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# Th6b

**CD-0006-20**

**December 18, 2020**

**EXHIBITS**

Exhibit 1 – General Management Plan Amendment (GMPA) planning area
Exhibit 2 – Ranches in the GMPA planning area
Exhibit 3 – Elk herd locations
Exhibit 4 – Proposed zoning for the GMPA planning area
Exhibit 5 – Sub-zone maps for each ranch included in the GMPA
Exhibit 6 – Mitigation measures and best practices associated with proposed management activities
Exhibit 7 – GMPA watersheds
Exhibit 8 – Past activities to enhance resource conditions in the GMPA planning area
Exhibit 9 – State-designated Marine Protected Areas offshore PRNS
Exhibit 10 – Habitats in the GMPA planning area
Exhibit 11 – List of rare plant species in the GMPA planning area
Exhibit 12 – Western snowy plover critical habitat

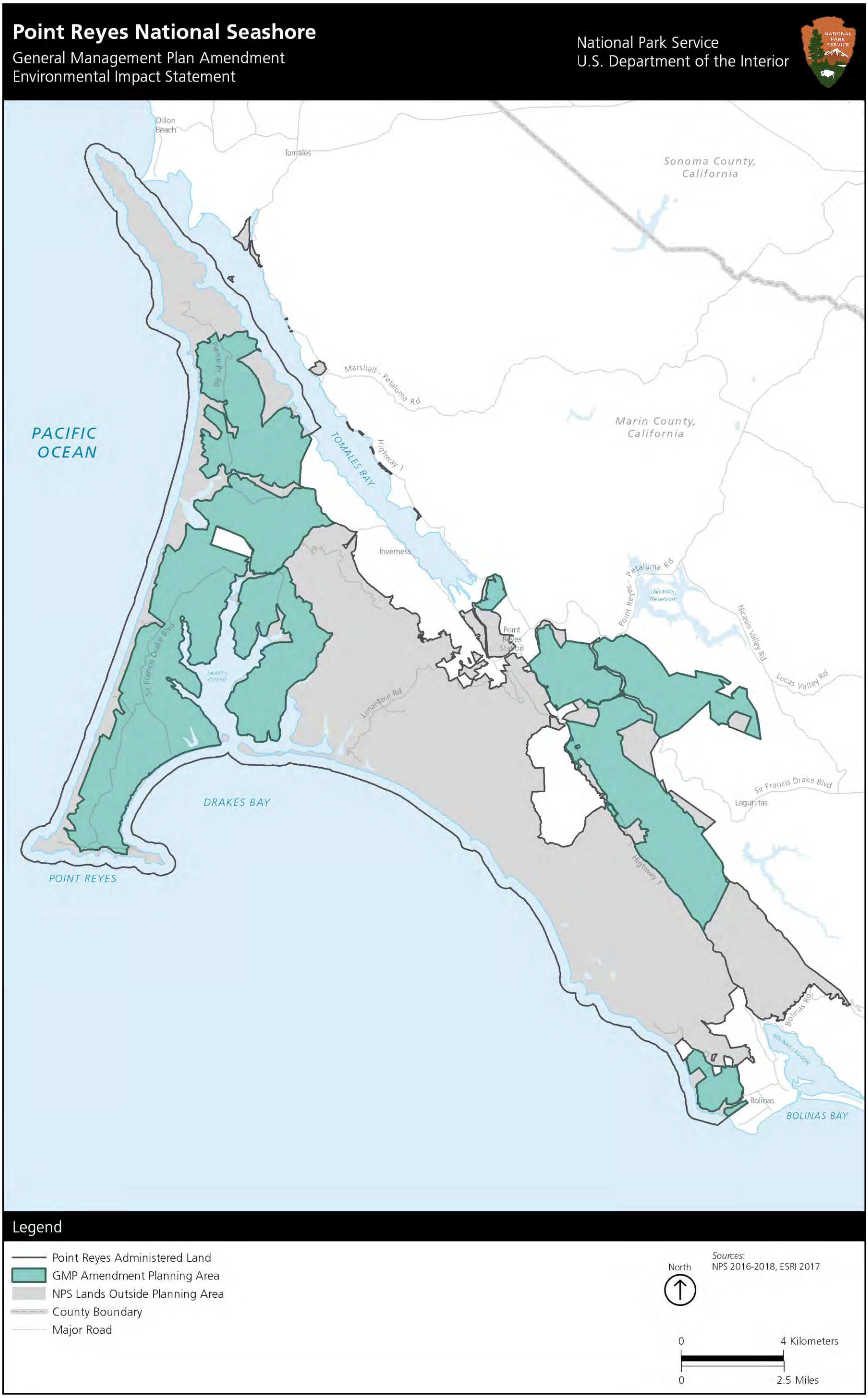


**FIGURE 1: PLANNING AREA**

# Point Reyes National Seashore

General Management Plan Amendment
Environmental Impact Statement

National Park Service
U.S. Department of the Interior

| Map ID | Ranch | Permit Acres |
|---|---|---|
| 1 | A Ranch (Dairy) | 838 |
| 2 | B Ranch (Dairy) | 1,257 |
| 3 | C Ranch/D Ranch (Dairy) | 850 |
| 4 | D Ranch Pasture B & C | 581 |
| 5 | E Ranch | 1,372 |
| 6 | F Ranch | 1,510 |
| 7 | ATT | 481 |
| 8 | G Ranch | 1,151 |
| 9 | D. Rogers Ranch | 382 |
| 10 | M Ranch | 1,178 |
| 11 | H Ranch | 1,099 |
| 12 | I Ranch (Dairy) | 1,076 |
| 13 | L Ranch (Dairy) | 1,126 |
| 14 | K Ranch | 566 |
| 15 | J Ranch/K Ranch (Dairy) | 1,134 |
| 16 | N Ranch | 924 |
| 17 | Home Ranch Developed Complex | 20 |
| 18 | Home Ranch | 2,660 |
| 19 | Martinelli Ranch | 259 |
| 20 | Genazzi Ranch | 436 |
| 21 | E. Gallagher Ranch | 320 |
| 22 | McFadden Ranch | 335 |
| 23 | C. Rogers Ranch | 229 |
| 24 | Zanardi Ranch | 404 |
| 25 | McIsaac Ranch | 1,403 |
| 26 | Cheda Ranch | 808 |
| 27 | Percy Ranch/Percy ROP * | 687 |
| 28 | Stewart Ranch/Lupton/Truttman | 2,188 |
| 29 | Stewart Ranch Developed Complex | 18 |
| 30 | R. Giacomini Ranch | 1,858 |
| 31 | Commonweal/Niman ROP* | 781 |

