Draft Environmental Assessment
Sweetwater River Trail Repair Project
San Diego National Wildlife Refuge

March 2024

U.S. Department of Interior
Fish and Wildlife Service
Region 8 (Pacific Southwest Region)
San Diego National Wildlife Refuge
Jamul, California

Executive Summary

This environmental assessment, or EA, evaluates two action alternatives and a no action alternative. The proposed action includes the rerouting and repair of an approximately 6,000-foot-long portion of the Sweetwater River Trail on the San Diego National Wildlife Refuge (NWR or Refuge). The proposed action would also include the closure of approximately 2,700 feet of existing user created trails. Under this alternative, an elevated boardwalk would be constructed over Steele Canyon Creek to replace the current puncheon. The purpose of all trail work is to minimize impacts to sensitive resources and improve accessibility. Under the no action alternative, trail repairs, reroutes, and closures would not occur.

This EA examines the potential environmental impacts associated with the proposed action and complies with the National Environmental Policy Act, NEPA, in accordance with the Council on Environmental Quality NEPA regulations (40 Code of Federal Regulations, or CFR, 1500-1508), the Department of the Interior NEPA regulations (43 CFR 46; 516 Department Manual, or DM, 8), U.S. Fish and Wildlife Service policies (550 Service manual, or FW, 3) and other relevant regulations and requirements. NEPA requires examination of the effects of proposed actions on the natural and human environment.

The following resources were analyzed in the EA: Habitat and Vegetation, Fish and Wildlife Species, Candidate, Geology and Soils, Air Quality, Water Resources, Cultural Resources, Visitor Use and Experience. Several other resources were initially considered by the U.S. Fish and Wildlife Service but were ultimately dismissed from further analysis because none of the alternatives would have the potential to result in measurable adverse impacts to these resources.

The draft EA was made available for public comment for 30 days. Public comments and agency responses will be available in the final EA.

Chapter 1: Introduction

1.1 Background

National Wildlife Refuges are guided by the mission and goals of the National Wildlife Refuge System, the purposes of an individual refuge, federal laws and executive orders, U.S. Fish and Wildlife Service policy and international treaties. Relevant guidance includes but are not limited to the National Wildlife Refuge Administration Act 1966, as amended by the National Wildlife Refuge System Improvement Act of 1997 (16 United States Code [U.S.C.] 668dd et seq.), the Refuge Recreation act of 1962 and selected portions of the Code of Federal Regulations and the Fish and Wildlife Service manual.

See Appendix A for a list of relevant laws and regulations.

The mission of the National Wildlife Refuge System, as outlined by the National Wildlife Refuge System Administration Act of 1966, as amended by the National Wildlife Refuge System Improvement Act of 1997 (16 U.S.C. 668dd), is:

"... to administer a national network of lands and waters for the conservation, management and, where appropriate, restoration of the fish, wildlife and plant resources and their habitats within the United States for the benefit of present and future generations of Americans."

The National Wildlife Refuge System Improvement Act of 1997 directs the Secretary of the Department of the Interior to ensure that the mission of the refuge system and purposes of individual refuges are carried out to (16 U.S.C. 668dd(5)(a)(3)(A-M)).

San Diego NWR (Figure 1) was established in 1996 under the authorities of the Fish and Wildlife Act of 1956, as amended (16 U.S. C. 742(a)-754), Endangered Species Act of 1973, as amended (16 U.S.C. 1531-1544, 87 Stat. 884), and Refuge Recreation Act of 1962, as amended (16 U.S.C. 460k-460k-4) (USFWS 1995a). Establishment occurred on April 10, 1996, when approximately 1,826 acres of land (referred to at the time as Rancho San Diego) were conveyed to the Service for management as a national wildlife refuge.

The purposes for this initial acquisition included:

". . . to conserve (A) fish or wildlife which are listed as endangered species or threatened species . . . or (B) plants. . ." 16 U.S.C. § 1534 (Endangered Species Act of 1973);

". . . for the development, advancement, management, conservation, and protection of fish and wildlife resources . . ." 16 U.S.C. § 742f(a)(4) ". . . for the benefit of the United States Fish and Wildlife Service, in performing its activities and services. Such acceptance may be subject to the terms of any restrictive or affirmative covenant, or condition of servitude . . ." 16 U.S.C. § 742f(b)(1) (Fish and Wildlife Act of 1956); and

". . . (1) incidental fish and wildlife-oriented recreational development, (2) the protection of natural resources, (3) the conservation of endangered species and threatened species . . ." 16 U.S.C. § 460k-460k-4 (Refuge Recreation Act of 1962).

Subsequent acquisitions have been made to meet these and other refuge purposes outlined in the Land Protection Plan (LPP) for the Otay-Sweetwater Unit of the San Diego NWR, approved in April 1997. In accordance with the LPP, "The purpose of the San Diego National Wildlife Refuge is to protect, manage, and restore habitats for federally listed endangered and threatened species and migratory birds and to maintain and enhance the biological diversity of native plants and animals" (USFWS 1997a).

The Refuge protects a variety of native upland and wetland habitats and plays a critical role in the regional effort to maintain the high biological diversity of southwestern San Diego County. More than 16 species currently listed as threatened or endangered under the Federal Endangered Species Act (ESA) and/or the California Endangered Species Act (CESA) are either known to occur on the Refuge or have occurred here within the last 20 years. Many other species of concern, including at least 35 species covered by the San Diego Multiple Species Conservation Program (MSCP) (City of San Diego 1998a) have also been documented on the Refuge.

The goals for the San Diego NWR include:

Goal 1: Protect, manage, and, where appropriate, enhance or restore habitat to support the recovery of the federally and State listed endangered and threatened species and other species of concern currently or historically present on the Refuge.

Goal 2: Protect, manage, and restore the Refuge's native habitats, MSCP-covered species, and other species of concern for their inherent value and to contribute to the regional effort of conserving the biological diversity of southwestern San Diego County.

Goal 3: Engage in partnerships and provide leadership in coordinating land management and acquisition efforts throughout southwestern San Diego County in support of the Multiple Species Conservation Program (MSCP) and other resource protection objectives developed for the Region.

Goal 4: Provide safe and high-quality opportunities for compatible wildlife-dependent recreational uses that foster public appreciation of the unique natural heritage of the San Diego region.

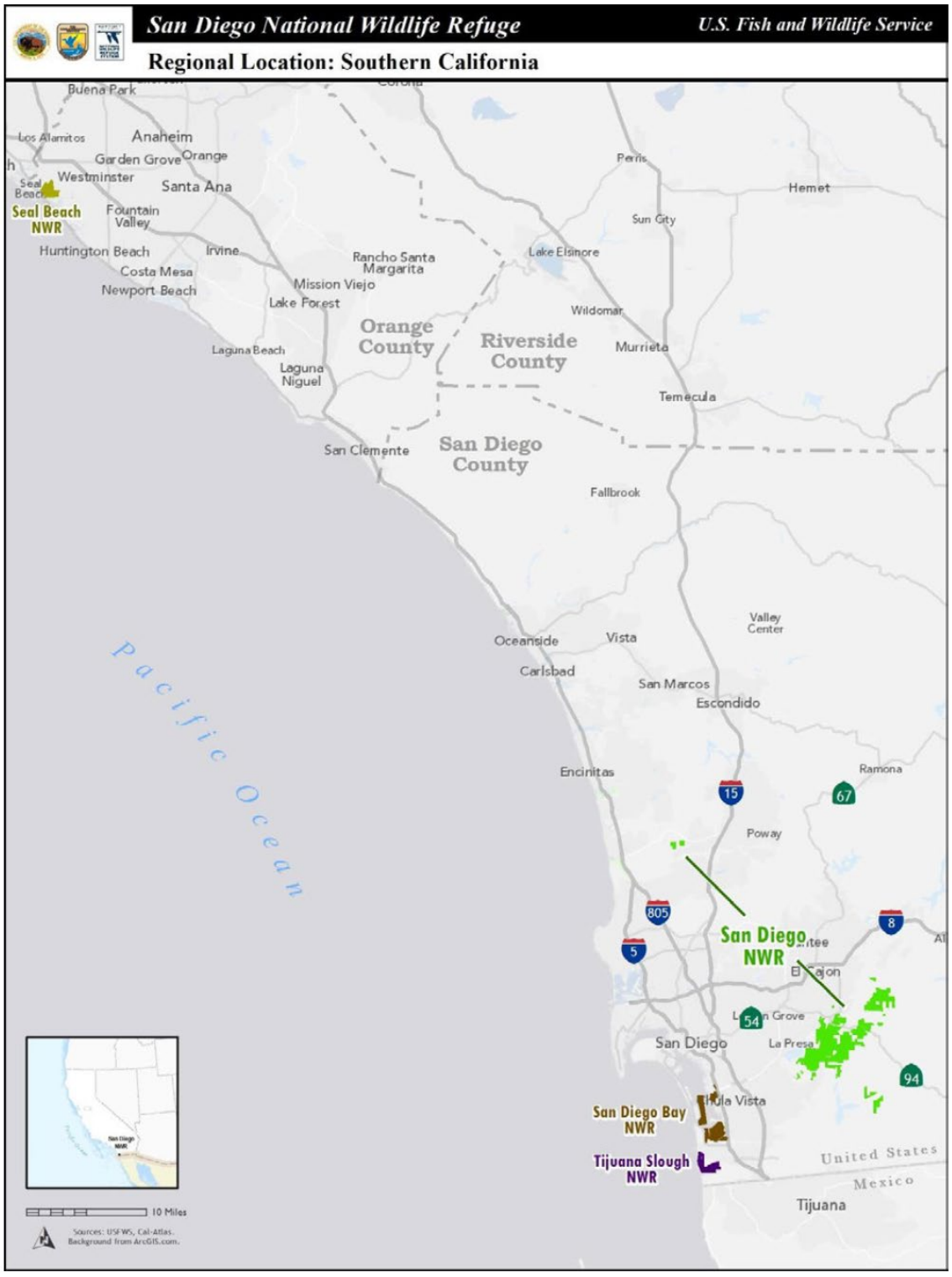


Figure 1. Location of San Diego National Wildlife Refuge in San Diego County, CA.

1.2 Proposed Action

The U.S. Fish and Wildlife Service is proposing to reroute and repair an approximately 6,000-foot-long portion of the Sweetwater River Trail on the Otay-Sweetwater Unit/Sweetwater River Management Area of the SDNWR (Figure 2), in accordance with the Refuge's Comprehensive Conservation Plan (CCP). The project will reroute a section of the trail to minimize impacts to sensitive resources and improve accessibility. Repairs will also include closure of a portion of the existing trail after the reroute is completed, closure of some user created trails to reduce trail redundancy and minimize impacts to Refuge resources, and repair of some existing trail segments. As part of the proposed action, the puncheon crossing Steele Canyon Creek would be replaced by an elevated boardwalk.

A proposed action is an initial proposal and may evolve during the development of alternatives, the impact analysis and public involvement. This environmental assessment may determine that there are other, better or less impactful ways to address the purpose and need and may become the preferred alternative. The proposed action and alternatives may evolve during the NEPA process as the agency refines its proposal and gathers feedback from the public, federally recognized tribes and tribal entities and other agencies or organizations. Therefore, the final action may be different from the originally identified preferred alternative and will be finalized at the conclusion of the public comment period after the incorporation of substantive comments. A decision to implement a proposed action will not be made until the environmental review process is complete.

1.3 Purpose and Need for Action

The purpose of the proposed action is to improve existing trail conditions and to reroute portions of the trail out of sensitive habitats. Trail widening and unauthorized user-created trails in the general area have further encroached into these habitats. Additionally, the current trail conditions do not meet the United States Access Board's Accessibility Standards for Federal Outdoor Developed Areas (Outdoor Standards).

The need of the proposed action is to meet the Service's priorities and mandates as outlined by the NWRSAA (16 U.S.C. 668dd(a)(4)). The following responsibilities would be achieved by this action:

(4) In administering the [National Wildlife Refuge] System, the Secretary shall –

- (A) provide for the conservation of fish, wildlife, and plants, and their habitats within the System;
- (B) ensure that the biological integrity, diversity, and environmental health of the System are maintained for the benefit of present and future generations of Americans;
- (H) recognize compatible wildlife-dependent recreational uses as the priority general public uses of the System through which the American public can develop an appreciation for fish and wildlife;

(I) ensure that opportunities are provided within the System for compatible wildlife-dependent recreational uses.

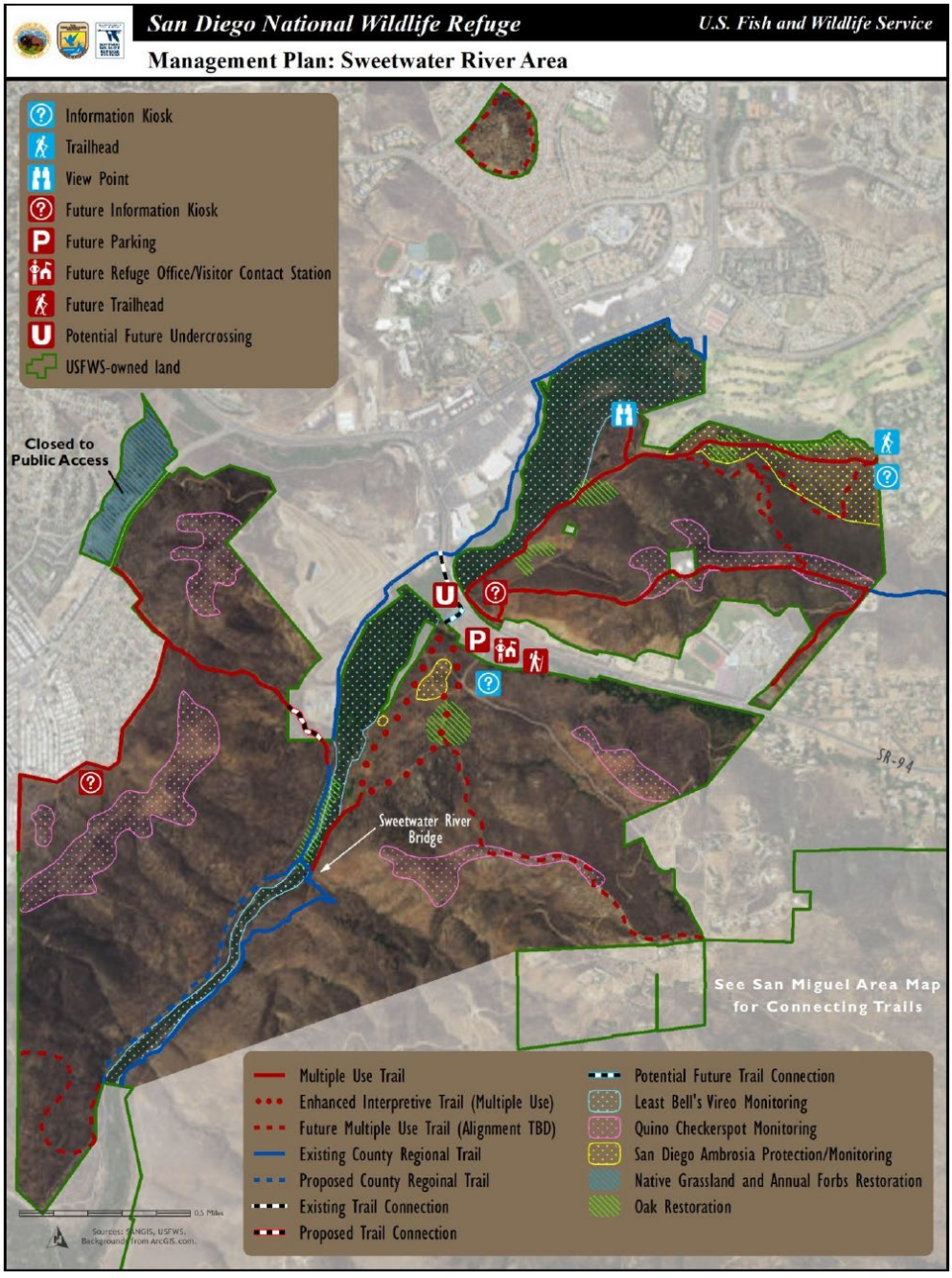


Figure 2. Sweetwater River Management Area of the San Diego NWR.

