming that recommended surveys identify cultural sites within the planning unit, the Stewardship Council recommends developing a cultural resources management plan for lands outside the Pit 1 Project APE to ensure that cultural resources are provided adequate protection in the future. The plan would include appropriate measures for the identification, evaluation, and treatment of cultural resources (archaeological and historical), as well as traditional use areas. Treatment measures could include avoidance, specific protective measures (e.g., fencing), site monitoring, and methods to preserve, restore, or enhance cultural resource values through conservation easements, management agreements, or through public interpretation and education programs. Development of the cultural resources management plan should be consistent with the Pit 1 Project Programmatic Agreement and HPMP and should be coordinated with Native American entities.