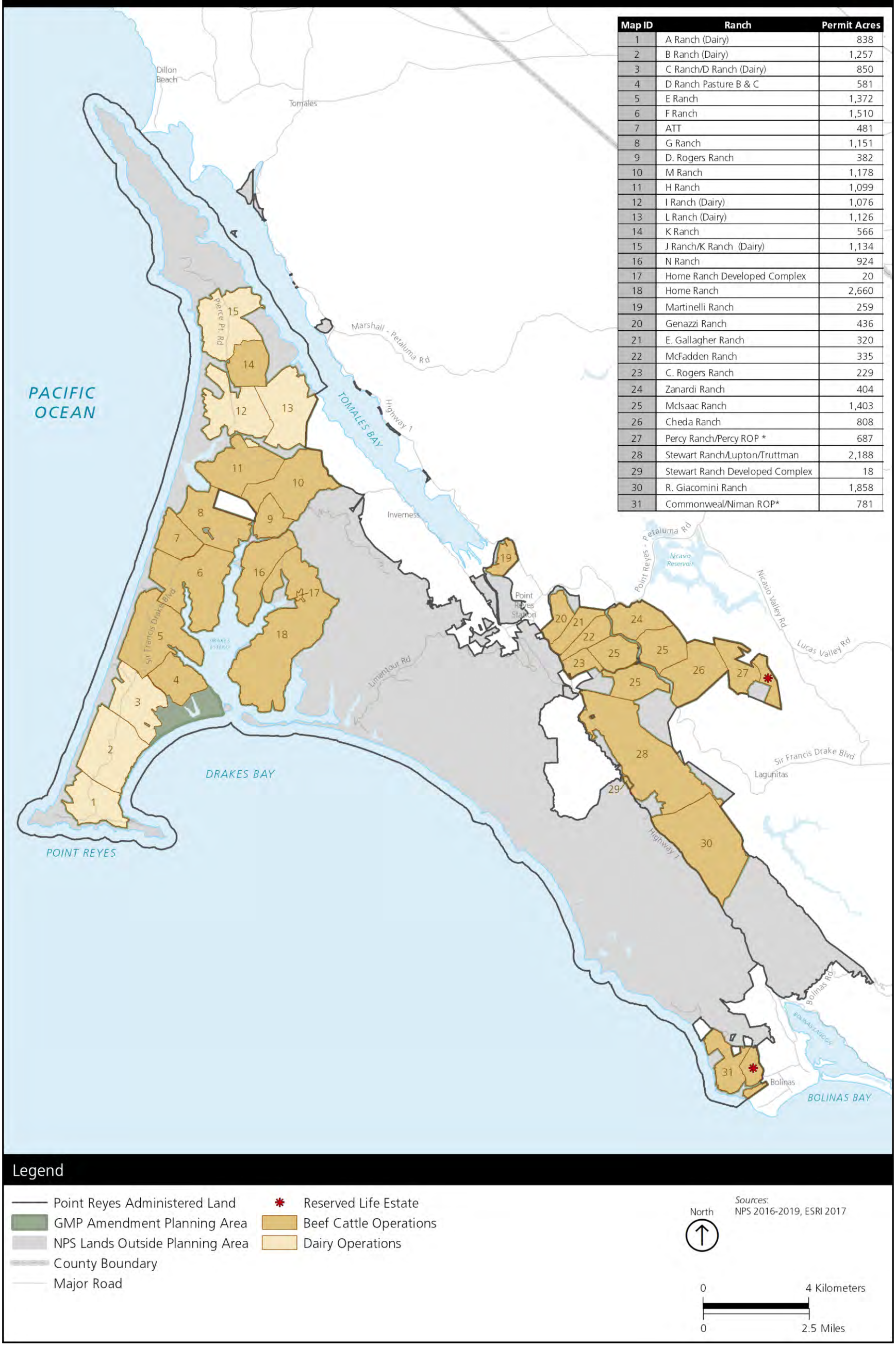


**FIGURE 3: RANCH KEY MAP**

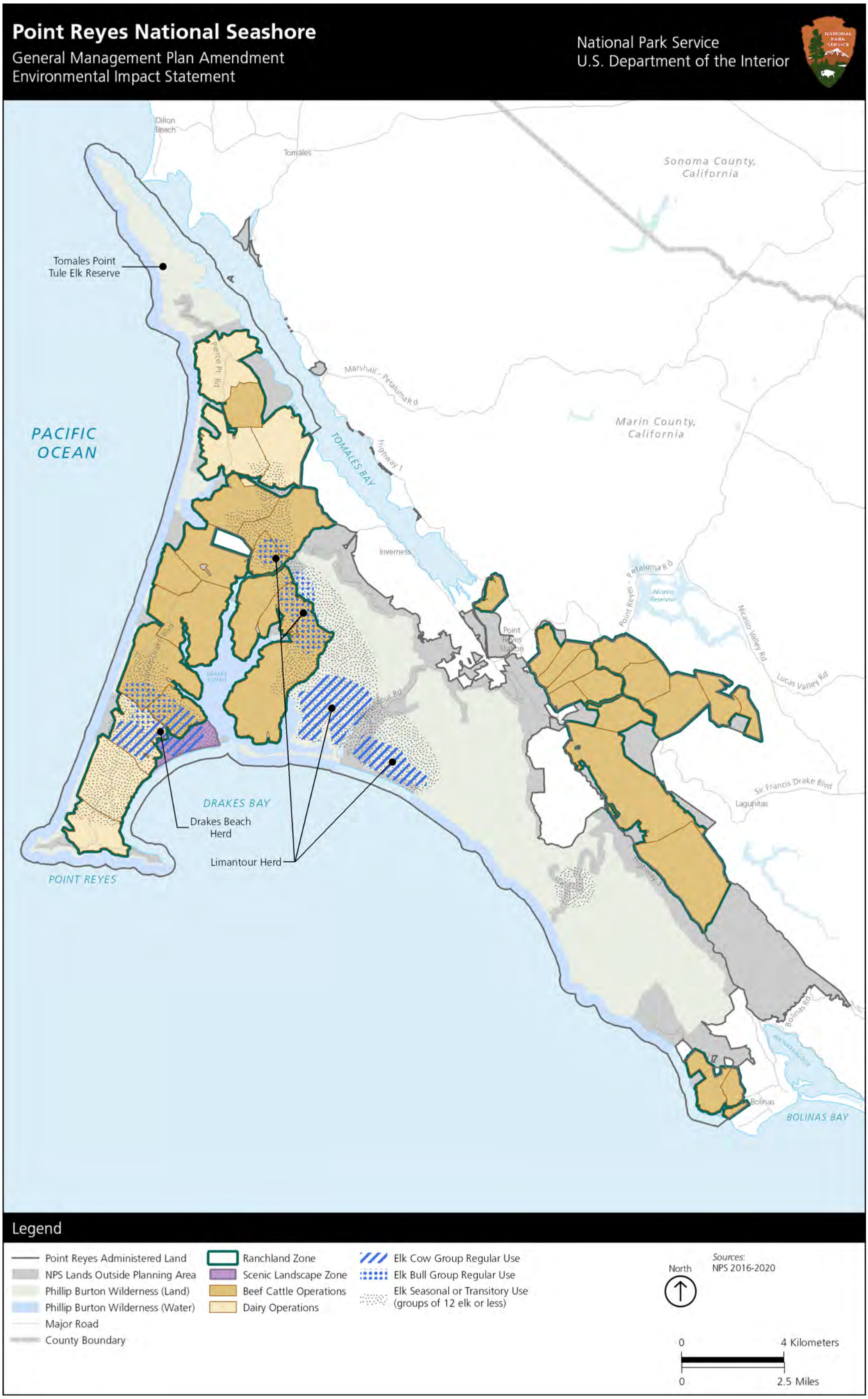


**FIGURE 2: TULE ELK RANGE IN POINT REYES**

**Point Reyes National Seashore**
General Management Plan Amendment
Environmental Impact Statement

National Park Service
U.S. Department of the Interior

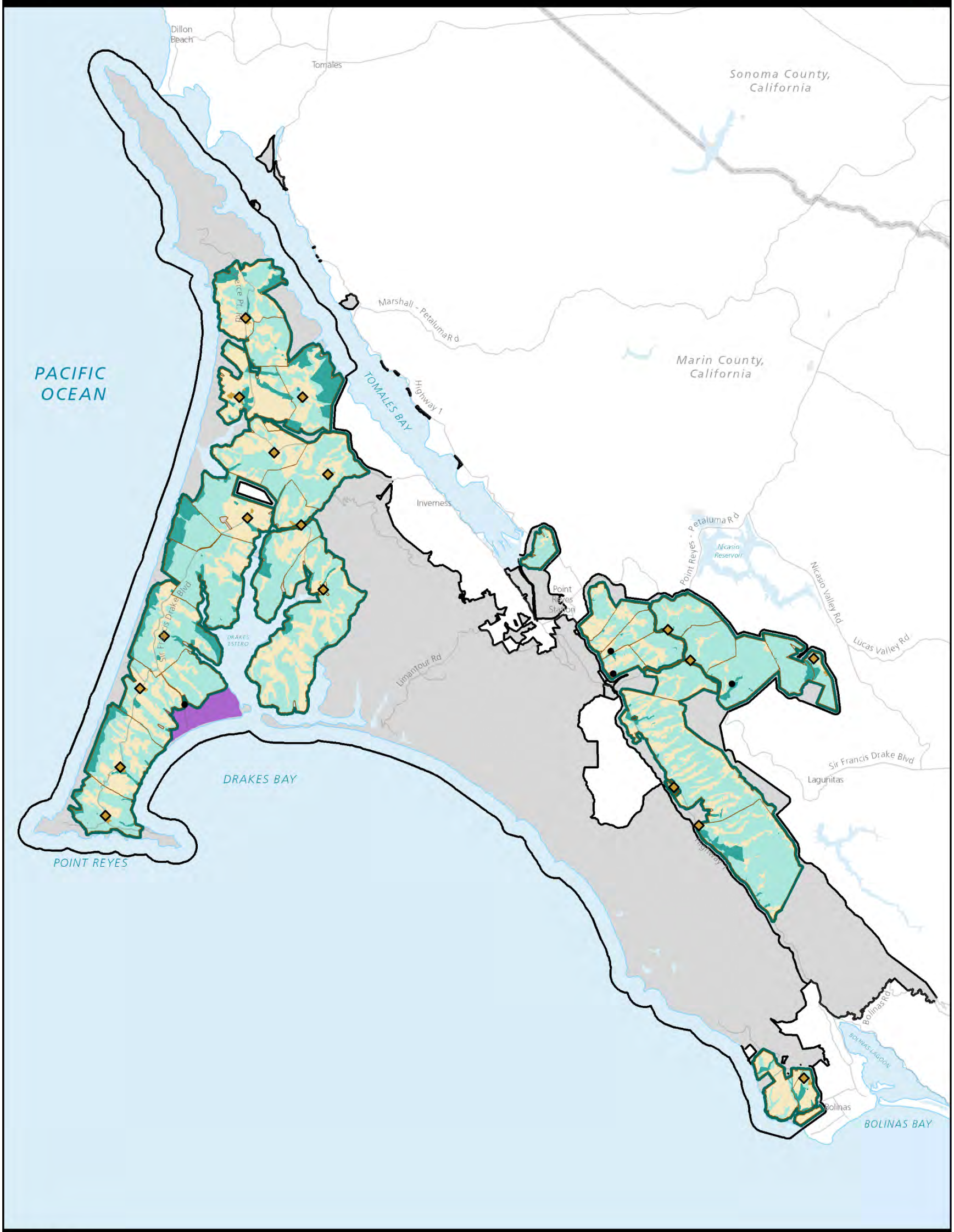


**FIGURE 7: ALTERNATIVE B ZONING MAP**

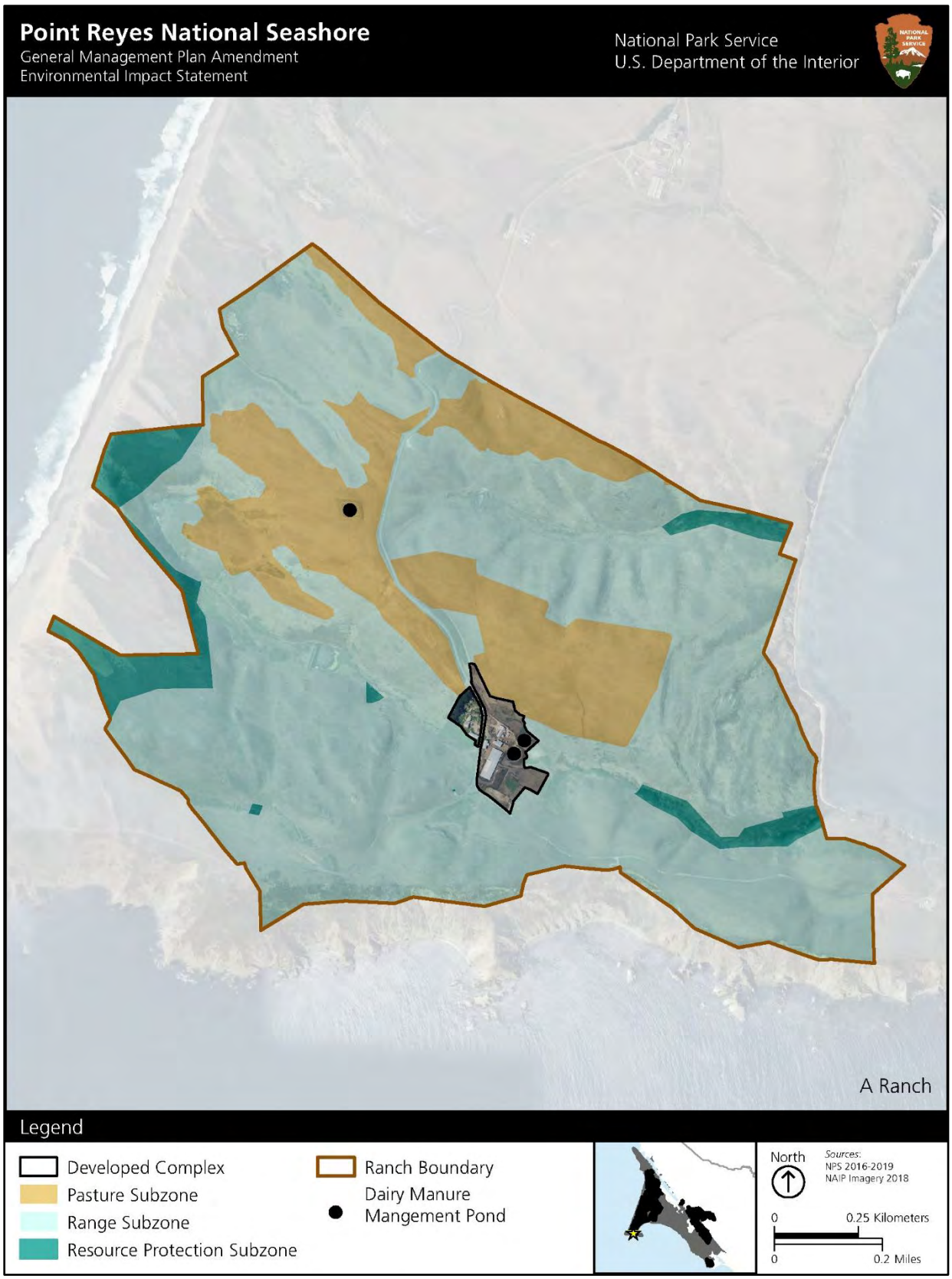


**FIGURE 9: A RANCH ZONING MAP**


**FIGURE 10: B RANCH ZONING MAP**

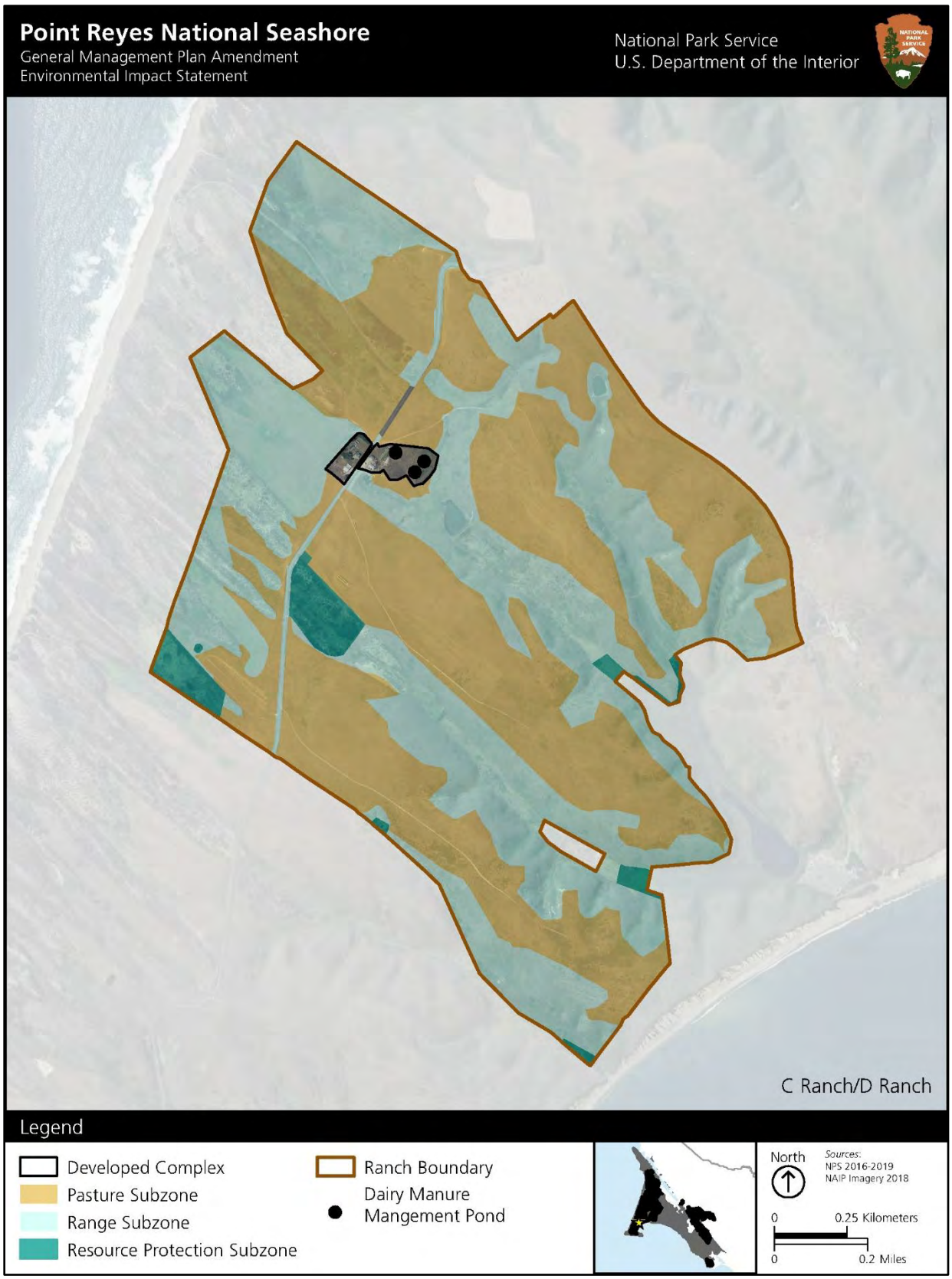


**FIGURE 11: C RANCH/D RANCH ZONING MAP**

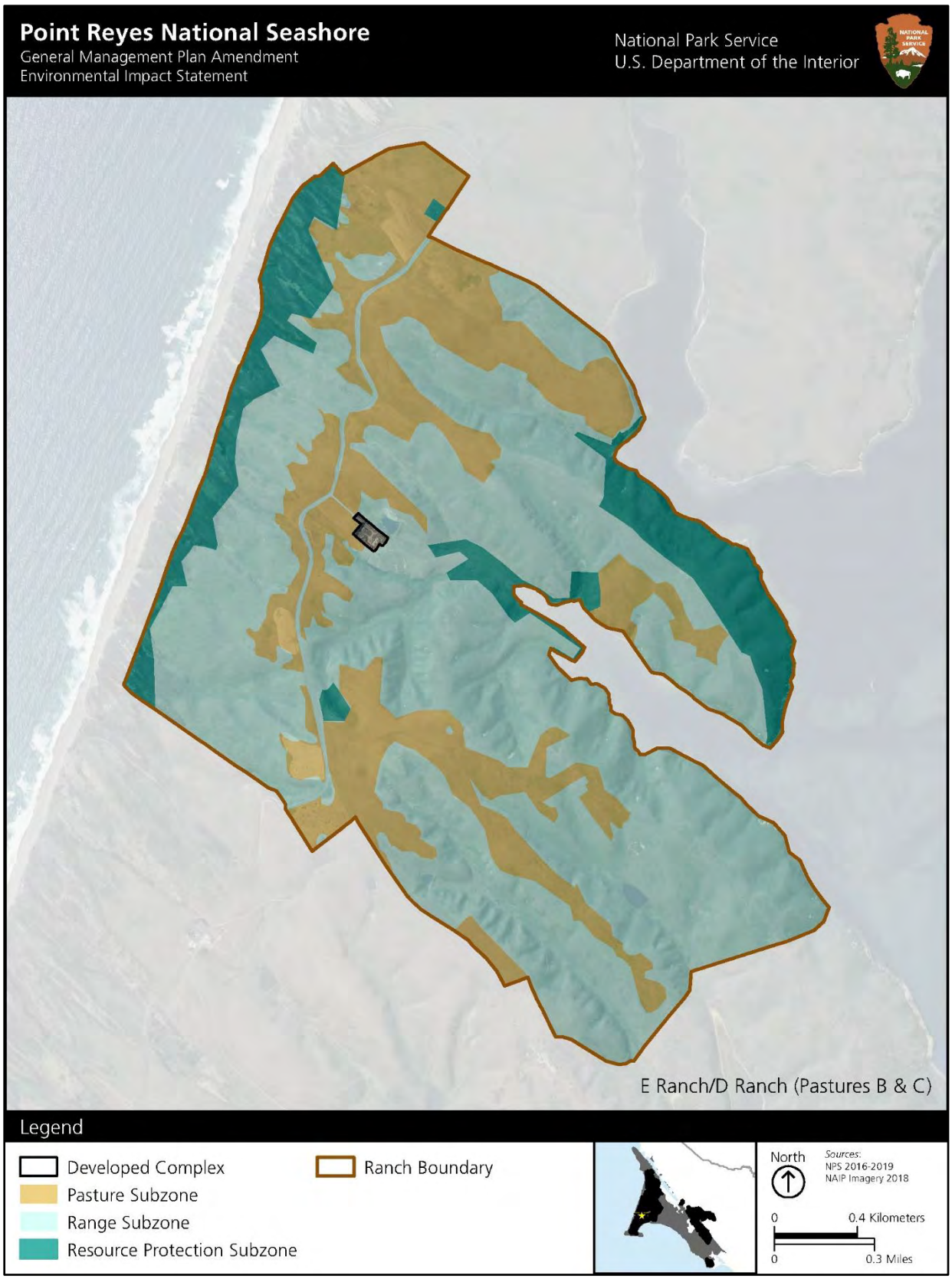


**FIGURE 12: E RANCH AND PASTURE B & C OF D RANCH ZONING MAP**

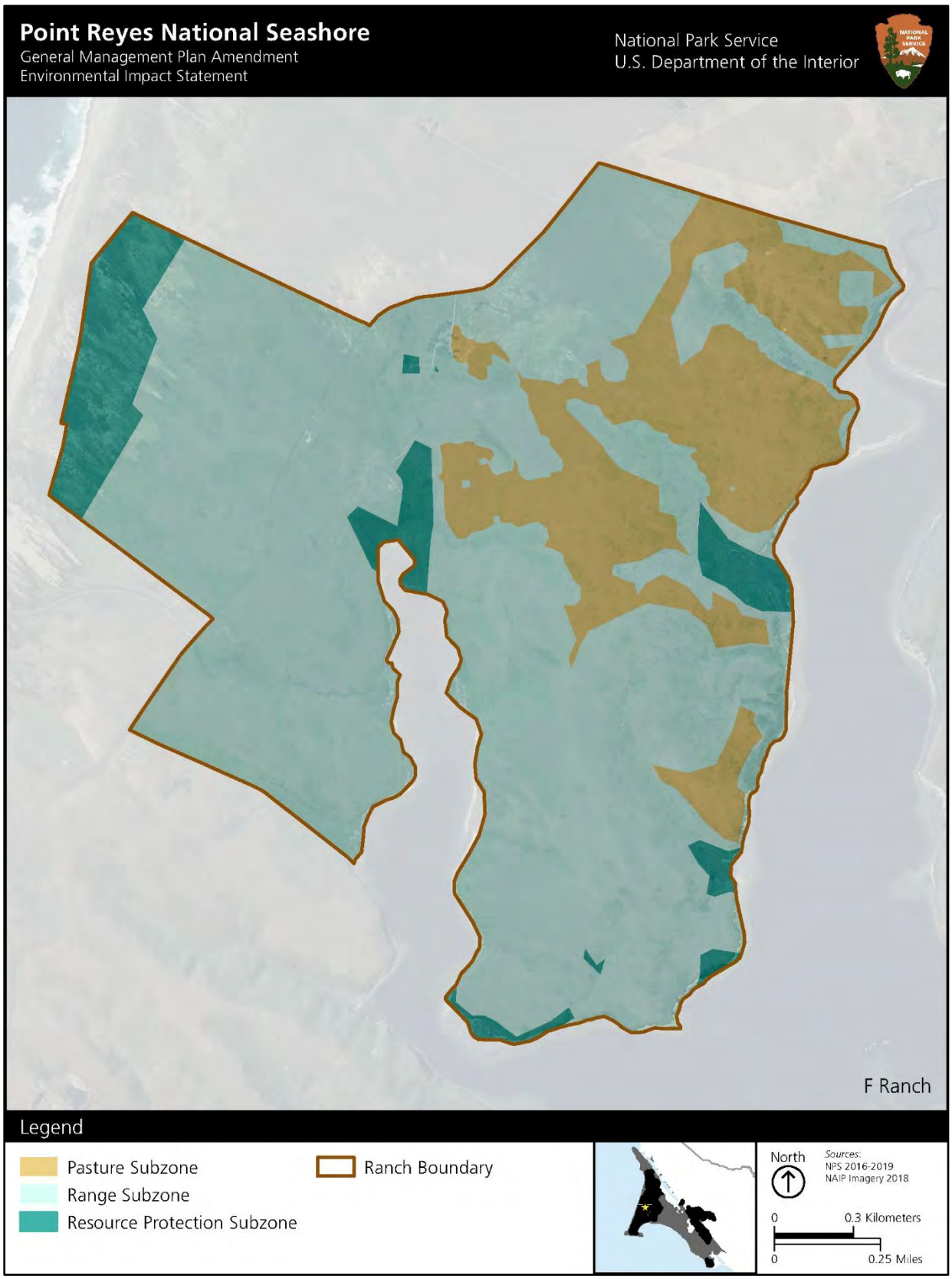


**FIGURE 13: F RANCH ZONING MAP**

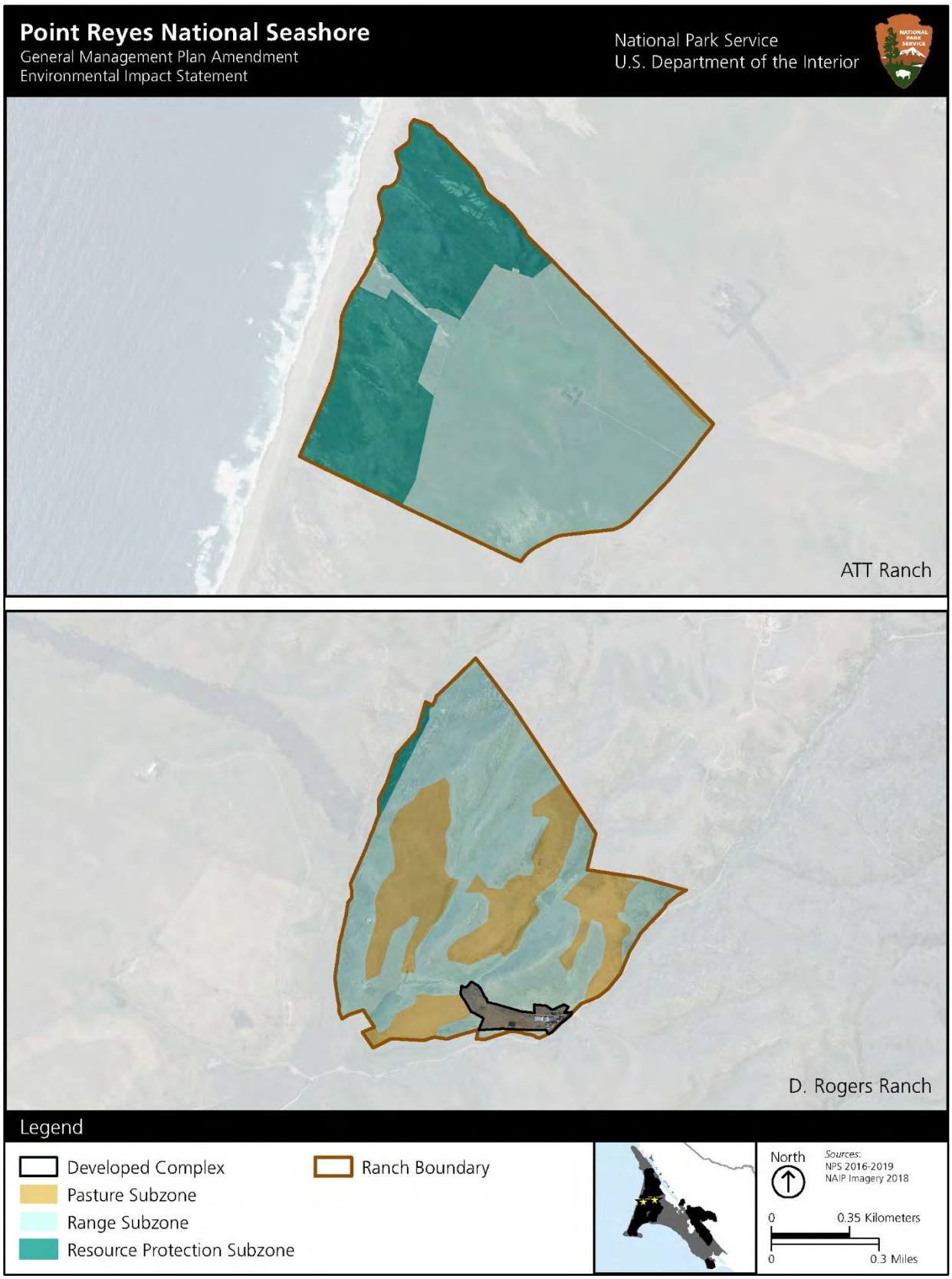


**FIGURE 14: ATT RANCH/D. ROGERS RANCH ZONING MAP**


**FIGURE 15: G RANCH ZONING MAP**

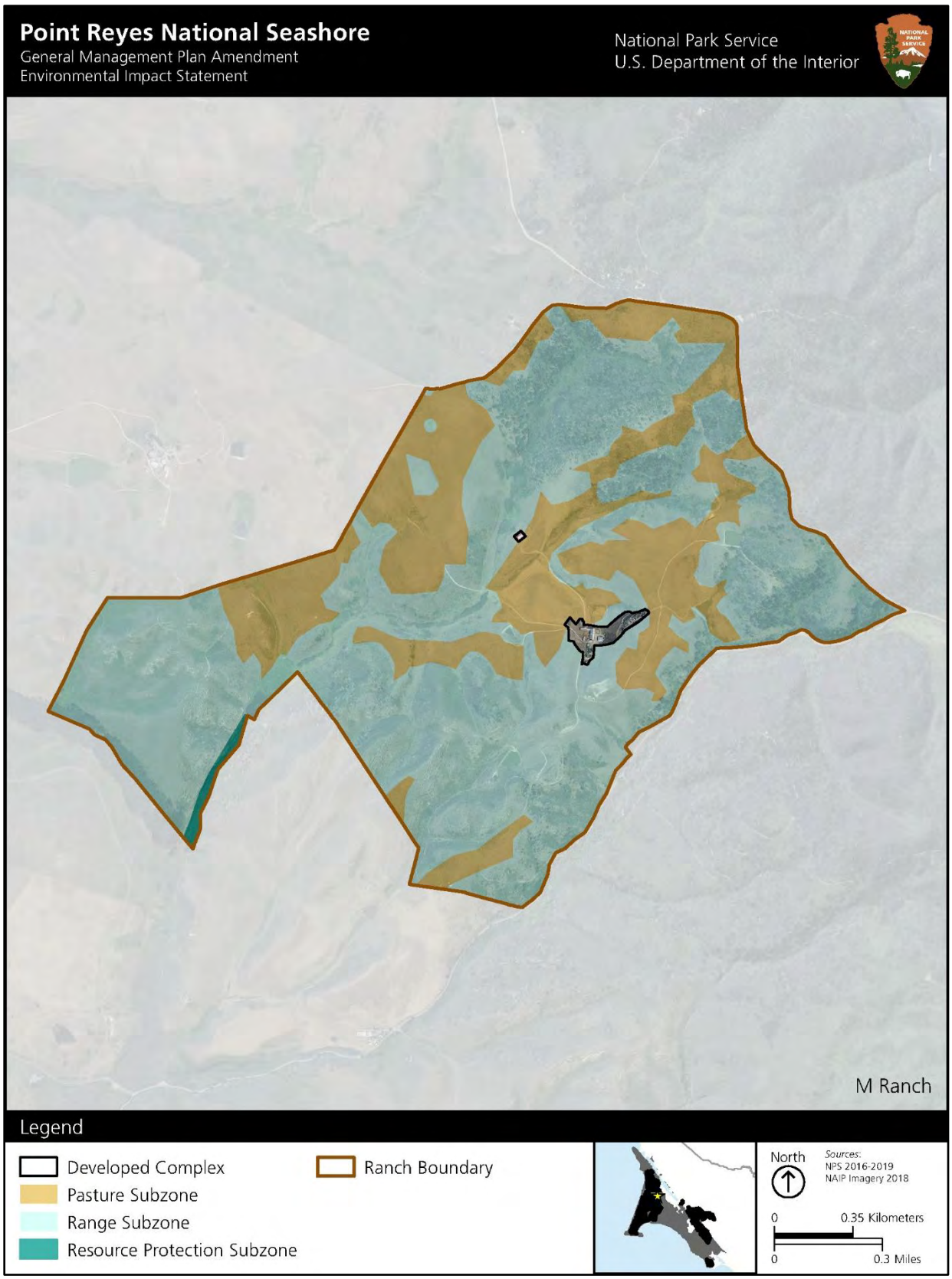


**FIGURE 16: M RANCH ZONING MAP**

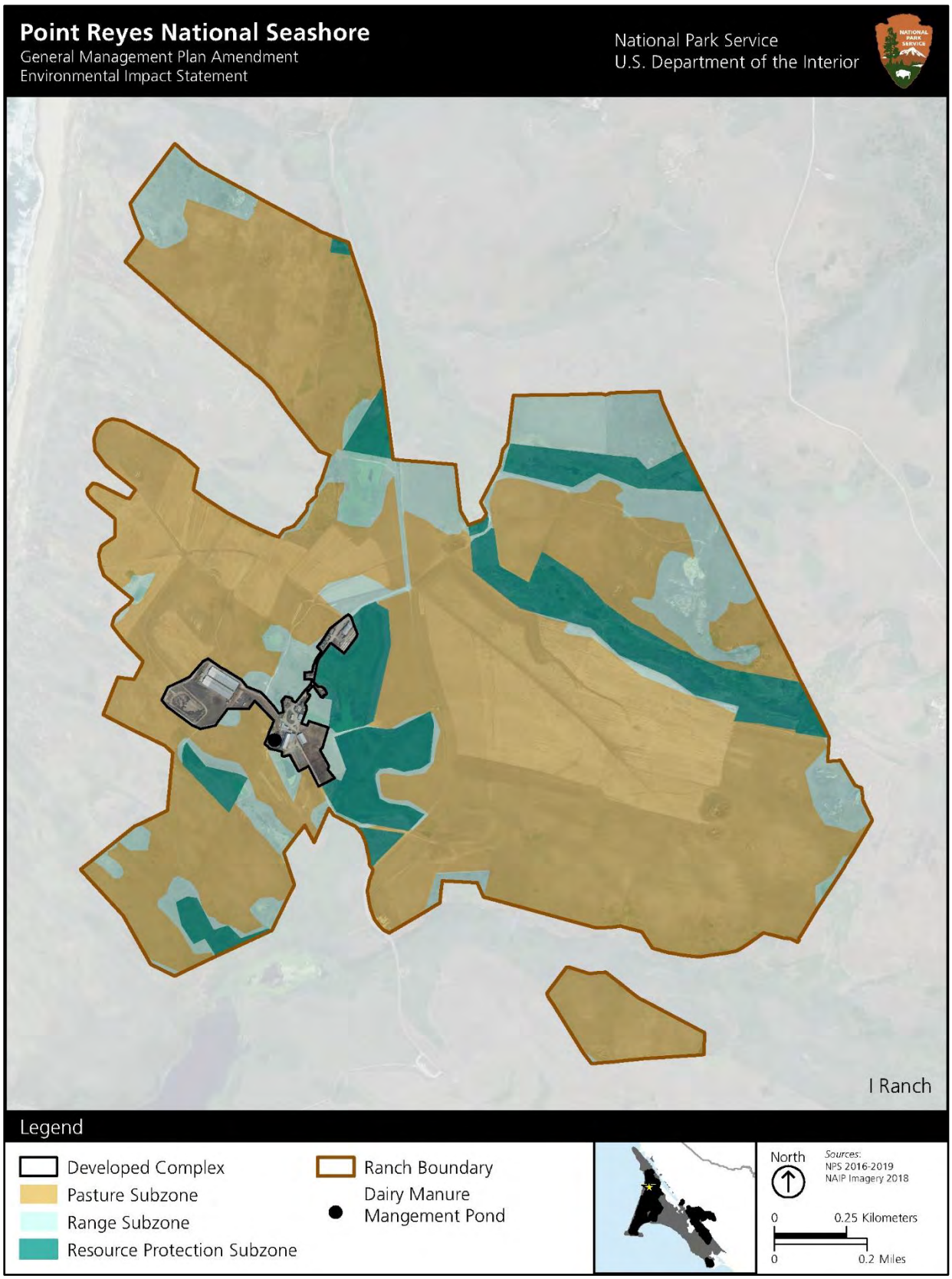


**FIGURE 17: I RANCH ZONING MAP**


**FIGURE 18: H RANCH/K RANCH ZONING MAP**

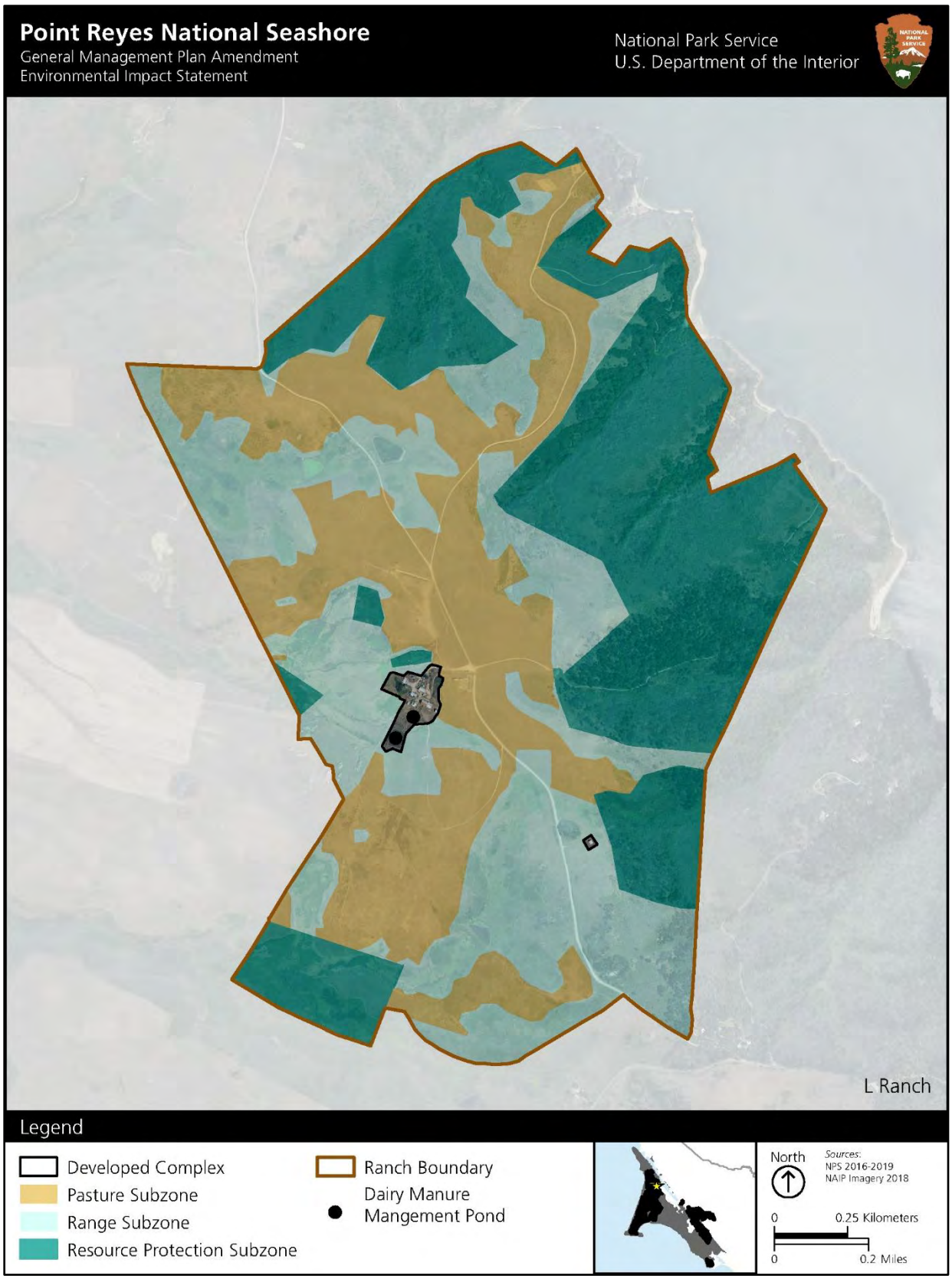


**FIGURE 19: L RANCH ZONING MAP**

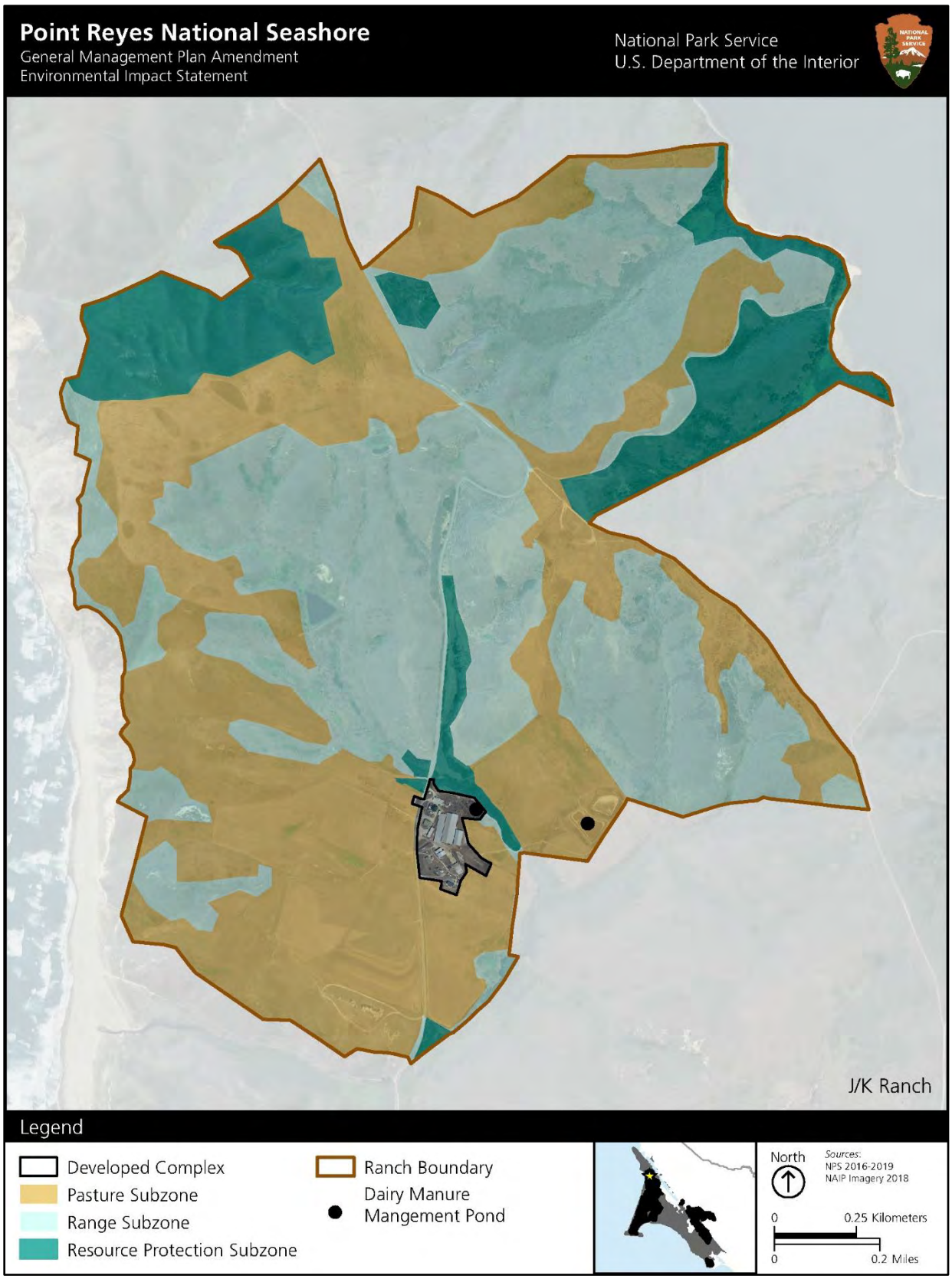


**FIGURE 20: J/K RANCH ZONING MAP**


**FIGURE 21: N RANCH/HOME RANCH ZONING MAP**

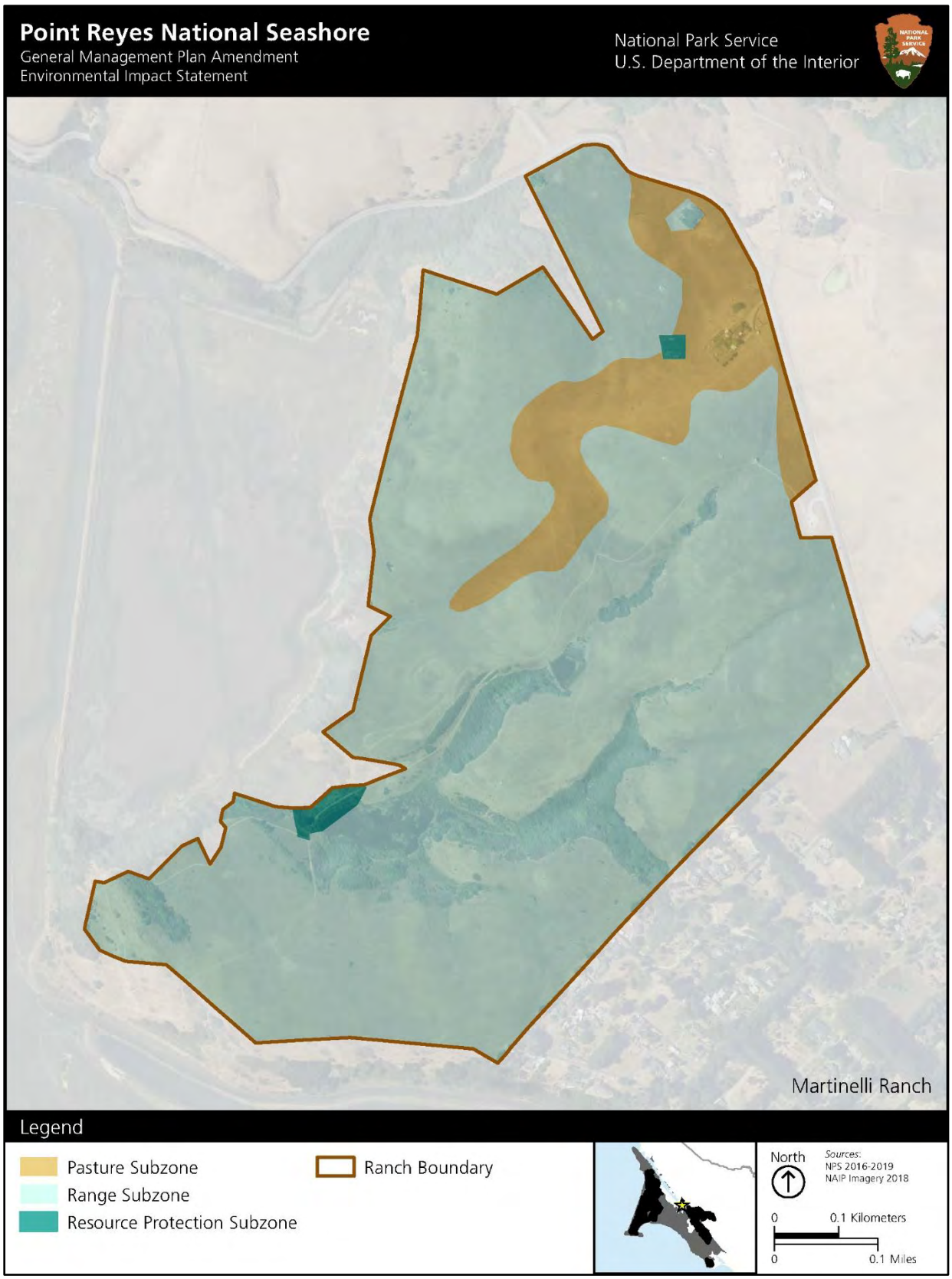


**FIGURE 22: MARTINELLI RANCH ZONING MAP**


**FIGURE 23: GENAZZI RANCH ZONING MAP**

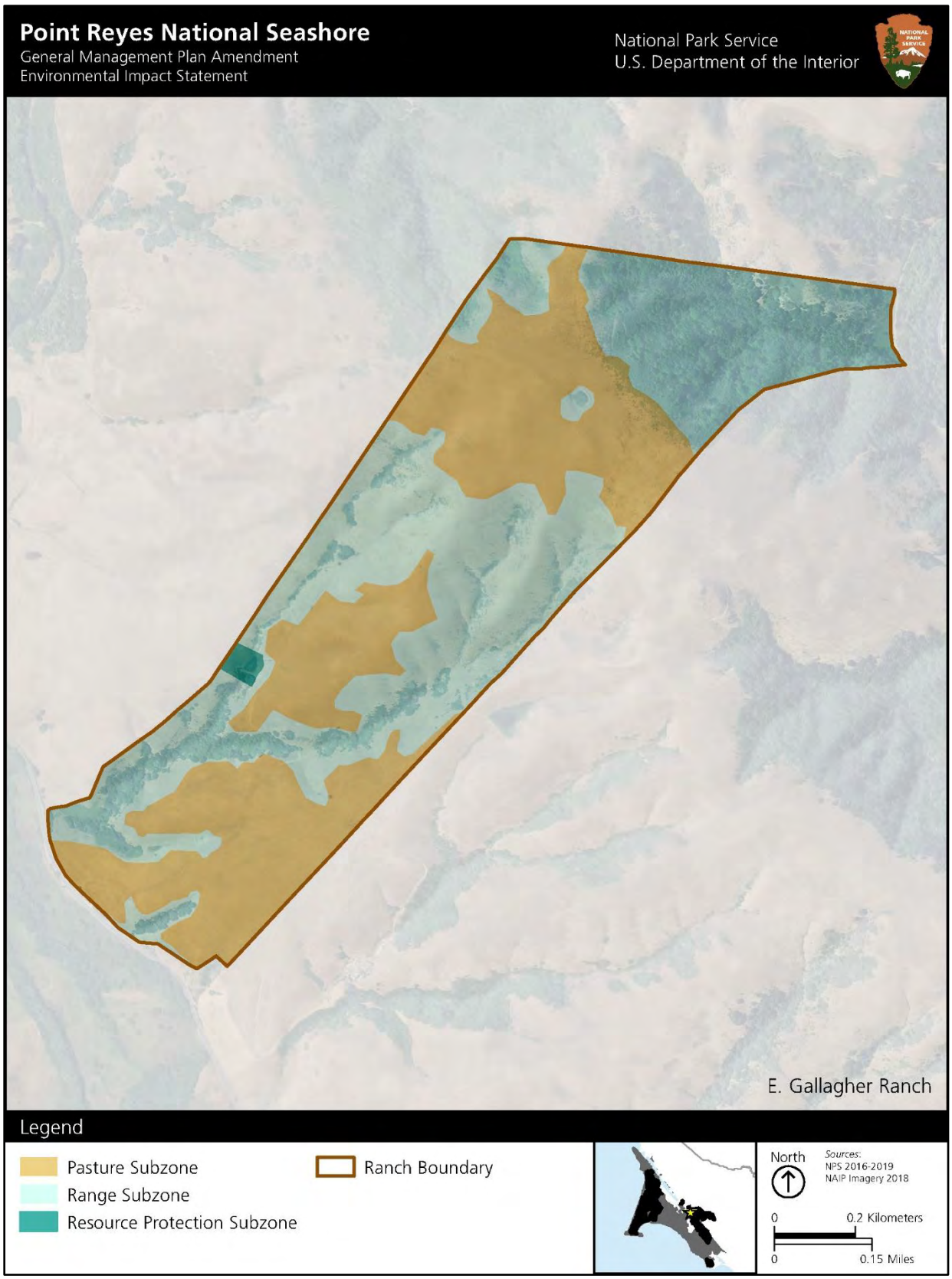


**FIGURE 24: E. GALLAGHER RANCH ZONING MAP**


**FIGURE 25: MCFADDEN RANCH ZONING MAP**

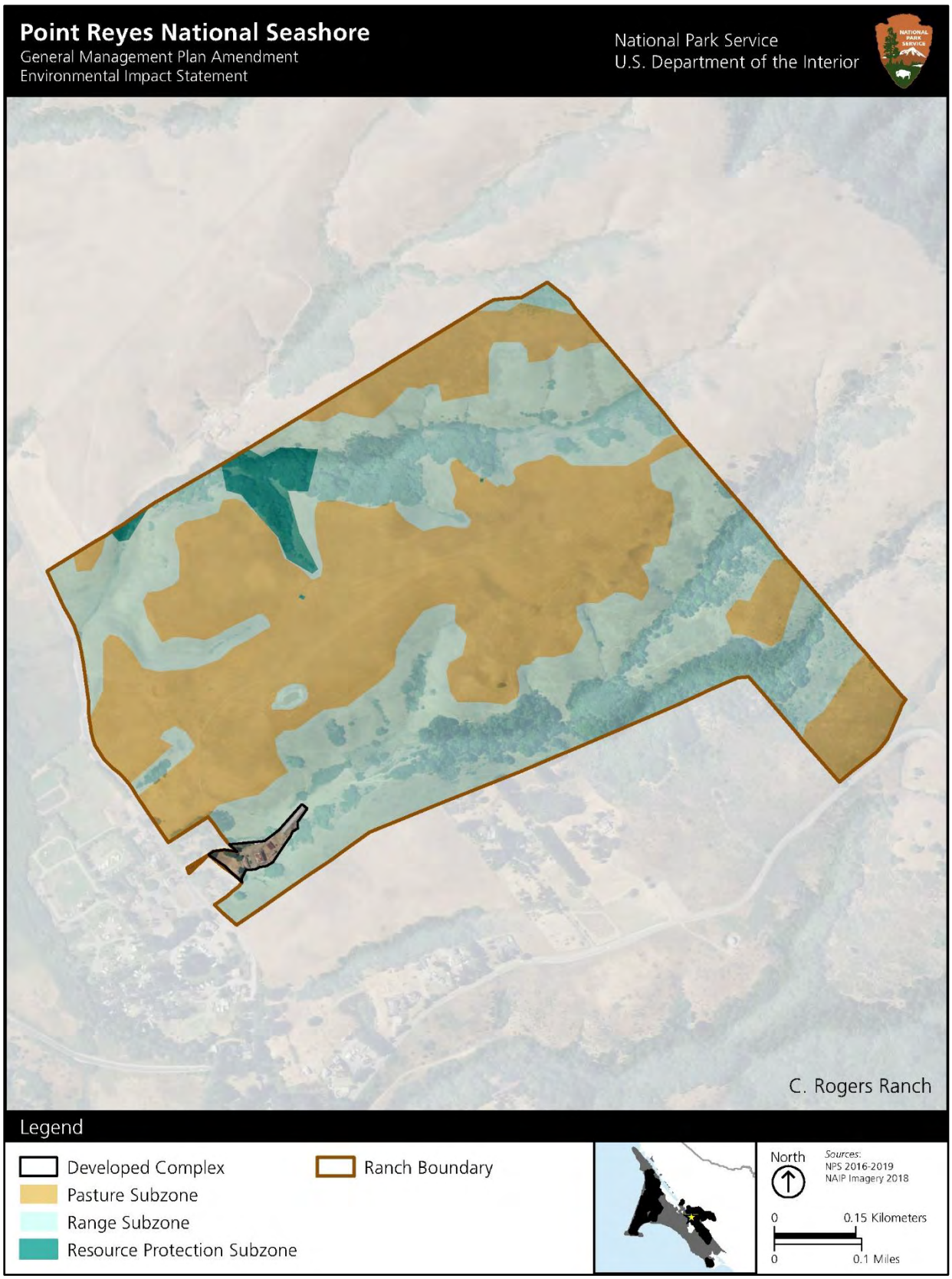


**FIGURE 26: C. ROGERS RANCH ZONING MAP**

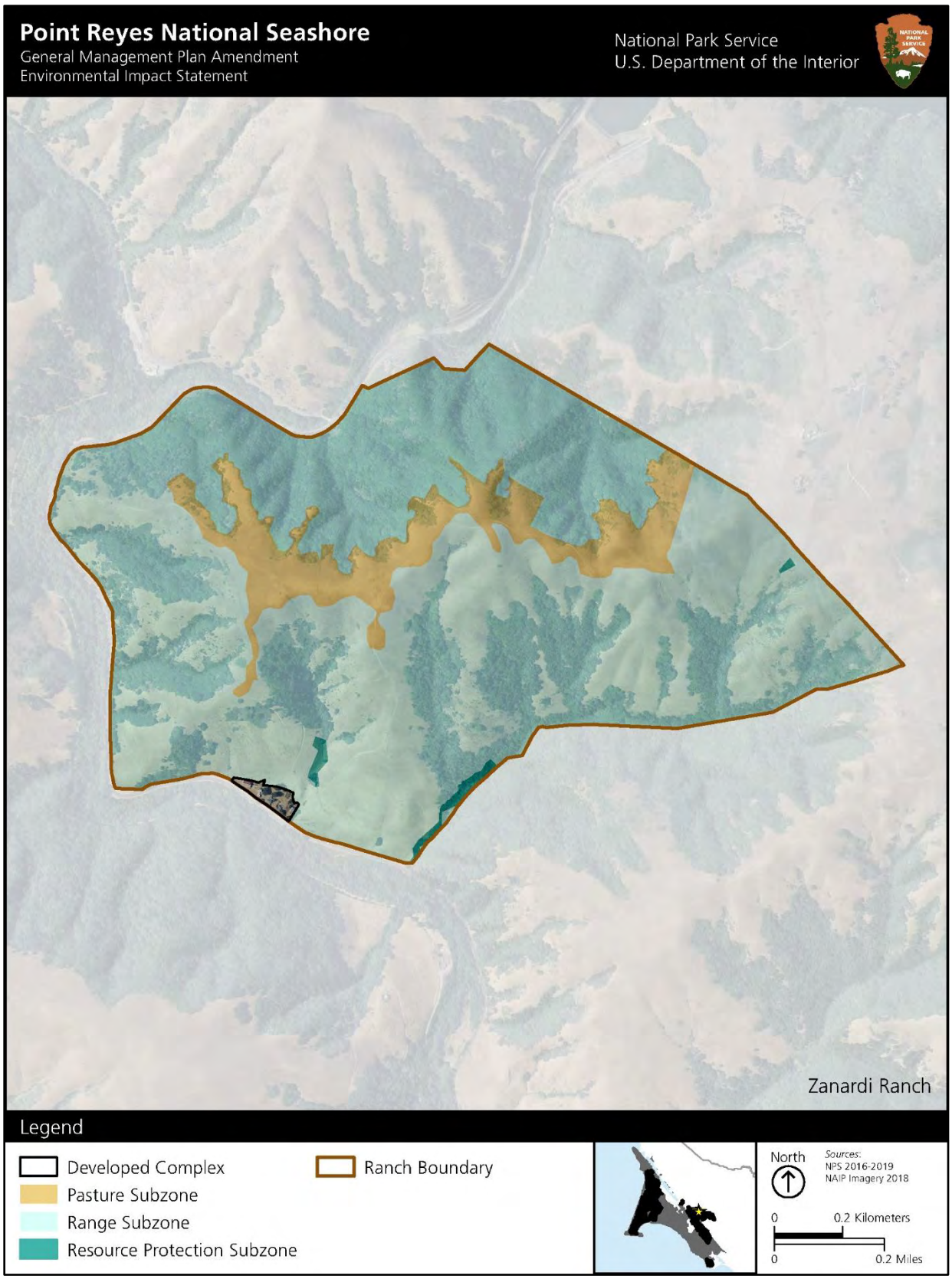


**FIGURE 27: ZANARDI RANCH ZONING MAP**

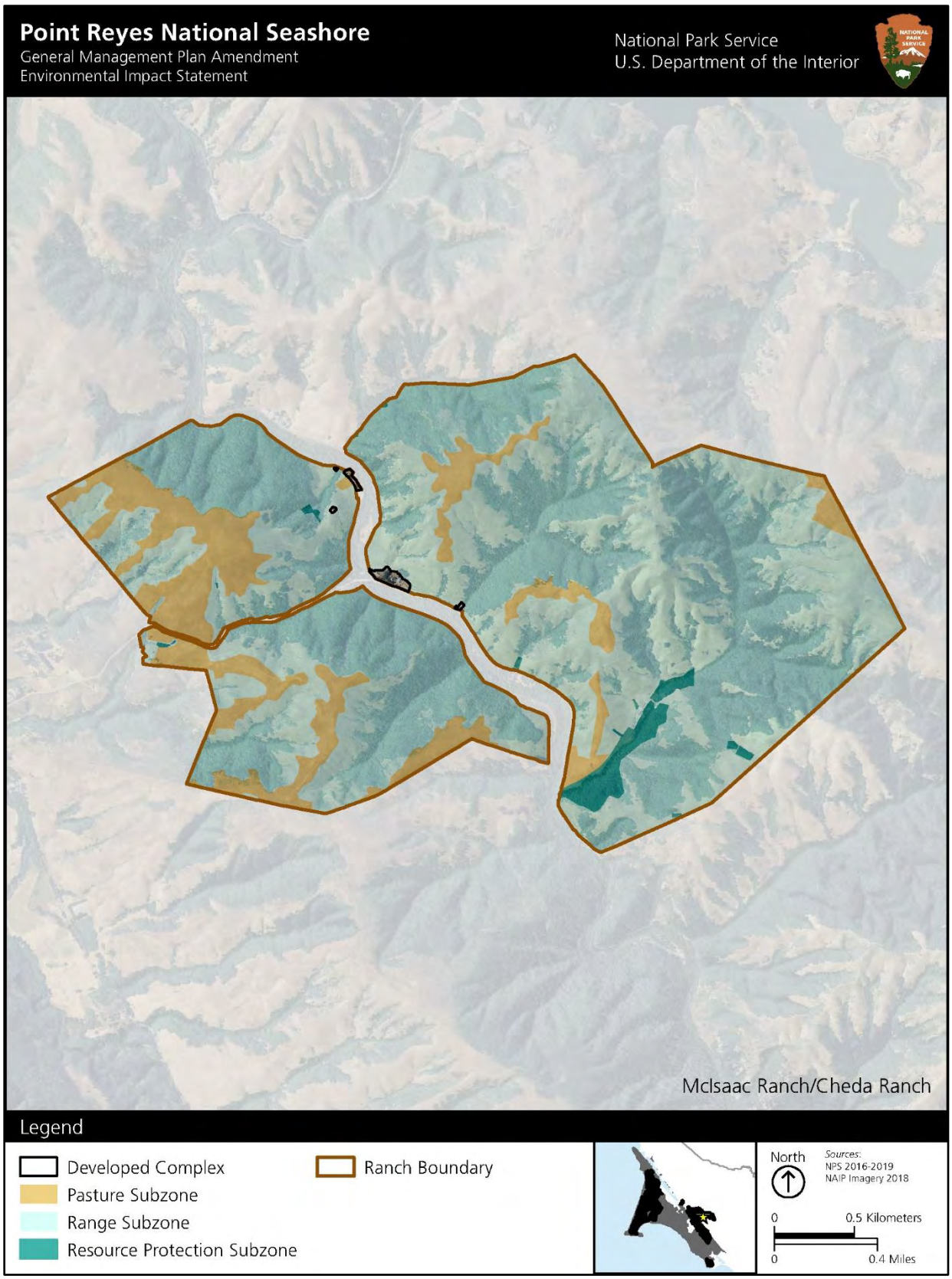


**FIGURE 28: MCISAAC RANCH/CHEDA RANCH ZONING MAP**

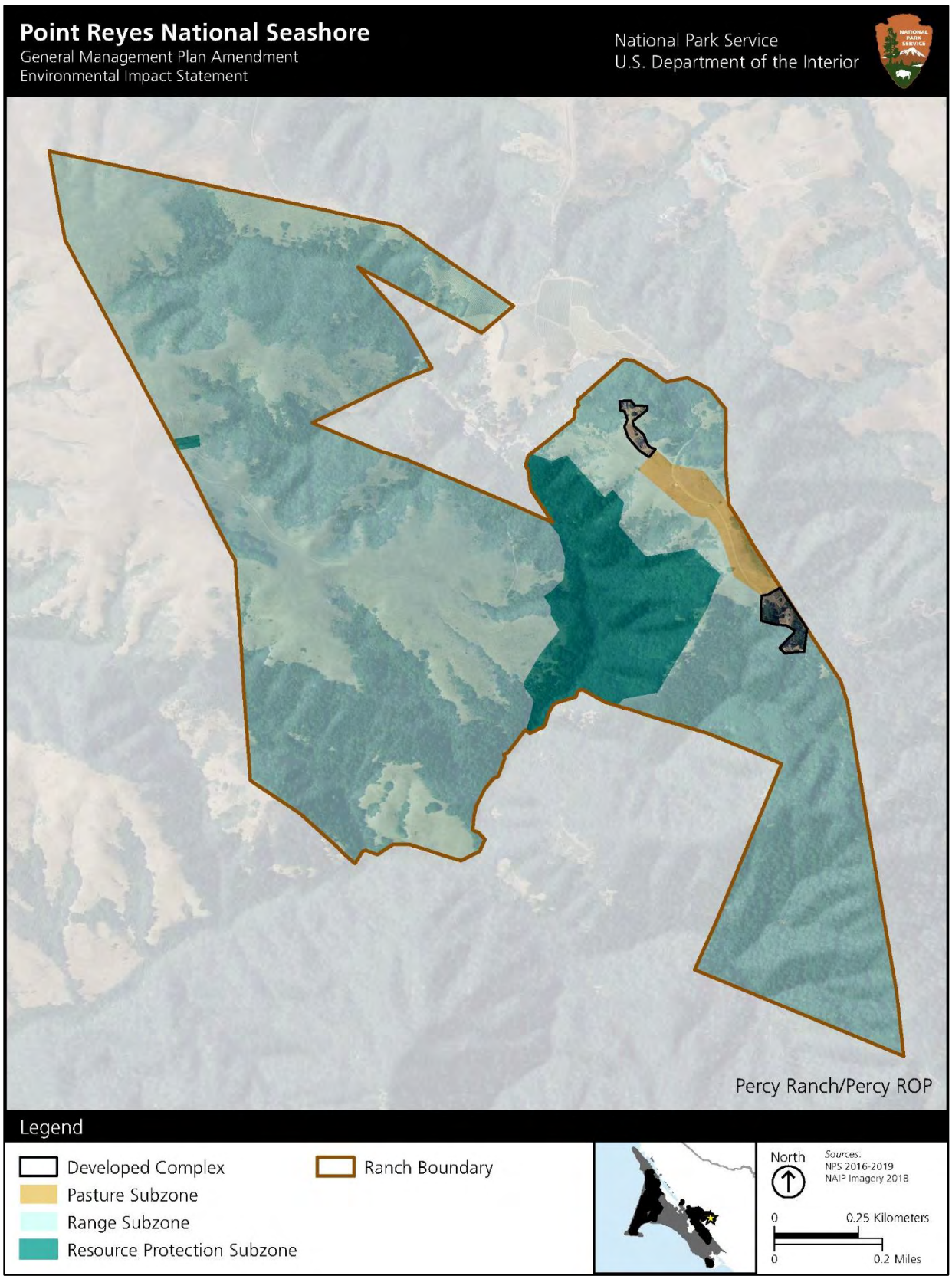


**FIGURE 29: PERCY RANCH/PERCY ROP ZONING MAP**


**FIGURE 30: STEWART RANCH/LUPTON/TRUTTMAN ZONING MAP**

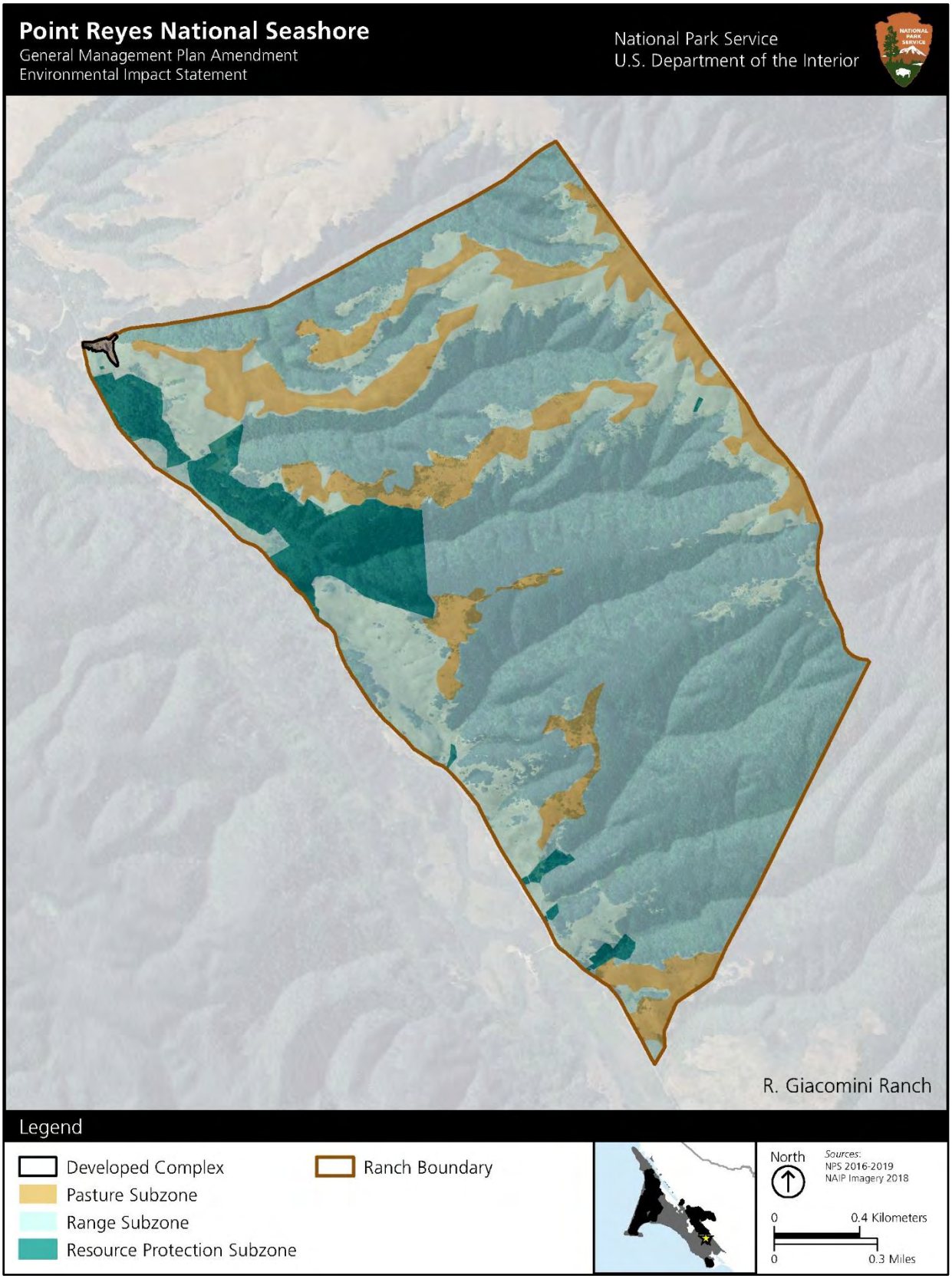


**FIGURE 31: R. GIACOMINI RANCH ZONING MAP**

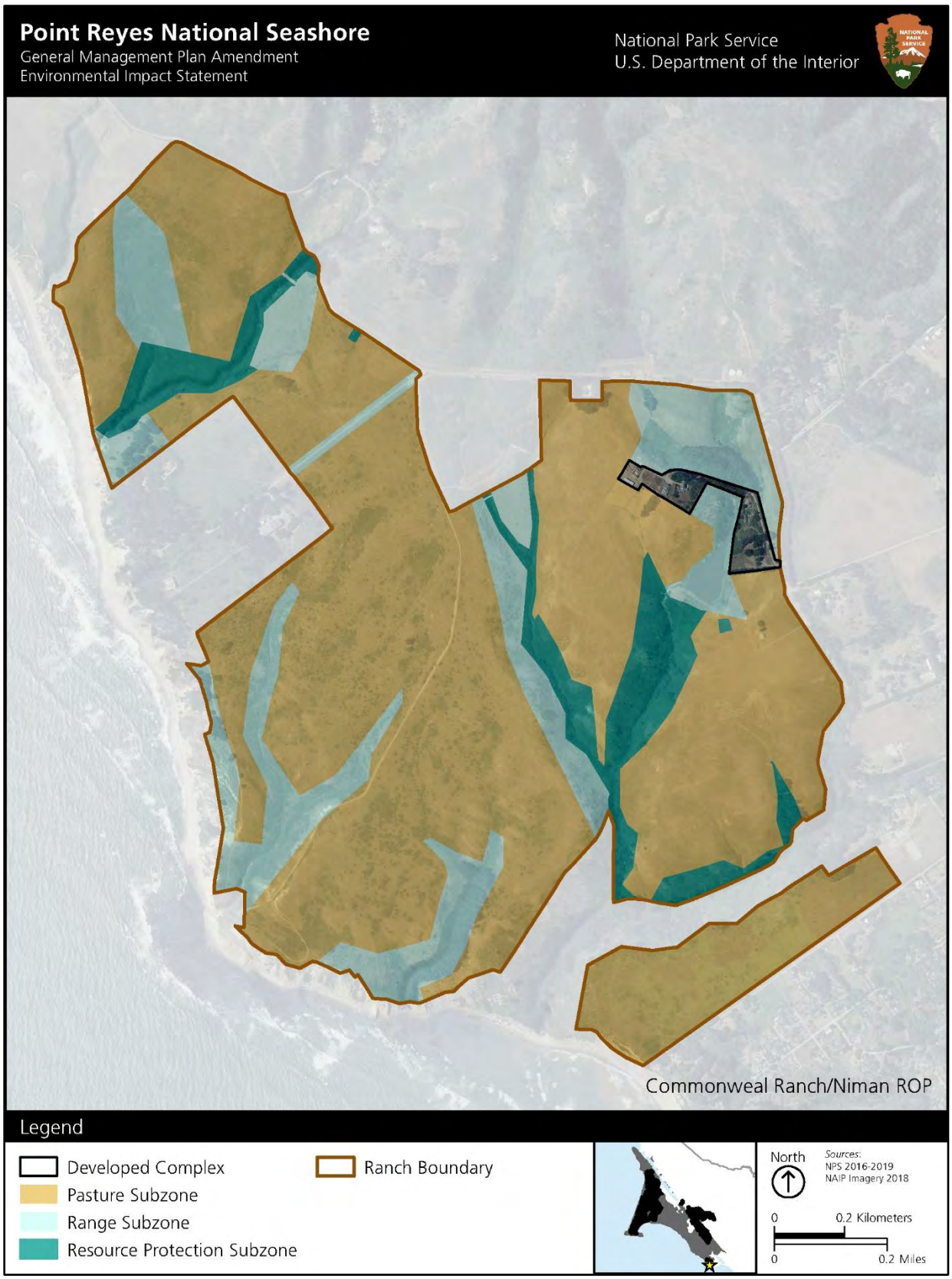


**FIGURE 32: COMMONWEAL RANCH/NIMAN ROP ZONING MAP**

# APPENDIX F: MANAGEMENT ACTIVITIES, PRACTICE STANDARDS AND MITIGATION MEASURES

## Introduction

The environmental impact statement (EIS) contains several tiers of National Park Service (NPS) oversight to ensure natural and cultural resources are protected while allowing ranching to occur in Point Reyes National Seashore (Point Reyes) and the north district of Golden Gate National Recreation Area (collectively referred to as the park). First, the agricultural lease/special use permits (lease/permits) would constitute the overall authorization for ranch families to operate on park lands, including general terms and conditions, commitments, and standards for ranching operations. Items addressed by lease/permit general terms and conditions include tree and vegetation removal; ground disturbance; use of hazardous materials; pesticides and herbicides; the treatment of livestock; management of refuse and carcasses; and protection of wildlife, plants, and water quality. Second, the subzoning framework would ensure resource protection by identifying the most appropriate locations on each ranch for grazing and Management Activities. Third, each lease/permit would require ranchers to enter into a ranch operating agreement (ROA), identifying ranch-specific operational details and requirements associated with beef or dairy ranching (as applicable), authorized diversification activities, and maintenance requirements. The ROA would also identify Management Activities, required United States Department of Agriculture-Natural Resource Conservation Service (NRCS) Conservation Practice Standards (Practice Standards), and mitigation measures that apply to the authorized activities that are outlined in this appendix.

This appendix was adapted from numerous compliance documents, including established guidance from the NRCS, the Marin Resource Conservation District Permit Coordination Program (which was established to streamline permitting for many of the Activity Types listed herein), as well as previous NPS National Environmental Policy Act (NEPA) compliance for projects, and biological opinions from the US Fish and Wildlife Service (USFWS) and National Marine Fisheries Service (NMFS).

To ensure protection of natural and cultural resources, streamline the permitting process for typical ranch maintenance activities, and provide consistent guidance to ranchers, this appendix outlines standardized Management Activities, Practice Standards, and required mitigation measures that will be permitted on ranches. Consistent with the EIS process, certain Practice Standards or Management Activities may be authorized only in specific subzones. The subzoning framework that designates ranchlands as Resource Protection, Range, Pasture, and Ranch Core subzones is based on analysis of topography and existing sensitive resource information. The Resource Protection and Range subzones generally contain known sensitive resources and/or slopes greater than 20%; activities in these subzones would be the most limited.

To ensure additional protection of wildlife and livestock, the following requirements would also apply to all livestock management and would be included as conditions in the ROA or the lease/permit:

- Dead livestock shall immediately be removed from the park and disposed of in accordance with all applicable laws.
- Wildlife access to feed, organic wastes (including afterbirths and stillborn animals), and ranch-related and household trash shall be restricted using structural controls, and these items shall be promptly removed from areas where wildlife access cannot be controlled.
- Feeding livestock shall be conducted in a manner that discourages or precludes wildlife (including raven) access to feed (e.g., use of covered feed bunks).
- In the Ranch Core, use fencing that will deter wildlife from digging under or climbing over, such as multiple strand electric.
- Where appropriate, young livestock (e.g., calves, lambs, and kids) shall be confined for approximately two weeks following birth.

- Where appropriate, recently castrated/branded/docked animals shall be kept in an area close to the Ranch Core for a time to allow healing before putting them out to pasture/rangeland because wounds create odors that attract wildlife.
- All ranchers are required to provide NPS with documentation that livestock are under veterinary care. Any disease detected must be reported to NPS.

The Management Activities described in table F-1 are analyzed in the EIS for a general management plan amendment (GMP Amendment) for the park. They are intended to guide planning, implementation, and operation and maintenance for ranches. Specific mitigation measures, listed in tables F-11 through F-13 by NRCS Practice Standard (presented at the end of this appendix), would limit potential impacts on sensitive resources. The mitigation measures were developed to provide a level of impact avoidance and minimization for all Management Activities and are mandatory when implementing any of the activities. The NRCS Practice Standards are designed to address the treatment of natural resource concerns. They are technical guidelines that contain information on the intended purpose and location where the practice may be applied, specifying the minimum quality criteria that must be met during the application or installation of the practice. Specific design requirements, avoidance measures, and mitigation measures that apply to all Activity Types are listed first. In addition, all Management Activities must fit within their individual maximum size limits; individual activities or projects that exceed the maximum limits do not qualify for coverage through the EIS. A *project* entails the establishment of any new Management Activity associated with one or more Practice Standards not in effect on a given ranch. Each project may constitute implementation of one or more Management Activities listed below (see table F-1). For example, a road upgrade project to address erosion from a ranch road could require use of Practice Standards for planning and installation of (1) an Access Road with (2) a Lined Waterway that would carry excess upland surface runoff to (3) a Structure for Water Control (e.g., a culvert). One project would comprise these three practices for the Road Upgrade Management Activity. Recurring Management Activities (e.g., annual mowing) would not be counted as new individual projects once established.

Unless noted in tables F-11 through F-13, the lessee is responsible for ensuring all mitigation measures are carried out for any Management Activity, including monitoring for compliance with the conditions herein for any contracted work. In the case that a third party (e.g., Marin Resource Conservation District) or NPS is the lead manager of the project, then the designated lead project manager would be responsible for ensuring mitigation measures are carried out. NPS would monitor recurring activities on each ranch to ensure mitigations are being met as defined through the ROA for that ranch once the activities are established. NPS would provide oversight and require a pre-construction meeting to review all applicable mitigation measures prior to the start of any new construction project or Management Activity. The NPS or lead project manager would also conduct a post-construction meeting to ensure the mitigation measures were carried out.

NPS can approve Management Activities covered by the EIS and that meet the criteria identified in this appendix without the need for additional NEPA compliance. Proposals for activities not included in the ROA shall be submitted in writing to NPS at least 30 days in advance of the annual ROA meeting, as required by the lease/permit.

Proposals for new activities not analyzed in the EIS will require individual review under NEPA and shall be submitted in writing to NPS at least 30 days in advance of the annual ROA meeting. NPS will determine whether to approve new activities on a case-by-case basis. Additional review and compliance could include the National Historic Preservation Act (NHPA); agency consultation; and federal, state, and local permitting requirements, as appropriate. Project leads, at their sole cost and expense, are responsible for obtaining approval deemed necessary by any agency. NPS would work with ranchers during annual meetings to identify projects and consolidate and coordinate review of ranch projects.

When developing and implementing projects, the lead project manager (lessee, third party, or NPS) shall adhere to these general principles and applicable conditions from the lease/permit to avoid or minimize the potential for adverse impacts:

- Permanent fill of wetlands shall not be authorized without consultation and issuance of regulatory permits from the US Army Corps of Engineers and/or Regional Water Quality Control Board.
- Projects in potential California red-legged frog habitat shall be designed to minimize disturbance to vegetation near or in permanent and seasonal pools of streams, marshes, ponds, or shorelines with extensive emergent or weedy vegetation.
- Ground and vegetation disturbance shall not exceed the minimum area necessary to complete the project. Removal of native trees and shrubs shall be minimized and only occur when necessary to meet project objectives.
- Site-specific design plans shall show the maximum extent of grading and include requirements to protect sensitive natural and cultural resources during construction and maintenance activities, including erosion control measures.
- Disturbed areas shall be restored to pre-construction or better conditions.
- Construction managers shall prepare and implement a spill prevention and clean-up plan, stormwater pollution prevention plan, or similar document for all construction projects. The plan shall address polluted runoff and spill prevention policies, erosion control materials required to be available on site in case of rain or a spill (e.g., straw bales and silt fencing), clean-up and reporting procedures, and locations of refueling and minor maintenance areas.
- Refuse, litter, trash, unused materials, and construction and other debris shall be removed from the premises and disposed of in an environmentally sound manner in accordance with applicable laws. Fencing and storage materials shall be reused when possible.
- Activities involving the use of heavy equipment (e.g., harvesting, mowing, shrub management, and seeding) shall not occur during rainy or saturated soil conditions.
- Planning shall consider methods available to achieve objectives and use the method(s) least disruptive to the habitat of endangered or sensitive species. If sensitive habitats or species near to proposed work must be avoided, the area shall be flagged and/or an NPS-approved representative shall be present on-site to denote sensitive resources. The parties implementing the project shall avoid all NPS-delineated sensitive resources.
- The spread or introduction of invasive plant species and other noxious weeds shall be avoided to the maximum extent possible by protecting areas with established native vegetation; implementing preventative measures, such as use of certified weed-free materials and inspection and cleaning of all equipment before entering or exiting sites during construction; restoring disturbed areas with native species where appropriate; performing post-project monitoring; and controlling non-native species.
- Ranchers shall employ integrated pest management (IPM) strategies (i.e., prevention, avoidance, monitoring, and suppression) to reduce risks to the public, park resources, and the environment from pests and pest-related management strategies.
- Because the practices appropriate for a given ranch depend on project layout, topography, soil types, and other factors, technical assistance from local USDA-NRCS, Resource Conservation District, University of California (UC) Cooperative Extension, licensed professionals, or other experts may be required.
- NPS shall oversee any use of biological control agents.

- NPS or the responsible party shall monitor and maintain all erosion control systems to ensure that issues can be addressed before failure.
- Cyclic maintenance of new and existing ranch infrastructure shall be performed as per the lease/permit or project requirements.
- Operations shall be conducted in such a manner that soil erosion and air and water pollution are minimized and held within legal limits.