The current conditions of much of the Sweetwater River Trail have led to unfavorable, and in some cases, unsafe conditions for trail users. The Sweetwater River Trail extends through areas of native soil that range from heavy clays to sandy substrate and is adjacent to occurrences of

cryptobiotic crusts. The presence of heavy clay substrates and the percent downslope and/or cross slope of the trail tread combined with water movement across and within the trail tread during storm events has led to severe erosion and ponding within the trail. These conditions make the trail inaccessible to many users and have resulted in trail widening as trail users try to avoid wet trail tread conditions. These and other portions of the trail bisect sensitive coastal sage scrub, southern mixed chaparral, wetland and riparian habitats. Trail widening and unauthorized user-created trails in the general area have further encroached into these habitats.

Additionally, the puncheon that crosses Steele Canyon Creek at the north end of the trail is not permanently installed and is routinely washed down the creek following heavy rain events. This makes the portion of the trail that bisects the creek un-passible to users. The Service is proposing the installation of a permanent stream crossing in the form of an elevated boardwalk to raise the trail out of the 100-year floodplain and improve trail accessibility.

Chapter 2: Involvement, Coordination and Consultation

2.1 Public Involvement

This draft environmental assessment will be available for public review and comment for 30 days. Members of the public will be notified of the availability of the draft documents which will be posted on the refuge website. The draft document will be made available at the San Diego National Wildlife Refuge Complex at 1080 Gunpowder Point Drive, Chula Vista CA 91910 by prior arrangement by calling (619) 221-3473, via email (fw8plancomments@fws.gov), and can be downloaded from the refuge website [(insert website)]. For access to the document in an alternative format contact the refuge. Comments may be submitted in writing via email (fw8plancomments@fws.gov) or by mail to the San Diego National Wildlife Refuge Complex, 1080 Gunpowder Point Drive, Chula Vista CA 91910. Any comments, concerns, suggestions or other feedback will be incorporated into the final environmental assessment if a substantive response is required.

Before including your address, phone number, email address, or other personal identifying information in your comment, you should be aware that your entire comment, including your personal identifying information, may be made publicly available at any time. While you can ask us in your comment to withhold your personal identifying information from public review, we cannot guarantee that we will be able to do so.

2.2 State Coordination

Coordination with the many stakeholders, including State agencies, was extensive during development of the SDNWR CCP which included a trails system that proposed repairs to existing trails, creation of new trails, and closure of other user created tails. The California Department of Fish and Wildlife will be contacted regarding any need for a Streambed Alteration Agreement for the proposed elevated boardwalk over Steele Canyon Creek. Also, the

California Water Board San Diego Region will be contacted to address any required Clean Water Act Section 401 Water Quality Certification.

2.3 Tribal Consultation

The Native American Heritage Commission (NAHC) was contacted to obtain an up-to-date list of potentially interested Tribes. The USFWS Cultural Resources team is preparing letters about the project to share with the eighteen Kumeyaay Tribal contacts suggested by the NAHC. A Kumeyaay monitor will be present for all ground disturbance during the project.

Chapter 3: Alternatives

3.1 Decision Framework

The Region 8 Assistant Regional Director for Refuges of the U.S Fish and Wildlife Service, will make two decisions based on this environmental assessment once the review process is complete. They will: (1) select an alternative for implementation, and (2) determine if the selected alternative is a major federal action that would significantly affect the quality of the human environment, and therefore, require the preparation of an environmental impact statement.

3.2 Alternatives

<u>Alternative A No Trail Improvements- No Action Alternative</u>

Under Alternative A, the No Action Alternative, trail repairs, reroutes, and closures would not occur. The 6,000-foot-long portion of the Sweetwater River Trail would remain in its current condition. Unfavorable trail conditions would continue and would likely worsen over time and improvements to water drainage along the trail segments would not occur. The approximately 3,100 feet of proposed repairs to existing trails would not occur. The closure and revegetation of the approximately 2,000-foot trail that bisects sensitive habitats would not occur and the approximately 2,700 feet of user-created trails would likely continue to be used by visitors. The proposed 2,000-foot trail reroute would not be constructed. The current puncheon crossing Steele Canyon Creek, which is 18 feet, 7 inches long and 48 inches wide and placed directly on the ground, would remain in place and would likely continue to become displaced during storms and high stream flow events. Under this alternative, the trail would not meet the Outdoor Standards for accessibility.

<u>Alternative B – Implementation of Full Extent of Trail Repairs- Preferred Alternative</u>

Under Alternative B, the Preferred Alternative, all necessary trail work would be implemented to the full extent. Proposed work under this alternative includes the repair and improvement of approximately 3,100 feet of existing trail, the closure and revegetation of approximately 2,000 feet of existing trail that bisects sensitive coastal sage scrub, southern mixed chaparral, wetland and riparian habitats, the closure and revegetation of approximately 2,700 feet of unauthorized user-created trails, and the construction of an approximately 2,000-foot trail reroute through an area primarily characterized by non-native grassland, avoiding sensitive habitat and

vegetation (Figure 3). The reroute of the 2,000-foot trail segment would move the trail outside of the 100-year floodplain and address poor drainage conditions.

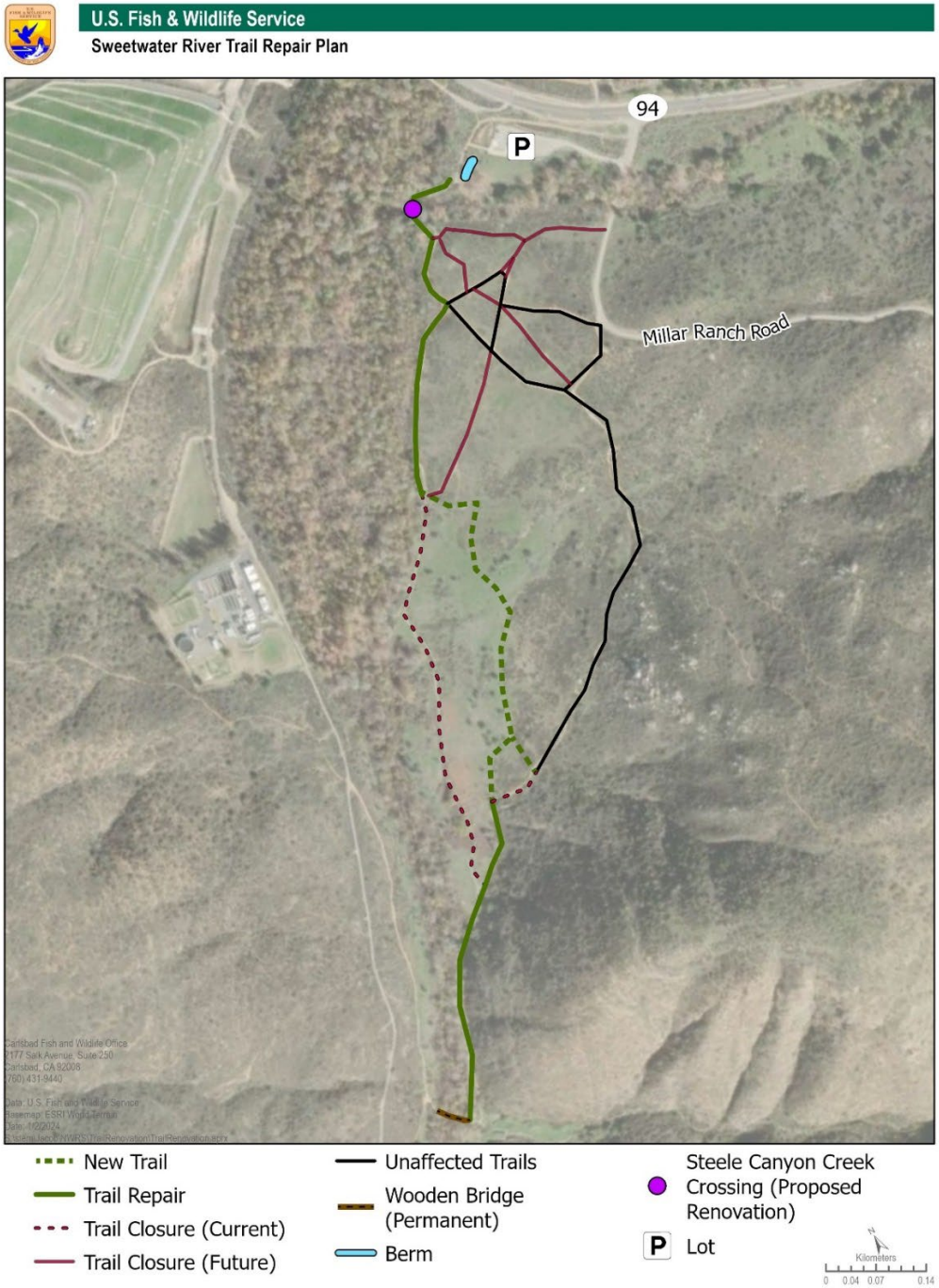


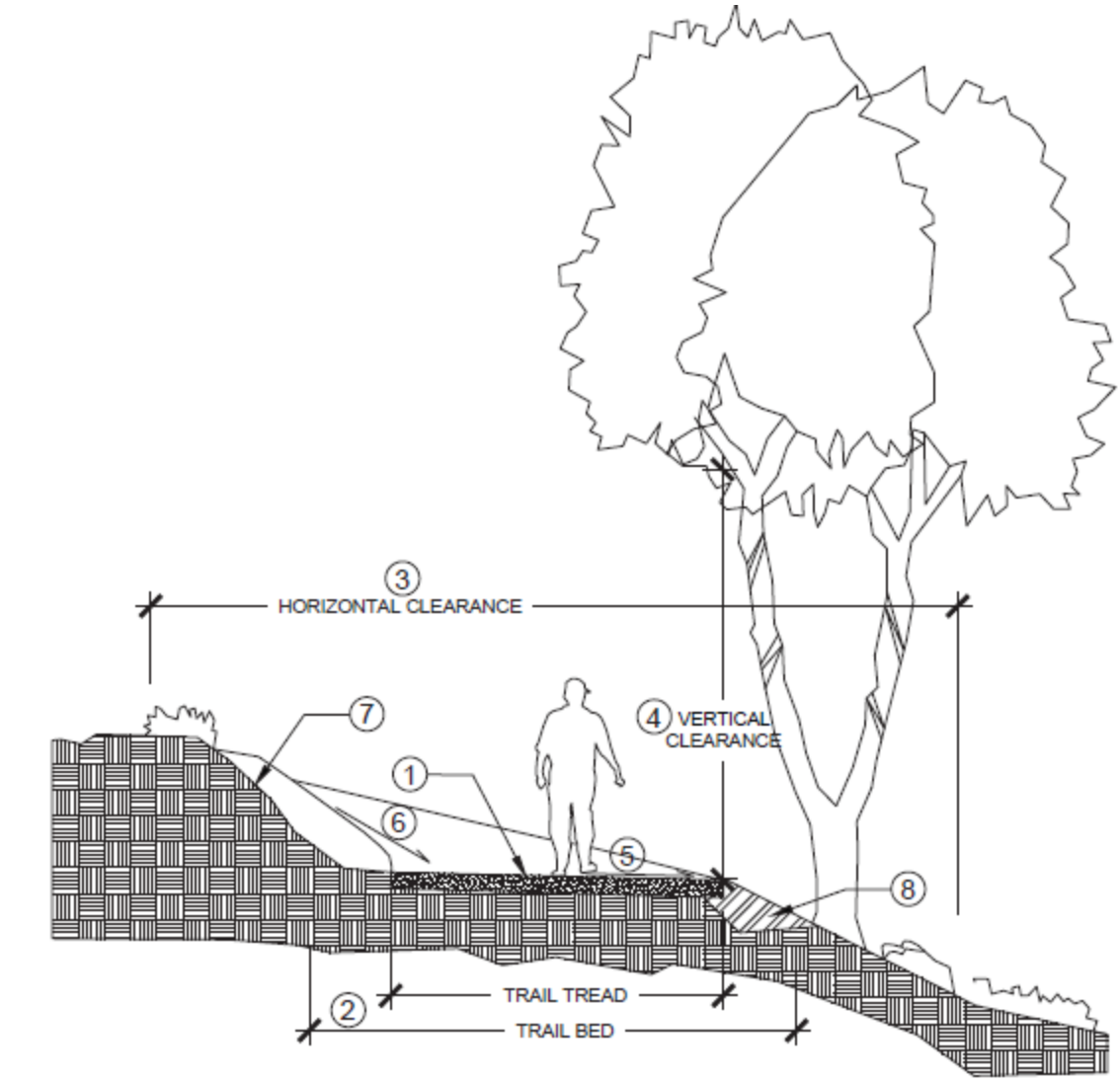
Figure 3. Map of proposed trail work under Alternative B.

Repair of existing trails will include re-grading steep segments to meet the Outdoor Standards for running slope, widening the trail tread in narrow segments to a width of 48-60 inches,

improving the trail surface by blending or capping with imported native soils, and removing large rocks or other obstructions (Figure 4). To improve water drainage, existing berms formed from maintenance grading will be breached, and drainage channels will be created to divert water from the trail tread (Figures 5 and 6). Five- to eight-inch-wide sections of the approximately 4-inch-tall existing berms throughout the trail may be removed to improve water drainage. In addition, a series of semi-circular 'knicks' may be carved into the downslope edge of the trail to divert water from the trail tread. These knicks may be up to approximately 4 inches deep and have a radius of about 5 to 10 feet from the trail edge and would not exceed a 5% slope (Figure 7).

Segments of the trails to be closed will be ripped or disced to a depth of four inches to de-compact the trail tread and allow for natural recruitment of vegetation. A native seed blend may also be used to revegetate closed trail segments. Container plants (up to one gallon size) may be planted at the intersection of the decommissioned trails and the official trails and roads. Fencing may be installed at either end of closed trail segments to provide a visual barrier to trail users. Fence posts would extend approximately 2 feet into the ground and may be encased in an approximately 2 ft. -wide by 2-ft.-long concrete footing. Construction activities for new trail reroutes will involve grading, clearing, and grubbing the new trail footprint using mechanized equipment and hand tools to remove roots and vegetation in the topsoil and other trail obstructions.

A series of puncheons may be installed throughout the trail, including along the new trail segment, to allow water to flow underneath at areas of low elevation. Exact locations would be determined during the next phase of the project planning. The puncheons would be installed on redwood mudsills that would extend 10 inches into the ground on either side (Figure 8). Additionally, an earthen berm would be installed at the far north end of the trail on the east side, where it enters the riparian zone along Steele Canyon Creek (Figure 3). This would divert runoff away from the trail to avoid future trail erosion. Material for the berm will be imported from off-site sources, and the berm will be revegetated to avoid erosion of sediment. A laydown area for construction may be necessary and will be either within an area to be disturbed by the project or within the nearby parking lot.



1. FIRM AND STABLE SURFACE
   FIRMNESS <0.5 INCHES
   STABILITY <1.0 INCHES
2. BRANCHES AND ROOTS REMOVED WITHIN 12 INCHES OF TREAD
3. MAXIMUM HORIZONTAL CLEARING LIMIT 30 INCHES FROM TREAD
4. MINIMUM VERTICAL CLEARANCE 12-FEET FROM TREAD SURFACE
5. PROVIDE POSITIVE DRAINAGE
   5% MAXIMUM CROSS SLOPE
6. RUNNING GRADE OF SLOPE:

<5%	UNLIMITED LENGTH
5-8.33%	200 FEET MAX
8.33-10%	30 FEET MAX
10-12%	10 FEET MAX
>12%	NOT ALLOWED

7. CUT BACK SLOPE
8. FILL SLOPE (IF NEEDED)

A VAR TRAIL CORRIDOR SECTION NO SCALE

Figure 4. Proposed trail corridor design.

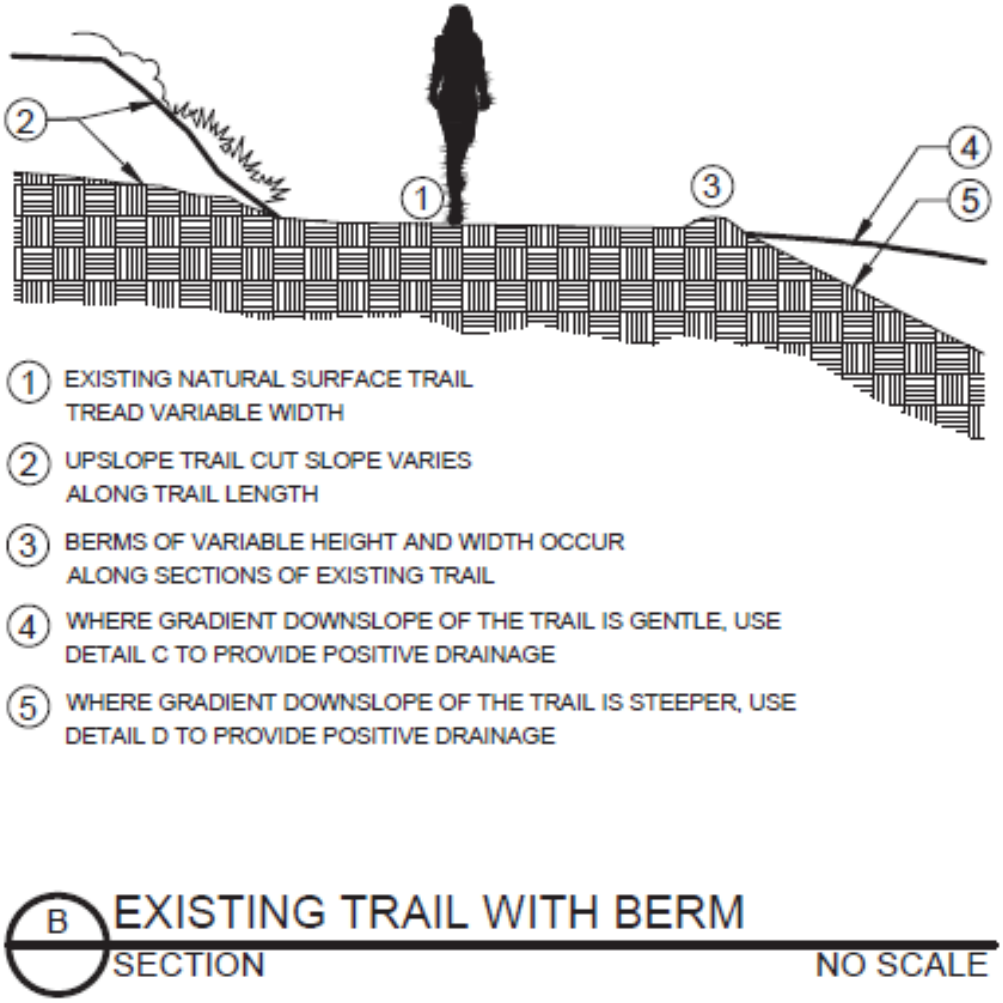


Figure 5. Example of an existing trail cross-section with a berm.

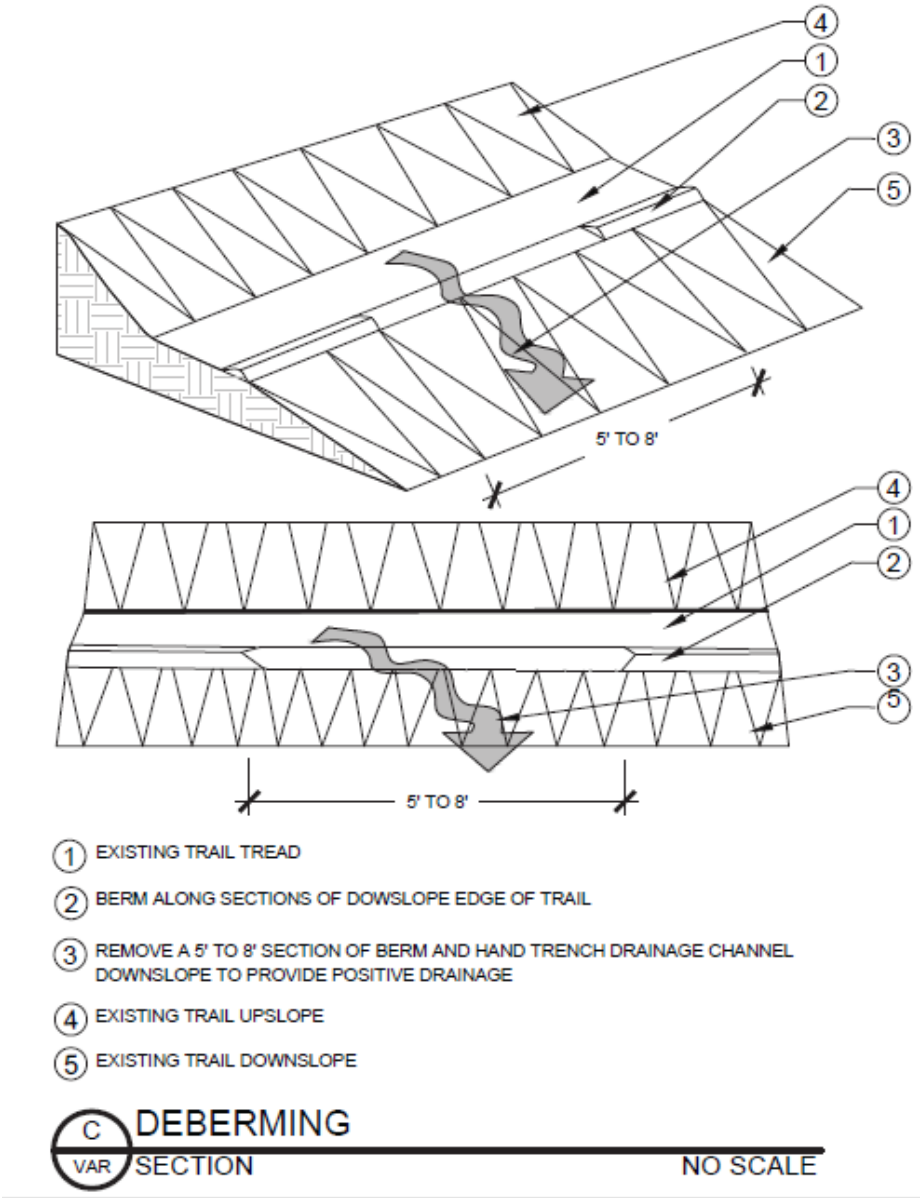


Figure 6. Example of the removal of an existing berm.

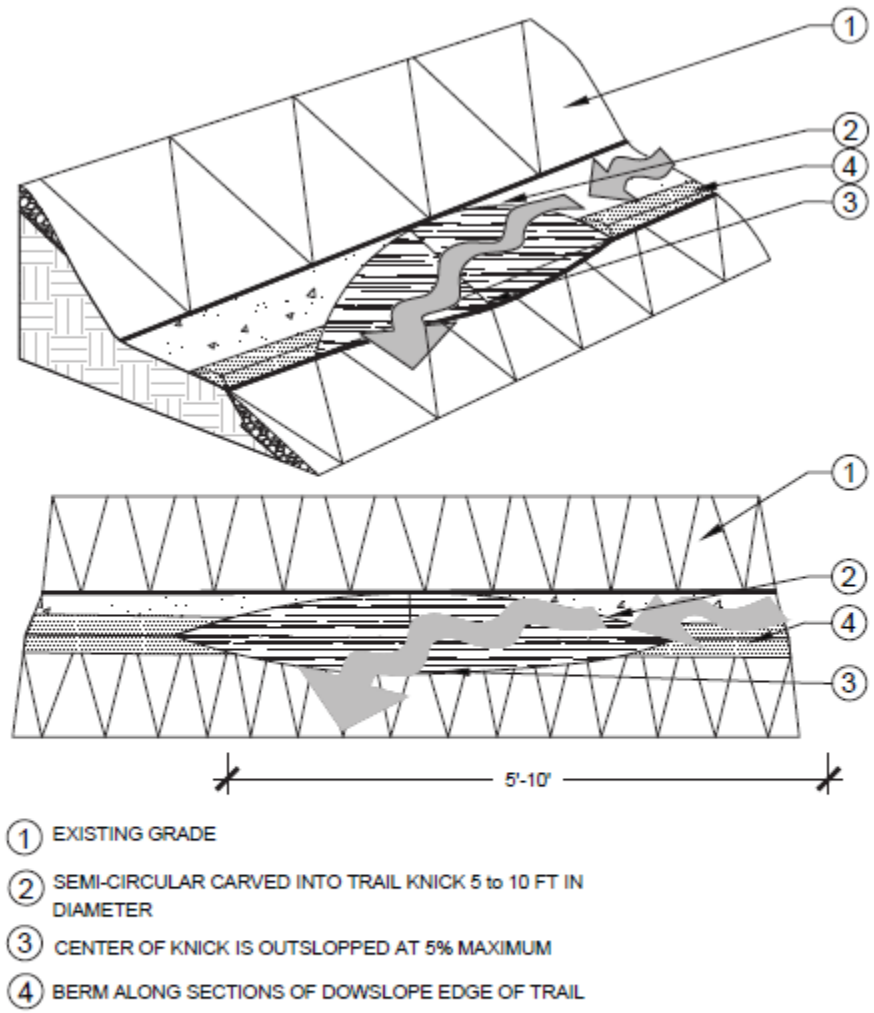


Figure 7. Example of construction of trail 'knick'.

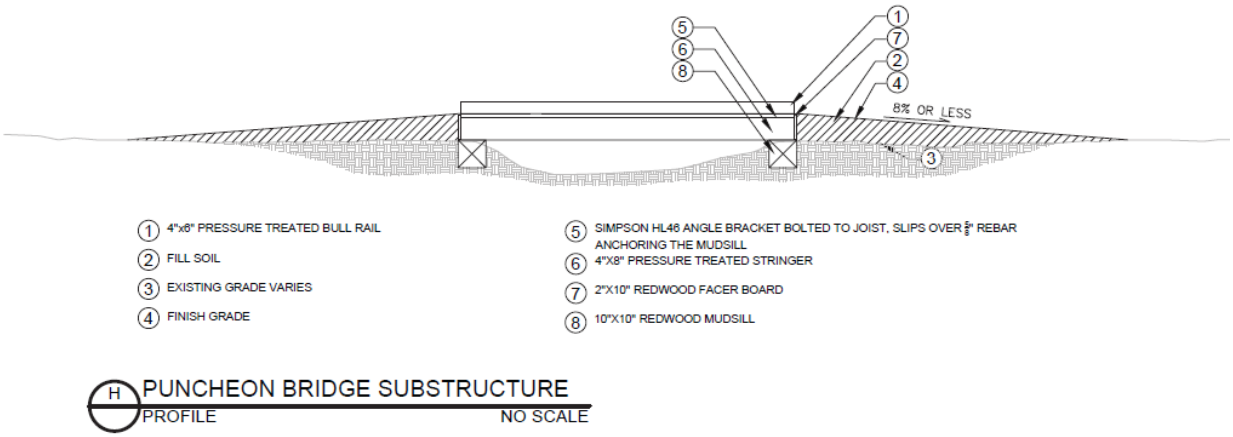


Figure 8. Example of trail puncheon.