- The owner, operator, contractor, or other persons shall conduct all work and operations in accordance with proper safety codes for the type of equipment and operations being performed with due regard for the safety of all persons and property.
- Activities shall follow all specifications associated with Practice Standards unless otherwise approved by NPS.

Proposed Management Activities and projects would require review and approval by NPS to ensure adherence to these principles.

Agencies with potential jurisdiction over these activities include USFWS, NMFS, the Regional Water Quality Control Board, and California Coastal Commission. These agencies may stipulate additional requirements for Management Activities or projects. All actions would adhere to stipulations within the biological opinions issued under the GMP Amendment, state and federal water quality laws, and the terms of any applicable permits, including San Francisco Bay RWQCB Waste Discharge Requirements and Waivers of Waste Discharge Requirements.

As noted in the Marin Permit Coordination Program (Marin Resource Conservation District 2018), consideration would be given to reducing wildland fire hazards when implementing all activities by:

- Removing dry, combustible vegetation from the construction site with specific focus on the staging areas for heavy equipment prior to construction activities.
- Ensuring vehicles are not parked in areas where exhaust systems can contact combustible materials.
- Ensuring fire extinguishers and fire suppression tools are available on the site when working in high fire hazard areas.

As part of the planning and implementation of these projects, the following cultural resource considerations are required:

- Construction activities would avoid impacts on archeological resources, ethnographic resources, and other cultural resources that may be present in the project area. If an area has not been previously surveyed for cultural resources, a survey by a qualified cultural resources specialist may be required.
- In the event that possible human remains, Native American artifacts, or concentrations of archeological or historic artifacts are discovered during construction, work in the area would cease immediately and the park's Cultural Resources Division would be notified for an evaluation of the discovery.

**F-1: MANAGEMENT ACTIVITIES BY ACTIVITY TYPE**

| Activity Type | Description | Associated NRCS Practice Standard(s) |
|---|---|---|
| **Ranch Infrastructure and Water Control Management** | | |
| **Road Upgrade and Decommissioning** | Improvements to an existing road network for the purpose of preventing erosion and protecting water quality that may include re-grading surfaces (e.g., out-sloping, crowning, in-sloping); construction of water bars, rolling dips, or critical dips; removal or addition of roadside ditches to assist with stormwater drainage; installation or repair of ditch relief culverts or critical culverts; removal of a screen or installation of a trash rack at a culvert inlet; construction of cross-road drains; and protection of ecologically sensitive, erosive, or potentially erosive sites. | Access Road (560)<br>Trails and Walkways (575)<br>Structure for Water Control (587)<br>Road Closure and Treatment (654) |
| **Infrastructure Improvement** | Management Activities to protect water quality and reduce erosion, including heavy use area protection, establishment of suitable vegetation to convey surface water at a non-erosive velocity using a broad and shallow cross section to a stable outlet, strips of vegetation to filter pollutants, roof and covers, and roof runoff structures to divert clean water away from potential pollutant sources. | Heavy Use Area Protection (561)<br>Roof and Covers (367)<br>Roof Runoff Structure (558) |
| **Waterway Vegetation and Planting** | Used in areas where added water conveyance capacity and vegetative protection are needed to prevent erosion and improve runoff water quality through infiltration that removes sediment, other suspended solids, and dissolved contaminants in runoff (table F-4). The Waterway Vegetation and Plantings Management Activity includes two Practice Standards—Grassed Waterway and Filter Strip. Installation of waterway vegetation and plantings often requires grading and use of equipment. | Grassed Waterway (412)<br>Filter Strip (393) |
| **Fencing** | Facilitates management goals and objectives by providing a means to control movement of animals and people, including vehicles. | Fence (382) |
| **Livestock Water Supply** | Actions to provide a dependable supply of water for livestock, including the collection system (e.g., pipeline, trench, appurtenances below ground). Implementation may require shallow digging/trenching for removal/installation of piping and associated equipment. This practice may include installation of an underground outlet to safely disperse concentrated runoff. | Spring Development (574)<br>Livestock Pipeline (516)<br>Underground Outlet (620)<br>Watering Facility (614)<br>Pumping Plant (533) |
| **Pond Restoration** | May include structural component repair, including spillways, alternative pipe outlets for water flow, and embankment repair, as well as obstruction removal and pond desiltation as necessary to maintain the pond. | Pond Restoration (378[R]) |

| Activity Type | Description | Associated NRCS Practice Standard(s) |
|---|---|---|
| **Waterway Stabilization** | Stabilization of a gully or downcutting channel by installing a structure to control the grade and/or stabilize the slope. Implementation may require some grading and installation of brush, erosion-control fabric, rock, or timber structures that do not impound water but rather allow water to be conveyed in a stable manner. Actions may include installing a rock weir to control and slow in-channel flow; adding rock to stabilize a gully draining towards a stream channel; lining an eroding swale or diversion ditch; rock armoring an eroding ditch; armoring below an outlet; installing an energy dissipater at a spillway or pipe outlet to a channel; and stabilizing and protecting streambanks through laying back the bank, bioengineering, or vegetated rock installation. | Grade Stabilization Structure (410)<br>Lined Waterway or Outlet (468) |
| **Stream Crossing** | Installation of a ford, bridge (channel-spanning when feasible), or culvert crossing for people, livestock, equipment, or vehicles where necessary for access over an intermittent or perennial watercourse to protect water quality, habitat, and species. | Stream Crossing (578) |
| **Vegetation Management** | | |
| **Upland and Riparian Vegetation Management and Planting** | Plant establishment to stabilize a disturbed area, reduce stormwater flow velocity and surface flow erosion, encourage infiltration, and enhance or establish wildlife habitat. Actions may include planting a vegetative buffer along a field perimeter to filter runoff exiting the area; establishing native grasses, forbs, shrubs, or trees in disturbed or eroding areas; planting permanent vegetation at a pipe or underground outlet; maintenance of a dense line of vegetation to function as a wind break/habitat enhancement/barrier to noise or to increase carbon storage capacity consistent with historic landscape, alignment, and species; establishing perennial or self-sustaining vegetation across fields used as rangeland; and replacing invasive species and potential disease-host plants with native species. | Critical Area Planting (342)<br>Range Planting (550)<br>Riparian Herbaceous Cover (390)<br>Riparian Forest Buffer (391)<br>Windbreak/ Shelterbelt Establishment (380)<br>Tree/Shrub Establishment (612)<br>Mulching (484)<br>Conservation Cover (327)<br>Wildlife Habitat Planting (420) |
| **Mowing** | The timely cutting, and in some cases removal of, herbaceous vegetation for forage, control of herbaceous weeds, and woody (nonherbaceous) plants including those that are invasive and noxious. | Brush Management, Mechanical (314-A)<br>Herbaceous Weed Treatment (315) |

| Activity Type | Description | Associated NRCS Practice Standard(s) |
|---|---|---|
| **Integrated Pest Management (IPM)** | Managing pest infestations (including weeds, insects, and diseases) to reduce adverse effects on environmental resources. The removal or control of herbaceous weeds, including invasive, noxious, and prohibited plants to enhance accessibility, quantity, and/or quality of forage and/or browse; restore or release native or create desired plant communities and wildlife habitats consistent with the site potential; protect soils and control erosion; reduce fine fuel loads and wildfire hazard. | IPM (595) |
| **Targeted Grazing** | Managing the harvest of vegetation with grazing and/or browsing animals with the intent to achieve specific ecological management objectives including one or more of the following:<br>Improve or maintain desired species composition, structure, and/or vigor of plant communities<br>Improve or maintain surface and/or subsurface water quality and/or quantity<br>Improve or maintain riparian and/or watershed function<br>Reduce soil erosion and maintain or improve soil health<br>Improve or maintain the quantity, quality, or connectivity of food and/or cover available for wildlife<br>Manage fine fuel loads to achieve desired conditions | Prescribed Grazing (528) |
| **Other Management Activities (applicable only on ranches where currently authorized)** | | |
| **Manure and Nutrient Management** | Installation of practices that improve management of manure, thereby resulting in improved water and/or air quality conditions. Actions include installation of manure/liquid separators, composting pads, techniques resulting in a reduction of greenhouse gas emissions, such as conversion from dairy flush to scrape systems, and the proper transfer of liquid manure to avoid impacts on environmentally sensitive areas. Agricultural management practices to protect water quality, such as the amount (rate), orientation, collection, placement, and timing of animal manure, residue, and amendments on the soil surface year-round while limiting soil-disturbing activities to only those necessary to place nutrients and condition residue. | Nutrient Management (590)<br>Composting Facility (317)<br>Waste Treatment (629)<br>Waste Separation Facility (632)<br>Waste Transfer (634)<br>Waste Storage Facility (313) |
| **Forage Production** | Establishing adapted and/or compatible species, varieties, or cultivars of herbaceous species suitable for pasture, silage, haylage, or hay, production, and the timely cutting and removal of forage from the field while limiting soil disturbance to manage the amount, orientation and distribution of crop and plant residue on the soil surface. On dairies, nutrient management may also be included as a soil amendment for forage production. | Forage and Biomass Planting (512)<br>Forage Harvest Management (511)<br>Residue and Tillage Management/ No-Till (329) |

Authorization of diversification activities would be evaluated based on rancher proposals. The general types of diversification activities that could be authorized are discussed in the EIS, and general mitigation measures are included in table F-14 (presented at the end of this appendix). Additional mitigation measures could be required depending on the proposal and type of diversification.

NRCS Conservation Practice Standards that have been identified as having greenhouse gas mitigation and/or carbon sequestration benefits on farms and ranches are denoted with an *asterisk* below, based on NRCS Comet-Planner (http://comet-planner.com/).

## Detailed Descriptions of Management Activities and Associated NRCS Conservation Practice Standards

### *Ranch Infrastructure and Water Control Management*

**Road Upgrades and Decommissioning.** Road Upgrade and Decommissioning Management Activities are intended to improve roadway stability and durability, limit road damage during all types of weather conditions, and prevent polluted runoff from entering sensitive environments. Roadways that are no longer needed for land management purposes should be decommissioned to protect water quality and restore habitat connectivity. Implementation typically requires use of heavy equipment, and improvements often involve multiple installations spread out over a long stretch of road. Four Road Improvement Practice Standards are included in this Management Activity—Access Road, Trails and Walkways, Structure for Water Control, and Road Closure and Treatment. Note that installation of bridges placed at top-of-bank to allow safe passage for livestock, pedestrians, equestrians, and farm vehicles is included in the Stream Crossing practice described below.

*Access Road (560)*—An Access Road is a fixed route for equipment and other vehicles used for agricultural and resource management activities. Access Roads range from single-purpose, seasonal roads designed for low speed and rough driving conditions to all-purpose, all-weather roads. This Practice Standard is intended to make improvements to existing roads used for moving livestock, vehicles or equipment and may include surface grading to effectively drain water. Water bars and rolling dips may be installed along roadways to redirect water off the road before it can concentrate and lead to erosion of the road surface or gully formation. Roadside ditches may be added, removed, or modified to improve water conveyance.

The Access Road Practice Standard does not include construction of new roads, addition of asphalt or concrete to existing roads, widening roadways, or increasing weight-bearing capacity of bridges. An exception may include construction of a short segment of new access road where a segment of existing roadway is relocated or extended out of a sensitive area to protect natural resources.

Culverts may be installed or replaced under the road to provide or improve drainage. Although culverts would generally be sized for a 100-year, 24-hour storm event, smaller culverts may be used (minimum 10-year storm capacity but not less than 12 inches in diameter) if topography and overflow facilities are adequate to prevent damage from larger storms or site conditions preclude use of a larger culvert. Outlets would be placed in a well-vegetated area that would not be subject to erosion, or the outlet would be rocked with an energy dissipater or stabilized by other means to provide a suitable location to discharge stormwater from the roadway that prevents erosion.