Under this alternative, the puncheon that crosses Steele Canyon Creek, which becomes displaced and moves downstream during high stream flows, would be replaced by a permanent elevated boardwalk, which would extend approximately 172 feet. The boardwalk would begin at an elevation of 312 feet on the east bank of Steele Canyon Creek and would gently slope to reach an elevation of 316 feet on the west bank. The elevated boardwalk would be supported by concrete caissons with a 24-inch diameter, which would extend approximately 13 feet into the ground. The caissons would be spaced 16 feet apart, with 24-foot spacing as the boardwalk crosses the creek channel (Figures 9-15). Railing height will be designed in consideration of boardwalk use by equestrians.

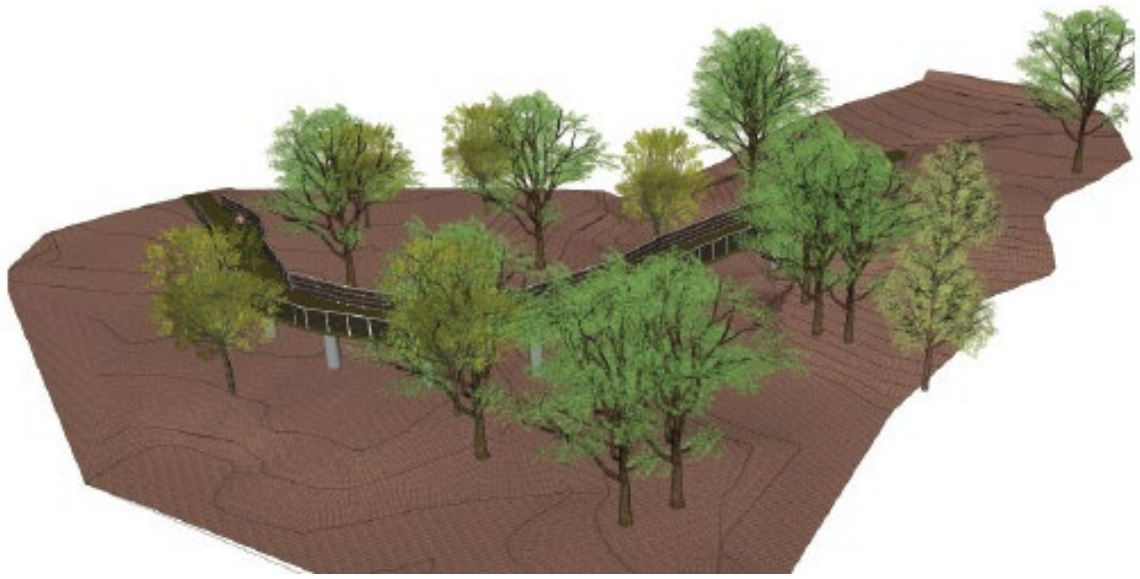


Figure 9. Proposed elevated boardwalk crossing over Steele Canyon Creek, looking east (upstream) with trees.

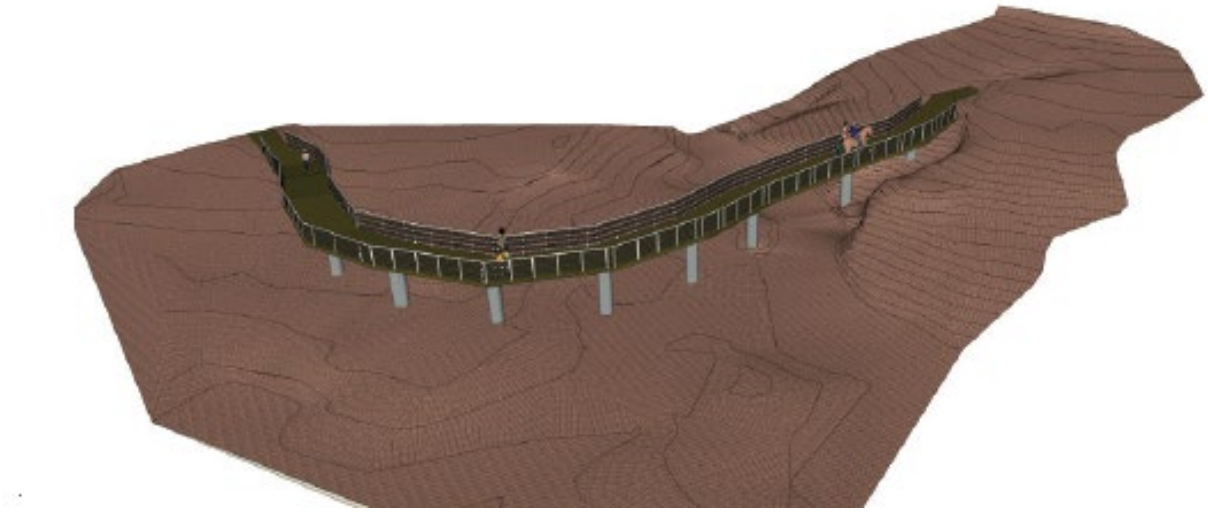


Figure 10. Proposed elevated boardwalk crossing over Steele Canyon Creek, looking east (upstream) without trees.

Figure 11. Proposed elevated boardwalk crossing over Steele Canyon Creek, looking north (with trees).

Figure 12. Proposed elevated boardwalk crossing over Steele Canyon Creek, looking north (without trees).

Figure 13. Proposed elevated boardwalk crossing over Steele Canyon Creek, looking south (with trees).

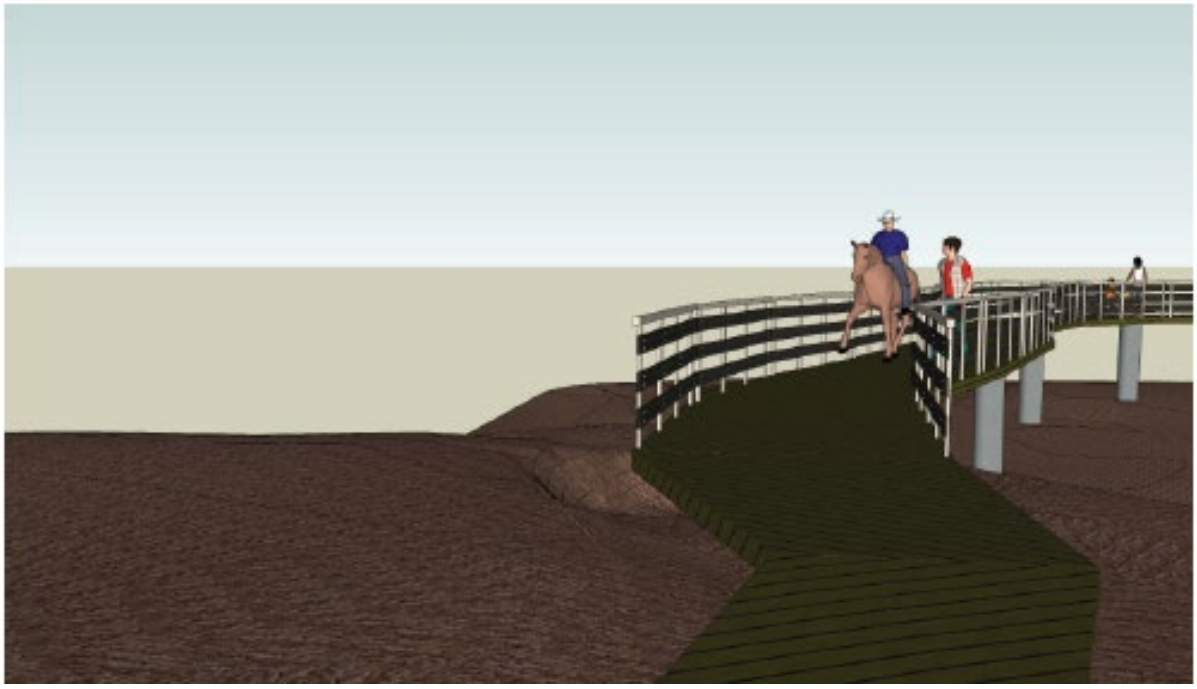


Figure 14. Proposed elevated boardwalk crossing over Steele Canyon Creek, looking south (without trees).

Figure 15. Proposed elevated boardwalk crossing Steele Canyon Creek, looking south from below the boardwalk.

Mitigation Measures

To avoid and/or minimize impacts of the proposed action, a preconstruction meeting with the construction contractor shall be conducted onsite to review all environmental mitigation requirements and special site protection requirements. Specific construction measures to be implemented by contractors include:

- Removal of habitat for birds will be done outside of the nesting season (nesting season is from February 15 to August 31) to avoid impacts to migratory birds including listed bird species.
- Prevent the spread of noxious weeds by cleaning vehicles and equipment used on the Refuge with high-pressure sprayers to dislodge seeds prior to accessing the area.
- Plant native plants or hydroseed immediately after construction to minimize invasion of weeds and non-native species.
- Avoid unnecessary disturbances to vegetation by driving on existing roads and working only in the required area.
- Install silt fencing and/or fiber rolls, as necessary, along the perimeter of the project site prior to initiating any ground disturbance.
- Minimize ground disturbance outside the footprint of the proposed facilities to the extent feasible.
- To minimize bank disturbance during the construction of the elevated boardwalk, abutments would be installed on the stream banks within the footprint of the boardwalk during construction activities.
- Establish construction staging areas and storage areas well away from wetland areas and providing appropriate barriers (including silt fencing and fiber rolls) to ensure that no runoff from these staging areas will drain into adjacent wetland areas. Construction equipment will not be stored, nor will it be fueled or repaired in areas that drain into wetlands or other natural areas.
- All equipment will be inspected for leaks immediately prior to the start of project activities and regularly inspected during construction.
- An emergency spill response plan will be developed prior to initiation of project construction.
- A spill kit will be maintained on-site throughout the duration of the proposed project.

In addition to the construction BMPs identified above, construction of the trail will adhere to the following:

- Layout trails following curvilinear alignment and avoid sudden grade changes whenever possible.
- Trail will be designed and constructed to not disrupt or alter the natural hydraulic flow patterns of the landform. Sheet flow runoff is not diverted or accumulated, and runoff can continue on its normal flow path. Watercourses, including micro-watercourses, are not

captured, diverted, or coupled with other watercourses by the trail. Water does not accumulate on the trail and does not drain onto the landform where natural watercourses do not exist.
- All trail structures will be constructed with the proper site selection, placement, and construction.
- Trail is designed and constructed to withstand the impacts of the intended users and the natural elements while receiving only routine cyclical maintenance.
- The Service will inspect trails for maintenance and repair needs at regular intervals and perform the required routine and cyclical trail maintenance.

Alternative C – Implementation of Minimum Extent of Trail Repairs

Under Alternative C, the minimum extent of trail repair work would occur to make necessary trail repairs and to move the trail footprint out of sensitive habitat. Similar to Alternative B, implementation of this alternative would include the repair and improvement of approximately 3,100 feet of existing trail, the closure and revegetation of approximately 2,000 feet of existing trail that bisects sensitive habitats, and the construction of an approximately 2,000-foot trail reroute to replace the existing 2,000-foot segment to be closed. However, compared to Alternative B, this alternative does not include the closure of the approximately 2,700 feet of user-created trails. These unauthorized trails would remain in their current state and would likely continue to be used by visitors.

Additionally, this alternative does not include the construction of the permanent elevated boardwalk proposed under Alternative B, but rather, the reconstruction and improvement of the existing puncheon. The current puncheon, which is 18 feet, 7 inches long and 48 inches wide and placed directly on the ground, would be constructed on treated lumber sills on both ends, making the reconstructed version 24 feet long and 60 inches wide. The footprint of the lumber sills would be approximately 2-feet deep, 5-feet wide, and 10-feet long on the east end and approximately 4-feet deep, 5-feet wide and 6-feet long on the west end (Figure 14). The difference in depth and length of the sills on either end of the puncheon is due to the difference in elevation on either end of the creek.

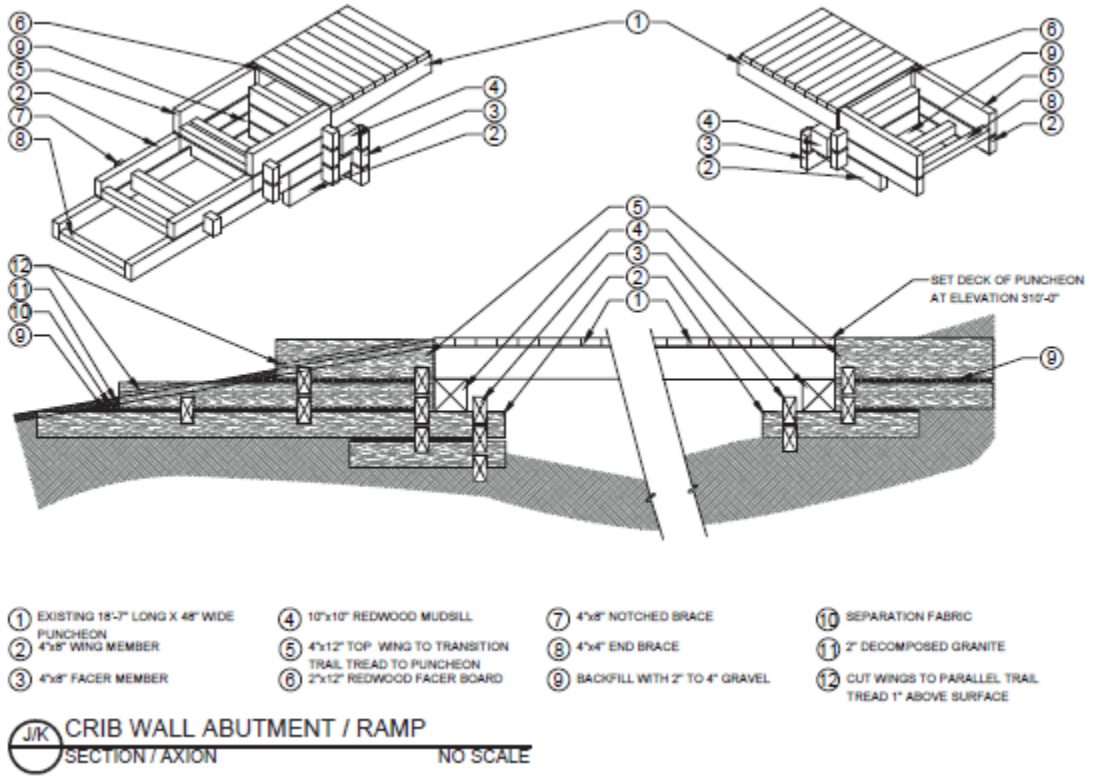


Figure 16. Reconstruction of puncheon crossing Steele Canyon Creek.

Monitoring Applicable to All Alternatives

Work that includes removal of habitat will take place outside the breeding season so no biological monitor is required. To the extent possible, all work will be done outside the breeding season. All ground disturbance work will have the presence of a Kumeyaay monitor.

Chapter 4: Affected Environment and Environmental Consequences

This section is organized by affected resource categories. Each affected resource discusses both (1) the existing environmental and socioeconomic baseline in the action area and (2) the effects and impacts of the alternatives on each resource. Effects and impacts from the proposed action or alternatives are changes to the human environment, whether adverse or beneficial, that are reasonably foreseeable (40 CFR 1508.1(g)). The impact analysis directly follows the affected environment description for a resource and is organized by alternative.

The impact analysis will evaluate a variety of criteria, as defined below, to describe the context and intensity of impacts on affected resources. The Council on Environmental Quality does not require the use of these terms, however, they are commonly used in NEPA documents and will be referenced in the subsequent sections.

Impact analysis criteria and terminology:

- Adverse effects: negative or detrimental effect to the resource (40 CFR 1501.3)

- Beneficial effects: positive effect to the resource (40 CFR 1501.3)
- Cumulative effects: effects on the environment resulting from the incremental effects of the action when added to other past, present and reasonably foreseeable actions regardless of what agency (e.g., federal or non-federal) or person undertakes the action (40 CFR 1508.1(g)(3))
- Direct effects: caused by the action and occur at the same time and place (40 CFR 1508.1(g)(1))
- Indirect effects: incidentally caused by the action and are often later in time or farther in distance but are still reasonably foreseeable (40 CFR 1508.1(g)(2))
- Irreversible: unable to be undone or altered
- Irretrievable: unable to regain, recover or repair
- Major: effects that are obvious, and would result in substantial local and larger scale consequences to the resource
- Minor: effects are detectable but small, of little consequence, and would not affect the population or resource on a large-scale
- Moderate: effects are readily detectable and may have some temporary effects to the population or resources on a large-scale but would not cause a substantive decline or increase in the resource
- Negligible: resource is slightly affected but the impact is so minimal that effects are not detectable or may not be observable
- No effect: resource would not be affected
- Short-term effects: occurring in or relating to a relatively short period of time (40 CFR 1501.3)
- Long-term effects: occurring in or relating to a relatively long period of time
- Unavoidable: unable to be prevented or ignored; inevitable

4.1 Resources Eliminated from Detailed Analysis

Impacts that are speculative (i.e., there is a remote possibility that the impact would occur, but no meaningful information exists on which to base a prediction) or indefinite will not be included in the analysis of this environmental assessment (43 CFR 46.30). If a resource is not expected to be affected, a brief justification is provided as to why it was dismissed.

Soundscape

Activities associated with the proposed project may impact the local soundscape from noise of equipment and trail puncheon/boardwalk construction. These are temporary impacts associated only with construction and would not persist. After the project, the resulting trail and its use would produce sounds similar to those of existing use of the area, including management and visitor uses.

Special Land Status Designations

There are no special land status designations present within the project area.

Land Use

Project activities will not affect the land use type of the area.

Management and Operations

The project will not impact the management or operations of the area.

Traffic

The proposed project is not expected to impact traffic. A small number of vehicles are required for transporting crews and project material, which would not impact the surrounding traffic circulation. The parking lot off of Millar Ranch Road may be used for staging but would have sufficient parking for other visitors. The gate further up Millar Ranch Road will provide entry to the interpretive loop area but entry/exit at this point will not affect traffic on the road.

Environmental Justice

On February 11, 1994, Executive Order 12898 ("Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations") was issued requiring that all Federal agencies achieve environmental justice by "identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations." Environmental justice is defined as the "fair treatment for peoples of all races, cultures, and incomes, regarding the development of environmental laws, regulations, and policies.

Low income and minority populations are not expected to be disproportionately affected by the project. The surrounding unincorporated community of Spring Valley has a high minority population. According to 2022 American Community Survey 5-year census data, Spring Valley has a minority population of 65%, and 13.1% of families are considered to be in poverty. While the surrounding area has high minority and low-income populations, activities associated with the project are expected to have minor or negligible and localized effects on Refuge resources including air quality and water quality, and therefore would not yield disproportionate impacts to these populations. The project may be beneficial if those communities feel safe and welcome to visit the refuge with the improved trail facility.

Public Health and Safety

Activities associated with the project are not expected to impact health and safety of the Refuge or the surrounding areas since visitors will be excluded from the work areas during construction.

Aesthetics and Visual Resources

The project is not expected to permanently impact visual resources of the Refuge and construction aesthetic and visual impacts would be temporary only.

4.2 Habitat and Vegetation

Habitat and Vegetation: Affected Environment

Vegetation types that comprise most of the San Diego NWR include coastal sage scrub (7,700 acres), chaparral (3,100 acres), cottonwood-willow riparian forest (170 acres), native (154 acres) and non-native (78 acres) grassland, oak woodland (114 acres) and coast live oak riparian forest (86 acres). Other vegetation types that occur over smaller areas include non-native woodland (36 acres), wetlands (15 acres), riparian willow scrub (4 acres), and southern interior cypress forest (3 acres).

The Sweetwater River Area of the Otay-Sweetwater Refuge unit is composed of both wetland and upland plant communities. In the Sweetwater River floodplain, the riparian vegetation ranges from riparian scrub, characterized by willows and mulefat, to well-developed riparian woodland. This riparian woodland is dominated by arroyo willow (*Salix lasiolepis*) and black willow (*Salix nigra*), with scattered individuals of western sycamore (*Platanus racemose*), coast live oak (*Quercus agrifolia*), velvet ash (*Fraxinus velutina*), and California black walnut (*Juglans californica*). This vegetation, as well as areas of coast live oak woodland, is also present along Steele Canyon Creek. There are also areas of freshwater seep and alkali seep located within this portion of the Sweetwater River floodway. Diegan coastal sage scrub is the predominant vegetation type within the upland portions of this area, occupying most of the south- and east-facing slopes that extend down into the Sweetwater River floodplain. Other native plant communities include southern mixed chaparral, coast live oak woodland, and native grassland. Non-native grasslands dominate portions of the area, composed of annual grass species such as wild oats (*Avena spp.*) and foxtail chess (*Bromus madritensis ssp. rubens*). In 2022 and 2023, plant communities present in the Sweetwater River Area were mapped.

Vegetation of Special Management Concern

The Sweetwater River Area contains several occurrences of vegetation of special management concern. Federal and State listed Threatened and Endangered species that have been observed in the vicinity of the Sweetwater River Trail include the Federally endangered San Diego ambrosia (*Ambrosia pumila*) and its critical habitat. Otay tarplant (*Deinandra conjugens*) critical habitat is designated nearby; however, that area is on the opposite side of the Sweetwater River from the project and will not be considered further. Plant species covered by the Multiple Species Conservation Program (MSCP) in the area include snake cholla (*Opuntia parryi var. serpentina*). Other rare plants observed in the area include the San Diego marsh-elder (*Iva hayesiana*), short woolyheads (*Psilocarphus brevissimus*), and the southwestern spiny rush (*Juncus acutus sp. Leopoldii*). The listed plant species present is the endangered San Diego ambrosia (*Ambrosia pumila*) described above.

Threatened and Endangered Species and Critical Habitat

San Diego Ambrosia (*Ambrosia pumila*)

The Service listed San Diego ambrosia as endangered on July 2, 2002 (67 FR 44372). At the time of listing, of the approximately 50 known historical occurrences in the United States, it was believed that there remained only 15 extant native occurrences. The loss of this species is attributed to destruction, fragmentation, and degradation of habitat, primarily by construction and maintenance of highways and utility easements; residential, commercial, and recreational development; potential competition, encroachment, and other negative impacts from non-native plants; mowing and disking for fuel modification; and trampling, including soil compaction by horses, humans, and vehicles. One of the most serious threats to this species is ground disturbance that results in the establishment of non-native, invasive weeds in the immediate vicinity of established ambrosia populations (USFWS 2010c). The critical habitat that was designated for this species on November 30, 2010 (75 FR 74546), includes various locations on the Otay-Sweetwater Unit; these areas are identified as Unit 7, Sweetwater River Watershed, and include approximately 28 acres (11 hectares) to the north and south of Highway 94 along the Sweetwater River floodplain and 118 acres (48 hectares) north of Highway 94 and south of the Sweetwater River in an area sometimes referred to as Par 4.

San Diego ambrosia is a clonal, perennial herb in the Asteraceae (sunflower) family. Observations indicate that it is sensitive to seasonal conditions and variations, causing the amount of above ground mass to fluctuate from year to year. San Diego ambrosia spreads vegetatively by means of slender, branched, underground root-like rhizomes from which new above ground stems (aerial stems or ramets) sprout each year. All aerial stems growing from the same root system are genetically identical. San Diego ambrosia can be distinguished from other species of Ambrosia in the area by its twice divided leaves, lack of hooked spines on the involucres (cup-like structures), and lack of longer stiff hairs on the stems and leaves. San Diego ambrosia occurs along the main Sweetwater River Trail in an extant population and also in three translocated populations within the interpretive loop area; these are not within the project footprint. Critical habitat is within the footprint of the project, from the parking lot south of SR 94 to about 400 feet south of Steele Canyon Creek.

Wetlands

Under Executive Order 11990, Federal agencies are required to avoid or minimize the destruction, loss or degradation of wetlands. A southern segment of the Sweetwater River Trail bisects an alkali seep wetland, as evident by a large occurrence of yerba mansa (*Anemopsis californica*), a wetland obligate species. This indicates that the current footprint of the trail runs directly through sensitive wetland habitat.

Habitat and Vegetation: Environmental Consequences

Alternative A

Under Alternative A, the No Action Alternative, repair activities of the Sweetwater River Trail would not occur. Without implementation of activities associated with the action alternatives, the current trail alignment would continue to impact native vegetation and habitat. The current trail alignment bisects sensitive coastal sage scrub, southern mixed chaparral, wetland and

riparian habitats. Seasonal wet conditions of the trail tread have resulted in trail widening, as users try to avoid muddy trail conditions, further encroaching into sensitive habitats. Additionally, the approximately 2,700 feet of unauthorized, user-created trails in the Sweetwater River area would not be closed or re-vegetated and would likely continue to be used by visitors. User-created trails bisect sensitive coastal sage scrub habitat on the north end of the trail. Without the ability to close and revegetate these unauthorized trails, the trails would likely continue to further encroach into sensitive habitats and may potentially impact sensitive plant species, such as occurrences of San Diego ambrosia (*Ambrosia pumila*) adjacent to user-created trails.

Alternative B

Under Alternative B, the Preferred Alternative, all necessary trail repair, closure, and construction activities would occur. Temporary and permanent impacts to native vegetation will occur from grading, widening, or otherwise improving existing trails. Activities associated with the closure and rerouting of existing trails may temporarily impact native vegetation through ripping and discing the existing trail tread or through clearing and grubbing the new trail alignment. However, these short-term impacts are expected to be minor. Proposed trail repairs and reroutes have been designed to avoid native and rare vegetation. All sensitive plant species, including San Diego ambrosia, present in the vicinity of project activities will be flagged and avoided by trail crews. Critical habitat is present for San Diego ambrosia; impacts to that area would occur in the vicinity of the Steele Canyon Creek.

The existing trail alignment bisects sensitive wetland habitat, and seasonal wet conditions of the trail tread have led to trail widening as users try to avoid ponding in the trail, further encroaching into sensitive habitats and potentially trampling rare vegetation. Proposed trail work would reroute the trail out of wetland habitat and would be replaced by a segment that would minimize impacts to native vegetation. The permanent impact from the trail reroute is mostly through non-native grassland, and measures would be taken to preserve existing native plants along the new trail footprint. The original trail segment that bisects wetlands would be closed and the soil would be ripped and disced to allow for the natural recruitment of wetland vegetation. A native seed blend may also be used to revegetate the closed segment. Additionally, trail improvements have been designed to divert water off the trail tread, reducing seasonal ponding and consequent trail widening by users. User-created trails present in the Sweetwater River area of the Refuge that bisect sensitive coastal sage scrub habitat and other sensitive plant species would also be closed and revegetated under this alternative.

In addition to trail reroutes and repairs, this alternative includes the construction of an elevated boardwalk crossing Steele Canyon Creek. Construction activities will occur within the existing trail tread, so removal of vegetation is not expected; however, trimming back for clearance may occur. Overall, implementation of Alternative B would beneficially affect native and sensitive vegetation and habitat on the Refuge compared to the No Action alternative. Closing trails that

bisect sensitive habitats and plant species will allow these resources to recover in the former trail tread.

Alternative C

Impacts to vegetation and habitat under Alternative C would be similar to those of Alternative B; however, under this alternative, user-created trails would not be closed, and a puncheon rather than an elevated boardwalk would be constructed over Steele Canyon Creek. Without the ability to close the approximately 2,700 feet of unauthorized trails, use of these trails would continue, which may lead to continued impacts to native and rare vegetation and further encroachment into sensitive habitats. The construction of a puncheon over Steele Canyon Creek to replace the elevated boardwalk is not expected to impact native vegetation. In all, this alternative is not expected to negatively impact vegetation and habitat but would yield less beneficial impacts compared to the Preferred Alternative.

4.3 Fish and Wildlife Species

Fish and Wildlife Species: Affected Environment

San Diego NWR provides habitat for a wide range of bird, mammal, reptile and amphibian species. The shrubland, riparian woodland, grassland, and other habitat types of the Refuge support at least 180 bird species, including a number of listed and sensitive species. The two predominant shrubland types on the Refuge include coastal sage scrub and chaparral, each providing slightly different nesting and foraging opportunities for birds. California coastal gnatcatchers (*Polioptila californica californica*) and rufous-crowned sparrows (*Aimophila ruficeps*) are associated almost exclusively with coastal sage scrub, while other species such as the greater roadrunner (*Geococcyx californianus*), western scrub-jay (*Aphelocoma californica*), wrentit (*Chamaea fasciata*), California thrasher (*Toxostoma redivium*), and California towhee (*Pipilo crissalis*) can be found in both vegetation types.

Grasslands provide foraging habitat for a variety of avian species, from raptors to seed-eating birds. Species that utilize the grassland areas of the Refuge include grasshopper sparrow (*Ammodramus savannarum*), northern harrier (*Circus hudsonius*) and white-tailed kite (*Elanus leucurus*).