*Trails and Walkways (575)*—This Practice Standard applies to a *trail*, a feature with a vegetated or earthen surface, or to a *walkway* that has an artificial surface. Upgrades include improvement of an existing travel lane on agricultural lands for livestock, pedestrians, and off-road vehicles used exclusively for agricultural purposes (e.g., farm all-terrain vehicles that are not designed for use on public roads) to traverse difficult, ecologically sensitive, or erosive terrain. The Trails and Walkways Practice Standard may also improve access to forage or water and to agricultural or maintenance operations and does not apply to roads constructed for movement of equipment or nonagricultural vehicles. Any required culverts

would be designed to carry, at a minimum, a 2-year, 24-hour flow, although, if watershed conditions or anticipated usage warrant, a larger storm-event design may be used.

*Structure for Water Control (587)*—The Structure for Water Control Practice Standard covers a number of water management system activities to convey water, control the direction or rate of flow, maintain a desired water surface elevation, or measure water. It is intended to remove culverts entirely where possible and is limited to:

- removing or replacing existing culverts in streams and other waterways when they are either not functioning properly or are a barrier to aquatic passage; and
- constructing new culverts to properly convey overland or concentrated water flow into a drainage or under a road, for example, as part of an improvement design for an access road.

Careful consideration would be given to addressing upslope sources of flow that are causing the need for a culvert (i.e., rather than replacing an undersized or defective culvert in an in-sloped road with a properly sized, functioning culvert, the road would be out-sloped to eliminate the need for the culvert). As with the Access Road Practice Standard, culverts would generally be sized for a 25-year, 24-hour event. However, smaller culverts may be used (minimum 10-year storm capacity and not less than 12 inches in diameter) if topography and overflow facilities exist to prevent damage from larger storms or if on-site conditions preclude use of a larger culvert.

*Road Closure and Treatment (654)*—The Road Closure and Treatment Practice Standard involves decommissioning and abandoning roads, trails, and landings (table F-2). Closure and decommissioning would include a range of activities, such as blocking the entrance to eliminate vehicle access, revegetation and water barring to reduce runoff, removal of fills and culverts, establishment of drainages, and full obliterations through recontouring and restoring natural slopes.

**TABLE F-2: SIZE LIMITATIONS PER PROJECT FOR ROAD UPGRADES AND DECOMMISSIONING**

| Item | Length | Disturbance Area | Soil Disturbance | Additional Criteria |
|---|---|---|---|---|
| Access Road | 2 miles | 2 acres | N/A | Road lengths are of disturbed area only; length of road network treated may be greater. |
| Trails and Walkways | 2 miles | 2 acres | N/A | Lengths are of disturbed area only; length of trail network treated may be greater. |
| Structure for Water Control | 200 feet | 0.25 acre | 500 cubic yards | Culverts that require permits would be designed and stamped by a licensed engineer, geologist, or landscape architect or a qualified NRCS engineer. |
| Road Closure and Treatment | 2 miles | 2 acres | N/A | Up to 1,000 feet of channel may be dewatered at each site or current regulatory standards. |

Treatments to restore vegetative cover, natural topography, and surface hydrology would result in stable slopes and would be compatible with existing land uses in the vicinity.

**Infrastructure Improvement.** Infrastructure Improvement Management Activities protect heavily used areas by preventing erosion and degradation of critical infrastructure, separating clean runoff from potential pollutant sources, and preventing flooding in Ranch Core areas. These could include establishment of suitable vegetation to convey surface water at a nonerosive velocity using a broad and shallow cross section to a stable outlet, strips of vegetation to filter pollutants, roof and covers and roof runoff infrastructure and placement of materials to stabilize a ground surface. Structure for Water Control (587) is also a Practice Standard for Infrastructure Improvement; details and size limitations are provided above under Road Upgrades and Decommissioning.

*Heavy Use Area Protection (561)*—The Heavy Use Area Protection Practice Standard is implemented to protect and improve water quality by providing a stable, noneroding surface for areas frequently used by animals, people, or vehicles. Commonly used treatments include vegetative cover, surfacing with suitable materials (e.g., concrete pad, gravel), or installing needed structures (e.g., roof, drainage and stable outlet, or vegetative filter strip).

This Practice Standard is often used to provide surface stability in areas where the concentration of livestock is causing a resource concern. These include feeding areas, portable hay rings, watering facilities, feeding troughs, and mineral areas where provision must be made for the collection, storage, utilization, and treatment of manure and contaminated runoff.

*Roof and Covers (367)*— A Roof and Cover system consists of a rigid, semi-rigid, or flexible manufactured membrane, composite material, or roof structure installed on an existing structure or waste management facility to divert clean water from animal management areas, waste storage facilities, or gutters and downspouts to prevent the escape of gases from waste facilities or to exclude precipitation from these facilities. It may also involve attaching downspouts into a subsurface drainage system. The Roof and Covers Practice Standard is a component of an agricultural waste management system.

*Roof Runoff Structure (558)*—A Roof Runoff Structure is made of various components that collect, control, and convey precipitation runoff from a roof; components of this Practice Standard can include gutters, downspouts, rock-filled trenches or pads, and subsurface drains or outlets (table F-3). It applies where roof runoff from precipitation needs to be diverted away from structures or contaminated areas. Roof runoff water that becomes contaminated by contact with animal waste would be diverted to an established manure pond or to a field for land application. Roof runoff water can be collected and used for many purposes (e.g., non-potable water can be used for irrigation).

**TABLE F-3: SIZE LIMITATIONS PER PROJECT FOR INFRASTRUCTURE IMPROVEMENT**

| Item | Practice Acres | Additional Criteria |
|---|---|---|
| Heavy Use Area Protection | N/A | -- |
| Roof and Covers | N/A | -- |
| Roof Runoff Structure | N/A | No capture of roof runoff for use as potable water is authorized. |

**Waterway Vegetation and Planting.** Waterway Vegetation and Planting Management Activities are used in areas where added water conveyance capacity and vegetative protection are needed to prevent erosion and improve runoff water quality through infiltration that removes sediment, other suspended solids, and

dissolved contaminants in runoff (table F-4). The Waterway Vegetation and Planting Management Activity includes two Practice Standards—Grassed Waterway and Filter Strip. Installation of Waterway Vegetation and Plantings would often require grading and use of equipment.

**TABLE F-4: SIZE LIMITATIONS PER PROJECT FOR WATERWAY VEGETATION AND PLANTING**

| Item | Length | Disturbance Area | Soil Disturbance | Additional Criteria |
|---|---|---|---|---|
| Grassed Waterway | 2,000 feet | 1 acre | 500 cubic yards | Length is of disturbed area only; length of area treated may be greater. |
| Filter Strip | 2,000 feet | N/A | N/A | Filter strips may not be installed in riparian zones. |

*Grassed Waterway (412)**—Installation of a vegetated, shaped or graded waterway is used to convey surface water at a nonerosive velocity using a broad and shallow cross section to a stable outlet. This Practice Standard is designed to reduce erosion in a concentrated flow area in order to reduce sediment and other substances delivered to receiving waters. Vegetation may act as a filter to remove some of the sediment, although this is not the primary function of a grassed waterway; see the Filter Strip Practice Standard below.

A Grassed Waterway would be designed to convey the peak runoff expected from a 10-year, 24-hour storm. Capacity may be increased, as needed, to account for potential volume of sediment expected to accumulate between planned maintenance activities. Design criteria include minimum depth, width, and side slopes to provide stability; selection of a stable outlet, such as another vegetated channel, earthen ditch, grade stabilization structure, or filter strip; and requirements to ensure successful vegetation establishment. Other considerations may consist of incorporation of wildlife habitat benefits, such as connectivity or use of plantings to attract pollinators, as well as use of water-tolerant vegetation and invasive species control. Grassed Waterways would not be used as field roads or turn-rows and would not be crossed by heavy equipment when wet.

*Filter Strip (393)**—Filter Strips are permanent areas of vegetation designed to remove both suspended and dissolved sediment, organic matter, and other pollutants from runoff and wastewater. This Practice Standard would be used between high use agricultural lands and environmentally sensitive areas. When the field or high use area borders are located such that runoff occurs as sheet flow, coarser-grained sediments are filtered and deposited.

Potential pollutants are removed from runoff through infiltration, absorption, adsorption, decomposition, and volatilization, thereby protecting water quality downstream. When established, filter strips may also reduce erosion.

**Fence.** *Fencing (382)* is used to facilitate conservation objectives by providing a means to control the movement of animals, people, and vehicles (table F-5). This Practice Standard includes both digging/trenching for post holes and installation of aboveground fencing. It can be used for livestock management in the Ranch Core, in a rotational grazing program, to restrict access to an area being revegetated, and to restrict livestock access to sensitive resources, such as riparian areas or creeks. Based on objectives, fences may be permanent, portable, or temporary. Fencing materials, type, and design would be of a high quality and durability to meet the management objectives and site challenges. Fences would be located and installed to meet appropriate NPS wildlife and land management needs and requirements.

**TABLE F-5: SIZE LIMITATIONS PER PROJECT FOR FENCING**

| Item | Practice Acres | Additional Criteria |
|---|---|---|
| Fencing | N/A | Livestock fencing must be wildlife-friendly, unless otherwise approved by NPS. |

**Livestock Water Supply.** Unrestricted livestock access to waterways can lead to potential resource degradation, including alterations to bank stability, water quality, riparian vegetation, and wildlife habitat. Alternative water sources can address potential adverse environmental effects of unrestricted livestock access. Over time, many ranches have developed springs, ponds and other water sources to meet livestock watering and associated ranch infrastructure needs.

Livestock Water Supply Management Activities include the following Practice Standards: Spring Development, Livestock Pipeline, Underground Outlet, Watering Facility, and Pumping Plant (table F-6). Collection of water from springs and seeps provide a reliable supply that can be directed to a livestock pipeline, often with the aid of a pump, to move water to areas where it would be useful and can be appropriately managed for livestock and wildlife use. Underground outlets are often used in conjunction with a pipeline to prevent erosion and polluted runoff.

*Spring Development (574)*—The Spring Development Practice Standard is used to improve the distribution of water or to increase the quantity of water available for livestock and wildlife. Piping is installed from water-bearing soil and rocks to a trough or tank away from the spring. A wooden or concrete box or plastic pipe backfilled with gravel (spring box) may also be installed to hold the water before distribution. In some cases, horizontal drilling may be used to tap into the water source. The area around the spring or seep would be fenced to control livestock access and improve habitat values. The Spring Development Practice Standard is included in the EIS for circumstances where the it would have minimal effects on springs or adjacent wetland habitat or involves redevelopment of an existing spring and would provide water quality improvements to nearby waterways. Spring Development would use an excavation process that does not result in placement of fill in or around spring areas, although fencing would be installed to exclude livestock from the area.

*Livestock Pipeline (516)*—The Livestock Pipeline Practice Standard conveys water from a source of supply to a point of use to direct livestock away from springs, streams, and other waterbodies. Livestock Pipelines may be made of flexible conduit materials, such as plastic, steel, or ductile iron pipe. Appurtenances used with pipelines may include inlets, outlets, check valves, backflow prevention devices, booster pumps, pressure tanks, surge tanks, air chambers, and pressure or air relief valves. Livestock Pipelines would be placed only in or on soils suitable for the type of material selected. Steel pipe installed above ground would be galvanized or insulated with a suitable protective paint coating. Plastic pipe installed above ground would be resistant to ultraviolet light throughout the intended life of the pipe, or measures would be taken to protect the pipe from damage due to ultraviolet light.

Buried pipelines would minimize ground disturbance. Buried pipe would be installed at sufficient depth below the ground surface to provide protection from hazards imposed by traffic loads, farming operations, freezing temperatures, or soil cracking, as applicable. Livestock Pipelines would have sufficient strength to withstand all external loads on the pipe for the given installation conditions. Horizontal drilling may also be used where appropriate.

*Underground Outlet (620)*—An Underground Outlet is a conduit or system of conduits installed below the ground to convey surface water to a suitable outlet where the discharge can occur without causing damage by erosion, polluted runoff, or flooding. The design capacity of an Underground Outlet Practice Standard would be based on size of the structure or feature that it serves and its intended purpose. It may be

designed to function as the only outlet or in conjunction with other types of outlets. Components of Underground Outlets, including inlet collection boxes and conduit junction boxes, would be designed with sufficient size to allow efficient maintenance and cleaning operations.

*Watering Facility (614)*—This Practice Standard involves the installation of water storage tanks (rainwater and groundwater supply) or water troughs and a plumbed pumping system to deliver water at a designed pressure and flow rate. This can include minor grading, shaping, and construction of a pad for the tank or troughs.

A Watering Facility is used to provide livestock and/or wildlife with drinking water to meet daily needs. Proper location of troughs would improve animal distribution and associated utilization of vegetation. They are sometimes installed to keep livestock out of streams and other surface water areas where water quality is a concern, often associated with Fencing.

This Practice Standard applies to all land uses where there is a need for a Watering Facility for livestock and/or wildlife, where there is a source of water that is adequate in quantity and quality, and where soils and topography are suitable for the structure.

The water source may be a well, spring, stream, pond, municipal water supply, or other source. A tank can be installed to store water to supply the trough.

*Pumping Plant (533)*—The Pumping Plant Practice Standard describes a facility that delivers water at a designed pressure and flow rate to meet a conservation need. Components of the facility include the required pump, associated power unit, plumbing, and necessary appurtenances. It also may include on-site fuel or energy sources and protective structures. The power supply for a Pumping Plant may come from line power, photovoltaic panels, or water-powered pumps (hydraulic rams) with generator backup.

A Pumping Plant may be installed for a wide variety of conservation purposes. This includes, but is not limited to, delivery of water for irrigation or livestock, maintenance of critical water levels in wetland sites, transfer of wastewater for use as part of a waste management system, and facilitation of drainage by removal of surface runoff or groundwater. When planning the installation of a Pumping Plant, consideration would be given to the potential effects on ground and surface water from water removal or delivery, as well as ways to protect it from damage by livestock, freezing temperatures, and flooding.

**TABLE F-6: SIZE LIMITATIONS PER PROJECT FOR LIVESTOCK WATER SUPPLY**

| Item | Length | Disturbance Area | Soil Disturbance | Additional Criteria |
|---|---|---|---|---|
| Spring Development | N/A | 0.05 acre | 75 | Springs would not provide water for recreation or construction activities. |
| *Livestock Pipeline; see also in-stream limitations below | 6,000 feet | -- | 1,500 cubic yards | Limited to 50 feet across per channel. |
| *Pipelines Located In-Stream or in the Riparian Zone | 250 feet | 100 square feet | 15 cubic yards | Included in the totals listed above. |
| Underground | 100 feet | 0.1 acre | 100 cubic | Pipelines and underground |

| Item | Length | Disturbance Area | Soil Disturbance | Additional Criteria |
|---|---|---|---|---|
| Outlet | | | yards | outlets installed in a stream would not include grouted rock, headwalls, or similar features. All outlets would have animal guards that allow passage of debris while blocking entry of animals large enough to restrict the flow in the conduit. |
| Watering Facility | N/A | N/A | N/A | Troughs would be constructed with wildlife ramps. |
| Pumping Plant | N/A | N/A | N/A | Maximum pump size is 3 horsepower; maximum pump rate is 10 gallons per minute. |

**Pond Restoration.** *Pond Restoration (378[R])* is limited to restoration and maintenance of existing water impoundment structures (table F-7). No new in-stream ponds or restoration activities that would involve an increase in the original area or storage capacity of a pond are authorized.

The purpose of this Practice Standard is to improve water availability for livestock, as well as available water and habitat for fish and wildlife, and to maintain or improve water quality. It would be used to repair emergency spillways, provide alternative pipe outlets for water flow, and remove built-up silt to restore the pond's original storage capacity. Material excavated from the pond would be securely compacted onto the pond berm or placed in an upland area where it would not be washed back into the pond or into an adjacent waterway by rainfall, or it would be legally disposed of off-site. Placement in wetlands would be prohibited. Pond Restoration activities would occur in late summer, when water levels are lowest, or when the pond is dry.

**TABLE F-7: SIZE LIMITATIONS PER PROJECT FOR POND RESTORATION**

| Item | Length | Disturbance Area | Soil Disturbance | Additional Criteria |
|---|---|---|---|---|
| Pond Restoration | Up to 300 feet of spillway | 1 acre | N/A | No new or enlarged ponds are allowed<br>No more than 3,000 cubic yards of fill removed from pond under any single project<br>Timing of pond maintenance and restoration activities should be late summer, when water levels are lowest, or when the pond is dry |

**Waterway Stabilization.** Waterway Stabilization Management Activities include two Practice Standards: Grade Stabilization Structure and Lined Waterway/Outlet, which are used to stabilize grade, prevent channel downcutting, reduce erosion and undermining of creek banks, avoid formation or advancement of gullies, and reduce sediment delivery to receiving waters. These Practice Standards can also be used to remediate sediment aggradation in channels that may be limiting aquatic passage and to install hydraulic alterations designed to maintain the water table. Implementation of Waterway Stabilization measures would generally require grading and use of heavy equipment.

An assessment of the erosion sites would be conducted in sufficient detail to identify the causes contributing to the instability (e.g., livestock access; watershed alterations resulting in significant modifications of discharge or sediment production; in-channel modifications such as gravel mining, headcutting, and water level fluctuations; increased runoff due to development in the watershed; or degradation due to channel modifications). Waterway Stabilization measures would be designed to avoid creation of unstable conditions upstream or downstream. Design considerations would include an evaluation of the effects of work on existing channel morphology, hydrology, and structures (e.g., culverts, bridges, buried cables, pipelines, and irrigation flumes); current and future sediment transport; and upstream improvements or structural measures.

To protect water quality and the integrity of the structure, an energy dissipater would be provided at the outlet of any Grade Stabilization Structure or Lined Waterway in areas where concentrated drainage may cause erosion and sedimentation. Otherwise, outlets would be directed to well-vegetated locations. Toe erosion would be stabilized by treatments that redirect the stream flow away from the toe or by structural treatments that armor the toe. Where toe protection alone is inadequate to stabilize the bank, the upper bank would be shaped to a stable slope and vegetated or would be stabilized with structural or soil -bioengineering treatments. Geotextiles or properly designed filter bedding would be incorporated with structural measures in locations where materials could migrate from behind the stabilization structure.

This Management Activity is intended to promote biotechnical approaches; hard structural solutions would be recommended only in unusual circumstances and would require justification to secure approval. Grade Stabilization Structures that involve riprap, rock, or other structural components used to prevent localized stream erosion, sediment transport, or movement may be used when biotechnical approaches are not feasible or effective. However, use of rock to facilitate natural stream processes and dynamics with the purpose of achieving stream equilibrium between erosional and depositional processes is acceptable. This Management Activity is intended to use instream structures made of natural materials such as boulders and logs to provide channel stability; no gabions, grouted rock, or concrete would be used in any waterway, and use of chemically treated timbers is prohibited.

*Grade Stabilization Structure (410)*—A Grade Stabilization Structure is used to control grade or stabilize a slope or downcutting channel, manage gully erosion, and eliminate erosional headcutting and formation or advancement of gullies (table F-9). This Practice Standard refers to vegetation, erosion-control fabric, rock, or timber structures that do not impound water but rather allow water to be conveyed in a stable manner that results in reduced erosion and improved downstream water quality. Installation would involve grading and bioengineering techniques for placement of rock or geotextile fabric and revegetation to stabilize the eroding area or prevent headcuts from moving further upslope. Design considerations would include water quantity and quality, as well as the visual quality of downstream water resources.

*Lined Waterway or Outlet (468)*—A Lined Waterway or Outlet has an erosion-resistant lining of rock, erosion control/reinforcement fabric, or other permanent material designed to convey runoff without causing erosion or flooding (table F-8). This Practice Standard is used to provide safe conveyance from diversions, terraces, or other concentrated water sources on sites where it is not practical to establish or maintain a Grassed Waterway; it is not used for irrigation water conveyance or in a natural watercourse. Lined Waterways or Outlets would be used in areas where:

- concentrated runoff, steep grades, wetness, seepage, or piping are causing erosion;
- soils are highly erosive or other conditions are present that preclude use of vegetation only to prevent erosion; and
- limited space is available, and a lining is required to address higher velocities.

**TABLE F-8: SIZE LIMITATIONS PER PROJECT FOR WATERWAY STABILIZATION**

| Item | Length | Disturbance Area | Soil Disturbance | Additional Criteria |
|---|---|---|---|---|
| Grade Stabilization Structure | 1,000 feet | 1.5 acres | 1,000 cubic yards | No more than 350 cubic yards of fill per rock structure. This Practice Standard would be sized to match the dimensions of the channel or gully and would be neither larger nor smaller than required to achieve stability. |
| Lined Waterway or Outlet | 500 feet | 2 acres | 2,000 cubic yards | No longer than 500 feet per project. If used, concrete must cure for a minimum of 30 days or be coated with an agency-approved sealant until it is dry before being allowed to interface water. |

**Stream Crossing.** The purpose of the *Stream Crossing (578*) Practice Standard is to install a permanent stabilized area or structure across a perennial or intermittent watercourse to provide access for people, livestock, equipment, and vehicles and to protect water quality through reducing potential for delivery of sediment and other pollutants into the water during use of the crossing (table F-9). Stream Crossings include stabilized areas, such as fords, wet crossings, and structures (e.g., bridges and culverts). Bridges authorized under this Management Activity would fully span the watercourse from top-of-bank to top-of-bank.

Ford crossings are best suited for use in wide, shallow watercourses with firm streambeds and when use of the crossing is infrequent. However, if the Stream Crossing would be used often, as in a dairy operation, a bridge or culvert would often be required. Implementation of Stream Crossings may require grading and use of mechanized equipment.

Stream Crossings would be designed to account for site conditions and accommodate sediment transport and passage of large woody materials. Proposed sites would first be evaluated to determine whether a crossing is necessary or if other activities or management strategies can be used in lieu of the crossing. Replacement of crossings would take frequency of use into account, and former crossings could be changed to a different type or removed if other strategies are feasible.

For Stream Crossings where installation of a structure (e.g., bridge or culvert) is determined to be necessary, the site would be evaluated to determine potential flood stages and discharge, hydraulics, fluvial geomorphic conditions, sediment transport and flow continuity, and movement of woody and organic material. In addition, habitat requirements of aquatic and terrestrial species (including any

threatened and endangered species) that may be affected by construction of the crossing would be assessed.

**TABLE F-9: SIZE LIMITATIONS PER PROJECT FOR STREAM CROSSINGS**

| Length | Disturbance Area | Soil Disturbance | Additional Criteria |
|---|---|---|---|
| 150 feet (per structure) | 1 acre | 250 cubic yards | Crossings would be designed to require the minimum amount of dewatering, not to exceed 500 feet of channel unless regulatory standards allow more. Bridges would be designed and stamped by a licensed California engineer or a qualified NRCS engineer. Culverts that require permits shall be designed and stamped by a licensed engineer, geologist, or landscape architect or a qualified NRCS engineer.<br>Stream crossings in a salmonid-bearing stream must be 1,500 meters (4,921 feet) apart. Crossings in a non-fish-bearing stream must be at least 100 feet apart (NOAA Fisheries 2016). |

### *Vegetation Management*

**Upland and Riparian Vegetation Management and Planting.** The Upland and Riparian Vegetation Management and Planting Management Activity include the following Practice Standards: Critical Area Planting, Range Planting, Riparian Herbaceous Cover, Riparian Forest Buffer, Windbreak and Shelterbelt Establishment, Tree and Shrub Establishment, Mulching, Conservation Cover, and Wildlife Habitat Planting. The purpose of Upland and Riparian Vegetation Management and Planting is to:

- restore, enhance, or create desired plant communities and fish and wildlife habitats;
- protect soils, control erosion, reduce sediment, and improve water quality;
- improve accessibility, quantity, and quality of forage and browse for livestock and wildlife;
- improve air quality;
- sequester carbon; and
- improve soil health.

The associated Practice Standards of Critical Area Planting, Range Planting, Riparian Herbaceous Cover, Riparian Forest Buffer, Windbreak/ Shelterbelt Establishment, Tree/Shrub Establishment, Mulching, Conservation Cover, and Wildlife Habitat Planting support establishment of adapted perennial or self-sustaining vegetation, such as grasses, forbs, legumes, shrubs, and trees using species approved by NPS. Herbicides and other biological treatments (e.g., grazing) may be used to control or eliminate invasive, noxious, or toxic infestations. NPS IPM regulations and mitigation measures would be followed when herbicides are used. Biological treatment plans for Upland and Riparian Vegetation Management and Planting would provide references for containment and management or control of target species; kind of grazing animals to be used; timing, frequency, duration, and intensity of grazing or browsing; desired degree of grazing or browsing use for effective control of target species; maximum allowable degree of use on desirable nontarget species; and precautions or requirements associated with the selected

treatments. Vegetation Management activities may include minor grading or digging to remove roots and prepare the area for planting.

There are no size limitations on Upland and Riparian Vegetation Management and Planting. However, the following limitations on vegetation removal would apply to all the activities:

- No more than 0.10 acre of native riparian trees, shrubs, or woody perennials may be removed from a stream area, and only if the area would be replanted with native vegetation.
- Where the area contains a mix of native and invasive species, no more than 0.25 acre of vegetation may be treated or removed from a streambank or stream channel, and only if the area would be replanted with native vegetation where appropriate.
- Outside riparian areas and other sensitive habitats, native vegetation may be removed only if replanting with native vegetation is completed at the site.
- Where the area is exclusively nonnative species, up to 5 acres of riparian vegetation may be removed and/or treated.

*Critical Area Planting (342)**—Critical Area Planting is the establishment of permanent vegetation on sites that have, or are expected to have, high wind or water erosion rates, and that have physical, chemical, or biological conditions that prevent the establishment of vegetation with normal seeding/planting methods. The Practice Standard may be used to stabilize stream and channel banks and pond and other shorelines. Permanent vegetation may include trees, shrubs, vines, grasses, forbs, or legumes depending on the site characteristics and management objectives. This Practice Standard reduces damage from sediment and runoff to downstream areas and improves wildlife habitat and visual resources. It can be used to replant areas where invasive vegetation has been removed or as an ancillary to stream restoration activities. Native plants characteristic of the local habitat type would be used when implementing and maintaining this Practice Standard in the Range subzone.

*Range Planting (550)**—The Range Planting Practice Standard involves the establishment of adapted vegetation on grazing land and applies to rangeland, native or naturalized pastures, grazed forest, or other suitable areas where the principal method of Vegetation Management is grazing. Range Planting is commonly used where existing stands of vegetation are inadequate for natural reseeding to occur and can be used to increase carbon sequestration. Plantings commonly include grasses, forbs, legumes, shrubs, and trees that are selected based on site-specific characteristics, erosion control and water quality improvement goals, wildlife values, carbon sequestration goals, and other management objectives such as restoration of a plant community similar to the Ecological Site Description reference state for the site or the desired plant community, or to provide or improve forage for livestock. Seeded species would be approved by NPS. Successful establishment of seeded species may require rest from grazing. Other Practice Standards, such as Herbaceous Weed Treatment, may be used to ensure successful planting.

*Riparian Herbaceous Cover (390)**—Riparian Herbaceous Cover involves establishment and maintenance of grasses, grass-like plants, and forbs that are tolerant of intermittent flooding or saturated soils and that are established or managed in the transitional zone between terrestrial and aquatic habitats. This Practice Standard would be used on lands along watercourses or at the boundary of waterbodies or wetlands where the natural or desired plant community is dominated by herbaceous vegetation; the ecosystem has been disturbed, and the natural plant community is missing, changed, or has been converted to high maintenance vegetation; or invasive species dominate. The purposes of this Practice Standard include provision of food and shelter; shading of aquatic substrate; access to adjacent habitats and pathways for movement by resident and nonresident aquatic, semiaquatic, and terrestrial organisms; improvement and protection of water quality; stabilization of streambanks and shorelines; and increased net carbon storage in the biomass and soil.

Plant selection would focus on native perennial plants that are adapted to site and hydrologic conditions and provide the structural and functional diversity preferred by fish and wildlife likely to benefit from the installation. In areas where native seeds and propagules are present, passive regeneration may be used in lieu of planting; however, planting would be required if no native seed bank is present. Plantings would be protected until the desired plant community is well established; protection measures may include plant shelters, wire mesh, weed-free mulching around the plant base to inhibit grass and weed growth, or preventing wildlife or cattle from accessing newly planted areas through use of exclusionary fencing.

*Riparian Forest Buffer (391)**—The establishment of Riparian Forest Buffers serves to reduce sediment, nutrient, and other contaminant loading to streams and waterbodies and to improve wildlife habitat. This Practice Standard would be used to create shade to lower water temperatures, to provide a source of detritus and large woody debris for fish and other aquatic organisms, and to improve overall riparian habitat and travel corridors for wildlife. It would be applied on stable areas adjacent to waterbodies and consist of native vegetative plantings ultimately resulting in forest canopy and understory development. Riparian Forest Buffers would be planted with native species characteristic of the local habitat type. Planting layout would be designed in such a way as to minimize maintenance and the potential for flooding.

*Windbreak and Shelterbelt Establishment (380)**—Windbreaks are documented as features within the historic landscape. Maintenance of historic Windbreaks would be encouraged under this Practice Standard. Consistent with the cultural landscape designation, alignment and species should be consistent with the historic condition.

*Tree/Shrub Establishment (612)**—Tree/Shrub Establishment involves planting seedlings or cuttings, seeding, or creating conditions that promote natural regeneration for conservation benefits, which include establishing forest cover, enhancing wildlife habitat, controlling erosion, improving water quality, capturing and storing carbon, and conserving energy. The Tree/Shrub Establishment Practice Standard can be applied on any site capable of growing woody plants. Species selection, site preparation, planting date and methodology, and tree spacing would vary depending on the planned purpose and site conditions. Planting of any nursery stock must be conducted consistent with park policies related to Phytophthora.

*Mulching (484)**—Mulching involves applying plant residues or other suitable materials to the land surface to improve the efficiency of moisture management, prevent or reduce erosion, improve plant productivity and health, maintain or increase organic matter content, or reduce emissions of particulate matter. Materials are spread evenly over a site and could include anchoring methods, if necessary, to hold the materials in place for a specified period. Spreading of wood products or inorganic materials must be at a minimum depth of 2 inches, and inorganic materials, such as gravel, must be a minimum size of 0.75 inch. Straw or grass hay must be applied at a rate to achieve a minimum 70 percent ground cover. Plant-based mulch materials with a carbon (C) to nitrogen (N) ratio less than 20:1 must not be applied where there is potential to enter watercourses. A Plans and Specifications document must be prepared that includes purpose of the cover, type of material to be used, percent cover or thickness of application, timing of application, site preparation, methods of anchoring, and operation and maintenance requirements. Materials used, including compost, must be approved by NPS.

*Conservation Cover (327)**—Conservation Cover involves establishing and maintaining permanent vegetative cover to reduce erosion, protect water quality, reduce emissions of particulate matter and greenhouse gasses, enhance wildlife habitat, or improve soil health. This Practice Standard may be used to promote the conservation of wildlife species in general, including threatened and endangered species. It does not apply to planting for Forage Production or Critical Area Planting. Species utilized must be native, adapted, and suitable to the site as approved by NPS. Removal of products would not be permitted. The site must be protected from grazing and trampling to the extent necessary to achieve the desired purpose. Herbaceous weed management or Mulching may be required to reduce competition from

weeds or improve establishment of the cover. A Plans and Specifications document must be prepared that includes species to be used, seeding rates and dates, establishment procedures, actions needed to ensure adequate cover of desired species, and operation and maintenance requirements.

*Wildlife Habitat Planting (420)*—Wildlife Habitat Planting involves the planting of native herbaceous vegetation or shrubs to establish wildlife habitat that resembles the historic, desired, and reference native community or to improve degraded wildlife habitat for a target species or guild. This Practice Standard applies to all lands where inadequate wildlife habitat is identified as a primary resource concern and a plant community inventory or wildlife habitat evaluation indicates a benefit in altering the current vegetative conditions (species diversity, richness, structure, and pattern) by establishing herbaceous plants or shrubs. The use of annuals that persist over the life of the Practice Standard and annuals that serve as a nurse crop to support the establishment of the persistent vegetative species are appropriate under this Practice Standard. The Practice Standard does not apply to the planting of trees, repeated cultivation, planting primarily for erosion control or water quality purposes, restoration of abiotic conditions or rare communities, or the treatment of weeds or woody vegetation. A Plans and Specifications document must be created that identifies the target wildlife species or guild, success criteria (target conditions) for the planting, including the target conditions and timeframes, vegetative establishment measures needed to meet minimum criteria, target habitat conditions to be created (including plant species richness, diversity, pattern and structure, taking into account season of use, life history, home range, condition of adjacent habitats, and landscape context), risks from or to nontarget species, plant material composition, rates, planting depth, and proper handling, necessary vegetative establishment protocols (including site preparation, weed and pest control, planting rates, planting dates, planting methods), post-planting management actions (e.g. mowing annual weeds and inspections/control for invasive plants), and other operation and maintenance requirements. Where the area is exclusively nonnative species, up to 5 acres of riparian vegetation may be removed and/or treated. All species used must be approved by NPS.

**Mowing.** Mowing involves the timely cutting, and in some cases removal of, herbaceous vegetation for forage, control of herbaceous weeds, and woody (nonherbaceous) plants including those that are invasive and noxious. The Mowing Management Activity may be used for Brush Management (314-A), and Herbaceous Weed Treatment (315) (see Integrated Pest Management). Mowing would not occur during fire weather watches or Red Flag Warnings.

*Brush Management, Mechanical (314-A)*—This Practice Standard involves the management or removal of woody (nonherbaceous or succulent) plants including those that are invasive and noxious. Brush Management is used to control woody plants on a site where they exceed the desired or expected amount. It would be designed to achieve the desired plant community based on species composition, structure, density, and canopy (or foliar) cover or height. Brush Management would generally be considered in the Pasture subzone and would require site specific analysis related to desired objectives. NPS may consider proposals for this Practice Standard in the Range subzone under limited circumstances. Any Brush Management would be conducted outside of bird nesting season. If authorized, ranchers would be responsible for maintenance of target conditions for the treated area on an annual basis.

*Herbaceous Weed Treatment (315)*—This Practice Standard includes the removal or control of herbaceous weeds including invasive, noxious and prohibited plants. The purpose is to enhance accessibility, quantity, and/or quality of forage and/or browse; restore or release native or create desired plant communities and wildlife habitats consistent with the site potential; protect soils and control erosion; reduce fine fuel loads and wildfire hazard; and control pervasive plant species to a desired level of treatment that would ultimately contribute to creation or maintenance of an ecological site description *steady state*, addressing the need for forage, wildlife habitat, and/or water quality; and improve rangeland health. Herbaceous Weed Treatment would be applied in a manner to achieve the desired control of the target species and protection of desired species. This would be accomplished by mechanical methods, but could also be used with chemical, or biological methods either alone or in combination following Integrated Pest Management procedures. Dependent on timing of removal, some weeds with forage value

may be taken off site for consumption by cattle. Pending NPS approval, Herbaceous Weed Treatment may be conducted by ranch operators within Pasture, Range and Ranch Core subzones as identified in the Ranch Operating Agreement. NPS and ranch operators may also consider actions to manage herbaceous weeds within the Resource Protection subzone as appropriate.