Riparian areas, which have been identified as habitat essential to the conservation of Neotropical migrant birds in California (RHJV 2004), harbor the highest number of bird species found in the arid and semiarid portions of the western United States. Not only do riparian areas provide important breeding grounds for birds, but they also represent vital overwintering and migration stopover areas and corridors for dispersal (RHJV 2004) for a variety of birds. Portions of the riparian habitat along the Sweetwater River are designated as critical habitat for the endangered least Bell's vireo (*Vireo bellii pusillus*) and southwestern willow flycatcher (*Empidonax traillii extimus*), while these and other riparian areas also support a range of migrant and resident birds including yellow-breasted chat (*Icteria virens*), yellow warbler (*Setophaga petechia*), blue grosbeak (*Passerina caerulea*), and warbling vireo (*Vireo gilvus*).

A comprehensive survey of the mammals present within the Refuge has not been conducted, but a number of species have been observed directly or detected by tracks, scat, burrows, pellets, or other indirect signs. Mammals present on the Refuge range from small rodents to large species such as southern mule deer (*Odocoileus hemionus fuliginatus*) and mountain lion (*Felis concolor*), both of which are MSCP-covered species. California ground squirrel (*Spermophilus beecheyi*), brush rabbit (*Sylvilagus bachmani*), and desert cottontail (*Sylvilagus audubonii*) are the most commonly observed mammals on the Refuge. These species are important prey items for the Refuge's carnivores, raptors, and large snakes (ERCE 1991.

Reptiles present on the Refuge include the Southern Pacific rattlesnake (*Crotalus viridis helleri*), Blainville's horned lizard (*Phyronosoma blainvillii*), orange-throated whiptail (*Cnemidophorus hyperythrusbeldingi*), and the silvery legless lizard (*Anniella pulchra pulchra*). Suitable habitat exists for the southwestern pond turtle (*Actinemys marmorata pallida*), a Reptile Species of Special Concern in California covered by the MSCP and a candidate for listing under the Endangered Species Act (ESA). Portions of the Sweetwater River corridor and portions of Steele Canyon Creek have been deemed as suitable for southwestern pond turtles, and a single turtle was incidentally observed on the Refuge in Steele Canyon Creek in 2010.

Amphibians native to the region, including the Federally threatened California red-legged frog (*Rana draytonii*) and the Federally endangered arroyo toad (*Anaxyrus californicus*), are not present on the Refuge. This is likely due in part to competition from non-native, invasive amphibian species including the American bullfrog (*Lithobates catesbeianus*) and the African clawed frog (*Xenopus laevis*). No native fish occur on the Refuge, but at least four species of non-native fish are present within the Sweetwater River, including mosquito fish (*Gambusia sp*.), carp (*Cyprinus carpio*), green sunfish (*Lepomis cyanellus*), and largemouth bass (*Micropterus salmoides*). All of these species are known to prey on frog eggs and larvae, representing a threat to native amphibians.

Threatened and Endangered Species and Critical Habitat

Wildlife species and critical habitats protected by the Federal Endangered Species Act are present within the vicinity of the Sweetwater River Trail project area. Federally listed wildlife species known to occur include the threatened coastal California gnatcatcher, the endangered least Bell's vireo (*Vireo bellii pusillus*), and the endangered southwestern willow flycatcher (*Empidonax traillii extimus*). The western spadefoot (*Spea hammondii*) has been proposed for listing as threatened. Designated critical habitats for the following species are present in the project area: coastal California gnatcatcher, least Bell's vireo, southwestern willow flycatcher, threatened Hermes copper butterfly (*Lycaena hermes*).

Coastal California Gnatcatcher (*Polioptila californica californica*)

The Service listed the coastal California gnatcatcher as threatened on March 30, 1993 (58 FR 16742), stating that the "habitat and range of the gnatcatcher [had] been significantly reduced". The species is also covered by the MSCP. The coastal California gnatcatcher is a small, long-tailed member of the thrush family (Muscicapidae) that is endemic to cismontane

southern California and northwestern Baja California, Mexico (Atwood 1980, Atwood 1991). Its body plumage is dark blue-gray above and grayish-white below, while the tail is mostly black. The male has a distinctive black cap that is absent during the winter, and both sexes have a slight white eye-ring. It is found on the coastal slopes of southern California, from southern Ventura southward through Los Angeles, Orange, Riverside, San Bernardino, and San Diego counties into Baja California, Mexico. This gnatcatcher typically occurs in or near coastal sage scrub, a habitat characterized by relatively low growing, dry-season deciduous, and succulent plants. Within the Otay-Sweetwater Unit, gnatcatcher populations occur in high-quality coastal sage scrub and persist in high densities. Prior to the Harris Fire in 2007, the Refuge supported approximately 6,175 acres (2,500 hectares) of high-quality coastal sage scrub. Today, in the aftermath of the fire, the Refuge supports only about 3,610 acres (1,460 hectares) of this high-quality habitat, which is distributed across the Refuge, including on the slopes to the west of the Sweetwater River and south of Highway 94. Much of the fire affected areas have somewhat recovered but have infestations of non-native grasses that limit the recovery of sage scrub plants. In the area of the project, much of the lower slope areas were farmed in the past so have a high level of non-native grasses and some scrub species. Gnatcatchers are anticipated to occur in the sage scrub within and adjacent to the project footprint.

Least Bell's Vireo (*Vireo bellii pusillus*)

The least Bell's vireo was listed as endangered by the Service on May 2, 1986 (51 FR 16474), due to a significant range-wide decline in population related to extensive habitat loss and degradation associated with urban development, exotic plant invasion, and expansion of agricultural practices into riparian zones. Brood parasitism by the brown-headed cowbird was also identified as an issue. This species is also covered under the MSCP. It is a small insectivorous, Neotropical migrant songbird. It is drab olive-gray in color above and mostly white below, with some gray on the upper breast and yellow on the flanks (USFWS 1998). This subspecies has indistinct white spectacles and two faint wing bars, with males and females having identical plumage. Least Bell's vireos are obligate riparian breeders, typically inhabiting structurally diverse woodlands along watercourses that feature dense cover within three to six feet of the ground and a dense, stratified canopy. They primarily forage and nest in riparian habitat, but they may also use adjoining upland scrub habitat (Goldwasser 1981, USFWS 1998). Within the vicinity of the project area, a moderate number of vireo territories exist along the Sweetwater River, as well as a low numbers of territories in disjunct patches along Steele Canyon Creek.

Southwestern Willow Flycatcher (*Empidonax traillii extimus*)

The southwestern willow flycatcher was listed as endangered by the Service effective March 29, 1995 (60 FR 10694) and is also covered under the San Diego MSCP. The southwestern willow flycatcher, a recognized subspecies of the willow flycatcher (Empidonax traillii), is a small Neotropical migratory bird that breeds in riparian ecosystems in the southwestern United States (Sogge et al. 2010) in habitats where water or saturated soils are present. It has a grayish-green back and wings, whitish throat, light grey-olive breast, and pale yellowish belly.

Two wing bars are visible; the eye ring is faint or absent. The nesting habitat of this subspecies is generally restricted to relatively dense riparian habitats associated with rivers, swamps, and other wetlands, including lakes and reservoirs (Bent 1960, USFWS 2002). The southwestern willow flycatcher does not currently breed within the Refuge. Within the segment of the Sweetwater River that extends through the Refuge, southwestern willow flycatcher surveys have been conducted incidental to least Bell's vireo surveys in various years (1987-1993, 1995, 1996, 1998, 2001, 2002, 2005, and 2007-2011). No southwestern willow flycatcher territories were identified on the Refuge during these surveys (pers comm. John Martin, San Diego NWR). Although this flycatcher is not currently nesting on the Refuge, areas of suitable habitat are present along the Sweetwater River. Unoccupied suitable habitat plays a vital role in the recovery of the flycatcher, because it will provide suitable areas for breeding flycatchers to: (a) colonize as the population expands (numerically and geographically), and (b) move following loss or degradation of existing breeding sites. The segment of the Sweetwater River between the Sweetwater Reservoir and the golf course to the north is considered important habitat for the recovery of the southwestern willow flycatcher.

Hermes Copper Butterfly (*Lycaena hermes*)

The Hermes copper butterfly was listed as a threatened species and its critical habitat was designated on December 21, 2021 (86 FR 72394). The species is a small, brightly-colored butterfly in the family Lycaenidae. It is approximately 2.5 to 3.2 centimeters (cm) (1 to 1.25 inches (in)) in length, with one tail on the hindwing. The forewing upperside is brown with a yellow or orange area enclosing several black spots, and the hindwing upperside has orange spots that may be merged into a band along the margin. On the underside, the forewing is yellow with four to six black spots, and the hindwing is orange fading to almost white with three to six black spots. Mean last instar (caterpillar life stage between molts) larval body length is 15 millimeters (mm) (0.6 in). Adults are active May through July, when females deposit single eggs exclusively on spiny redberry (*Rhamnus crocea*) shrubs in coastal sage scrub and chaparral vegetation. Adult occupancy and feeding are also associated with presence of their primary nectar source, the shrub California buckwheat (*Eriogonum fasciculatum*), although other nectar sources may provide equivalent or supplemental adult nutrition. Hermes copper butterflies are considered poor dispersers, they appear to have limited directed movement ability, and they have been recaptured no more than 0.7 mi (1.1 km) from the point of release. Extensive surveys for the species have been conducted, including at the refuge but none have been detected in the area since before the 2007 wildfires. Given its low dispersal capacity, it is unlikely that the species is within the project area. Critical habitat (Unit 3) for the species occurs within the project area. That designation provides the physical and biological features essential to the conservation of the species, spiny redberry host plants and nectar sources for adult butterflies, between 30 and 1,341 m above sea level in habitat providing appropriate quality, quantity, and spatial/temporal arrangement of the characteristics in the context of the species' life-history needs. There are spiny redberry generally in the project area, mainly near the rerouted trail section, and potential nectar plants like buckwheat occur throughout.

Western spadefoot (*Spea hammondii*)

The western spadefoot is a small amphibian often referred to as a toad but is typical in shape to most fossorial (burrowing) frogs. Individuals of the species vary in size from 1.5 to 2.5 inches (in) (3.8 to 6.3 centimeters (cm)) in length. Western spadefoots have a wedge-shaped, glossy black hardened ‘‘spade’’ on each hind foot that is used for digging burrows in the ground to avoid desiccation during the dry season (from late spring to early fall) or for sheltering during the active season (early fall to late spring). The western spadefoot requires a variety of both terrestrial and aquatic habitat components in close proximity and accessible to each other in order to meet all of their life history requirements. The terrestrial (upland) habitat is primarily open grasslands, scrub, or mixed woodland and grassland on flat or gently rolling topography and provides areas for sheltering and foraging. The aquatic habitat required for breeding, egg laying, and tadpole and juvenile development is most often associated with vernal pool or other ephemeral wetland areas. The western spadefoot was proposed for listing as a threatened species on December 5, 2023 (88 FR 84252); any animals within the Refuge would be within the southern Distinct Population Segment of southern California and northwestern Mexico. In the proposed listing, the Service concluded that there was not sufficient information to determine critical habitat.

Fish and Wildlife Species: Environmental Consequences

Alternative A

Implementation of Alternative A, the No Action Alternative is not likely to impact wildlife. Under this alternative, trail repair work would not occur. Existing trails would remain in their current state, and trail segments would not be rerouted. While this alternative would not improve wildlife habitat, overall impacts to wildlife would be negligible.

Alternative B

Under Alternative B, all proposed trail repair activities would be implemented. As described in the ‘Vegetation and Habitat’ section, this alternative would improve habitat by rerouting the trail tread out of sensitive wetland, coastal sage scrub and southern mixed chaparral habitats and realign these segments through areas dominated mostly by non-native grasslands. This would benefit wildlife by improving and expanding habitat. Short-term disturbance to wildlife may occur during trail construction activities, such as during the use of tractors or other mechanized equipment. Additionally, the construction of an elevated boardwalk over Steele Canyon Creek may temporarily disturb wildlife. However, these disturbances would be localized, and impacts to wildlife would be negligible. Any wildlife species present in the vicinity of trail construction would likely move away from the immediate area and return following the completion of construction activities. The trail area is consistently used by the public and wildlife is likely habituated to a great extent to human activity.

To avoid impacts to nesting birds, including threatened and endangered species such as the California gnatcatcher and the least Bell’s vireo, all habitat clearing would occur outside of the

bird nesting season and construction activities would be restricted to the period between September 1st and February 15th. If the bird nesting season is avoided for construction activities, the long-term impacts to wildlife species would likely be beneficial under this alternative, due to the potential for the improvement of wildlife habitat through proposed trail reroutes. If work must occur during breeding season, a biological monitor will determine whether any birds are nesting within or near the work area. If nesting is detected, a buffer of 50 feet will be established and no work will occur until the nest fledges or fails as determined by a biological monitor. Hermes copper butterfly have not been detected during surveys for the species; therefore, the species will not be affected by the project. Western spadefoot have the potential to be within ephemeral pools and uplands, but known locations near the project are uphill from the rerouted and restored trail area near the southeast section of the project, or in or on the opposite side of Sweetwater River and further downstream. Toads may be burrowed into the uplands but are unlikely to be burrowed into trail tread. However, there may be impact to toads from the rerouted trail section. Given the fossorial nature of spadefoot, it is not likely that individuals will be detected prior to ground disturbance and therefore, individuals may be harmed or killed for that section of the project. For all these species, critical habitat may have small impacts from the rerouting; however, the quality and quantity of these habitats may be enhanced by the full project's implementation with the restoration of trails to be closed to further public access.

Alternative C

Impacts to wildlife under Alternative C would be similar to those of Alternative B. However, under this alternative, unauthorized trails would not be closed and revegetated. Because of this, implementation of Alternative C may result in less beneficial impacts to wildlife than Alternative B. If these user-created trails remain in their current state, further encroachment into habitat may continue, which may continue to adversely impact wildlife. The construction of a puncheon over Steele Canyon Creek proposed under this alternative may lessen short-term impacts to wildlife compared to the construction of an elevated boardwalk under Alternative B. The puncheon, which would span 24-feet long over the Steele Canyon Creek channel, would require less time to construct than the elevated boardwalk proposed under Alternative B, which would extend 172 feet and would be constructed on concrete caissons. For this reason, construction of the puncheon under this alternative may cause less short-term disturbance to wildlife than construction of the elevated boardwalk. However, these differences in disturbance to wildlife are negligible, and impacts to wildlife under this alternative are expected to be overall similar to those under Alternative B.

4.4 Geology and Soils

Geology and Soils: Affected Environment

The majority of the lands within the Otay-Sweetwater Unit occur within the Peninsular Ranges geomorphic region of San Diego County, which is underlain by granitic rocks formed during the cooling of magmas generated between 140 and 90 million years ago (Deméré n.d.). The

majority of the Refuge area to the south of Highway 94, including the project area, is underlain with Santiago Peak metavolcanic rocks. These consist of a collection of mildly metamorphosed (altered by heat and pressure) volcanic and volcanoclastic rocks (sedimentary units derived from volcanic rocks) with minor amounts of sedimentary material (Ogden 1992). Santiago Peak volcanics are generally hard and extremely resistant to erosion.

Both sides of Highway 94 within and adjacent to the floodplain of the Sweetwater River and its tributaries are underlain by Quaternary alluvium and colluvium. The Sweetwater River area is overlain with a variety of soil types, including Tujunga sand in the floodway of the Sweetwater River and Riverwash within the streambed near the northern end of the Sweetwater River area. The upland soils on the area to the south of Highway 94 and east of the Sweetwater River are overlain with Vista, Cieneba, San Miguel-Exchequer series soils. About 10 to 20 percent of the surface in these areas is covered with rock outcrops and large granodioritic boulders. Cryptobiotic crusts are present along the north end of the Sweetwater River trail.

Geology and Soils: Environmental Consequences

Alternative A

Impacts to soils associated with the No Action Alternative would result from the continued erosion of the trail tread due to the current trail design. The presence of heavy clay substrates and the percent downslope and/or cross slope of the trail tread combined with water movement across and within the trail tread during storm events has led to severe erosion within and along the trail. Under the No Action Alternative, trail repair activities would not occur, and conditions would remain as they are. Seasonal rain events would continue to erode and cause ponding within the trail, leading to trail widening by users. In some areas, this widening may impact sensitive soils including adjacent cryptobiotic crusts. Implementation of this alternative would lead to continued erosion within and adjacent to the trail tread.

Alternative B

Under the Preferred Alternative, all necessary trail repair activities would be implemented. Proposed trail repairs within existing segments would reduce erosion along the trail. To improve drainage and reduce erosion within the trail tread, existing berms formed from maintenance grading may be breached, and drainage channels may be created to divert water from the trail. In some areas, the trail surface may be improved by capping with imported native soils. A series of puncheons may be installed throughout the trail to allow water to flow underneath, and to reduce ponding and erosion. Additionally, a series of 'knicks' may be carved into the downslope edge of the trail to divert water from the trail tread. BMPs would be followed to prevent soil erosion during trail construction activities.

This alternative also includes the closure of user-created trails, which may reduce erosion by preventing unauthorized use in those areas, as plants would revegetate the former trail tread. Under this alternative, an elevated boardwalk would be constructed over Steele Canyon Creek, which would be supported by concrete caissons with a 24-inch diameter, extending

approximately 13 feet into the ground. Prior to construction of the elevated boardwalk, soil borings would be drilled, and a geotechnical investigation would be conducted to determine the physical and chemical properties of the soil. This would inform structural support decisions and determine required depths of structures needed to support the boardwalk. BMPs would be followed to reduce erosion of the stream banks during bridge construction. The construction of this boardwalk is not expected to adversely impact soils.

Alternative C

Impacts to soils under Alternative C would be similar to those of Alternative B. All repairs of existing trails proposed under Alternative B would also occur under Alternative C. However, this alternative does not include the closure of user-created trails, so erosion in those areas would not improve under Alternative B. A puncheon would be constructed over Steele Canyon Creek rather than the elevated boardwalk proposed under Alternative B. This puncheon would be constructed on treated lumber sills on both ends, the footprint of which would be approximately two-feet deep, five-feet wide, and ten-feet long on the east end and approximately four-feet deep, five-feet wide and six-feet long on the west end. The construction of this puncheon is not expected to result in substantively different effects than the construction of the elevated boardwalk under Alternative B since similar BMPs would be implemented. Impacts to soil under this alternative would be negligible, but slightly less beneficial than those of Alternative B.

4.5 Air Quality and Greenhouse Gas Emissions

Air Quality and Greenhouse Gas Emissions: Affected Environment

The Federal Clean Air Act (42 U.S.C. §§ 7401-7671q) requires the USEPA to set outdoor air quality standards for the nation, referred to as National Ambient Air Quality Standards (NAAQS). To date, standards have been established for sulfur dioxide (SO2), carbon monoxide (CO), nitrogen dioxide (NO2), ozone eight-hour standard, ozone one-hour standard, particulate matter equal to or less than 10 microns in size (PM10), fine particulate matter equal to or less than 2.5 microns in size (PM2.5), and lead (Pb). The Clean Air Act also permits states to adopt additional or more protective air quality standards if needed. Within California, the California Ambient Air Quality Standards (CAAQS), managed by the California Air Resource Board (CARB), set parameters for pollutants, such as particulate matter and ozone, that provide greater protection of public health than the respective Federal standards. Areas where measured concentrations of these pollutants are above the NAAQS or CAAQS are defined as nonattainment areas. All other areas are defined as attainment areas.

The San Diego NWR is located within the southwestern region of the San Diego Air Basin, which is managed by the San Diego Air Pollution Control District (APCD). In accordance with its monitoring responsibilities, the APCD maintains an ambient air monitoring network and records air quality readings to determine compliance with national and California standards. Compliance with air quality standards is measured based on these records. In addition to monitoring regional ambient air quality, the San Diego APCD also evaluates and issues air

quality permits to ensure that proposed new and changed operations and industrial equipment meet emission standards. San Diego Air Basin is in Federal nonattainment status for ozone (8-hour), and unclassifiable for PM10. The air basin is in State nonattainment status for ozone (8-hour), ozone (1-hour), PM10, and PM2.5.

The USEPA and the State of California identify the principal GHG that enter the atmosphere because of human activities as: carbon dioxide (CO2), methane (CH4), nitrous oxide (N2O), and fluorinated gases (i.e., hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride). The most common GHG that results from human activity is carbon dioxide, followed by methane and nitrous oxide. In California, emissions from transportation, electrical power generation and the industrial sector account for over 80 percent of GHG emissions. The transportation sector alone is responsible for more than one third of all such emissions in the state (California OEHHA 2013).

Scientific evidence acknowledges that world climate is changing as indicated by increases in global surface temperature, altered precipitation patterns, warming of the oceans, sea level rise, increases in storm intensity, changes in wind patterns, and changes in ocean pH (Bierbaum et al. 2007, Coastal Resources Center and International Resources Group 2009). In California, maximum, average, and minimum air temperatures have shown an increase over the past century, with the greatest increase seen in minimum temperatures (Anderson et al. 2008). Between 1950 and 2000, the mean annual temperatures in California have increased by 1.8°F (LaDochy et al. 2007). According to recent climate modeling, California is projected to warm by approximately 2.7°F above 2000 averages by 2050, a threefold increase in the rate of warming over the last century. In addition, summer temperatures are expected to rise more than winter temperatures, with increases greater in inland California than on the coast. Heat waves, with higher temperatures and longer durations, are also expected to occur more frequently throughout California (Moser et al. 2012).

Some climate models for the San Diego region indicated that by mid-century the 30-year average precipitation in the San Diego region will decrease by more than 8 percent compared to historical totals, even under a lower greenhouse gas emissions scenario (Moser et al. 2012). With respect to temperature, several of the recent climate simulations for southern California suggest that increases in average temperature are more likely to occur during the summer than in the winter, with the effects felt most significantly in the interior areas of southern California (Cayan 2009). Pratt and Mooney (2013) hypothesize that Mediterranean plant communities (like those supported on the San Diego NWR) may be particularly sensitive to changes in precipitation, requiring the integration of biological processes, including local adaptation and adaptive plasticity, into forecasts of ecosystem response to changing climatic conditions.

For more information on air quality standards in the proposed project area, see the Final CCP (USFWS 2017).

Air Quality: Environmental Consequences

Alternative A

Impacts to air quality associated with the No Action Alternative are limited to vehicle use by visitors and staff as they travel to and from the Sweetwater River area of the Refuge to access the area for hiking trails and land management activities. Vehicle use associated with the Refuge produces emissions including CO2 and particulate matter. However, the average annual daily traffic daily for the section of SR 94 is 8,500 trips (USFWS 2019) as commuters travel to and from areas east and west of the Refuge. Therefore, impacts to air quality from current vehicle transportation to and from the Refuge from visitors and staff are negligible. Because all roads open to the public in this area of the Refuge are paved, dust production (PM10) associated with visitor vehicle transportation are non-existent. Dust may be produced from staff maintenance vehicle access on unpaved roads in this area of the Refuge, but due to the infrequency of these activities, impacts from dust are negligible.

Alternative B

Under Alternative B, impacts to air quality may result from tractors or other mechanized, gas-powered equipment that may be used within the trail tread for trail repairs, construction, or closures. Equipment may also be used for the construction of the elevated boardwalk. The use of this equipment may result in an increase in localized greenhouse gas emissions. However, impacts to air quality from these activities are expected to be minor, because of the short-term nature of the project and the limited amount of gas-powered equipment that would be used at a time. Additionally, the project footprint is minimal (approximately 6 acres). All project activities are expected to be completed in less than six months, so emissions from construction activities would be short-term. Construction activities will not violate air quality standards or increase the frequency or severity of an existing violation. While project construction activities may result in increased dust production, this is expected to be minor and short-term. These impacts are especially minor in comparison to the emissions produced daily within the greater San Diego County.

Alternative C

Emissions and dust production under this alternative may be less than those of the Preferred Alternative, because this alternative does not include the closure of 2,700 feet of unauthorized trails and includes the construction of a smaller stream crossing structure. However, because impacts to air quality are expected to be minor under Alternative B, impacts to air quality are also expected to be minor under this alternative.

4.6 Water Resources and Hydrology

Water Resources and Hydrology: Affected Environment

The Sweetwater River area, including the proposed project area, is located entirely within the Sweetwater River watershed. The Sweetwater River watershed encompasses about 230 square miles and extends from the Laguna Mountains to San Diego Bay. The primary tributary within this watershed is the Sweetwater River, which has undergone significant changes over the past

100 years. These changes began in 1888 with the construction of the Sweetwater Reservoir. This was followed in 1945 by the construction of the Loveland Reservoir near the eastern end of the drainage. The construction of this dam resulted in a significant reduction in the intensity and volume of freshwater flows through the portion of the Sweetwater River that extends through the Refuge.

The Loveland Reservoir controls about 98 square miles of the drainage basin, while the Sweetwater Reservoir, located approximately 17 miles downstream, controls approximately 84 square miles the basin. Both reservoirs are owned and operated by the Sweetwater Authority, which provides water service to a population of approximately 177,288 within the western and central portions of the City of Chula Vista, all of the City of National City, and unincorporated areas of the County of San Diego (Bonita) (Sweetwater Authority and RMC Water and Environment 2011).

The project area includes the intersection of the Sweetwater River and Steele Canyon Creek, an area that may flood in winter months. All of the proposed trail repair work would take place in the area east of the Sweetwater River, and a permanent water crossing may be installed over Steele Canyon Creek. Alluvial and sedimentary aquifers are present below portions of the Otay-Sweetwater Unit that are located along the Sweetwater River or adjacent to the Jamacha Valley.

Surface water quality within a watershed is directly affected by the types of land uses present within the watershed. As development in the watershed increases, the level of pollutants in surface runoff also increases. This situation is made worse because a high proportion of developed areas consist of impervious surfaces, greatly reducing the potential for native plants and soil to filter pollutants out of runoff water before it enters nearby rivers and streams. Pollutants such as petroleum products, antifreeze, heavy metals, and sulfates accumulate on impervious surfaces and are easily carried downstream by natural and human-generated runoff. In addition, irrigation and natural runoff transport fertilizers, pesticides, bacteria, viruses, and erosion-generated sediments into storm drains or natural drainages. These types of discharges are the primary sources of surface water and groundwater contamination in San Diego County (County of San Diego 2011).

The Final Program Environmental Impact Report for the County of San Diego's General Plan Update (County of San Diego 2011) identifies various areas in the unincorporated county with known groundwater quality issues. Of the areas identified, four occur within or in close proximity to properties located within the Otay-Sweetwater Unit. One of these sites is located near the Sweetwater River where it crosses under Highway 94. This site is in close proximity to the proposed project area and may affect the water quality of the Sweetwater River or Steele Canyon Creek.

Floodplains

Under Executive Order 11988, Federal agencies are responsible for ensuring that their actions avoid long and short-term adverse impacts associated with the construction in and modification of floodplains. The regulatory floodplain is defined by areas inundated by a 100-year or 500-year rain event. The southern segment of the existing alignment of the Sweetwater River Trail bisects the regulatory floodway of the Sweetwater River, and implementation of the proposed project would reroute this segment out of the floodplain. At the intersection of the Sweetwater River Trail and Steele Canyon Creek, the existing stream crossing and proposed replacement stream crossings fall within the regulatory floodway.

Water Resources: Environmental Consequences

Alternative A

Under the No Action Alternative, trail improvements would not occur. The segment of trail that falls within the floodplain of the Sweetwater River would not be rerouted out of the floodplain, and it would continue to flood during heavy storm events.

Alternative B

Implementation of Alternative B would likely have beneficial impacts on water resources and floodplains. This alternative includes a reroute that would move a segment of the trail out of the floodplain of the Sweetwater River. This segment of the trail currently has substantial drainage issues due to its alignment within the floodplain, and the proposed project would move this segment east of its current location. This would require temporary construction work within the floodplain to rip and disc the existing trail, which would allow for natural recruitment of native vegetation. By rerouting this trail segment out of the floodplain, previous modifications to the floodplain would be reversed, and the need for future trail maintenance activities within the floodplain would be eliminated.

Trail construction activities could potentially result in soil erosion and sedimentation into the Sweetwater River or Steele Canyon Creek. Because gas-powered machinery may be used for trail construction activities, there is potential for fuel leaks into these adjacent waterways. However, if BMPs are followed, these impacts are unlikely. Erosion control measures will be taken to prevent sedimentation. All machinery will be fueled away from waterways, and fueling will be confined to the staging area.

The elevated boardwalk to be constructed over Steele Canyon Creek under this alternative would be designed as to not impact water flow of the creek. The current puncheon, which is placed directly on the ground, has been washed downstream following heavy rain events. Because the puncheon was not designed with consideration for seasonal heavy stream flow, it often impedes the flow of water. The elevated boardwalk proposed under this alternative would be permanently constructed at a high enough elevation as to not obstruct the flow of water. The boardwalk would be constructed on caissons spaced 16-feet apart leading up to the creek on either end, with 24-feet spacing as the boardwalk crosses the creek channel. BMPs will

be followed to prevent erosion of the stream banks during boardwalk construction. Prior to construction, appropriate permits would be obtained. For example, U.S. Army Corps of Engineers Section 404 permit would be needed for the elevated boardwalk proposed under this alternative for the support structures over Steele Canyon Creek. This structure would be anticipated to improve wet season creek flow compared to the No Action Alternative and the current existing puncheon.