**Integrated Pest Management.** *IPM (595)* is a site-specific combination of pest prevention, pest avoidance, pest monitoring, and pest suppression strategies. It a decision-making process that coordinates knowledge of pest biology, the environment, and available technology to prevent unacceptable levels of pest damage by cost-effective means while posing the least possible risk to people, resources, and the environment (NPS 2006). The purpose of IPM is to: prevent or mitigate off-site pesticide risks to water quality from leaching, solution runoff and adsorbed runoff losses; prevent or mitigate off-site pesticide risks to soil, water, air, plants, animals and humans from drift and volatilization losses; prevent or mitigate on-site pesticide risks to pollinators and other beneficial species through direct contact; and prevent or mitigate cultural, mechanical and biological pest suppression risks to soil, water, air, plants, animals and humans. NPS addresses pest issues on a case-by-case basis following an IPM policy, which helps determine the combination of procedures that are most effective for each pest situation. The decision to incorporate a chemical, biological, or bioengineered pesticide into a management strategy is based on a determination that a product is necessary, and other available options are either not acceptable or not feasible. Proposals for the use of a pesticide, biological control agent, or genetically modified organism (also known as pesticide use proposals), are reviewed on a case-by-case basis by the Park IPM Coordinator considering site-specific conditions. NPS must approve the pesticide use proposal before a product can be purchased or applied. Pesticide applications are only to be performed by or under the supervision of a certified or registered applicator licensed under the procedures of a federal or state certification system. All pesticide applications are reported to NPS annually.

**Targeted Grazing.** *Prescribed Grazing (528)** includes managing grazing and/or browsing animals with the intent to achieve specific management objectives. This Practice Standard would be conducted in coordination with NPS as a part of a conservation management system to achieve one or more of the following: improve or maintain desired species composition, structure, and/or vigor of plant communities; improve or maintain surface and/or subsurface water quality and/or quantity; improve or maintain riparian and/or watershed function; reduce soil erosion and maintain or improve soil health; improve or maintain the quantity, quality, or connectivity of food and/or cover available for wildlife; and manage fine fuel loads to achieve desired conditions.

### *Other Management Activities (Applicable only on Ranches Where Currently Authorized)*

**Manure and Nutrient Management.** Manure and Nutrient Management Activities are intended to protect water and air quality while improving soil conditions for forage production. This Management Activity applies specifically to dairies as they must manage the waste generated from operations. Actions associated with the Practice Standards include installing composting pads and manure/liquid separators; using techniques that reduce greenhouse gas emissions, such as conversion from dairy flush to scrape systems; and properly transferring liquid manure to avoid affecting environmentally sensitive areas. Manure and Nutrient Management includes the following Practice Standards: Nutrient Management, Composting Facility, Waste Treatment, Waste Separation Facility, Waste Transfer, and Waste Storage Facility. Manure and Nutrient Management Activities are subject to regulation by the Regional Water Quality Control Board under Waste Discharge Requirements or Waivers of Waste Discharge Requirements.

*Nutrient Management (590)**—Nutrient Management involves development of a plan to manage the amount (rate), source, placement (method of application), and timing of plant nutrients and soil amendments to all lands where plant nutrients and soil amendments are applied. The purpose of Nutrient Management is to minimize nonpoint-source pollution to surface and groundwater, to properly use compost as a soil amendment, to protect air quality, and to maintain or improve soil and crop conditions.

The type, amount, and timing of nutrients and soil amendments would be based on soil testing, planned crop yield, growing season of target plants, and carbon sequestration goals and potentials.

Nutrient Management activities would include a budget for nitrogen and, if needed, for phosphorus and potassium, that considers all potential sources of nutrients, including, but not limited to, green manures,, crop residues, compost, animal manure, organic by-products, organic matter, soil biological activity, and irrigation water. Compost application rates would be consistent with established agronomic practice and applicable water quality regulations. On organic operations, the nutrient sources and management must be consistent with the USDA National Organic Program. Nutrient Management Plans are also required for dairy operations as a condition of current Regional Water Quality Control Board regulations.

*Composting Facility (317)*—A Composting Facility is a structure to contain and facilitate controlled aerobic decomposition of manure or other organic materials into biologically stable organic matter that is suitable for beneficial reuse. It is designed to produce a soil amendment that adds organic matter and beneficial organisms to the soil, provides slow-release plant-available nutrients, reduces greenhouse gas emissions from waste material decomposition, and improves soil condition. Composting can be used to reduce water pollution potential and improve handling characteristics of organic waste materials, to repurpose organic waste into animal bedding, and to suppress potential plant and animal pathogens. Consideration for such infrastructure would be limited to the Ranch Core subzone and would require additional evaluation if the structure consisted of more than a concrete pad (e.g., walls and roof) for managing compost.

The structure of a composting facility is typically a concrete pad with concrete or wood walls. It may also include a roof and a drain to outlet leachate into a vegetated swale, or otherwise stable area. Design considerations would include landscape features to buffer prevailing winds, minimize odor transport, and protect visual resources; equipment access; and a determination if a heavy use area apron is needed to properly manage the compost.

*Waste Treatment (629)*—Waste Treatment involves the mechanical or biological treatment of agricultural waste. The waste treatment Practice Standard is used to:

- improve ground and surface water quality by reducing the nutrient content, organic strength, and pathogen levels of agricultural waste
- improve air quality by reducing odors and gaseous emissions
- produce value-added by-products
- facilitate desirable waste handling, storage, or land application alternatives

This Practice Standard applies where a new technology can be used to manage the form and characteristics of agricultural waste to prevent it from becoming a nuisance or hazard, or where changing the form or composition provides additional use alternatives. This Practice Standard would be part of an agricultural waste management plan.

*Waste Separation Facility (632)**—A solid/liquid Waste Separation Facility is a filtration or screening device, settling tank, settling basin, or settling channel used to separate a portion of solids from a liquid waste stream. This Practice Standard applies where solid/liquid separation would:

- remove solids from the liquid waste stream and allow further treatment processes to be applied to the separated materials
- reduce problems associated with solids accumulation in liquid storage facilities
- reduce solids in stored liquids so liquids can be recycled for other uses
- assist with partitioning nutrients in the waste stream to improve nutrient management

The type of solid/liquid Waste Separation Facility that is selected would depend on the separation efficiency needed, the available space, and the planned use of the separated material. Consideration for such infrastructure would be limited to the Ranch Core subzone.

*Waste Transfer (634)*—Waste Transfer is a system of structures, pipes, or conduits installed to convey wastes or waste byproducts from the agricultural production site to storage, treatment, or application; it may involve one to several actions, such as various types of structures, pipelines, and pumps. The purpose of the Practice Standard is to transfer animal waste, bedding material, spilled feed, wastewater, and other residues associated with animal production to a storage/treatment facility or to agricultural land for application. Generated material is conveyed from the source to a storage/treatment facility or a loading area and from storage/treatment to an area for use.

The system design would include items necessary for the safety of humans and animals, including fencing, ventilation, and warning signs. The design would also include measures to prevent tractors or other equipment from slipping into waste collection, storage, or treatment facilities. This Practice Standard is only one component of a manure management system.

*Waste Storage Facility (313)*—A Waste Storage Facility is an impoundment or containment made by constructing an embankment, by excavating a pit or dugout, or by fabricating a structure. This Practice Standard provides temporary storage of manure, agricultural by-products, wastewater, or contaminated runoff and allows agricultural operation management flexibility for waste use. Storage structure types include liquid waste storage ponds or tanks and solid waste stacking structures.

Waste Storage Facility planning would incorporate environmental concerns, economics, the overall waste management system plan, and safety and health factors. The design of structures would depend on the intended storage period; the site location; federal, state, and local laws and regulations; waste type and production rate; equipment limitations; and safety concerns (table F-10).

**TABLE F-10: SIZE LIMITATIONS PER PROJECT FOR MANURE AND NUTRIENT MANAGEMENT**

| Item | Length | Disturbance Area | Soil Disturbance | Volume | Additional Criteria |
|---|---|---|---|---|---|
| Composting Facility | N/A | N/A | N/A | 25,000 cubic yards | Required setback of 100 feet from nearest surface waterbody or the nearest water supply well. A lesser setback may be allowed by the San Francisco Bay Regional Water Quality Control Board if NPS can demonstrate that the groundwater, geologic, topographic, and well construction conditions at the site are adequate to protect water quality (SWRCB 2015). |
| Waste Treatment | N/A | N/A | N/A | N/A | Same as composting facility |

| Item | Length | Disturbance Area | Soil Disturbance | Volume | Additional Criteria |
|---|---|---|---|---|---|
| Waste Separation Facility | N/A | N/A | N/A | N/A | Required setback of 100 feet from any down gradient surface waters, open tile line intake structures, sinkholes, agricultural or domestic well heads, or other conduits to surface water, unless a 35-foot wide vegetated buffer or physical barrier is substituted for the 100-foot setback or alternative conservation practices or field-specific conditions would provide pollutant reductions equivalent or better than the reductions achieved by the 100-foot setback (San Francisco RWQCB 2016). |
| Waste Transfer | N/A | N/A | N/A | N/A | Same as composting facility |
| Waste Storage Facility | N/A | N/A | N/A | N/A | Same as composting facility |

**Forage Production.** Forage Production involves the timely cutting and removal of forages from fields as hay, haylage, green-chop or silage. This Management Activity is authorized only in specific areas of Point Reyes with an NPS-approved plan. The purpose of silage is to optimize yield and quality of forage for livestock and promote vigorous plant re-growth. The Management Activity involves establishing adapted and/or compatible species, varieties, or cultivars of herbaceous species suitable for pasture, hay, or biomass production while limiting soil disturbance to manage the amount, orientation and distribution of crop and plant residue on the soil surface year-round. The promotion of desired plant species growth is often conducted in conjunction with the Nutrient Management Practice Standard.

All permits that allow Forage Production would be required to obtain a conservation plan from NRCS or NPS, with final approval by NPS. These plans would identify requirements such as silage crop residue cover, cut stubble height, row spacing, disc passes, disc depth, and the number of animal days grazed.

*Forage and Biomass Planting (512)**—This Practice Standard involves establishing adapted and/or compatible species, varieties, or cultivars of herbaceous species suitable for pasture, silage, haylage, or hay production to improve or maintain livestock nutrition and/or health, provide or increase forage supply during periods of low Forage Production, reduce soil erosion, or improve soil and water quality. Planted species would be approved by NPS and not contain species considered noxious weeds. Planting would occur in the fall using a no-till seed drill, which may be conducted in combination with Nutrient Management under a plan approved by NPS. The seeding/planting component of the required plan would

address the following elements: site/seedbed preparation, nutrient management (if applicable), methods of seeding/planting, timing of seeding/planting, selection of species, seed/plant source, seed analysis, and rate of seeding/planting.

*Forage Harvest Management (511)*—This Practice Standard involves the timely cutting and removal of forages from the field as hay, green-chop, or ensilage. Forage would be harvested based on stage of maturity, moisture content, length of cut, stubble height, harvest interval to achieve optimal use (i.e., silage, haylage, hay), plant community, and stand life. Approaches to minimize harvest impacts on wildlife should be considered when using this Practice Standard (e.g., harvest timing, cutting procedures, and cover patterns). Storage of harvested forage would use an associated runoff management system and/or Waste Storage Facility to avoid seepage. The Forage Harvest Management component of the required NPS approved plan would address the following elements: goals, objectives, and specific purpose, method of harvest, stage of maturity, optimal harvest moisture content, length of cut, stubble height to be left, harvest interval, and contaminant avoidance recommendations.

*Residue and Tillage Management/ No-Till (329)**—This Practice Standard limits soil disturbance to manage the amount, orientation and distribution of crop and plant residue on the soil surface to reduce sheet, rill and wind erosion, reduce tillage-induced particulate emissions, maintain or increase soil health and organic matter content, increase plant-available moisture, and reduce energy use. Soil disturbance is limited to the methods of planting/seeding under the Forage and Biomass Planting Practice Standard. Residues would be distributed evenly over the entire field and maintain a minimum of 60% residue cover on the soil surface throughout the year. Approaches to minimize harvest impacts to wildlife should be considered (e.g., leaving rows of unharvested crop standing at intervals across the field or adjacent to permanent cover for one or more years). Limited tillage is allowed to close or level ruts from harvesting equipment. No more than 10% of the field may be tilled for this purpose.

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**TABLE F-11: RANCH INFRASTRUCTURE, INCLUDING WATER CONTROL MANAGEMENT PRACTICE STANDARDS AND MITIGATION MEASURES**

| Management Activities | Road Upgrade and Decommissioning | | | | Infrastructure Improvement | | | Waterway Vegetation and Planting | | Fence | Livestock Water Supply | | | | | Pond Restoration | Waterway Stabilization | | Stream Crossing | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Practice Standards** | Access Road (560) | Trails and Walkways (575) | Structure for Water Control (587) | Road Closure and Treatment (654) | Heavy Use Area Protection (561) | Roof and Covers (367) | Roof Runoff Structure (558) | Grassed Waterway (412) | Filter Strip (393) | Fence (382) | Spring Development (574) | Livestock Pipeline (516) | Underground Outlet (620) | Watering Facility (614) | Pumping Plant (533) | Pond Restoration (378[R]) | Grade Stabilization Structure (410) | Lined Waterway or Outlet (468) | Stream Crossing (578) | **Resources** | **Subzone** | **Reference** |
| **Mitigations**<br>**NOTE: If sensitive resources are not in the project area that mitigations are intended to protect, the NPS may waive that mitigation requirement. Further, if the proposed practice does not require the level of disturbance or equipment addresses, additional mitigation measures may be required. Additional mitigation measure may be added to this list over the 20-year lease/permit term, as necessary.** | | | | | | | | | | | | | | | | | | | | | | |
| Use of heavy machinery shall be performed by experienced operators and heavy machinery shall:<br>▪ avoid steep slopes (>20%), slopes vulnerable to landslides, and uneven or rocky terrain<br>▪ be kept at least 10 feet from any cliffs or steep banks<br>▪ only be allowed based on daily fire danger rating<br>▪ avoid woody material larger than the machine is intended for and, otherwise, conform to the machine's user's manual<br>▪ avoid significant wildlife habitat and plant communities except where deemed necessary by NPS to address resource protection needs<br>▪ avoid waterbodies and riparian zones unless specifically required and approved by NPS as critical to the project objective (e.g. Pond Restoration, Waterway Stabilization, Stream Crossing)<br>▪ avoid lands designated by USDA, NRCS, as "highly erodible lands," compactable soils, and minimize soil disturbance to the greatest extent possible | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | Soils<br>Vegetation<br>Wildlife | All | University of California 2006<br>NPS<br>Pitt, Burgy, and Heady 1978 |

| Management Activities | Road Upgrade and Decommissioning | | | | Infrastructure Improvement | | | Waterway Vegetation and Planting | | Fence | Livestock Water Supply | | | | | Pond Restoration | Waterway Stabilization | | Stream Crossing | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Practice Standards** | Access Road (560) | Trails and Walkways (575) | Structure for Water Control (587) | Road Closure and Treatment (654) | Heavy Use Area Protection (561) | Roof and Covers (367) | Roof Runoff Structure (558) | Grassed Waterway (412) | Filter Strip (393) | Fence (382) | Spring Development (574) | Livestock Pipeline (516) | Underground Outlet (620) | Watering Facility (614) | Pumping Plant (533) | Pond Restoration (378[R]) | Grade Stabilization Structure (410) | Lined Waterway or Outlet (468) | Stream Crossing (578) | **Resources** | **Subzone** | **Reference** |
| To control the spread of plant diseases, insects, and weeds, equipment and vehicles shall be free of soil and debris accumulations on tires, wheel wells, vehicle undercarriages, and other surfaces before arrival at the park, when being moved between sites within the park, and before storing within the park. A high-pressure washer, compressed air, brushes, or other means shall be used to ensure that soil and debris are completely removed. All vehicles will be pressure-washed before their first entry into the park or when being moved for use in a different job site within the park.<br>Hand tools, shovels, loaders, and other equipment must be clean and free of soil and plant debris before initial use at the park and before being moved between work sites within the park. A high-pressure washer, compressed air, brushes, or other means shall be used to ensure that soil and debris are completely removed.<br>No soil or plant debris from the interior of vehicles or equipment (cabs, etc.) shall be deposited at the work site. If drivers/operators will be entering or exiting vehicles at the job site, the cab must be free of mud, soil, plant parts, and organic debris before arriving at the job site. Interior floors, floor mats, and seats must be free of potentially contaminated material.<br>Equipment and vehicles shall be inspected by NPS to ensure the undercarriage is clean and to allow the vehicle to proceed to the job site; be removed from NPS property if deficient and properly clean it at the expense of the project manager before returning to NPS property. | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | Soils<br>Vegetation | All | |

| Management Activities | Road Upgrade and Decommissioning | | | | Infrastructure Improvement | | | Waterway Vegetation and Planting | | Fence | Livestock Water Supply | | | | | Pond Restoration | Waterway Stabilization | | Stream Crossing | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Practice Standards** | Access Road (560) | Trails and Walkways (575) | Structure for Water Control (587) | Road Closure and Treatment (654) | Heavy Use Area Protection (561) | Roof and Covers (367) | Roof Runoff Structure (558) | Grassed Waterway (412) | Filter Strip (393) | Fence (382) | Spring Development (574) | Livestock Pipeline (516) | Underground Outlet (620) | Watering Facility (614) | Pumping Plant (533) | Pond Restoration (378[R]) | Grade Stabilization Structure (410) | Lined Waterway or Outlet (468) | Stream Crossing (578) | **Resources** | **Subzone** | **Reference** |
| A spill prevention and clean-up plan, Stormwater Pollution Prevention Plan, or similar document shall be prepared and implemented for all construction projects to address polluted runoff and spill prevention policies, erosion control materials required to be available on site in case of rain or a spill (e.g., straw bales, silt fencing), clean-up and reporting procedures, and locations of refueling and minor maintenance areas. Petroleum products, chemicals, silt, fine soils, and any substances deleterious to fish, amphibian, plant, or bird life are prohibited from passing into, or being placed where they can pass into the waters of the state.<br>Equipment operators shall have emergency spill clean-up gear (spill containment and absorption materials), dry cleanup methods (i.e., absorbent materials, and/or rags), and fire equipment available on site at all times.<br>Petroleum-powered equipment shall be stored and operated in a manner to prevent the potential release of petroleum materials into waters of the state and follow precautionary measures:<br>▪ All vehicles and equipment on the site shall not leak any type of hazardous materials, such as oil, hydraulic fluid, or fuel; inspect vehicles each day for leaks and repair immediately.<br>▪ Equipment storage, short-term maintenance, and refueling shall be conducted in a contained area located at least 100 feet from a watercourse or riparian area as approved by NPS; these activities will be prohibited from taking place on the project site unless deemed necessary for project completion by NPS.<br>▪ Immediately clean up leaks, drips, and other spills to avoid soil or groundwater contamination and notify NPS staff of any such occurrence.<br>▪ All spent fluids, including motor oil, radiator coolant, or other fluids, and used vehicle batteries must be collected, stored, and recycled as hazardous waste off site.<br>All major vehicle maintenance and washing shall be conducted off site. | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | Water<br>Wildlife | All | Marin PCP 2018 (HYD-2, Protect Water Quality – Erosion Control and Stormwater Detention during Grading and Other Disturbance in a Stream, Waterway, or Other Sensitive Habitat)<br>NPS |

| Management Activities | Road Upgrade and Decommissioning | | | | Infrastructure Improvement | | | Waterway Vegetation and Planting | | Fence | Livestock Water Supply | | | | | Pond Restoration | Waterway Stabilization | | Stream Crossing | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Practice Standards** | Access Road (560) | Trails and Walkways (575) | Structure for Water Control (587) | Road Closure and Treatment (654) | Heavy Use Area Protection (561) | Roof and Covers (367) | Roof Runoff Structure (558) | Grassed Waterway (412) | Filter Strip (393) | Fence (382) | Spring Development (574) | Livestock Pipeline (516) | Underground Outlet (620) | Watering Facility (614) | Pumping Plant (533) | Pond Restoration (378[R]) | Grade Stabilization Structure (410) | Lined Waterway or Outlet (468) | Stream Crossing (578) | **Resources** | **Subzone** | **Reference** |
| Revegetation must be completed as soon as possible after disturbance using live native plantings, native seed casting, or hydroseeding, preferably prior to the onset of rain.<br>Temporary erosion control measures shall be used on disturbed soils until permanent vegetation is established.<br>Disturbed and uncompacted soils shall be covered with straw mulch and/or biodegradable netting or matting. For slopes exceeding 20% staked biodegradable erosion logs or wattles are required for decelerating runoff.<br>Silt fences or filter bags shall be used if working in areas known to flood or experience heavy flow.<br>Temporary seeding using non-invasive, non-persistent grass species (e.g., barley grass, sterile wheat) or hydromulching may be utilized if approved by NPS.<br>To avoid scouring, erosion control materials shall be placed to allow water to sheet as opposed to channel.<br>Areas that may be accessed by cattle or other livestock shall be enclosed by fencing to exclude livestock until restoration goals have been met. | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | Air<br>Vegetation<br>Water | All | Marin PCP 2018 (HYD-1, Protect Water Quality – Planting and Revegetation after Soil Disturbance) |
| Vehicles and equipment shall be restricted to one principal access route, preferably one that has been used for past activities.<br>All vehicles and equipment shall be staged on roads, in NPS-specified staging areas, or on existing disturbed ranch operation sites. | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | Air<br>Soils<br>Vegetation<br>Visitor Use and Exp.<br>Water<br>Wildlife | All | Marin PCP 2018 (BIO-3, Protect Wetlands)<br>NPS |
| If access through a wetland is necessary, low ground pressure, rubber-tired equipment is required. NPS will determine the necessity and timing of access to minimize disturbance (typically later summer). | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | Vegetation<br>Water | All | Marin PCP 2018 (BIO-3, Protect Wetlands) |
| Erosion control and sediment detention measures must be available on site at all times and in place at all locations where the likelihood of sediment input exists prior to the onset of rain to detain sediment-laden water on site and minimize fine sediment and sediment/water slurry input to flowing water.<br>Dispose of sediment collected in the structures away from the collection site in an upland area where it cannot enter a waterway.<br>When required by NPS or project regulators, NPS staff or a qualified designee shall inspect in-stream habitat and the performance of erosion and sediment control devices during construction to ensure the devices are functioning properly. | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | Water<br>Wildlife | All | Marin PCP 2018 (HYD-2, Protect Water Quality – Erosion Control and Stormwater Detention during Grading and Other Disturbance in a Stream, Waterway, or Other Sensitive Habitat) |

| Management Activities | Road Upgrade and Decommissioning | | | | Infrastructure Improvement | | | Waterway Vegetation and Planting | | Fence | Livestock Water Supply | | | | | Pond Restoration | Waterway Stabilization | | Stream Crossing | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Practice Standards** | Access Road (560) | Trails and Walkways (575) | Structure for Water Control (587) | Road Closure and Treatment (654) | Heavy Use Area Protection (561) | Roof and Covers (367) | Roof Runoff Structure (558) | Grassed Waterway (412) | Filter Strip (393) | Fence (382) | Spring Development (574) | Livestock Pipeline (516) | Underground Outlet (620) | Watering Facility (614) | Pumping Plant (533) | Pond Restoration (378[R]) | Grade Stabilization Structure (410) | Lined Waterway or Outlet (468) | Stream Crossing (578) | **Resources** | **Subzone** | **Reference** |
| Prohibit discharge of water from any onsite temporary sediment stockpile or storage areas or any other discharge of construction dewatering flows to surface waters, unless specific mitigations are approved in permits.<br>If rain is forecast to occur while materials are temporarily stockpiled, cover with plastic that is secured in place to ensure the piles are protected from rain and wind, and install silt fencing or wattles on contour around all stockpile locations. | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | Air<br>Water | Pasture and Ranch Core | Marin PCP 2018 (HYD-2, Protect Water Quality, Erosion Control and Stormwater Detention during Grading and Other Disturbance in a Stream, Waterway, or Other Sensitive Habitat) |
| Conduct any grading and other earth-disturbing activities, including in-stream and riparian activities (other than native vegetation planting or erosion control activities on disturbed sites without mechanized equipment) during the dry season, generally June 1 through October 31; exceptions may be made by the NPS in cases such as catastrophic failure due to a large storm or other event that causes water quality or public safety concerns, or project-specific recommendations from regulators or NPS suggest an alternative work window to avoid impacts on special-status species.<br>Work that would disturb waterways or sensitive riparian habitats outside the June through October time frame must be approved in advance by the NPS and project regulators. | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | Soils<br>Water<br>Vegetation<br>Water<br>Wildlife | All | Marin PCP 2018 (HYD-2, Protect Water Quality – Erosion Control and Stormwater Detention during Grading and Other Disturbance in a Stream, Waterway, or Other Sensitive Habitat)<br>Marin PCP 2018 (BMP BR-3 Temporal limitations and requirements to protect special-species during construction, vegetation management and other maintenance activities) |

| Management Activities | Road Upgrade and Decommissioning | | | | Infrastructure Improvement | | | Waterway Vegetation and Planting | | Fence | Livestock Water Supply | | | | | Pond Restoration | Waterway Stabilization | | Stream Crossing | | | |
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| **Practice Standards** | Access Road (560) | Trails and Walkways (575) | Structure for Water Control (587) | Road Closure and Treatment (654) | Heavy Use Area Protection (561) | Roof and Covers (367) | Roof Runoff Structure (558) | Grassed Waterway (412) | Filter Strip (393) | Fence (382) | Spring Development (574) | Livestock Pipeline (516) | Underground Outlet (620) | Watering Facility (614) | Pumping Plant (533) | Pond Restoration (378[R]) | Grade Stabilization Structure (410) | Lined Waterway or Outlet (468) | Stream Crossing (578) | **Resources** | **Subzone** | **Reference** |
| Perform work in and around areas, including structures, that may support bird nesting before March 15 or after July 31, unless vegetation height is less than 8 inches, or otherwise authorized by the NPS. | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | Wildlife (Birds) | All | Marin PCP 2018 (BMP BR-3 Temporal limitations and requirements to protect special-species during construction, vegetation management and other maintenance activities) |
| Conduct preconstruction breeding bird surveys for projects with construction activities occurring from March 15 through July 31 for special-status birds, migratory birds, and raptors (surveys for raptors would be required for work beginning as early as February 1).<br>Conduct these preconstruction surveys in all locations identified by a qualified biologist.<br>Conduct the surveys within three days two weeks prior to initiation of vegetation clearing, tree removal and trimming, or other construction activities.<br>Note: the results of surveys will be reviewed by NPS prior to any work authorization. If nests are identified by the biologist, NPS will work with the project manager to identify appropriate avoidance measures and buffers. Determinations of the appropriate measures are be based on the nesting species, sensitivity, and listing status. If the biologist finds no active nesting or breeding activity, NPS may authorize work to begin. | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | Wildlife (Birds) | All | Marin PCP 2018 (BIO-1j, Protect Nesting Birds during Construction) |
| The following American badger protection measures must be implemented for all projects requiring disturbance to open grasslands or low-growing vegetation habitats:<br>Conduct a preconstruction survey for the American badger prior to beginning work. If any badgers are documented in the project area or within 500 feet of it, establish and maintain buffer zones until the badgers have vacated the area. Do not begin working in the buffer zone until the area is cleared by the project biologist. In consultation with NPS, develop and implement additional protection measures, which may include larger buffer zones or relocations, as required. | X | X | X | X | X | | | X | X | X | X | X | X | X | X | X | X | X | X | Wildlife (American Badger) | All | Marin PCP 2018 (BIO-1n, Protect American Badger) |

| Management Activities | Road Upgrade and Decommissioning | | | | Infrastructure Improvement | | | Waterway Vegetation and Planting | | Fence | Livestock Water Supply | | | | | Pond Restoration | Waterway Stabilization | | Stream Crossing | | | |
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| **Practice Standards** | Access Road (560) | Trails and Walkways (575) | Structure for Water Control (587) | Road Closure and Treatment (654) | Heavy Use Area Protection (561) | Roof and Covers (367) | Roof Runoff Structure (558) | Grassed Waterway (412) | Filter Strip (393) | Fence (382) | Spring Development (574) | Livestock Pipeline (516) | Underground Outlet (620) | Watering Facility (614) | Pumping Plant (533) | Pond Restoration (378[R]) | Grade Stabilization Structure (410) | Lined Waterway or Outlet (468) | Stream Crossing (578) | **Resources** | **Subzone** | **Reference** |
| For project areas located in habitats with known presence of special-status species or critical wildlife corridors, install temporary wildlife exclusion fencing around the project perimeter.<br>Exclusion fencing must be highly visible and installation overseen by the project biologist. Openings shall be restricted to areas of construction site access.<br>Note: the purpose of the temporary fencing is to preclude animals from entering the work area and prevent debris and workers from entering adjacent habitats | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | Wildlife | All | Marin PCP 2018 (BIO-1c Avoid Listed Special-status Wildlife Species) |
| If suitable CRLF breeding habitat is present, only conduct project activities between July 1 and October 15 to avoid impacts on breeding CRLF or egg masses.<br>If a project site occurs in potential CRLF habitat, an NPS approved biologist must conduct a preconstruction survey of potential CRLF habitat and immediately adjacent uplands with suitable vegetation cover that is potential habitat for the CRLF no more than 48 hours before the start of construction activities.<br>The biologist shall look for individual frogs, evaluate the likelihood of usage, and determine whether additional biological monitoring is needed during construction to ensure that individuals present are be removed or avoided.<br>The biologist shall monitor initial ground-disturbing activities within 300 feet of CRLF habitat and halt work activities that may adversely affect the CRLF until it no longer occupies the project area.<br>Note: relocation of CRLF can performed only by individuals, who are approved in advance by CDFW and USFWS. | X | X | X | X | X | | X | X | X | X | X | X | X | X | X | X | X | X | X | Wildlife (CRLF) | All | Marin PCP 2018 (BIO-1g, Protect California Red-legged Frog) |
| Do not begin work in and around streams that support anadromous fish populations or California freshwater shrimp until August 1 and complete work by October 15.<br>Note: work prior to June 15 or beyond October 15 may be authorized on a site-specific basis with approval from the NPS and project regulators.<br>Channel-spanning bridges, bottomless arch culverts with natural streambed substrates, or other fish-friendly solutions are required in salmonid streams. | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | Wildlife (CA freshwater shrimp, Salmonids) | All | Marin PCP 2018 (BMP BR-3 Temporal limitations and requirements to protect special-species during construction, vegetation management and other maintenance activities) |

| Management Activities | Road Upgrade and Decommissioning | | | | Infrastructure Improvement | | | Waterway Vegetation and Planting | | Fence | Livestock Water Supply | | | | | Pond Restoration | Waterway Stabilization | | Stream Crossing | | | |
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| **Practice Standards** | Access Road (560) | Trails and Walkways (575) | Structure for Water Control (587) | Road Closure and Treatment (654) | Heavy Use Area Protection (561) | Roof and Covers (367) | Roof Runoff Structure (558) | Grassed Waterway (412) | Filter Strip (393) | Fence (382) | Spring Development (574) | Livestock Pipeline (516) | Underground Outlet (620) | Watering Facility (614) | Pumping Plant (533) | Pond Restoration (378[R]) | Grade Stabilization Structure (410) | Lined Waterway or Outlet (468) | Stream Crossing (578) | **Resources** | **Subzone** | **Reference** |
| Reconnaissance-level surveys must be performed by a designated project biologist to determine whether suitable habitat for listed butterflies, including Myrtle's silverspot butterfly, is present in the project area.<br>If larval host or nectar plants for listed butterflies are present and the target species is documented in the project vicinity, project work must be conducted with minimum soil compaction and disturbance, and with hand tools wherever possible. | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | Wildlife (Myrtle's Silverspot) | All | Marin PCP 2018 (BIO-1m, Protect Special-status Butterflies) |
| Protect host plants for listed butterflies identified by the designated project biologist, including Sedum spathulifolium and Viola adunca, with a clearly demarcated 20-foot buffer zone. | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | Wildlife (Myrtle's Silverspot) | All | Marin PCP 2018 (BIO-1m, Protect Special-status Butterflies) |
| Areas must be closely monitored for pest plant invasion after construction, mechanical and burn treatments, aeration, and seeding; a monitoring plan must be established by the project manager to detect and eradicate any weeds.<br>Monitoring shall employ an early detection, rapid response approach to any previously undetected aggressive weedy species observed, once the plant's species identification and non-native status have been confirmed following best available weed-specific technical guidance current at the time of implementation. | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | Vegetation | All | NPS |
| Replace all native plants removed during project activities with species similar to that of the removed vegetation or with species that are appropriate to the site conditions and are native to the project watershed, as approved by the NPS Plants shall be sourced from Marin County or southern Sonoma County unless otherwise approved by NPS.<br>Plants sourced from nursery require NPS approval of the nursery, which shall include documentation of pathogen avoidance protocols and source of plant materials.<br>Use of native plant species with high wildlife and/or pollinator values will be prioritized by NPS during approval. | X | X | X | X | X | | | | | | X | X | X | | | | X | X | X | Vegetation | All | Marin PCP 2018 (HYD-1, Protect Water Quality – Planting and Revegetation after Soil Disturbance), |