Alternative C

Impacts to water quality under Alternative C would be similar to those of Alternative B. Alternative C does not include the additional closure of 2,700 feet of unauthorized trails, and therefore less construction activities are required under this alternative. For this reason, Alternative C is associated with less of a potential for erosion and consequent sedimentation of waterways associated with construction activities. However, the differences are negligible if BMPs are followed.

This alternative includes the construction of a puncheon crossing Steele Canyon Creek, rather than the elevated boardwalk proposed under Alternative B. This puncheon would likely cross the creek at a lower elevation than the proposed boardwalk, and therefore, may obstruct stream flow following heavy rain events. The creek crossing proposed under this alternative may result in less beneficial impacts to stream flow than the Preferred Alternative. However, the impacts associated with the creek crossing structure in this alternative are not expected to be substantively different than impacts of the current puncheon.

4.7 Cultural Resources

Cultural Resources: Affected Environment

The Otay-Sweetwater Unit and the greater SDNWR was originally occupied by the Kumeyaay people, who used the lands for long-term villages, short-term camps, and processing sites. In A.D. 1769, Spanish colonist settled in San Diego, forming the Mission San Diego de Alcalá. Historical records indicate that missionary contact with the native inhabitants of the Jamacha Valley (portions of which are now located within the present-day Refuge) first occurred in 1775 (Van Wormer 1984). It was during this time that the Mission San Diego de Alcalá claimed ownership of the Jamacha Valley. Doña Apolinaria Lorenzana, a lifelong resident of Mission San Diego de Alcalá, received a grant in 1840 to purchase 8,881 acres of land from the missionaries located almost entirely within the Jamacha Valley. This land grant included portions of the Sweetwater River, Steele Canyon, and the lower western slopes of San Miguel Mountain, areas that are now within the boundary of the Refuge. Various improvements were made to the land after 1840, including construction of a house, corral, and lime kiln on the west side of the valley (Van Wormer 1984). Wheat and corn were planted in the valley to the east of the Sweetwater River, and other areas were used for grazing by sheep and goats. In 1853, Rancho Jamacha was purchased from Doña Apolinaria by four partners to be used to grow wheat, barley, oats, rye, and vegetables, and to raise livestock. According to a record search by California Historical Resources Information System South Coastal Information Center (SCIC), 151 prehistoric sites, 28

prehistoric isolates, 26 historic sites, and six multi-component sites have been identified within the boundaries of San Diego NWR. The majority of sites contain lithic (stone) artifacts and/or debitage (stone flakes generated during the crafting of stone tools). Of the 211 sites, five have been evaluated for eligibility for listing on the National Register of Historic Places (NRHP).

Cultural Resources: Environmental Consequences

Alternative A

Under Alternative A, impacts to cultural resources may result from the continued use of 2,700 feet of unauthorized trails. These trails were created by users, and therefore did not receive the appropriate cultural review that is required prior to trail construction. Cultural resources may be present in the areas that these trails bisect, and continued use of these trails may continue to impact these sensitive resources.

Alternative B

Under this alternative, all necessary trail work would occur, which would require ground disturbance along the current trail tread and within the proposed trail reroute footprint. Ground disturbance would also occur during the construction of the elevated boardwalk, which would be built on concrete caissons extending approximately 13 feet into the ground. This alternative also includes the closure of 2,700 feet of unauthorized trails, which would involve ripping and discing the surface of these trails to a depth of four inches, in addition to proposed trail reroutes and repairs.

All proposed trail work under this this alternative would comply with Section 106 of the National Historic Preservation Act (NHPA) of 1966, as amended, and the Archaeological Resources Protection Act (ARPA), which prohibits the disturbance of archaeological or historical sites and the removal of artifacts. Staff would also coordinate with the Service's Regional Archaeologist to comply with all Federal laws relating to cultural resources. The Service will initiate consultations with interested Tribes, and a Kumeyaay cultural monitor will be present during ground-disturbing activities. If these measures are followed, adverse effects to cultural resources are not expected.

Alternative C

Under Alternative C, all trail work would comply with Section 106 of the NHPA, as well as the ARPA. Coordination with the Service's Regional Archaeologist and interested Tribes would occur. A cultural monitor would be present during construction activities.

This alternative would result in fewer ground disturbances than the Preferred Alternative because 2,700 feet of unauthorized trails would not be ripped, disced and closed, and a small puncheon would be constructed over Steele Canyon Creek rather than an elevated boardwalk. Ground disturbance would not occur within the 2,700 feet of user-created trails, and these trails would remain accessible. Although the ground disturbance associated with closing these trails would not occur under this alternative, the trails would continue to be used by visitors.

This may result in unregulated impacts to cultural resources in these areas, as a formal cultural review has not been conducted for trails in these areas.

The puncheon proposed under this alternative would have a different footprint of ground disturbance compared to the boardwalk proposed under Alternative B. The puncheon would be constructed on treated lumber sills, which would be approximately two-feet deep, five-feet wide, and ten-feet long on the east end and approximately four-feet deep, five-feet wide and six-feet long on the west end. This is compared to the boardwalk proposed under Alternative B which would be constructed on concrete caissons with a 24-inch diameter and would extend approximately 13 feet in the ground. While the creek crossing proposed under this alternative has a different footprint than that proposed under Alternative B, impacts to cultural resources would be minor if all Federal laws relating to cultural resources are followed.

4.8 Visitor Use and Experience

Visitor Use and Experience: Affected Environment

San Diego NWR provides a wide range of opportunities for visitors to experience Refuge resources. Activities approved for visitor use include hiking, mountain biking, horseback riding, wildlife observation and photography, interpretation, and environmental education. Approved visitor uses vary by area or trail; no hunting is permitted within the project area. The Refuge currently manages several miles of trails in the Otay-Sweetwater Unit, and the primary trailheads on the Refuge are the Sweetwater River Trailhead, the Par 4 Drive Trailhead, the McGinty Mountain Trailhead, and the Mother Miguel Mountain Trailhead.

When the Refuge was established, public access was officially only open for use of the county's Sweetwater Loop and River Trail and a trail within the northern portion of the Sweetwater River area that was utilized by equestrian users. Today, numerous other trails are present, many of which have been created by users or follow old access roads and existing utility easements. Users have also created pathways onto the Refuge through adjacent private properties. These unofficial trails and access paths represent more than 210 miles of disturbance within the Otay-Sweetwater Unit. The Refuge's CCP formalized a trail system, with current trails and future proposed trails.

Some Refuge trails, including the Sweetwater River Trail and the Par four Trail, allow mountain biking and horseback riding in addition to hiking. The Refuge's Sweetwater River Trail connects at the south end to the County of San Diego's Sweetwater River Regional Trail, which adds an additional continuous 5.5 miles to the Refuge's one-mile-long Sweetwater River Trail. The Refuge hosts educational activities along the Sweetwater River Trail, including nature photography workshops and school field trips. Interpretive signage describing endangered and threatened plants and animals occurring on the Refuge are provided along the trail.

Visitor Use and Experience: Environmental Consequences

Alternative A

Under the No Action Alternative, visitor use of the Refuge would continue as it has previously. Trail repairs would not occur, and therefore drainage problems within with the trail tread would not be improved. Current conditions contribute to severe seasonal ponding on the trail and unsafe conditions due to erosion. In some areas, seasonal ponding makes the trail impassible to users. Implementation of the No Action Alternative would lead to increased erosion and insufficient drainage over time, inhibiting user experience of the trail.

Alternative B

The Preferred Alternative may temporarily impact visitor use but is expected to improve visitor experience in the long-term. Construction activities associated with this alternative would result in temporary trail closures, as trails are repaired, rerouted, and revegetated, and while the elevated boardwalk is constructed. A phasing plan for trail construction has been designed to minimize impacts to visitor's experience using the trail. Trail construction will be completed in six phases, which will allow users to continue utilizing open trail segments while some segments are closed for construction activities. During all phases, either a loop or out-and-back trail will be maintained. During certain phases when access to the trail from the main trail head is inaccessible, access to the Sweetwater River Trail on the north end would be from the trail entrance on Millar Ranch Road, or from the County of San Diego trail connections to the south. Trail construction activities under this alternative are expected to take approximately six months, which would include all trail repairs, reroutes, closures, and the construction of the elevated boardwalk.

Implementation of this alternative is expected to beneficially impact visitors in the long-term. Trail conditions would be substantially improved following construction, and unfavorable and unsafe trail conditions including ponding and erosion would no longer occur. Implementation of this alternative would improve accessibility of the trail and would enable the trail to comply with the Accessibility Standards. This would create more opportunities for visitors with limited mobility to experience the Refuge and engage in wildlife-dependent recreation activities. The elevated boardwalk proposed under this alternative would improve visitors' experience as they cross Steele Canyon Creek. This boardwalk would provide an interesting feature to users as they navigate the trail and would further improve trail accessibility.

Alternative C

Impacts to visitor use and experience under Alternative C would be similar to those of Alternative B. A phased construction plan would be implemented under this alternative to minimize impacts to visitors. However, under this alternative, a puncheon, rather than a boardwalk would be constructed over Steele Canyon Creek. Additionally, unauthorized trails within close vicinity of the Sweetwater River Trail would not be closed under this alternative. For this reason, project construction is expected to take three months under this alternative. Although this alternative would require less construction time, it would provide less beneficial

impacts to visitor experience than the Preferred Alternative. The construction of a puncheon crossing Steele Canyon Creek proposed under this alternative would not comply with the Accessibility Standards and would continue to inhibit those with accessibility needs from accessing the trail.

4.9 Cumulative Impacts

Cumulative impacts are those impacts on the environment resulting from incremental consequences of a proposed action when added to other past, present, and reasonably foreseeable future actions, regardless of who undertakes those actions. Cumulative impacts can be the result of individually minor impacts that can become significant when added over time. It is difficult to accurately analyze cumulative impacts because one action may increase or improve a resource in one area, while other unrelated actions may decrease or degrade that resource in another area.

To assess the potential for cumulative impacts, all past, current, and potential future projects were considered. The CCP identified trail repairs and realignments that were deemed necessary at the creation of the document, implementation of which has periodically occurred as funding has become available. Recent trail repair work has occurred on the 'connector trail' near Mother Miguel Mountain on the Refuge, but due to its distance from the Sweetwater River Trail project, cumulative impacts are not expected. Trail repair work in both locations is not expected to result in significant adverse effects, individually or cumulatively. Currently, other trail repairs in close vicinity of the Sweetwater River Trail are not proposed. The unauthorized creation of trail routes by users may continue to occur on the Sweetwater Unit, but proposed trail improvements under the Preferred Alternative are expected to minimize this. Cumulative impacts are not expected to result from unauthorized trail creation and the proposed project.

4.10 Summary of Analysis

<u>Alternative A – No Trail Repairs – No Action Alternative</u>

Under Alternative A, trail repair activities would not occur. Segments of the trail would remain within the floodplain of the Sweetwater River, and poor trail drainage would not be improved. Seasonal ponding would continue to occur, which would lead to further trail widening as users avoid wet areas. Several authorized and unauthorized trail segments bisect sensitive habitats, including coastal sage scrub and wetlands, and further encroachment into these habitats would likely occur under this alternative. The Sweetwater River Trail would remain inaccessible to many users and would not comply with the Outdoor Standards. The current puncheon crossing Steele Canyon Creek would remain as is and would likely continue to be washed downstream during heavy stream flow events, obstructing stream flow. While potential temporary adverse impacts associated with trail repair and construction would not occur under this alternative, the long-term beneficial impacts of necessary trail repairs would also not occur.

Alternative B – Implementation of Full Extent of Trail Repairs – Preferred Alternative

Under the Preferred Alternative, all necessary trail work would occur, including trail repairs, reroutes, and closures. Temporary impacts may occur during these activities, including erosion, sedimentation, temporary disturbance to wildlife and habitat, and temporary trail closures for visitors. However, these impacts are expected to be mitigated if BMPs are followed. Impacts to cultural resources are not expected if all applicable regulations are adhered to, which include consultation with interested Tribes and the presence of a Kumeyaay monitor during soil-disturbing activities. Implementation of this alternative would enable the Sweetwater River Trail to adhere to the Outdoor Standards, expanding accessibility of the Refuge. The construction of an elevated boardwalk and all trail erosion and drainage repairs proposed under this alternative would improve visitor experience and trail longevity. By closing and revegetating all user-created trails in this area, conditions associated with potential impacts to natural and cultural resources in these areas would improve. Long-term impacts associated with this alternative are expected to be beneficial.

Alternative C – Implementation of Minimum Trail Repairs

Impacts associated with implementation of Alternative C would be similar to those of Alternative B. However, under this alternative, 2,700 feet of user-created, unauthorized trails would not be closed or revegetated. While the exclusion of these trail closures would reduce the potential for temporary impacts associated with erosion, sedimentation, and other disturbances in the short-term, this may yield more adverse effects in the long-term. In addition, a puncheon, rather than an elevated boardwalk, would be constructed over Steele Canyon Creek. Similarly, the construction of this puncheon would be less intensive than the construction of an elevated boardwalk. However, in the long-term, construction of this structure may yield less beneficial impacts to creek flow and user experience in the long-term.

Chapter 5: List of Preparers and Sources

5.1 List of Preparers

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Appendix A: Applicable Statutes and Executive Orders

EO 11988 (Floodplain Management): The project would partially occur in a floodplain. The SDNWR Sweetwater River Trail Repair Project and associated federal funding would not contribute to flood damage or negative impacts to the floodplain. Mitigation measures and best management practices, as outlined in the Environmental Assessment, would be used to protect the floodplain and minimize impacts.

EO 11990 (Protection of Wetlands): The project would partially occur in wetlands but is designed to avoid to the extent possible long- and short-term adverse impacts associated with the destruction or modification of wetlands. The project will reroute the existing trail out of wetland areas and provide an elevated boardwalk to minimize impacts to Steele Canyon Creek.

Architectural Barriers Act (ABA) of 1968: This trail project's goal is to meet the ABA accessibility standards of Chapter 10 for Outdoor Developed Areas to the maximum extent practical.

Endangered Species Act of 1973, as amended: This project will comply with this Act through implementation of mitigation measures and best management practices. A separate Intra-Agency Section 7 Consultation to address potential effects to listed species and critical habitat will be completed.

Migratory Bird Treaty Act of 1918, as amended: This project will comply with this Act through implementation of mitigation measures and best management practices.

National Environmental Policy Act (NEPA) of 1969: Development of this EA and associated environmental documents ensures compliance with NEPA.