| Management Activities | Road Upgrade and Decommissioning | | | | Infrastructure Improvement | | | Waterway Vegetation and Planting | | Fence | Livestock Water Supply | | | | | Pond Restoration | Waterway Stabilization | | Stream Crossing | | | |
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| **Practice Standards** | Access Road (560) | Trails and Walkways (575) | Structure for Water Control (587) | Road Closure and Treatment (654) | Heavy Use Area Protection (561) | Roof and Covers (367) | Roof Runoff Structure (558) | Grassed Waterway (412) | Filter Strip (393) | Fence (382) | Spring Development (574) | Livestock Pipeline (516) | Underground Outlet (620) | Watering Facility (614) | Pumping Plant (533) | Pond Restoration (378[R]) | Grade Stabilization Structure (410) | Lined Waterway or Outlet (468) | Stream Crossing (578) | **Resources** | **Subzone** | **Reference** |
| Any import of soils must be pre-approved by the NPS.<br>Soils shall not be imported directly adjacent to sites known to be infested with pathogens, areas of heavy use, or sites with high risk for contamination such as landscaped areas, old nursery stock, or parking lots.<br>Soils shall not be imported to sites or upslope of sites with habitat for plants that are species of concern or listed species. NPS shall approve any Import of soil to sites that host plants susceptible to Phytophthora (Fagaceae, Ericaeae).<br>Soils with copious organic matter and water-logged soils shall not be imported as these are ideal candidates for Phytophthora contamination.<br>Only weed-free certified soils and aggregates shall be used unless approved by NPS.<br>Imported soils shall be evenly heat treated to 300°F or solarized for 15 hours under black plastic, reaching a minimum temperature of 113°F. | X | X | X | | X | | | | | | X | X | | | X | X | X | X | X | Soils | All | NPS |
| Avoid conducting work in the RPZ (Root Protect Zone) of trees wherever possible and do not work in the RPZ when soils are wet.<br>Note: the RPZ is defined as 1.5 times the dripline radius measured from the tree trunk and extending approximately three feet below the soil surface.<br>The project manager shall ensure that the outer extent of the RPZ is clearly demarcated with exclusionary fencing to keep construction vehicles and activities away from tree roots.<br>If work must occur in the RPZ:<br>▪ All tree trunks shall be wrapped up to 8 feet high or the height of the equipment working in the area.<br>▪ Use protection materials that may include wood boards or heavy-duty rubber matting.<br>▪ Install trench plates or heavy mulch for heavy equipment working in the RPZ.<br>▪ Cut all roots larger than 1 inch with a clean, sharp saw.<br>▪ Prune no more than 20% of live foliage in one year. | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | Vegetation | All | Marin PCP 2018 (BIO-2b, Avoid Work in or Compensate for Impacts on Native Tree Root Protection Zone) |
| Remove no more than 0.25 acre of vegetation from a streambank or stream channel where the area contains a mix of native and invasive species and no more than 0.10 acre of native riparian trees, shrubs, or woody perennials for a single project. | X | | X | X | | | | | | | X | X | X | X | X | X | X | X | X | Vegetation<br>Water | All | Marin PCP 2018 (BMP VM-1 Project areal limitations on vegetation management) |
| Fence construction shall adhere to the wildlife friendly USDA, NRCS, specifications (382D) for fence construction, unless otherwise approved by NPS. Minimize the number of internal wire strands to the extent practicable. | | | | | | | | | | X | | | | | | | | | | Wildlife | All | Karhu 2008; Paige 2012; Weigand 2008 |

| Management Activities | Road Upgrade and Decommissioning | | | | Infrastructure Improvement | | | Waterway Vegetation and Planting | | Fence | Livestock Water Supply | | | | | Pond Restoration | Waterway Stabilization | | Stream Crossing | | | |
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| **Practice Standards** | Access Road (560) | Trails and Walkways (575) | Structure for Water Control (587) | Road Closure and Treatment (654) | Heavy Use Area Protection (561) | Roof and Covers (367) | Roof Runoff Structure (558) | Grassed Waterway (412) | Filter Strip (393) | Fence (382) | Spring Development (574) | Livestock Pipeline (516) | Underground Outlet (620) | Watering Facility (614) | Pumping Plant (533) | Pond Restoration (378[R]) | Grade Stabilization Structure (410) | Lined Waterway or Outlet (468) | Stream Crossing (578) | **Resources** | **Subzone** | **Reference** |
| Design culverts to minimize habitat fragmentation and barriers to aquatic movement.<br>Design all structural crossings of low and high flows to provide passage for as many different aquatic species and age classes as possible.<br>Culverts that require Section 401/404 permits shall be designed and stamped by a licensed engineer, geologist, landscape architect or a qualified NRCS engineer. | X | X | X | | X | | X | | | | | | | | | | | | X | Wildlife (Salmonids, Fish) | All | Marin PCP 2018 (BMP DC-3 Required design considerations for roads, culverts, and stream crossings to protect sensitive biological resources and water quality). |
| Livestock Water Supply activities shall include:<br>▪ installing buried pipe at minimum sufficient depth (typically 18” or less) below the ground surface to provide protection from hazards imposed by traffic loads, farming operations, freezing temperatures, or soil cracking, as applicable<br>▪ using pipelines of sufficient strength to withstand all external loads on the pipe for the given installation conditions.<br>▪ installing a trench (if the action include such), placing the top 6 inches of excavated soil to one side and the remaining soil to the other side of the trench; when refilling the trench, placing the top 6 inches of soil back on top of the final fill to retain the existing native seed bank and to return the surface to existing condition and grade<br>▪ keeping trench width to the minimum necessary to allow for pipeline installation<br>▪ equipping the pipe leading from the spring to a tank or trough with a valve or overflow to allow water to return to the spring when the tank or trough is full<br>▪ conducting work during driest time of the year (August to first fall rains)<br>▪ placing any material excavated from springs or ponds during development on pond berm or on upland fields approved by NPS with <5% slope, >100 feet from wetlands, and spread to a height of 12 inches or less<br>▪ conducting spring maintenance activities with hand tools whenever possible<br>▪ requiring wildlife escape ramps in all troughs<br>▪ placing new water troughs a minimum distance of 150 feet from riparian areas | | | | | | | | | | | X | X | X | X | X | | | | | All | All | NPS |

| Management Activities | Road Upgrade and Decommissioning | | | | Infrastructure Improvement | | | Waterway Vegetation and Planting | | Fence | Livestock Water Supply | | | | | Pond Restoration | Waterway Stabilization | | Stream Crossing | | | |
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| **Practice Standards** | Access Road (560) | Trails and Walkways (575) | Structure for Water Control (587) | Road Closure and Treatment (654) | Heavy Use Area Protection (561) | Roof and Covers (367) | Roof Runoff Structure (558) | Grassed Waterway (412) | Filter Strip (393) | Fence (382) | Spring Development (574) | Livestock Pipeline (516) | Underground Outlet (620) | Watering Facility (614) | Pumping Plant (533) | Pond Restoration (378[R]) | Grade Stabilization Structure (410) | Lined Waterway or Outlet (468) | Stream Crossing (578) | **Resources** | **Subzone** | **Reference** |
| All pond restoration activities shall adhere to the following conditions:<br>▪ No new or enlarged ponds are authorized.<br>▪ No more than 3,000 cubic yards of fill shall be removed from a pond under any single project.<br>▪ Ensure that maintenance activities are conducted either when a pond has dried out completely, or during the driest period of the year in September or October (late August is an option if necessary, but not preferred).<br>▪ Ensure that no mowing occurs around ponds unless pre-approved by NPS.<br>▪ Avoid excavating below original pond depth.<br>▪ Provide sloping or benched sides with shallow areas and keeping deep areas at least a yard deep.<br>▪ Use spoils from the ponds to buttress the berm; otherwise, place excess soils in an NPS-identified area for stockpiling or spreading.<br>▪ Place excavated material on pond berm or on upland fields approved by NPS with <5% slope, >100 feet from wetlands, and spread to a height of 12 inches or less.<br>▪ Install a staff gage in the pond before construction begins to monitor water level.<br>▪ Maintain 10% to 35% cover if the pond has existing emergent vegetation. | | | | | | | | | | | | | | | **X** | | | | Soils<br>Water<br>Wildlife (CRLF) | All | NPS |
| Unless otherwise stated on the Practice Requirement sheet or seeding plan, the timing of seeding must occur in the fall before October 15.<br>Only use local (collected in Marin County or southern Sonoma County) genotypes of native species seed or species on the park's approved seed species list (based on information provided by the USDA, NRCS Plant Materials Program), unless otherwise approved by NPS.<br>Only seed certified to be free of noxious weed seeds and fungicides shall be used.<br>Adjust seeding rates for soil textural differences and the pure live seed rating.<br>Only conduct seeding using no-till drill or broadcast methods and using only broadcast methods on sites with a high risk of soil erosion. | | | | | | | **X** | **X** | | | | | | | | | | | Air<br>Soils<br>Vegetation | Pasture | NPS 1990<br>DEFRA 2009<br>USDA-NRCS 2010<br>University of California 2006 |

| Management Activities | Road Upgrade and Decommissioning | | | | Infrastructure Improvement | | | Waterway Vegetation and Planting | | Fence | Livestock Water Supply | | | | | Pond Restoration | Waterway Stabilization | | Stream Crossing | | | |
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| **Practice Standards** | Access Road (560) | Trails and Walkways (575) | Structure for Water Control (587) | Road Closure and Treatment (654) | Heavy Use Area Protection (561) | Roof and Covers (367) | Roof Runoff Structure (558) | Grassed Waterway (412) | Filter Strip (393) | Fence (382) | Spring Development (574) | Livestock Pipeline (516) | Underground Outlet (620) | Watering Facility (614) | Pumping Plant (533) | Pond Restoration (378[R]) | Grade Stabilization Structure (410) | Lined Waterway or Outlet (468) | Stream Crossing (578) | **Resources** | **Subzone** | **Reference** |
| In-stream crossings shall not be designed for placement within 300 feet of known spawning or breeding areas of listed species.<br>Stream crossings in a salmonid-bearing stream must be a minimum of 1,500 meters (4,921 feet) apart. Crossings in a non-fish bearing stream must be at least 100 feet apart. | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | Wildlife (T&E) | All | Marin PCP 2018 (BMP DC-3 Required design considerations for roads, culverts, and stream crossings to protect sensitive biological resources and water quality). NOAA Fisheries 2016 |
| Crossings shall be designed to require the minimum amount of dewatering, not to exceed 500 feet of channel unless otherwise approved by NPS.<br>Bridges shall be designed and stamped by a licensed California engineer or a qualified NRCS engineer. | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | All | All | NPS |
| All precipitation and clean surface drainage outside of manured areas, including that from roofed areas, shall be diverted away from confined and/or manured areas, unless such drainage is fully contained in a retention pond. | X | X | X | | X | X | X | X | X | | | | | | | | | X | | Water | Ranch Core | Cal. Code Regs., tit. 27, §22562(b) |
| General seeding mitigations:<br>▪ A Plans and Specifications document must be prepared that includes species to be used, seeding rates and dates, establishment procedures, actions needed to ensure adequate cover of desired species, and operation, monitoring, and maintenance requirements.<br>▪ All purchased seed shall be tagged and labeled in accordance with the California Agricultural Code and Seed Law, and acceptable to the County Agricultural Commissioner. Bag tags shall include evidence of purity and germination. Seed shall be of a quality that weed seed shall not exceed 0.5% of the aggregate of pure live seed (PLS) (% germination x % purity) and other material. Time since date of seed test shall not exceed 9 months. | | | | | | | X | X | | | | | | | | | | | All | All | NPS |

**TABLE F-12: VEGETATION MANAGEMENT PRACTICE STANDARDS AND MITIGATION MEASURES**

| Management Activities | Upland and Riparian Vegetation Management and Planting | | | | | | | | | Mowing | | IPM | Targeted Grazing | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Practice Standards** | Critical Area Planting (342) | Range Planting (550) | Riparian Herbaceous Cover (390) | Riparian Forest Buffer (391) | Windbreak/ Shelterbelt Establishment (380) | Tree/Shrub Establishment (612) | Mulching (484) | Conservation Cover (327) | Wildlife Habitat Planting (420) | Brush Management, Mechanical (314-A) | Herbaceous Weed Treatment (315) | IPM (595) | Targeted Grazing (528) | **Resources** | **Subzone** |
| **NOTE: If sensitive resources are not in the project area that mitigations are intended to protect, the NPS may waive that mitigation requirement. Further, if the proposed practice does not require the level of disturbance or equipment addresses, additional mitigation measures may be required. Additional mitigation measure may be added to this list over the 20-year lease/permit term, as necessary.** | | | | | | | | | | | | | | | |
| Use of heavy machinery shall be performed by experienced operators and heavy machinery shall:<br>▪ avoid steep slopes (>20%), slopes vulnerable to landslides, and uneven or rocky terrain<br>▪ be kept at least 10 feet from any cliffs or steep banks<br>▪ only be allowed based on daily fire danger rating<br>▪ avoid woody material larger than the machine is intended for and, otherwise, conform to the machine's user's manual<br>▪ avoid significant wildlife habitat and plant communities except where deemed necessary by NPS to address resource protection needs<br>▪ avoid waterbodies and riparian zones unless specifically required and approved by NPS as critical to the project objective (e.g. Pond Restoration, Waterway Stabilization, Stream Crossing)<br>▪ avoid lands designated by USDA, NRCS, as "highly erodible lands," compactable soils, and minimize soil disturbance to the greatest extent possible | **X** | **X** | **X** | **X** | **X** | **X** | **X** | **X** | **X** | **X** | **X** | **X** | **X** | Soils<br>Vegetation<br>Wildlife | All |
| To control the spread of plant diseases, insects, and weeds, equipment and vehicles shall be free of soil and debris accumulations on tires, wheel wells, vehicle undercarriages, and other surfaces before arrival at the park, when being moved between sites within the park, and before storing within the park. A high-pressure washer, compressed air, brushes, or other means shall be used to ensure that soil and debris are completely removed. All vehicles will be pressure-washed before their first entry into the park or when being moved for use in a different job site within the park.<br>Hand tools, shovels, loaders, and other equipment must be clean and free of soil and plant debris before initial use at the park and before being moved between work sites within the park. A high-pressure washer, compressed air, brushes, or other means shall be used to ensure that soil and debris are completely removed.<br>No soil or plant debris from the interior of vehicles or equipment (cabs, etc.) shall be deposited at the work site. If drivers/operators will be entering or exiting vehicles at the job site, the cab must be free of mud, soil, plant parts, and organic debris before arriving at the job site. Interior floors, floor mats, and seats must be free of potentially contaminated material.<br>Equipment and vehicles shall be inspected by NPS to ensure the undercarriage is clean and to allow the vehicle to proceed to the job site; be removed from NPS property if deficient and properly clean it at the expense of the project manager before returning to NPS property. | **X** | **X** | **X** | **X** | **X** | **X** | **X** | **X** | **X** | **X** | **X** | **X** | **X** | Soils<br>Vegetation | All |

| Management Activities | Upland and Riparian Vegetation Management and Planting | | | | | | | | | Mowing | | IPM | Targeted Grazing | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Practice Standards** | Critical Area Planting (342) | Range Planting (550) | Riparian Herbaceous Cover (390) | Riparian Forest Buffer (391) | Windbreak/ Shelterbelt Establishment (380) | Tree/Shrub Establishment (612) | Mulching (484) | Conservation Cover (327) | Wildlife Habitat Planting (420) | Brush Management, Mechanical (314-A) | Herbaceous Weed Treatment (315) | IPM (595) | Targeted Grazing (528) | **Resources** | **Subzone** |
| A spill prevention and clean-up plan, Stormwater Pollution Prevention Plan, or similar document shall be prepared and implemented for all construction projects to address polluted runoff and spill prevention policies, erosion control materials required to be available on site in case of rain or a spill (e.g., straw bales, silt fencing), clean-up and reporting procedures, and locations of refueling and minor maintenance areas. Petroleum products, chemicals, silt, fine soils, and any substances deleterious to fish, amphibian, plant, or bird life are prohibited from passing into, or being placed where they can pass into the waters of the state.<br>Equipment operators shall have emergency spill clean-up gear (spill containment and absorption materials), dry cleanup methods (i.e., absorbent materials, and/or rags), and fire equipment available on site at all times.<br>Petroleum-powered equipment shall be stored and operated in a manner to prevent the potential release of petroleum materials into waters of the state and follow precautionary measures:<br>▪ All vehicles and equipment on the site shall not leak any type of hazardous materials, such as oil, hydraulic fluid, or fuel; inspect vehicles each day for leaks and repair immediately.<br>▪ Equipment storage, short-term maintenance, and refueling shall be conducted in a contained area located at least 100 feet from a watercourse or riparian area as approved by NPS; these activities will be prohibited from taking place on the project site unless deemed necessary for project completion by NPS.<br>▪ Immediately clean up leaks, drips, and other spills to avoid soil or groundwater contamination and notify NPS staff of any such occurrence.<br>▪ All spent fluids, including motor oil, radiator coolant, or other fluids, and used vehicle batteries must be collected, stored, and recycled as hazardous waste off site.<br>All major vehicle maintenance and washing shall be conducted off site. | **X** | **X** | **X** | **X** | **X** | **X** | **X** | **X** | **X** | **X** | **X** | **X** | **X** | Water<br>Wildlife | All |
| Revegetation must be completed as soon as possible after disturbance using live native plantings, native seed casting, or hydroseeding, preferably prior to the onset of rain.<br>Temporary erosion control measures shall be used on disturbed soils until permanent vegetation is established.<br>Disturbed and uncompacted soils shall be covered with straw mulch and/or biodegradable netting or matting. For slopes exceeding 20% staked biodegradable erosion logs or wattles are required for decelerating runoff.<br>Silt fences or filter bags shall be used if working in areas known to flood or experience heavy flow.<br>Temporary seeding using non-invasive, non-persistent grass species (e.g., barley grass, sterile wheat) or hydromulching may be utilized if approved by NPS.<br>To avoid scouring, erosion control materials shall be placed to allow water to sheet as opposed to channel.<br>Areas that may be accessed by cattle or other livestock shall be enclosed by fencing to exclude livestock until restoration goals have been met. | **X** | **X** | **X** | **X** | **X** | **X** | | **X** | **X** | **X** | **X** | **X** | | Air<br>Vegetation<br>Water | All |

| Management Activities | Upland and Riparian Vegetation Management and Planting | | | | | | | | | Mowing | | IPM | Targeted Grazing | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Practice Standards** | Critical Area Planting (342) | Range Planting (550) | Riparian Herbaceous Cover (390) | Riparian Forest Buffer (391) | Windbreak/ Shelterbelt Establishment (380) | Tree/Shrub Establishment (612) | Mulching (484) | Conservation Cover (327) | Wildlife Habitat Planting (420) | Brush Management, Mechanical (314-A) | Herbaceous Weed Treatment (315) | IPM (595) | Targeted Grazing (528) | **Resources** | **Subzone** |
| Vehicles and equipment shall be restricted to one principal access route, preferably one that has been used for past activities.<br>All vehicles and equipment shall be staged on roads, in NPS-specified staging areas, or on existing disturbed ranch operation sites. | X | X | X | X | X | X | X | X | X | X | X | X | X | Air<br>Soils<br>Vegetation<br>Visitor Use and Experience<br>Water<br>Wildlife | All |
| If access through a wetland is necessary, low ground pressure, rubber-tired equipment is required. NPS will determine the necessity and timing of access to minimize disturbance (typically later summer). | X | X | X | X | X | X | X | X | X | X | X | X | X | Vegetation<br>Water | All |
| Erosion control and sediment detention measures must be available on site at all times and in place at all locations where the likelihood of sediment input exists prior to the onset of rain to detain sediment-laden water on site and minimize fine sediment and sediment/water slurry input to flowing water.<br>Dispose of sediment collected in the structures away from the collection site in an upland area where it cannot enter a waterway.<br>When required by NPS or project regulators, NPS staff or a qualified designee shall inspect in-stream habitat and the performance of erosion and sediment control devices during construction to ensure the devices are functioning properly. | X | X | X | X | X | X | X | X | X | | | | | Water<br>Wildlife | All |
| Prohibit discharge of water from any onsite temporary sediment stockpile or storage areas or any other discharge of construction dewatering flows to surface waters, unless specific mitigations are approved in permits.<br>If rain is forecast to occur while materials are temporarily stockpiled, cover with plastic that is secured in place to ensure the piles are protected from rain and wind, and install silt fencing or wattles on contour around all stockpile locations. | | | | | | | X | | | | | X | | Air<br>Water | Pasture and Ranch Core |
| Conduct any grading and other earth-disturbing activities, including in-stream and riparian activities (other than native vegetation planting or erosion control activities on disturbed sites without mechanized equipment) during the dry season, generally June 1 through October 31; exceptions may be made by the NPS in cases such as catastrophic failure due to a large storm or other event that causes water quality or public safety concerns, or project-specific recommendations from regulators or NPS suggest an alternative work window to avoid impacts on special-status species.<br>Work that would disturb waterways or sensitive riparian habitats outside the June through October time frame must be approved in advance by the NPS and project regulators. | | X | | | | | | | | X | X | X | | Soils<br>Water<br>Vegetation<br>Water<br>Wildlife | All |
| Perform work in and around areas, including structures, that may support bird nesting before March 15 or after July 31, unless vegetation height is less than 8 inches, or otherwise authorized by the NPS. | X | X | | | | | | | | X | X | X | | Wildlife (Birds) | All |

| Management Activities | Upland and Riparian Vegetation Management and Planting | | | | | | | | | Mowing | | IPM | Targeted Grazing | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Practice Standards** | Critical Area Planting (342) | Range Planting (550) | Riparian Herbaceous Cover (390) | Riparian Forest Buffer (391) | Windbreak/ Shelterbelt Establishment (380) | Tree/Shrub Establishment (612) | Mulching (484) | Conservation Cover (327) | Wildlife Habitat Planting (420) | Brush Management, Mechanical (314-A) | Herbaceous Weed Treatment (315) | IPM (595) | Targeted Grazing (528) | **Resources** | **Subzone** |
| Conduct preconstruction breeding bird surveys for projects with construction activities occurring from March 15 through July 31 for special-status birds, migratory birds, and raptors (surveys for raptors would be required for work beginning as early as February 1).<br>Conduct these preconstruction surveys in all locations identified by a qualified biologist.<br>Conduct the surveys within three days two weeks prior to initiation of vegetation clearing, tree removal and trimming, or other construction activities.<br>Note: the results of surveys will be reviewed by NPS prior to any work authorization. If nests are identified by the biologist, NPS will work with the project manager to identify appropriate avoidance measures and buffers. Determinations of the appropriate measures are be based on the nesting species, sensitivity, and listing status. If the biologist finds no active nesting or breeding activity, NPS may authorize work to begin. | **X** | **X** | | | | | | | | **X** | **X** | **X** | | Wildlife (Birds) | All |
| The following American badger protection measures must be implemented for all projects requiring disturbance to open grasslands or low-growing vegetation habitats:<br>▪ Conduct a preconstruction survey for the American badger prior to beginning work.<br>▪ If any badgers are documented in the project area or within 500 feet of it, establish and maintain buffer zones until the badgers have vacated the area.<br>▪ Do not begin working in the buffer zone until the area is cleared by the project biologist.<br>▪ In consultation with NPS, develop and implement additional protection measures, which may include larger buffer zones or relocations, as required. | **X** | **X** | | | | | | | | **X** | **X** | **X** | | Wildlife (American Badger) | All |
| For project areas located in habitats with known presence of special-status species or critical wildlife corridors, install temporary wildlife exclusion fencing around the project perimeter<br>Exclusion fencing must be highly visible, and installation overseen by the project biologist. Openings shall be restricted to areas of construction site access.<br>Note: The purpose of the temporary fencing is to preclude animals from entering the work area and prevent debris and workers from entering adjacent habitats. | **X** | | | | | | | | | | **X** | **X** | | Wildlife | All |
| If suitable CRLF breeding habitat is present, only conduct project activities between July 1 and October 15 to avoid impacts on breeding CRLF or egg masses.<br>If a project site occurs in potential CRLF habitat, an NPS approved biologist must conduct a preconstruction survey of potential CRLF habitat and immediately adjacent uplands with suitable vegetation cover that is potential habitat for the CRLF no more than 48 hours before the start of construction activities.<br>The biologist shall look for individual frogs, evaluate the likelihood of usage, and determine whether additional biological monitoring is needed during construction to ensure that individuals present are be removed or avoided.<br>The biologist shall monitor initial ground-disturbing activities within 300 feet of CRLF habitat and halt work activities that may adversely affect the CRLF until it no longer occupies the project area.<br>Note: Relocation of CRLF can performed only by individuals, who are approved in advance by CDFW and USFWS. | **X** | | | | | | | | | **X** | **X** | **X** | | Wildlife (CRLF) | All |

| Management Activities | Upland and Riparian Vegetation Management and Planting | | | | | | | | | Mowing | | IPM | Targeted Grazing | | |
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| **Practice Standards** | Critical Area Planting (342) | Range Planting (550) | Riparian Herbaceous Cover (390) | Riparian Forest Buffer (391) | Windbreak/ Shelterbelt Establishment (380) | Tree/Shrub Establishment (612) | Mulching (484) | Conservation Cover (327) | Wildlife Habitat Planting (420) | Brush Management, Mechanical (314-A) | Herbaceous Weed Treatment (315) | IPM (595) | Targeted Grazing (528) | **Resources** | **Subzone** |
| Do not begin work in and around streams that support anadromous fish populations or California freshwater shrimp until August 1 and complete work by October 15.<br>Note: Work prior to June 15 or beyond October 15 may be authorized on a site-specific basis with approval from the NPS and project regulators. Channel-spanning bridges, bottomless arch culverts with natural streambed substrates, or other fish-friendly solutions are required in salmonid streams. | | | | | | | | | | **X** | **X** | **X** | | Wildlife (CA freshwater shrimp, Salmonids) | All |
| Reconnaissance-level surveys must be performed by a designated project biologist to determine whether suitable habitat for listed butterflies, including Myrtle's silverspot butterfly, is present in the project area.<br>If larval host or nectar plants for listed butterflies are present and the target species is documented in the project vicinity, project work must be conducted with minimum soil compaction and disturbance, and with hand tools wherever possible. | **X** | **X** | | | | | | | | **X** | **X** | **X** | | Wildlife (Myrtle's Silverspot) | All |
| Protect host plants for listed butterflies identified by the designated project biologist, including Sedum spathulifolium and Viola adunca, with a clearly demarcated 20-foot buffer zone. | **X** | **X** | | | | | | | | **X** | **X** | **X** | | Wildlife (Myrtle's Silverspot) | All |
| Areas must be closely monitored for pest plant invasion after construction, mechanical and burn treatments, aeration, and seeding: a monitoring plan must be established by the project manager to detect and eradicate any weeds.<br>Monitoring shall employ an early detection, rapid response approach to any previously undetected aggressive weedy species observed, once the plant's species identification and non-native status have been confirmed following best available weed-specific technical guidance current at the time of implementation. | **X** | **X** | **X** | **X** | **X** | **X** | **X** | **X** | **X** | **X** | **X** | **X** | **X** | Vegetation | All |
| Replace all native plants removed during project activities with species similar to that of the removed vegetation or with species that are appropriate to the site conditions and are native to the project watershed, as approved by the NPS.<br>Plants shall be sourced from Marin County or southern Sonoma County unless otherwise approved by NPS.<br>Plants sourced from nursery require NPS approval of the nursery, which shall include documentation of pathogen avoidance protocols and source of plant materials.<br>Use of native plant species with high wildlife and/or pollinator values will be prioritized by NPS during approval. | | | | | | | | | | | | **X** | | Vegetation | All |

| Management Activities | Upland and Riparian Vegetation Management and Planting | | | | | | | | | Mowing | | IPM | Targeted Grazing | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Practice Standards** | Critical Area Planting (342) | Range Planting (550) | Riparian Herbaceous Cover (390) | Riparian Forest Buffer (391) | Windbreak/ Shelterbelt Establishment (380) | Tree/Shrub Establishment (612) | Mulching (484) | Conservation Cover (327) | Wildlife Habitat Planting (420) | Brush Management, Mechanical (314-A) | Herbaceous Weed Treatment (315) | IPM (595) | Targeted Grazing (528) | **Resources** | **Subzone** |
| Any import of soils must be pre-approved by the NPS.<br>Soils shall not be imported directly adjacent to sites known to be infested with pathogens, areas of heavy use, or sites with high risk for contamination such as landscaped areas, old nursery stock, or parking lots.<br>Soils shall not be imported to sites or upslope of sites with habitat for plants that are species of concern or listed species. NPS shall approve any Import of soil to sites that host plants susceptible to Phytophthora (Fagaceae, Ericaeae).<br>Soils with copious organic matter and waterlogged soils shall not be imported as these are ideal candidates for Phytophthora contamination.<br>Only weed-free certified soils and aggregates shall be used unless approved by NPS.<br>Imported soils shall be evenly heat treated to 300F or solarized for 15 hours under black plastic, reaching a minimum temperature of 113°F. | **X** | | | | | **X** | | | | | | | | Soils | All |
| Avoid conducting work in the RPZ (Root Protect Zone) of trees wherever possible and do not work in the RPZ when soils are wet.<br>Note: The RPZ is defined as 1.5 times the dripline radius measured from the tree trunk and extending approximately three feet below the soil surface.<br>The project manager shall ensure that the outer extent of the RPZ is clearly demarcated with exclusionary fencing to keep construction vehicles and activities away from tree roots.<br>If work must occur in the RPZ:<br>▪ All tree trunks shall be wrapped up to 8 feet high or the height of the equipment working in the area.<br>▪ Use protection materials that may include wood boards or heavy-duty rubber matting.<br>▪ Install trench plates or heavy mulch for heavy equipment working in the RPZ.<br>▪ Cut all roots larger than 1 inch with a clean, sharp saw.<br>▪ Prune no more than 20% of live foliage in one year. | **X** | **X** | **X** | **X** | **X** | **X** | **X** | **X** | **X** | **X** | **X** | **X** | | Vegetation | All |
| Remove no more than 0.25 acre of vegetation from a streambank or stream channel where the area contains a mix of native and invasive species and no more than 0.10 acre of native riparian trees, shrubs, or woody perennials for a single project. | | | **X** | **X** | | | | | | | **X** | **X** | | Vegetation<br>Water | All |
| Design culverts to minimize habitat fragmentation and barriers to aquatic movement.<br>Design all structural crossings of low and high flows to provide passage for as many different aquatic species and age classes as possible.<br>Culverts that require Section 401/404 permits shall be designed and stamped by a licensed engineer, geologist, landscape architect or a qualified NRCS engineer. | | | | | | | | | | | | | | Wildlife (Salmonids, Fish) | All |

| Management Activities | Upland and Riparian Vegetation Management and Planting | | | | | | | | | Mowing | | IPM | Targeted Grazing | | |
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| Unless otherwise stated on the Practice Requirement sheet or seeding plan, the timing of seeding must occur in the fall before October 15.<br>Only use local (collected in Marin County or southern Sonoma County) genotypes of native species seed or species on the park's approved seed species list (based on information provided by the USDA, NRCS Plant Materials Program), unless otherwise approved by NPS.<br>Only seed certified to be free of noxious weed seeds and fungicides shall be used.<br>Adjust seeding rates for soil textural differences and the pure live seed rating.<br>Only conduct seeding using no-till drill or broadcast methods and using only broadcast methods on sites with a high risk of soil erosion. | **X** | **X** | **X** | | | | | **X** | **X** | | | | | Air<br>Soils<br>Vegetation | Pasture |
| Inspect seeding area the year prior to seeding to identify potential weed problems and to control weeds during planting and throughout the first growing season. | **X** | **X** | | | | | | **X** | **X** | | | | | Vegetation | Pasture |
| Restrict or reduce grazing in the two years of establishment at least until the seedlings have completed their growth for the first growing season. | **X** | **X** | | | | | | **X** | **X** | | | | | Vegetation | Resource Protection |
| Selection of seed species and their cultivars must be based on: climatic conditions, such as annual precipitation, distribution, growing season length, tolerance of temperature extremes, and the USDA, NRCS, plant hardiness zone, soil condition and landscape position attributes, such as pH, available water holding capacity, aspect, slope, drainage class, fertility level, salinity, depth, flooding and ponding, and levels of phytotoxic elements that may be present | **X** | **X** | **X** | **X** | **X** | **X** | | **X** | **X** | | | | | Vegetation | All |
| With the exception of silage harvest and management of certain weed species as approved by NPS, mowing shall be timed to minimize resource impacts:<br>▪ August 1–October 15 (or first autumn rains, whichever comes first) is preferred to avoid impacts to ground nesting birds and California red-legged frog (CRLF).<br>▪ March 15–July 31 (bird nesting season) is limited to removal of vegetation less than 8 inches in height or can take place only if bird nesting surveys are completed. | | | | | | | | | | **X** | **X** | **X** | | Vegetation<br>Wildlife (Birds, CRLF) | All |
| Maintain a 35-foot buffer between wetlands and mowed areas.<br>Note: Depending on site specific conditions, NPS may require leaving in place scattered islands of brush to service as a corridor for wildlife species that inhabit brushy habitat. | | | | | | | | | | **X** | | | | Vegetation<br>Water | Range |
| Rotational mowing practices (i.e., early, late, or rested) must be followed to maintain grassland communities in various stages of growth and vegetative diversity, promoting nesting habitat for grassland birds.<br>Do not mow at night due to the risk of higher wildlife mortality. | | | | | | | | | | **X** | | | | Wildlife (Birds) | Pasture |
| For shrub management, generally apply one or more initial treatments to remove existing shrubs, followed by periodic or ongoing management to prevent subsequent re-establishment, as defined in the ROA.<br>Apply follow-up spot treatment methods when woody vegetation is recovering or small and is the most vulnerable to treatment. | | | | | | | | | | **X** | | | | Vegetation | Pasture and Range upon site specific approval |

| Management Activities | Upland and Riparian Vegetation Management and Planting | | | | | | | | | Mowing | | IPM | Targeted Grazing | | |
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| Shrub management efforts shall be limited to areas previously occupied by grassland, as shown by historical photographs, or to soil types appropriate to support grassland, according to the USDA, NRCS, soil survey and associated ecological site descriptions. Shrub treatment shall be limited areas to those identified by NPS biologists as acceptable based on:<br>▪ the absence of endangered species and significant wildlife and plant communities, including areas with high concentrations of nesting birds<br>▪ appropriate ratio and spatial arrangement of grassland and woody vegetation at the site and landscape scale to provide food, shelter, and cover to shrub-dependent wildlife and appropriate structure for wildlife that benefit from edge habitat or structural diversity<br>▪ appropriate size and shape of treated acreage and of any shrubland acreage left untreated<br>▪ desired age or successional status of remaining shrubland | | | | | | | | | **X** | | | | Vegetation | Pasture, Range upon site specific approval |
| Use the following grazing methods to control weeds, especially as a follow-up method that minimizes the need for repeated mechanical or chemical applications:<br>▪ use targeted grazing to impact weedy species when they are vulnerable, using species-specific technical guidance available from sources such as NPS; University of California, Cooperative Extension and Weed Research and Information Center; USDA, NRCS; and DiTomaso et al. (2013)<br>▪ avoid heavy grazing of infested areas at stages of the weedy species' phenology when herbivory favors increased tillering<br>▪ encourage vigorous growth of desirable grass species in infested or recently treated areas by maintaining sufficient residual dry matter in fall and winter and by allowing thick grass growth throughout winter | | | | | | | | | **X** | | **X** | **X** | Air<br>Vegetation | All |
| Use multiple methods for weed management as a means of reducing the amount of herbicide needed and increasing the overall speed and effectiveness of treatment | | | | | | | | | | **X** | **X** | **X** | **X** | Air<br>Vegetation<br>Water | |
| Ensure that any use of herbicides conforms to relevant restrictions on use in and near potential habitat for protected amphibians or invertebrates. Consult with a PCA and/or NPS, and:<br>address measures to minimize the use of high-persistence herbicides and the potential for leaching to surface and groundwater, especially in soil types with high leaching potential<br>consider the use of herbicides specifically formulated and approved for use in water for application of herbicides to uplands that may have CRLFs or other rare amphibians present<br>consider the use of pollinator-protective strategies as described in NOAA Fisheries (2014), especially when considering broadcast applications and applications when pollinator host plants are flowering<br>minimize the use herbicides or fertilizers in habitat that supports special-status butterflies and do not use herbicides in this habitat during Myrtle's silverspot butterfly flight season (June 15-early September) | | | | | | | | | | **X** | **X** | | Water<br>Wildlife (CRLF, Fish, Amphibians, Invertebrates Myrtle's Silverspot Butterfly) | |

| Management Activities | Upland and Riparian Vegetation Management and Planting | | | | | | | | | Mowing | | IPM | Targeted Grazing | | |
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| In-stream crossings shall not be designed for placement within 300 feet of known spawning or breeding areas of listed species.<br>Stream crossings in a salmonid-bearing stream must be a minimum of 1,500 meters (4,921 feet) apart. Crossings in a non-fish bearing stream must be at least 100 feet apart. | X | X | X | X | X | X | | | | X | X | X | X | Wildlife (T&E) | All |
| Crossings shall be designed to require the minimum amount of dewatering, not to exceed 500 feet of channel unless otherwise approved by NPS.<br>Bridges shall be designed and stamped by a licensed California engineer or a qualified NRCS engineer. | X | X | X | X | X | X | | | | X | X | X | X | All | NPS |
| Pasture and crop fertilization shall comply with Nutrient Management Plans and USDA, NRCS, guidelines for nutrient management, including but not limited to:<br>▪ Develop a nutrient budget that considers all sources of nutrients.<br>▪ Evaluate the risks of nitrogen and phosphorus transport using methods cited by USDA, NRCS.<br>▪ Conduct pertinent soil analyses to determine the appropriate (and maximum) level of nutrient addition, such as nutrient and pH levels and electrical conductivity, and ensure that the total nutrient loading does not exceed the amount needed to meet crop demand.<br>▪ Cropland applications shall maintain soil pH in a range that favors nutrient uptake by crops.<br>▪ Application rates of nitrogen, phosphorus, and potassium shall not exceed the University of California guidelines (or industry practice when recognized by the university). Lower rates are acceptable.<br>▪ Application timing shall correspond as closely as practicable with the timing of plant uptake by crops or pasture grasses.<br>▪ Application of solid or liquid waste discharges to land shall be at rates that are reasonable for crop, soil, climate, special local situations, management system, and type of manure.<br>▪ Application of manure and wastewater discharges shall only be done during non-rainy or non-saturated conditions, ensuring that discharges do not result in runoff to surface waters and that discharges infiltrate completely within 72 hours after application.<br>▪ Spreading of compost, manure, or fertilizer shall not occur when the top 2 inches of soil are saturated or when enough precipitation to cause runoff is forecast.<br>▪ Sufficient setbacks (filter strips or otherwise well-vegetated areas) shall be maintained from drainages and waterbodies to prevent pollution and comply with state and federal water quality regulations; setback distance should be greater for steeper slopes, higher levels of nutrients applied, and lower levels of setback ground cover.<br>▪ Best practices shall be employed (e.g., USDA-NRCS 2011) to minimize the risk of nutrient runoff in application of liquids, slurry and solids, such as adjusting the thickness of the applied layer of manure and compost relative to slope and setback distance to minimize the chance that material will be washed downhill to waterbodies. | X | X | | | | | | | | | | | | Air<br>Soils<br>Vegetation<br>Water | Pasture |

| Management Activities | Upland and Riparian Vegetation Management and Planting | | | | | | | | | Mowing | | IPM | Targeted Grazing | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Practice Standards** | Critical Area Planting (342) | Range Planting (550) | Riparian Herbaceous Cover (390) | Riparian Forest Buffer (391) | Windbreak/ Shelterbelt Establishment (380) | Tree/Shrub Establishment (612) | Mulching (484) | Conservation Cover (327) | Wildlife Habitat Planting (420) | Brush Management, Mechanical (314-A) | Herbaceous Weed Treatment (315) | IPM (595) | Targeted Grazing (528) | **Resources** | **Subzone** |
| Records must be maintained for at least five years documenting the types and rates of nutrients applied, soil analyses, weather conditions at time of application, and elapsed time between application and the next rainfall or irrigation event.<br>Keep these records with the Nutrient Management Plan. | **X** | **X** | | | | | | | | | | | | | Pasture |
| Excessive fly populations associated with manure storage shall be controlled, in consultation with NPS, using an Integrated Pest Management approach and avoiding wet areas around manure storage where flies may breed | | | | | | | | | | | | **X** | | Health and Safety<br>Visitor Use and Experience | Ranch Core |
| Avoid tilling or if necessary and with prior NPS approval use shallow tillage operations (1 to 2 inches) or operations that do not invert the soil.<br>Limited tillage is allowed to close or level ruts from harvesting equipment. No more than 10% of the field may be tilled for this purpose. | | | | | | | | **X** | | | | | | Air<br>Cultural Resources<br>Soil<br>Water | Pasture |
| Do not aerate soils, unless soil compaction is demonstrated, which can be predicted using USDA, NRCS, soil maps and measured using a soil cone penetrometer, when soils are saturated and ideally are at field capacity. | **X** | **X** | | | | | | | | | | | | Soils | Pasture |
| Materials used must be approved by NPS. No synthetic materials shall be used for mulching.<br>▪ Apply mulch material evenly. Use tackifiers, emulsions, pinning, netting, crimping or other methods of anchoring, to hold the mulch in place for specified periods<br>▪ Spreading of wood products or inorganic materials must be at a minimum depth of two inches, and inorganic materials, such as gravel, must be a minimum size of 0.75 inches. Straw or grass hay must be applied at a rate to achieve a minimum 70-percent ground cover.<br>▪ Avoid excessively thick or tightly packed mulches; fine-textured mulches that allow less oxygen penetration than coarser materials shall not be thicker than 2 inches.<br>▪ Plant-based mulch materials with a carbon (C) to nitrogen (N) ratio less than 20:1 must not be applied where there is potential to enter watercourses.<br>▪ A Plans And Specifications document must be prepared that includes purpose of the cover, type of material to be used, percent cover or thickness of application, timing of application, site preparation, methods of anchoring, and operation and maintenance requirements. | | | | | | | **X** | | | | | | | All | NPS |

| Management Activities | Upland and Riparian Vegetation Management and Planting | | | | | | | | | Mowing | | IPM | Targeted Grazing | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Practice Standards** | Critical Area Planting (342) | Range Planting (550) | Riparian Herbaceous Cover (390) | Riparian Forest Buffer (391) | Windbreak/ Shelterbelt Establishment (380) | Tree/Shrub Establishment (612) | Mulching (484) | Conservation Cover (327) | Wildlife Habitat Planting (420) | Brush Management, Mechanical (314-A) | Herbaceous Weed Treatment (315) | IPM (595) | Targeted Grazing (528) | **Resources** | **Subzone** |
| A Plans And Specifications document must be created that identifies:<br>▪ the target wildlife species or guild<br>▪ success criteria (target conditions) for the planting, including the target conditions and timeframes<br>▪ vegetative establishment measures needed to meet minimum criteria<br>▪ target habitat conditions to be created (including plant species richness, diversity, pattern and structure, taking into account season of use, life history, home range, condition of adjacent habitats, and landscape context)<br>▪ risks from or to nontarget species<br>▪ plant material composition, rates, planting depth, and proper handling<br>▪ necessary vegetative establishment protocols (including site preparation, weed and pest control, planting rates, planting dates, planting methods)<br>▪ post-planting management actions (e.g. mowing annual weeds and inspections/control for invasive plants), and<br>▪ other operation and maintenance requirements | | | | | | | | | **X** | | | | All | NPS |
| General seeding mitigations:<br>▪ A Plans and Specifications document must be prepared that includes species to be used, seeding rates and dates, establishment procedures, actions needed to ensure adequate cover of desired species, and operation, monitoring, and maintenance requirements.<br>▪ All purchased seed shall be tagged and labeled in accordance with the California Agricultural Code and Seed Law, and acceptable to the County Agricultural Commissioner. Bag tags shall include evidence of purity and germination. Seed shall be of a quality that weed seed shall not exceed 0.5% of the aggregate of pure live seed (PLS) (% germination x % purity) and other material. Time since date of seed test shall not exceed 9 months. | **X** | **X** | **X** | | | | | **X** | **X** | | | | | All | NPS |

**TABLE F-13: OTHER ACTIVITIES PRACTICE STANDARDS AND MITIGATION MEASURES**

| Management Activities | Manure and Nutrient Management | | | | | | Forage Production, including Silage, Haylage and Hay | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Practice Standards** | Nutrient Management (590) | Composting Facility (317) | Waste Treatment (629) | Waste Separation Facility (632) | Waste Transfer (634) | Waste Storage Facility (313) | Forage and Biomass Planting (512) | Forage Harvest Management (511) | Residue and Tillage Management/ No-Till (329) | **Resources** | **Subzone** | **Reference** |
| **Mitigations**<br>**NOTE: If sensitive resources are not in the project area that mitigations are intended to protect, the NPS may waive that mitigation requirement. Further, if the proposed practice does not require the level of disturbance or equipment addresses, additional mitigation measures may be required. Additional mitigation measure may be added to this list over the 20-year lease/permit term, as necessary.** | | | | | | | | | | | | |
| Use of heavy machinery shall be performed by experienced operators and heavy machinery shall:<br>▪ avoid steep slopes (>20%), slopes vulnerable to landslides, and uneven or rocky terrain<br>▪ be kept at least 10 feet from any cliffs or steep banks<br>▪ only be allowed based on daily fire danger rating<br>▪ avoid woody material larger than the machine is intended for and, otherwise, conform to the machine's user's manual<br>▪ avoid significant wildlife habitat and plant communities except where deemed necessary by NPS to address resource protection needs<br>▪ avoid waterbodies and riparian zones unless specifically required and approved by NPS as critical to the project objective (e.g. Pond Restoration, Waterway Stabilization, Stream Crossing)<br>▪ avoid lands designated by USDA, NRCS, as "highly erodible lands," compactable soils, and minimize soil disturbance to the greatest extent possible | **X** | **X** | **X** | **X** | **X** | **X** | **X** | **X** | **X** | Soils, Vegetation, Wildlife | All | University of California 2006<br>NPS<br>Pitt, Burgy, and Heady 1978 |
| To control the spread of plant diseases, insects, and weeds, equipment and vehicles shall be free of soil and debris accumulations on tires, wheel wells, vehicle undercarriages, and other surfaces before arrival at the park, when being moved between sites within the park, and before storing within the park. A high-pressure washer, compressed air, brushes, or other means shall be used to ensure that soil and debris are completely removed. All vehicles will be pressure-washed before their first entry into the park or when being moved for use in a different job site within the park.<br>Hand tools, shovels, loaders, and other equipment must be clean and free of soil and plant debris before initial use at the park and before being moved between work sites within the park. A high-pressure washer, compressed air, brushes, or other means shall be used to ensure that soil and debris are completely removed.<br>No soil or plant debris from the interior of vehicles or equipment (cabs, etc.) shall be deposited at the work site. If drivers/operators will be entering or exiting vehicles at the job site, the cab must be free of mud, soil, plant parts, and organic debris before arriving at the job site. Interior floors, floor mats, and seats must be free of potentially contaminated material.<br>Equipment and vehicles shall be inspected by NPS to ensure the undercarriage is clean and to allow the vehicle to proceed to the job site; be removed from NPS property if deficient and properly clean it at the expense of the project manager before returning to NPS property. | **X** | **X** | **X** | **X** | **X** | **X** | **X** | **X** | **X** | Soils, Vegetation | All | NPS |

| Management Activities | Manure and Nutrient Management | | | | | | Forage Production, including Silage, Haylage and Hay | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Practice Standards** | Nutrient Management (590) | Composting Facility (317) | Waste Treatment (629) | Waste Separation Facility (632) | Waste Transfer (634) | Waste Storage Facility (313) | Forage and Biomass Planting (512) | Forage Harvest Management (511) | Residue and Tillage Management/ No-Till (329) | **Resources** | **Subzone** | **Reference** |
| A spill prevention and clean-up plan, Stormwater Pollution Prevention Plan, or similar document shall be prepared and implemented for all construction projects to address polluted runoff and spill prevention policies, erosion control materials required to be available on site in case of rain or a spill (e.g., straw bales, silt fencing), clean-up and reporting procedures, and locations of refueling and minor maintenance areas. Petroleum products, chemicals, silt, fine soils, and any substances deleterious to fish, amphibian, plant, or bird life are prohibited from passing into, or being placed where they can pass into the waters of the state.<br><br>Equipment operators shall have emergency spill clean-up gear (spill containment and absorption materials), dry cleanup methods (i.e., absorbent materials, and/or rags), and fire equipment available on site at all times.<br><br>Petroleum-powered equipment shall be stored and operated in a manner to prevent the potential release of petroleum materials into waters of the state and follow precautionary measures:<br>▪ All vehicles and equipment on the site shall not leak any type of hazardous materials, such as oil, hydraulic fluid, or fuel; inspect vehicles each day for leaks and repair immediately<br>▪ Equipment storage, short-term maintenance, and refueling shall be conducted in a contained area located at least 100 feet from a watercourse or riparian area as approved by NPS; these activities will be prohibited from taking place on the project site unless deemed necessary for project completion by NPS<br>▪ Immediately clean up leaks, drips, and other spills to avoid soil or groundwater contamination and notify NPS staff of any such occurrence<br>▪ All spent fluids, including motor oil, radiator coolant, or other fluids, and used vehicle batteries must be collected, stored, and recycled as hazardous waste off site<br><br>All major vehicle maintenance and washing shall be conducted off site. | **X** | **X** | **X** | **X** | **X** | **X** | **X** | **X** | **X** | Water, Wildlife | All | Marin PCP 2018 (HYD-2, Protect Water Quality – Erosion Control and Stormwater Detention during Grading and Other Disturbance in a Stream, Waterway, or Other Sensitive Habitat)<br><br>NPS |
| Revegetation must be completed as soon as possible after disturbance using live native plantings, native seed casting, or hydroseeding, preferably prior to the onset of rain.<br><br>Temporary erosion control measures shall be used on disturbed soils until permanent vegetation is established.<br><br>Disturbed and uncompacted soils shall be covered with straw mulch and/or biodegradable netting or matting. For slopes exceeding 20% staked biodegradable erosion logs or wattles are required for decelerating runoff.<br><br>Silt fences or filter bags shall be used if working in areas known to flood or experience heavy flow.<br><br>Temporary seeding using non-invasive, non-persistent grass species (e.g., barley grass, sterile wheat) or hydromulching may be utilized if approved by NPS.<br><br>To avoid scouring, erosion control materials shall be placed to allow water to sheet as opposed to channel.<br><br>Areas that may be accessed by cattle or other livestock shall be enclosed by fencing to exclude livestock until restoration goals have been met. | **X** | **X** | **X** | **X** | **X** | **X** | **X** | | | Air, Vegetation, Water | All | Marin PCP 2018 (HYD-1, Protect Water Quality – Planting and Revegetation after Soil Disturbance) |
| Vehicles and equipment shall be restricted to one principal access route, preferably one that has been used for past activities.<br><br>All vehicles and equipment shall be staged on roads, in NPS-specified staging areas, or on existing disturbed ranch operation sites. | **X** | **X** | **X** | **X** | **X** | **X** | **X** | **X** | **X** | Air, Soils, Vegetation, Visitor Use and Experience, Water, Wildlife | All | Marin PCP 2018 (BIO-3, Protect Wetlands)<br><br>NPS |

| Management Activities | Manure and Nutrient Management | | | | | | Forage Production, including Silage, Haylage and Hay | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Practice Standards** | Nutrient Management (590) | Composting Facility (317) | Waste Treatment (629) | Waste Separation Facility (632) | Waste Transfer (634) | Waste Storage Facility (313) | Forage and Biomass Planting (512) | Forage Harvest Management (511) | Residue and Tillage Management/ No-Till (329) | **Resources** | **Subzone** | **Reference** |
| If access through a wetland is necessary, low ground pressure, rubber-tired equipment is required. NPS will determine the necessity and timing of access to minimize disturbance (typically later summer). | X | X | X | X | X | X | X | X | X | Vegetation, Water | All | Marin PCP 2018 (BIO-3, Protect Wetlands) |
| Erosion control and sediment detention measures must be available on site at all times and in place at all locations where the likelihood of sediment input exists prior to the onset of rain to detain sediment-laden water on site and minimize fine sediment and sediment/water slurry input to flowing water.<br>Dispose of sediment collected in the structures away from the collection site in an upland area where it cannot enter a waterway.<br>When required by NPS or project regulators, NPS staff or a qualified designee shall inspect in-stream habitat and the performance of erosion and sediment control devices during construction to ensure the devices are functioning properly. | X | X | X | X | X | X | X | X | X | Water, Wildlife | All | Marin PCP 2018 (HYD-2, Protect Water Quality – Erosion Control and Stormwater Detention during Grading and Other Disturbance in a Stream, Waterway, or Other Sensitive Habitat) |
| Prohibit discharge of water from any onsite temporary sediment stockpile or storage areas or any other discharge of construction dewatering flows to surface waters, unless specific mitigations are approved in permits.<br>If rain is forecast to occur while materials are temporarily stockpiled, cover with plastic that is secured in place to ensure the piles are protected from rain and wind, and install silt fencing or wattles on contour around all stockpile locations. | X | X | X | X | X | X | X | X | | Air, Water | Pasture and Ranch Core | Marin PCP 2018 (HYD-2, Protect Water Quality, Erosion Control and Stormwater Detention during Grading and Other Disturbance in a Stream, Waterway, or Other Sensitive Habitat) |
| Conduct any grading and other earth-disturbing activities, including in-stream and riparian activities (other than native vegetation planting or erosion control activities on disturbed sites without mechanized equipment) during the dry season, generally June 1 through October 31; exceptions may be made by the NPS in cases such as catastrophic failure due to a large storm or other event that causes water quality or public safety concerns, or project-specific recommendations from regulators or NPS suggest an alternative work window to avoid impacts on special-status species.<br>Work that would disturb waterways or sensitive riparian habitats outside the June through October time frame must be approved in advance by the NPS and project regulators. | | X | X | X | X | X | X | X | X | Soils, Vegetation, Water, Wildlife | All | Marin PCP 2018 (HYD-2, Protect Water Quality – Erosion Control and Stormwater Detention during Grading and Other Disturbance in a Stream, Waterway, or Other Sensitive Habitat)<br>Marin PCP 2018 (BMP BR-3 Temporal limitations and requirements to protect special-species during construction, vegetation management and other maintenance activities) |

| Management Activities | Manure and Nutrient Management | | | | | | Forage Production, including Silage, Haylage and Hay | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Practice Standards** | Nutrient Management (590) | Composting Facility (317) | Waste Treatment (629) | Waste Separation Facility (632) | Waste Transfer (634) | Waste Storage Facility (313) | Forage and Biomass Planting (512) | Forage Harvest Management (511) | Residue and Tillage Management/ No-Till (329) | **Resources** | **Subzone** | **Reference** |
| Perform work in and around areas, including structures, that may support bird nesting before March 15 or after July 31, unless vegetation height is less than 8 inches, or otherwise authorized by the NPS. | **X** | **X** | **X** | **X** | **X** | **X** | **X** | | **X** | Wildlife (Birds) | All | Marin PCP 2018 (BMP BR-3 Temporal limitations and requirements to protect special-species during construction, vegetation management and other maintenance activities) |
| Conduct preconstruction breeding bird surveys for projects with construction activities occurring from March 15 through July 31 for special-status birds, migratory birds, and raptors (surveys for raptors would be required for work beginning as early as February 1)<br>Conduct these preconstruction surveys in all locations identified by a qualified biologist.<br>Conduct the surveys within three days two weeks prior to initiation of vegetation clearing, tree removal and trimming, or other construction activities<br>Note: The results of surveys will be reviewed by NPS prior to any work authorization. If nests are identified by the biologist, NPS will work with the project manager to identify appropriate avoidance measures and buffers. Determinations of the appropriate measures are be based on the nesting species, sensitivity, and listing status. If the biologist finds no active nesting or breeding activity, NPS may authorize work to begin. | **X** | **X** | **X** | **X** | **X** | **X** | **X** | | **X** | Wildlife (Birds) | All | Marin PCP 2018 (BIO-1j, Protect Nesting Birds during Construction) |
| The following American badger protection measures must be implemented for all projects requiring disturbance to open grasslands or low-growing vegetation habitats:<br>▪ Conduct a preconstruction survey for the American badger prior to beginning work.<br>▪ If any badgers are documented in the project area or within 500 feet of it, establish and maintain buffer zones until the badgers have vacated the area.<br>▪ Do not begin working in the buffer zone until the area is cleared by the project biologist.<br>▪ In consultation with NPS, develop and implement additional protection measures, which may include larger buffer zones or relocations, as required. | **X** | **X** | **X** | **X** | **X** | **X** | **X** | | **X** | Wildlife (American Badger) | All | Marin PCP 2018 (BIO-1n, Protect American Badger) |
| Do not begin work in and around streams that support anadromous fish populations or California freshwater shrimp until August 1 and complete work by October 15.<br>Note: Work prior to June 15 or beyond October 15 may be authorized on a site-specific basis with approval from the NPS and project regulators.<br>Channel-spanning bridges, bottomless arch culverts with natural streambed substrates, or other fish-friendly solutions are required in salmonid streams. | **X** | **X** | **X** | **X** | **X** | **X** | | | | Wildlife (CA freshwater shrimp, Salmonids) | All | Marin PCP 2018 (BMP BR-3 Temporal limitations and requirements to protect special-species during construction, vegetation management and other maintenance activities) |
| Reconnaissance-level surveys must be performed by a designated project biologist to determine whether suitable habitat for listed butterflies, including Myrtle's silverspot butterfly, is present in the project area.<br>If larval host or nectar plants for listed butterflies are present and the target species is documented in the project vicinity, project work must be conducted with minimum soil compaction and disturbance, and with hand tools wherever possible. | | **X** | **X** | **X** | **X** | **X** | | | | Wildlife (Myrtle's Silverspot) | All | Marin PCP 2018 (BIO-1m, Protect Special-status Butterflies) |

| Management Activities | Manure and Nutrient Management | | | | | | Forage Production, including Silage, Haylage and Hay | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Practice Standards** | Nutrient Management (590) | Composting Facility (317) | Waste Treatment (629) | Waste Separation Facility (632) | Waste Transfer (634) | Waste Storage Facility (313) | Forage and Biomass Planting (512) | Forage Harvest Management (511) | Residue and Tillage Management/ No-Till (329) | **Resources** | **Subzone** | **Reference** |
| Protect host plants for listed butterflies identified by the designated project biologist, including Sedum spathulifolium and Viola adunca, with a clearly demarcated 20-foot buffer zone. | | X | X | X | X | X | | | | Wildlife (Myrtle's Silverspot) | All | Marin PCP 2018 (BIO-1m, Protect Special-status Butterflies) |
| Areas must be closely monitored for pest plant invasion after construction, mechanical and burn treatments, aeration, and seeding. A monitoring plan must be established by the project manager to detect and eradicate any weeds.<br>Monitoring shall employ an early detection, rapid response approach to any previously undetected aggressive weedy species observed, once the plant's species identification and non-native status have been confirmed following best available weed-specific technical guidance current at the time of implementation. | X | X | X | X | X | X | X | X | X | Vegetation | All | |
| Avoid conducting work in the RPZ (Root Protect Zone) of trees wherever possible and do not work in the RPZ when soils are wet.<br>Note: The RPZ is defined as 1.5 times the dripline radius measured from the tree trunk and extending approximately three feet below the soil surface.<br>The project manager shall ensure that the outer extent of the RPZ is clearly demarcated with exclusionary fencing to keep construction vehicles and activities away from tree roots.<br>If work must occur in the RPZ:<br>▪ All tree trunks shall be wrapped up to 8 feet high or the height of the equipment working in the area.<br>▪ Use protection materials that may include wood boards or heavy-duty rubber matting.<br>▪ Install trench plates or heavy mulch for heavy equipment working in the RPZ.<br>▪ Cut all roots larger than 1 inch with a clean, sharp saw.<br>▪ Prune no more than 20% of live foliage in one year. | X | X | X | X | X | X | | | | Vegetation | All | Marin PCP 2018 (BIO-2b, Avoid Work in or Compensate for Impacts on Native Tree Root Protection Zone) |
| Unless otherwise stated on the Practice Requirement sheet or seeding plan, the timing of seeding must occur in the fall before October 15<br>Only use local (collected in Marin County or southern Sonoma County) genotypes of native species seed or species on the park's approved seed species list (based on information provided by the USDA, NRCS Plant Materials Program), unless otherwise approved by NPS.<br>Only seed certified to be free of noxious weed seeds and fungicides shall be used.<br>Adjust seeding rates for soil textural differences and the pure live seed rating.<br>Only conduct seeding using no-till drill or broadcast methods and using only broadcast methods on sites with a high risk of soil erosion. | | | | | | | X | | X | Air, Soils, Vegetation | Pasture | NPS 1990<br>DEFRA 2009<br>USDA-NRCS 2010<br>University of California 2006 |
| Inspect seeding area the year prior to seeding to identify potential weed problems and to control weeds during planting and throughout the first growing season | | | | | | | X | | | Vegetation | Pasture | University of California 2006 |
| With the exception of silage harvest and management of certain weed species as approved by NPS, mowing shall be timed to minimize resource impacts:<br>▪ August 1–October 15 (or first autumn rains, whichever comes first) is preferred to avoid impacts to ground nesting birds and California red-legged frog (CRLF).<br>▪ March 15–July 31 (bird nesting season) is limited to removal of vegetation less than 8 inches in height or can take place only if bird nesting surveys are completed. | | | | | | | | X | X | Vegetation, Wildlife (Birds, CRLF) | All | USDA-NRCS 2003 |

| Management Activities | Manure and Nutrient Management | | | | | | Forage Production, including Silage, Haylage and Hay | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Practice Standards** | Nutrient Management (590) | Composting Facility (317) | Waste Treatment (629) | Waste Separation Facility (632) | Waste Transfer (634) | Waste Storage Facility (313) | Forage and Biomass Planting (512) | Forage Harvest Management (511) | Residue and Tillage Management/ No-Till (329) | **Resources** | **Subzone** | **Reference** |
| Maintain a 35-foot buffer between wetlands and mowed areas.<br>Note: Depending on site-specific conditions, NPS may require leaving in place scattered islands of brush to service as a corridor for wildlife species that inhabit brushy habitat. | | | | | | | | **X** | | Vegetation, Water | Range | NPS |
| As appropriate, attach flushing bars to the mower to help to flush birds and mammals (especially deer and rabbit) before the mower reaches them.<br>Mow from the middle to the outside to minimize impacts.<br>Avoid mowing until after the peak of the nesting season which typically falls in the middle of April.<br>Explore ways to reduce the amount of wild radish (*Raphanus raphanistrum*) and mustards (*Brassica sp.*) in silage fields that may attract certain nesting birds.<br>Maintain awareness for the presence of nesting Tricolored Blackbird (*Agelaius tricolor*), a state listed threatened species. | | | | | | | | **X** | | Wildlife (Birds and Mammals) | Pasture | Green n.d.; Hyde and Cambell 2012; Ochterski 2006; USDA-NRCS 2009 |
| Rotational mowing practices (i.e., early, late, or rested) must be followed to maintain grassland communities in various stages of growth and vegetative diversity, promoting nesting habitat for grassland birds.<br>Do not mow at night due to the risk of higher wildlife mortality. | | | | | | | | **X** | | Wildlife (Birds) | Pasture | Hyde and Cambell 2012; USDA-NRCS 2009; Ochterski 2006 |
| In-stream crossings shall not be designed for placement within 300 feet of known spawning or breeding areas of listed species.<br>Stream crossings in a salmonid-bearing stream must be a minimum of 1,500 meters (4,921 feet) apart. Crossings in a non-fish bearing stream must be at least 100 feet apart. | **X** | **X** | **X** | **X** | **X** | **X** | **X** | **X** | **X** | Wildlife (T&E) | All | Marin PCP 2018 (BMP DC-3 Required design considerations for roads, culverts, and stream crossings to protect sensitive biological resources and water quality). NOAA Fisheries 2016 |
| Crossings shall be designed to require the minimum amount of dewatering, not to exceed 500 feet of channel unless otherwise approved by NPS.<br>Bridges shall be designed and stamped by a licensed California engineer or a qualified NRCS engineer. | **X** | **X** | **X** | **X** | **X** | **X** | **X** | **X** | **X** | All | All | NPS |

| Management Activities | Manure and Nutrient Management | | | | | | Forage Production, including Silage, Haylage and Hay | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Practice Standards** | Nutrient Management (590) | Composting Facility (317) | Waste Treatment (629) | Waste Separation Facility (632) | Waste Transfer (634) | Waste Storage Facility (313) | Forage and Biomass Planting (512) | Forage Harvest Management (511) | Residue and Tillage Management/ No-Till (329) | **Resources** | **Subzone** | **Reference** |
| Pasture and crop fertilization shall comply with Nutrient Management Plans and USDA, NRCS, guidelines for nutrient management, including but not limited to:<br>▪ Develop a nutrient budget that considers all sources of nutrients.<br>▪ Evaluate the risks of nitrogen and phosphorus transport using methods cited by USDA, NRCS.<br>▪ Conduct pertinent soil analyses to determine the appropriate (and maximum) level of nutrient addition, such as nutrient and pH levels and electrical conductivity, and ensure that the total nutrient loading does not exceed the amount needed to meet crop demand.<br>▪ Cropland applications shall maintain soil pH in a range that favors nutrient uptake by crops.<br>▪ Application rates of nitrogen, phosphorus, and potassium shall not exceed the University of California guidelines (or industry practice when recognized by the university). Lower rates are acceptable.<br>▪ Application timing shall correspond as closely as practicable with the timing of plant uptake by crops or pasture grasses.<br>▪ Application of solid or liquid waste discharges to land shall be at rates that are reasonable for crop, soil, climate, special local situations, management system, and type of manure.<br>▪ Application of manure and wastewater discharges shall only be done during non-rainy or non-saturated conditions, ensuring that discharges do not result in runoff to surface waters and that discharges infiltrate completely within 72 hours after application.<br>▪ Spreading of compost, manure, or fertilizer shall not occur when the top 2 inches of soil are saturated or when enough precipitation to cause runoff is forecast.<br>▪ Sufficient setbacks (filter strips or otherwise well-vegetated areas) shall be maintained from drainages and waterbodies to prevent pollution and comply with state and federal water quality regulations; setback distance should be greater for steeper slopes, higher levels of nutrients applied, and lower levels of setback ground cover.<br>▪ Best practices shall be employed (e.g., USDA-NRCS 2011) to minimize the risk of nutrient runoff in application of liquids, slurry and solids, such as adjusting the thickness of the applied layer of manure and compost relative to slope and setback distance to minimize the chance that material will be washed downhill to waterbodies. | **X** | | | | | | **X** | **X** | | Air, Soils, Vegetation, Water | Pasture | Marin PCP 2018 (BIO-1b)<br>Sonoma County 2013<br>USDA-NRCS 2016<br>USDA-NRCS 2011<br>CBARCD 2003 |
| Records must be maintained for at least five years documenting the types and rates of nutrients applied, soil analyses, weather conditions at time of application, and elapsed time between application and the next rainfall or irrigation event.<br>Keep these records with the Nutrient Management Plan. | **X** | | | | | | **X** | **X** | | All | Pasture | NPS |
| Do not spread manure or compost when winds are in excess of 20 miles per hour. | **X** | | | | | | | | | Air, Soils, Visitor Use and Experience, Water | Pasture | NPS |
| Liquid (irrigated) manure application shall avoid saturating the soil. Pipes, hoses, and other irrigation equipment must be checked daily for leaks. | **X** | | | | | | | | | Air, Soils, Water | Pasture | NHDAMF 2011 |
| Compost of manure before spreading is recommended to reduce the volume of material, and potential for spread of weeds and pathogens. | **X** | | | | | | | | | Air, Soils, Water | Pasture | NHDAMF 2011 |
| Store organic waste in well-ventilated areas and take extra safety precautions if handling these materials when stored in ventilated containers. | **X** | **X** | **X** | **X** | **X** | **X** | | | | Health and Safety | Ranch Core | NPS |

| Management Activities | Manure and Nutrient Management | | | | | | Forage Production, including Silage, Haylage and Hay | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Practice Standards** | Nutrient Management (590) | Composting Facility (317) | Waste Treatment (629) | Waste Separation Facility (632) | Waste Transfer (634) | Waste Storage Facility (313) | Forage and Biomass Planting (512) | Forage Harvest Management (511) | Residue and Tillage Management/ No-Till (329) | **Resources** | **Subzone** | **Reference** |
| Excessive fly populations associated with manure storage shall be controlled, in consultation with NPS, using an Integrated Pest Management approach and avoiding wet areas around manure storage where flies may breed. | **X** | **X** | **X** | **X** | **X** | **X** | | | | Health and Safety, Visitor Use and Experience | Ranch Core | NHDAMF 2011 |
| Do not store or apply manure, manured bedding, compost, and process water within a 100-foot setback to any down-gradient surface water, open tile line intake structure, sinkhole, agricultural or domestic well head, or other conduit to surface water unless a 35-foot-wide vegetated buffer or physical barrier (i.e., a berm) is substituted for the 100-foot setback or an alternative conservation practice or field-specific condition is installed that provides pollutant reductions equivalent to or better than achieved by the 100-foot setback.<br>Place manure and contaminated bedding materials in contained storage or composting locations for later disposal or composting; ensure such locations have roofs, tarps, or other cover sufficient to keep rainfall out during the rainy season and two to four walls or sides sufficient to keep contents in place. | **X** | **X** | **X** | **X** | **X** | **X** | | | | Water | Ranch Core | Marin PCP 2018 (BIO-1b) |
| Composting and waste separation facilities shall be set back at least 100 feet from the nearest surface waterbody and/or the nearest water supply well.<br>Note A lesser setback distance may be allowed by the San Francisco Bay Regional Water Quality Control Board if it can be demonstrated that the groundwater, geologic, topographic, and well construction conditions at the site are adequate to protect water quality as described in the State Water Resources Control Board Compost General Order, 2015 or as revised. | | **X** | **X** | **X** | **X** | **X** | | | | Water | Ranch Core | Marin PCP 2018 (BIO-1b); Marin PCP 2018 (BMP DC-6 Setback from Water Supply Wells at Waste Storage Facilities) |
| All precipitation and clean surface drainage outside of manured areas, including that from roofed areas, shall be diverted away from confined and/or manured areas, unless such drainage is fully contained in a retention pond. | **X** | **X** | **X** | **X** | **X** | **X** | | | | Water | Ranch Core | Cal. Code Regs., tit. 27, §22562(b) |
| Existing retention ponds must, at a minimum, be lined with, or underlain by, soils which contain at least ten (10) percent clay and not more than ten (10) percent gravel or artificial materials or materials with equivalent impermeability or include additional lining materials necessary to comply with the San Francisco Bay Regional Water Quality Control Board Conditional Waiver's Discharge Prohibitions.<br>New retention ponds (or expansion of ponds) must comply with Natural Resources Conservation Service (NRCS) Waste Storage Facility Code 313 including a maximum specific discharge (unit seepage rate) of 1 x 10-6 cm/sec. Such ponds may not be used until the Discharger submits a report verifying that the pond liner meets this requirement. Waste shall not be placed into the retention pond until after the Water Board notifies the operator in writing that the report is acceptable.<br>Following a storm event, the operator shall restore the wastewater holding capacity of retention ponds, if necessary, in a timely manner and in a manner consistent with the required Waste Management Plan and Nutrient Management Plan. | | | | | | **X** | | | | Water | Ranch Core | Cal. Code Regs., tit. 27, §22562(d),<br>Waste Storage Facility (313), RWQCB 2016 Waste Discharge Requirements for Confined Animal Facilities<br>Order No. R2-2016-0031 |
| Soil disturbance is limited to the methods of planting/seeding under the Forage and Biomass Planting Practice Standard.<br>Residues shall be distributed evenly over the entire field and a minimum of 60% residue cover on the soil surface shall be maintained throughout the year. Approaches to minimize harvest impacts to wildlife shall be considered (e.g., leaving rows of unharvested crop standing at intervals across the field or adjacent to permanent cover for one or more years). | | | | | | | **X** | | **X** | Soils | Pasture | Residue and Tillage Management/ No-Till (329) |
| For all lease/permits that allow Forage Production, a conservation plan must be obtained from USDA, NRCS, or NPS which identifies requirements such as silage crop residue cover, cut stubble height, row spacing, disc passes, disc depth, and number of animal days grazed | | | | | | | **X** | **X** | **X** | Air, Soils, Vegetation, Water | Pasture | NPS 1990<br>USDA-NRCS 2013 |

| Management Activities | Manure and Nutrient Management | | | | | | Forage Production, including Silage, Haylage and Hay | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Practice Standards** | Nutrient Management (590) | Composting Facility (317) | Waste Treatment (629) | Waste Separation Facility (632) | Waste Transfer (634) | Waste Storage Facility (313) | Forage and Biomass Planting (512) | Forage Harvest Management (511) | Residue and Tillage Management/ No-Till (329) | **Resources** | **Subzone** | **Reference** |
| Avoid tilling or if necessary and with prior NPS approval use shallow tillage operations (1 to 2 inches) or operations that do not invert the soil.<br>Limited tillage is allowed to close or level ruts from harvesting equipment. No more than 10% of the field may be tilled for this purpose. | | | | | | | X | | X | Air, Cultural Resources, Soil, Water | Pasture | USDA-NRCS 2007, 2013 |
| Do not aerate soils, unless soil compaction is demonstrated, which can be predicted using USDA, NRCS, soil maps and measured using a soil cone penetrometer, when soils are saturated and ideally are at field capacity. | X | | | | | | X | | | Soils | Pasture | Wynne and Hancock 2008 |
| Efforts must be made to control silage leachate. Install an impermeable cover to minimize the entry of clean rain water from the top of the cover into the bunker, and ensure that water is not running along the sides of the bunker and coming into contact with the feed.<br>Note: A leachate collection system or vegetated filters strip may be required. Use a minimum cubic foot of leachate storage capacity for each ton of material placed in storage if and when containment becomes necessary. | | | | | | | | X | | Air, Water | Ranch Core | Kammel 1995 |
| General seeding mitigations:<br>▪ A Plans and Specifications document must be prepared that includes species to be used, seeding rates and dates, establishment procedures, actions needed to ensure adequate cover of desired species, and operation, monitoring, and maintenance requirements.<br>▪ All purchased seed shall be tagged and labeled in accordance with the California Agricultural Code and Seed Law, and acceptable to the County Agricultural Commissioner. Bag tags shall include evidence of purity and germination. Seed shall be of a quality that weed seed shall not exceed 0.5% of the aggregate of pure live seed (PLS) (% germination x % purity) and other material. Time since date of seed test shall not exceed 9 months. | | | | | | X | | | All | All | NPS |

**F-14: MITIGATIONS ASSOCIATED WITH OTHER LIVESTOCK, HORSE BOARDING, AND CROP DIVERSIFICATION**

| Diversification Mitigations |
|---|
| Adhere to the following Livestock Diversification practices specific to the Pasture subzone (if applicable):<br>▪ Avoid heavy or prolonged grazing by sheep and goats in pastures on areas with steep slopes or sparse vegetation.<br>▪ Control grazing practices, including pasture rotation, for goats and sheep in pastures to avoid overgrazing.<br>▪ Locate watering facilities in pastures on areas that promote even grazing distribution by sheep and goats and reduce grazing pressure on specific areas.<br>▪ Locate watering facilities in pastures away from well heads and install wellhead protection (i.e., fencing).<br>▪ Place watering facilities, new feed rack, and salt and mineral feeders in pastures a minimum of 300 feet from any riparian or aquatic habitat.<br>▪ Regularly move portable/moveable structures located in pastures for the production of fowl with to avoid or minimize contamination, disease occurrence, and overgrazing.<br>▪ Place portable/moveable structures located in pastures for the production of fowl a minimum of 300 feet from any drainages, riparian areas, wetlands, or ponds from mid-June through mid-September.<br>▪ Place floorless broiler chicken huts located within the Pasture subzone a minimum of 150 feet from any drainages, riparian areas, wetlands, or ponds from mid-June through mid-September. |
| Ensure livestock receive preventative veterinary care as needed. As appropriate and consistent with organic standards, vaccinate livestock and fowl if regional disease issues have been identified and administer vaccinations according to manufacturer recommendations. Inform NPS of livestock disease testing results, and contact USDA and CDFA for required, reportable diseases. |
| Ensure the design, construction, and maintenance of enclosures, buildings, and equipment used for livestock diversification located in the Ranch Core subzone or Pasture subzone:<br>▪ Allow for easy maintenance to allow for good hygiene and air quality<br>▪ Provide shelter from predators and from adverse weather conditions.<br>▪ Limit the risk of disease, contamination, and injuries.<br>▪ Include the use of fire-resistant materials and properly installed electrical equipment and wiring. |
| Conduct daily inspections and quickly pick up livestock (i.e., sheep, goat, and hog) and fowl (i.e., chicken) carcasses and dispose of them outside the park. Document disposal methods and instances using the USDA-approved methods and emergency action plans if necessary. |
| Adhere to the following key points for use of all livestock guardian animals:<br>▪ Post signs to alert the public of the presence of livestock guardian animals.<br>▪ Ensure health and safety by providing adequate food and water, routine veterinary care and vaccinations, de-worming, hoof trimming for donkeys and llamas (ATTRA 2002; BCAC 2011a, 2011b; CDFA n.d.) Report all livestock guardian animal interactions with wildlife and visitors to the NPS.<br>Adhere to the following key points for use of guard dogs (ATTRA 2002; BCAC 2011a, 2011b; CDFA n.d.; Green and Woodruff 1999; MDC 1996; Van Bommel 2010; USDA-APHIS 2002):<br>▪ Select a suitable breed for guard dogs, such as the Maremma-Abbruzzi, Akbash, Kuvasz, Anatolian Shepherd, Great Pyrenees, or Kommondor and purchase from a reputable breeder registered with the American Kennel Club.<br>▪ Properly train the dog to understand commands made by owner(s).<br>▪ Rear singly, from 8 weeks of age, with the animals the dog is guarding and minimize human contact<br>▪ Ensure some (limited) human contact to adequately socialize the dog and avoid aggressive behavior toward humans—10 minutes twice day for a puppy and once a day for an adult on pasture is typically enough contact.<br>▪ Spay or neuter guard dogs at appropriate age. |

| Diversification Mitigations |
| --- |
| ▪ Monitor and correct any undesirable behavior.<br>▪ Do not feed any raw food.<br>▪ When feasible, contain livestock and guard dogs within temporary exclosures bordered by electrified netting.<br>Adhere to the following key points for use of llamas (ATTRA 2002; BCAC 2011b; CDFA n.d.; Iowa State University 1994; MDC 1996):<br>▪ Use gelded adult male llamas, nonbreeding females, or females with young.<br>▪ Use only one llama per pasture.<br>▪ Monitor for aggressive behavior toward humans.<br>▪ Feed with the animals they are guarding.<br>Adhere to the following key points for use of donkeys (ATTRA 2002; BCAC 2011b; CDFA n.d.; MDC 1996):<br>▪ Select donkeys from medium- to large-size stock.<br>▪ Use jennies and geldings (Jacks are usually too aggressive).<br>▪ Feed with the animals they are guarding.<br>▪ Use only one donkey per pasture. |
| Report to NPS all observed or suspected interactions between livestock and native predators, including coyotes, bobcats, and mountain lions. Lethal control of wildlife is explicitly prohibited. |
| Adhere to the Livestock Diversification practices specific to the Ranch Core subzone:<br>▪ Place watering facilities, new feed rack, salt and mineral feeders, corrals, and feed storage facilities based on operational needs.<br>▪ Regularly clean and disinfect livestock and fowl housing, processing areas, and equipment as needed to reduce or prevent the spread of disease and pathogens by removing debris, cleaning and disinfecting surfaces. |
| Structural measures to prevent predation of poultry include:<br>▪ Build wildlife-proof structures for poultry using strong wire metal mesh that is firmly secured.<br>▪ Enclose poultry in night houses or shelters for species on pasture. |
| Implement dust control measures, such as wetting down paddocks and riding arenas, especially on dry, windy days and use low-dust or no-dust footing materials to control dust while reducing water use. |
| Implement measures to minimize concentrated flow from roads, roofs, and paved surfaces into stables, such as rolling dips for roads, and/or to prevent concentrated flow from causing erosion, such as roof gutter downspouts with energy dissipaters, and French drains.<br>Divert rainfall and runoff away from high-use areas with animal waste, such as stalls, manure piles, paddocks, and arenas, using methods such as guttered roofs, manure bins, and grassed waterways to keep such areas as dry as possible during the rainy season. |
| Route water from horse wash areas to a filter strip or into a plumbing system or outlet this water as sheet flow to a large, well-vegetated grassy area away from drainages and wetlands.<br>Minimize the amount of water used by using sponges or hoses equipped with shut-off or low-flow nozzles; and the amount of soap used, especially soap with surfactants. |
| As part of any crop proposal, identify whether a crop rotation sequence with different crops grown in a recurrent sequence over a given number of years is appropriate.<br><br>Use straw mulch (2 tons per acre) in areas where crop residue or cover crops are not present in the spring or late |

| Diversification Mitigations |
| --- |
| fall and use certified weed-free straw if purchased from outside the park or from a different ranch.<br><br>Incorporate structural erosion control systems to intercept and diffuse water flow to prevent excess sediment from entering streams and encourage infiltration into row crop design (i.e., drop inlets with sediment traps, daylight underground outlets to vegetated swales, energy dissipaters, sediment basin).<br><br>Store harvested crops in enclosed structures (i.e., buildings, barrels, crates).<br><br>If wildlife control is needed, only non-lethal management methods are permitted (i.e., scarecrows or decoys and control garden debris). Lethal control of wildlife is explicitly prohibited. |
| Plant cover crop or cover soils with mulch and use at least 30% cover in fallow crop areas throughout the rainy season. |
| For crop diversification, conclude tilling activities row crop areas, such as ripping, disking, or harrowing, before the first rains or November 1, whichever comes later |

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**Point Reyes National Seashore**
General Management Plan Amendment
Environmental Impact Statement

National Park Service
U.S. Department of the Interior

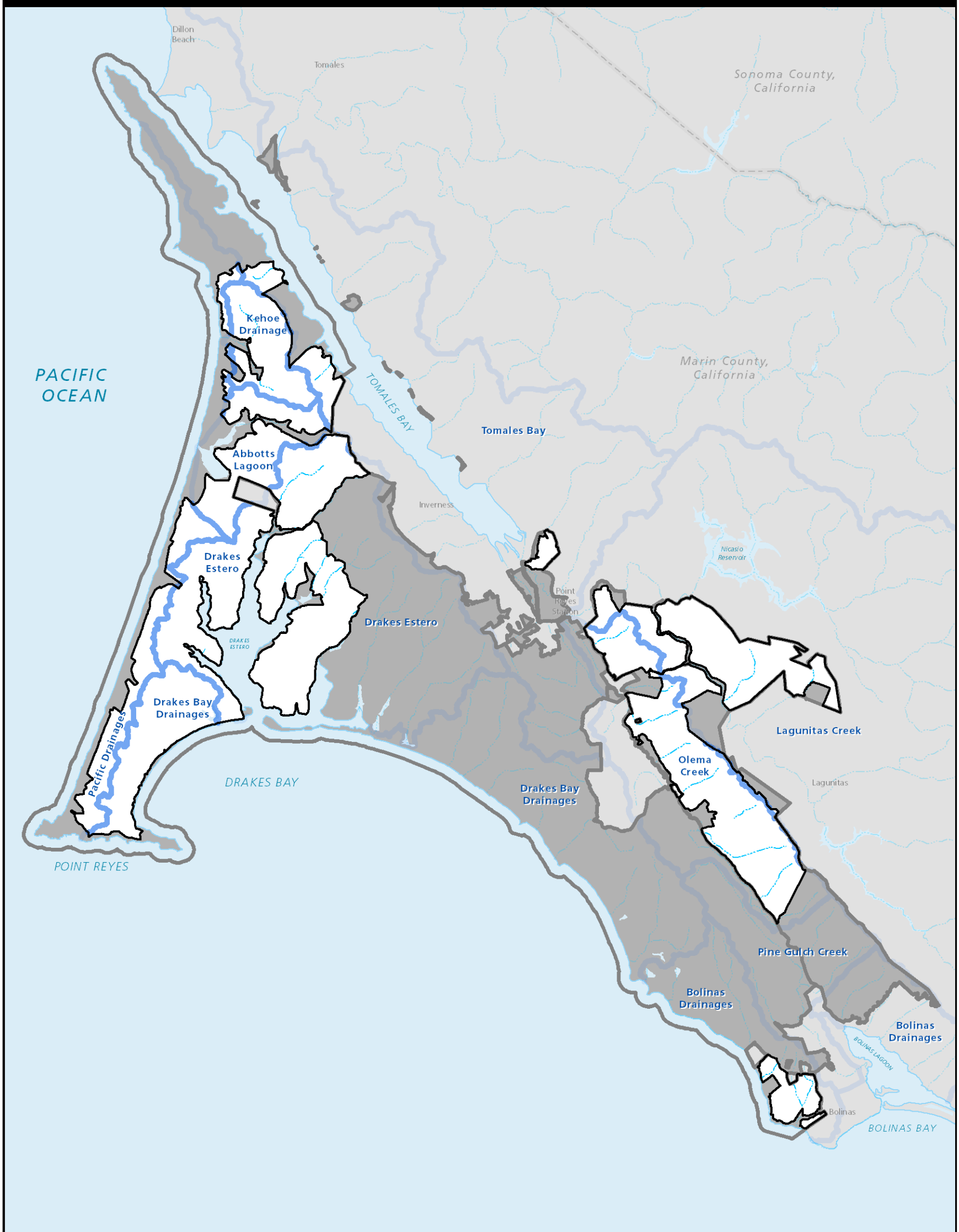



**FIGURE 44: HYDROLOGY IN THE PLANNING AREA**

**Point Reyes National Seashore**
General Management Plan Amendment
Environmental Impact Statement

National Park Service
U.S. Department of the Interior

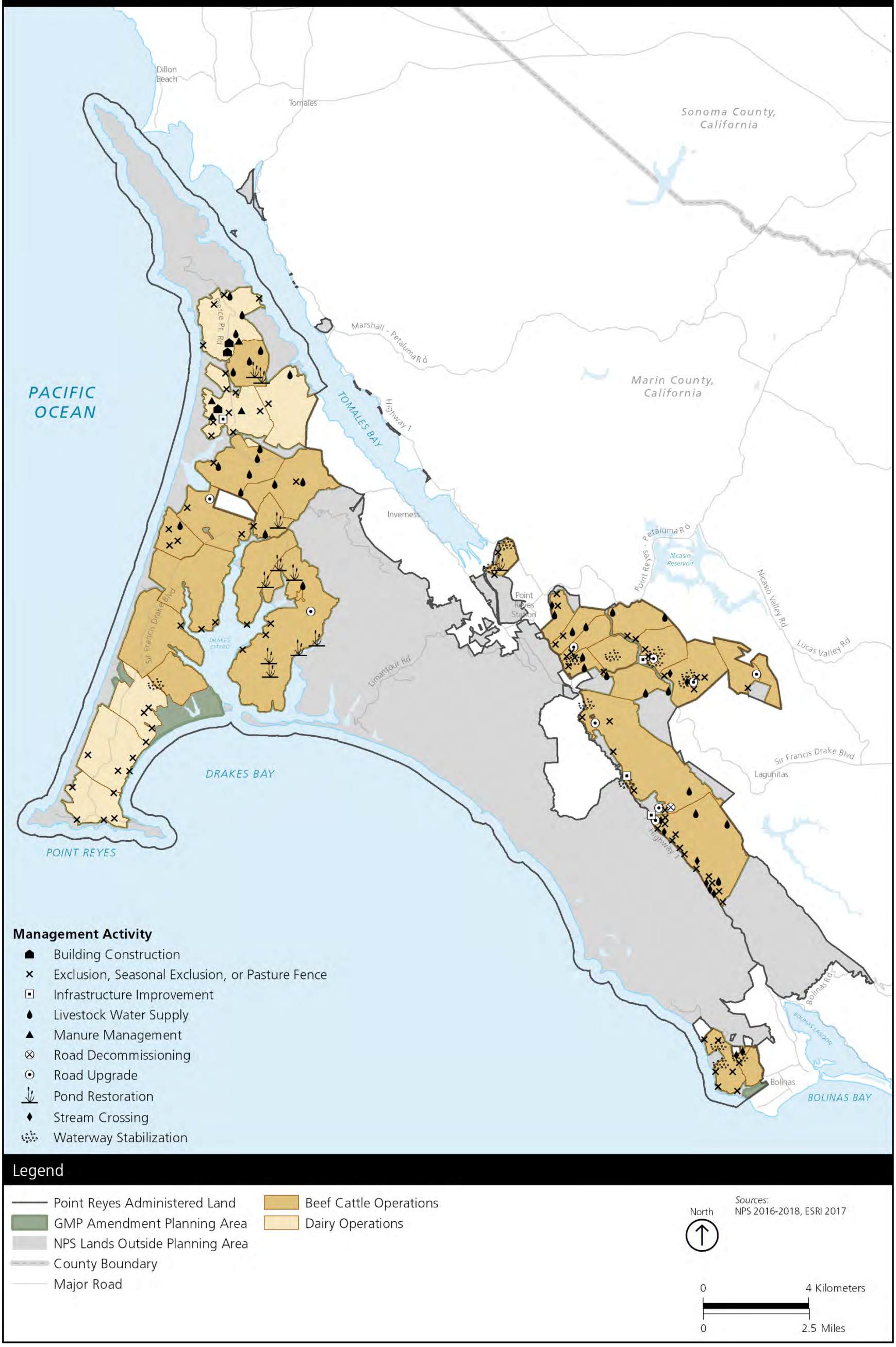



**FIGURE 4: ACTIVITIES TO IMPROVE RESOURCE CONDITIONS IN THE PLANNING AREA**

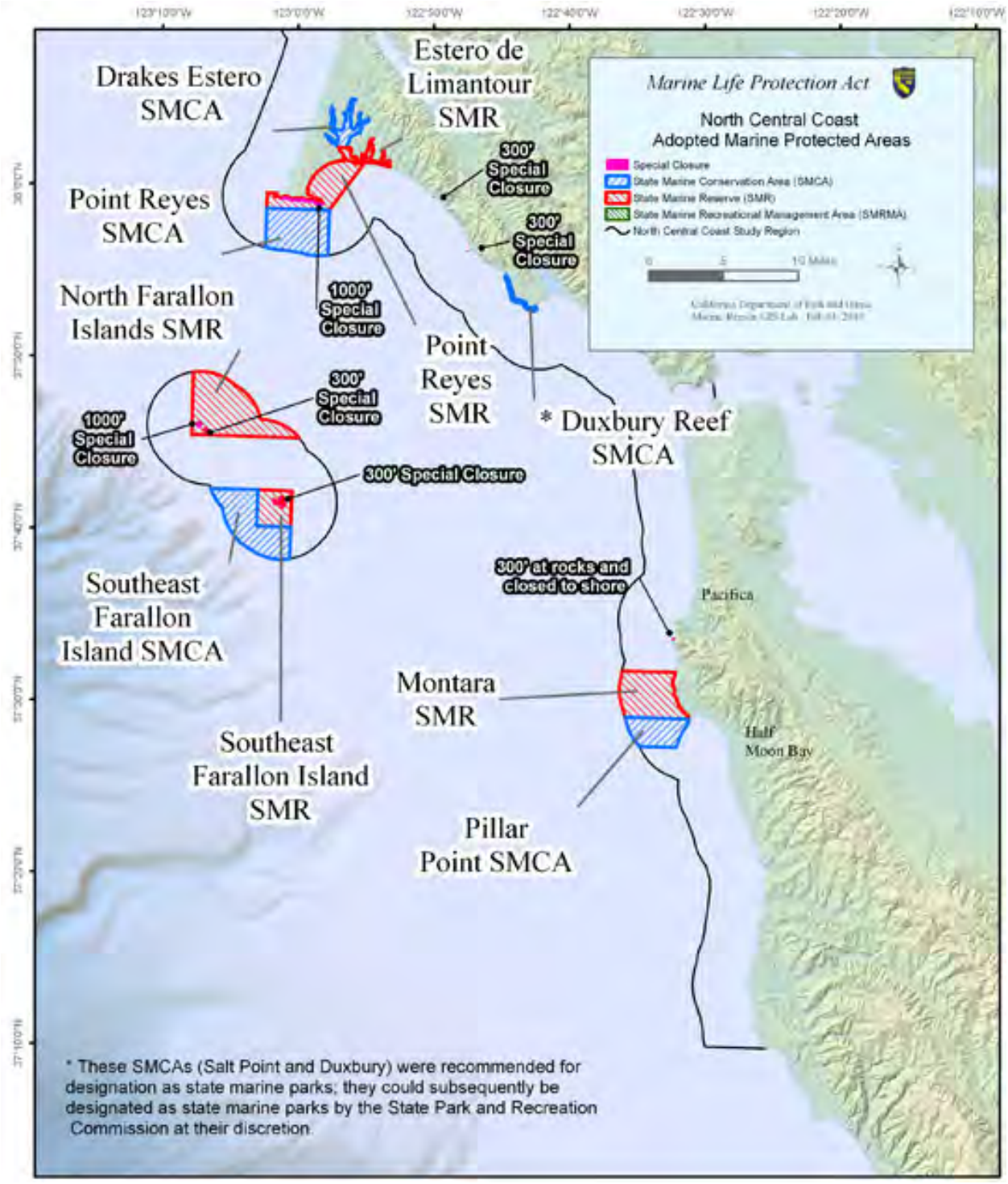
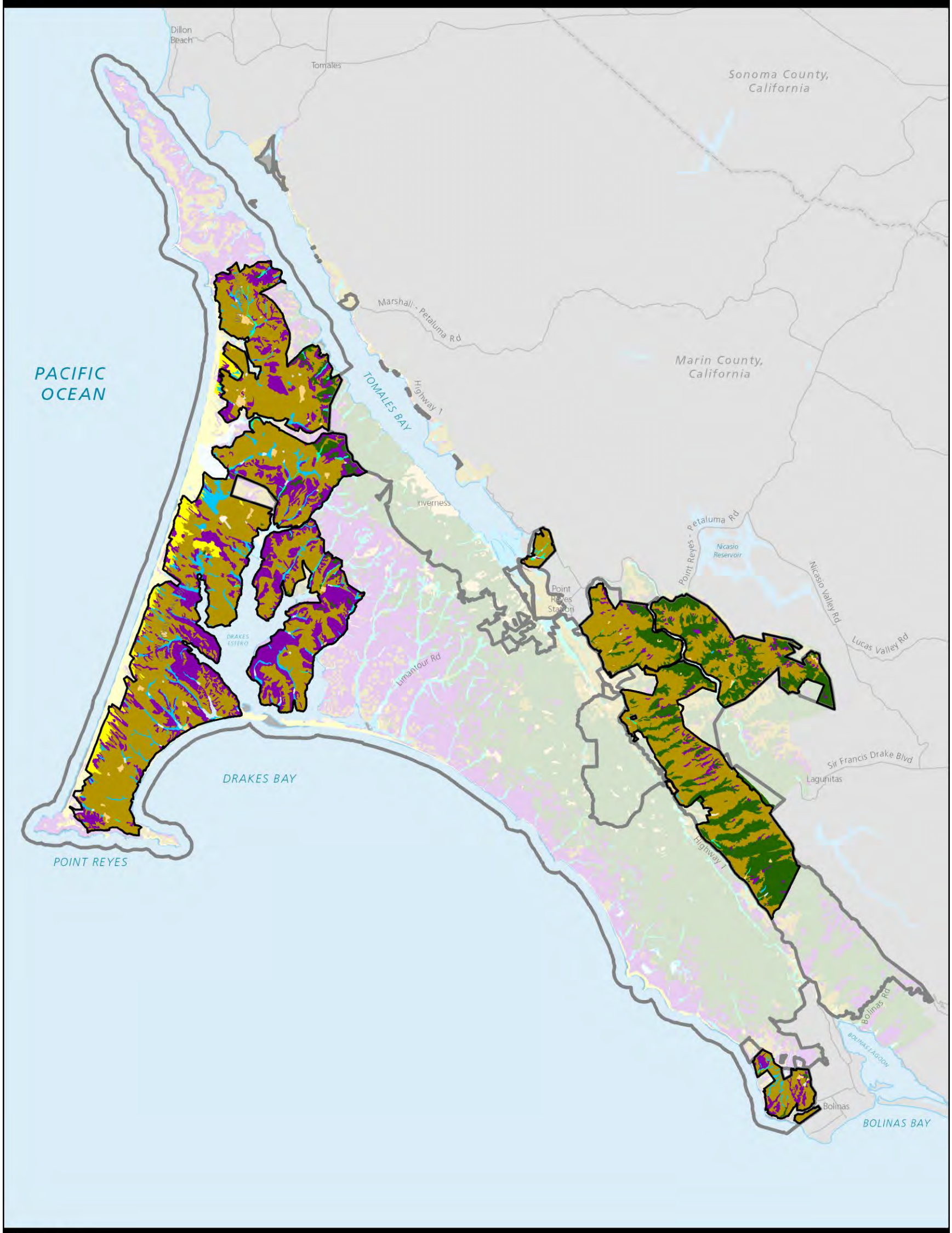



**Figure 27.** Adopted California Marine Life Protection Act designations (effective April 1, 2010) for the North Central Coast including Point Reyes National Seashore and Golden Gate National Recreation Area coastlines (CDFG 2009).

**Point Reyes National Seashore**
General Management Plan Amendment
Environmental Impact Statement

National Park Service
U.S. Department of the Interior




Legend

- Point Reyes Administered Land
- GMP Amendment Planning Area
- NPS Lands Outside Planning Area
- County Boundary
- Major Road

**Vegetation**

- Other
- Riparian Forest/Shrubland
- Coastal Scrub
- Grassland
- Dunes/Coastal Dunes
- Wetland
- Forest

North

*Sources:*
NPS Schirokauer D. Vegetation Map 2004

Note: Resources outside the planning area are masked and may appear lighter on the map than in the legend

0 4 Kilometers
0 2.5 Miles

**FIGURE 45: VEGETATION IN THE PLANNING AREA**

# APPENDIX M: THREATENED, ENDANGERED, AND SPECIAL-STATUS SPECIES TABLES

### TABLE M-1: STATE-LISTED/STATE RARE PLANTS

| Common Name | Scientific Name | State Status[a]/ CRPR[b] | Habitat |
|---|---|---|---|
| Pink sand-verbena | *Abronia umbellata ssp. breviflora* | NA/1B.1 | Coastal dune |
| Blasdale's bent grass | *Agrostis blasdalei* | NA/1B.2 | Coastal prairie; coastal dune; coastal scrub; chaparral |
| Coast rock cress | *Arabis blepharophylla* | NA/4.3 | Hardwood forest; coastal scrub; coastal prairie |
| Coastal marsh milkvetch | *Astragalus pycnostachyus var. pycnostachyus* | NA/1B.2 | Wetland; riparian; along estuary margins |
| Point Reyes blemnosperma | *Blennosperma nanum var. robustum* | CR/1B.2 | Coastal prairie; grazed and ungrazed areas |
| Thurber's reed grass | *Calamagrostis stricta ssp. inexpansa* | NA/2B.1 | Freshwater marsh; northern coastal scrub |
| Coastal bluff morning-glory | *Calystegia purpurata ssp. saxicola* | NA/1B.2 | Coastal scrub; coastal dunes; grazed and ungrazed areas |
| Swamp harebell | *Campanula californica* | NA/1B.2 | Bogs and fens; coniferous forest; coastal prairie and meadows; freshwater marshes and swamps |
| Buxbaum's sedge | *Carex buxbaumii* | NA/4.2 | Bogs and fens; meadows and seeps; marshes and swamps |
| Johnny-nip | *Castilleja ambigua ssp. ambigua* | NA/4.2 | Coastal scrub; coastal prairie; marshes and swamps; valley and foothill grassland |
| Glory bush | *Ceanothus gloriosus var. exaltatus* | NA/4.3 | Chaparral |
| Point Reyes ceanothus | *Ceanothus gloriosus var. gloriosus* | NA/4 | Coastal scrub; coniferous forest; coastal dunes |
| Mount Vision ceanothus | *Ceanothus gloriosus var. porrectus* | NA/1B | Coniferous forest; coastal scrub; coastal prairie; valley foothill and grassland |
| Mason's ceanothus | *Ceanothus masonii* | NA/1B.2 | Chaparral (openings, rocky, serpentine) |
| Point Reyes bird's beak | *Chloropyron maritimum spp. palustre* | NA/1B.2 | Coastal salt marshes |
| San Francisco bay spineflower | *Chorizanthe cuspidata var. cuspidata* | NA/1B.2 | Coastal bluff scrub; coastal dune; coastal prairie; coastal scrub |
| Wooly-headed Spineflower | *Chorizanthe cuspidata var. villosa* | NA/1B.2 | Coastal dunes; coastal prairie; coastal scrub |
| Bolander's water hemlock | *Cicuta maculate var. bolanderi* | NA/2B.1 | Marshes and swamps; coastal, fresh or brackish water; wetlands in pastureland |
| Franciscan thistle | *Cirsium andrewsii* | NA/1B.2 | Coastal prairie; coastal scrub; mixed coniferous forest |
| San Francisco wallflower | *Erysimum franciscanum* | NA/4.2 | Often serpentine or granite, sometimes roadsides; chaparral; coastal dunes; coastal scrub; valley and foothill grasslands |

| Common Name | Scientific Name | State Status[a]/ CRPR[b] | Habitat |
|---|---|---|---|
| Marin checker lily | *Fritillaria lanceolata var. tristulis* | NA/1B.1 | Coastal scrub; coastal prairie |
| Fragrant fritillary | *Fritillaria liliacea* | NA/1B.2 | Coastal prairie; valley grassland; coastal scrub; woodland |
| Blue coast gilia | *Gilia capitata ssp. chamissonis* | NA/1B.1 | Coastal dunes; coastal scrub; areas of open sand |
| Manyleaf gilia | *Gilia millefoliata* | NA/1B.2 | Coastal dune |
| Short-leaved evax | *Hesperevax sparsiflora var. brevifolia* | NA/1B.2 | Coastal scrub; coastal dunes; coastal prairie |
| Harlequin's lotus | *Hosackia gracilis* | NA/4.2 | Hardwood forest/woodland; coastal scrub; coniferous forest; coastal prairie; meadows and seeps; marshes and swamps; valley and foothill grassland. Found in cattle grazed areas and near trails. |
| Perennial goldfields | *Lasthenia californica ssp. macrantha* | NA/1B.2 | Coastal scrub; coastal dunes |
| Large-flower leptosiphon | *Leptosiphon grandiflorus* | NA/4.2 | Coastal scrub; coniferous forest; woodland; coastal dunes; coastal prairie; valley and foothill grassland |
| Rose leptosiphon | *Leptosiphon rosaceus* | NA/1B.1 | Coastal scrub; coastal prairie |
| Coast lily | *Lilium maritimum* | NA/1B.1 | Coastal prairie; coastal scrub; forest/woodland |
| Point Reyes meadowfoam | *Limnanthes douglasii* ssp. *sulphurea* | CE/1B.2 | Coastal prairie; mesic areas in meadows; freshwater marsh; and vernal pools. |
| Marsh microseris | *Microseris paludosa* | NA/1B.2 | Forest/woodland; grassland; coastal dune; coastal scrub; chaparral |
| Curly-leaved monardella | *Monardella undulata* | NA/4.2 | Coastal dune; coastal scrub |
| Gairdner’s yampah | *Perideridia gairdneri ssp. gairdneri* | NA/4.2 | Hardwood forest; chaparral; coastal prairie; valley and foothill grassland; vernal pools |
| North coast phacelia | *Phacelia insularis var. continentis* | NA/1B.2 | Coastal scrub; coastal dune |
| Michael’s piperia | *Piperia michaelii* | NA/4.2 | Coastal prairie |
| Lobb's aquatic buttercup | *Ranunculus lobbii* | NA/4.2 | Shallow pools near sea level |
| Point Reyes checkerbloom | *Sidalcea calycosa ssp. rhizomata* | NA/1B.2 | Marshes and wet places |
| Beach starwort | *Stellaria littoralis* | NA/4.2 | Marshes; bogs; coastal bluffs; seasonal wetlands in coastal prairie |
| Mt. Tamalpais jewel-flower | *Streptanthus glandulosus ssp. pulchellus* | NA/1B.2 | Chaparral; valley and foothill grassland |
| Two-fork clover | *Trifolium amoenum* | NA/1B.1 | Coastal bluff scrub; valley and foothill grassland |
| San Francisco owl's clover | *Triphysaria floribunda* | NA/1B.2 | Coastal prairie |
| Western dog violet | *Viola adunca* | NA/NA | Coastal prairie; forest; wetland and riparian |

Sources: CDFW (2019a); CNPS (2019); NPS (2017)

[a] NA – Not state listed; CR – State listed as Rare; CE – Listed as Endangered under CESA.

[b] California rare plant ranking; listing significance: List 1B – Plants rare, threatened, or endangered in California and elsewhere; List 2 – Plants rare, threatened, or endangered in California, but more common elsewhere; List 3 – Plants about which additional Information is needed – A review list; List 4 – Plants of limited distribution – A watch list.


**Figure 11: Western snowy plover critical habitat in the action area**