TURLOCK GROUNDWATER

East Turlock Subbasin GSA

IMPLEMENTATION STANDARDS AND MANAGEMENT PRACTICES
FOR REWILDING

Overview

Description

Rewilding is the general term for replacing areas occupied by irrigated crops with non-irrigated vegetation to reduce consumptive use of applied irrigation water and enhance natural habitat value (Rewilding). Examples of areas suitable for rewilding include those prone to water accumulation, floodplain areas, or areas in an orchard with lower productivity. Rewilding may also include the installation of berms, small stormwater retention ponds, or other modifications of local diffused stormwater runoff or floodplain hydrology.

A key rewilding strategy in ETSGSA is the rewilding of orchard swales. The orchard swale rewilding process involves removal of trees from swale areas for land cover conversion to non-irrigated vegetative cover that provides habitat, hydrologic, water quality and soil health benefits. Removed trees must be either chipped on-site, for whole orchard recycling or taken off-site for other beneficial uses. When chipped on-site and incorporated into the soil, additional benefits of carbon sequestration and storage, increased water retention, and improved soil heath may occur.

These *Implementation Standards and Management Practices for Rewilding* covers: Benefits and Objectives, Applicable Land Repurposing Practices, Participation Requirements, Best Practices and Guidelines, and References.

ETSGSA reserves the right to update these *Implementation Standards*.

Benefits and Objectives

The benefits of Rewilding irrigated cropland vary depending on the application objective(s). Benefits may include, but are not necessarily limited to, the following:

- Reduction in irrigation water demand and consumptive use of groundwater;
- Stormwater retention or detention;
- Increased soil moisture retention;
- Attenuation of flood discharges;
- Enhanced groundwater recharge and aquifer replenishment;
- Increased habitat for pollinators, other beneficial insects, amphibians, and birds;
- Reintroduction and propagation of native plant species;
- Climate resiliency through carbon capture and drought improved drought resilience;
- Improved soil structure, quality, and health; and
- Opportunity for economic benefits from stacked grazing enterprises.

Applicable Land Repurposing Strategies

These *Implementation Standards and Management Practices for Rewilding* apply to the following land repurposing strategies that are promoted as part of ETSGSA's groundwater management framework and Multi-Benefit Land Repurposing Program (MLRP):

- Orchard Swale Rewilding; and
- Floodplain Reconnection.

Requirements

General

Unless otherwise indicated, these Requirements apply to Rewilding implemented by an Owner or Operator as defined in ETSGSA *Rules and Regulations* and subject to an agreement under ETSGSA's MLRP; such Rewilding is referred to herein as a Rewilding Project. Rewilding implemented by an Owner or Operator that is not covered by an agreement under one of ETSGSA's incentive programs is not considered a Rewilding Project and is not subject to these Requirements. Unless otherwise indicated, all requirements listed herein are the responsibility of the Owner or Operator.

An Owner or Operator implementing a Rewilding Project shall:

- Be solely responsible for their management decisions and activities; and
- Maintain the land in a condition that does not create a nuisance because of, but not limited to, the following: fire danger, dust emissions, erosion, spread of noxious weeds and invasive plants, spread of plant or vector-borne diseases, pests, flood discharge, erosion or sediment discharge.

It is the responsibility of the Owner or Operator to:

- Comply with all federal, state, and local laws, regulations, and ordinances relevant to the Rewilding Project;
- Comply with the terms and requirements of the agreement executed between the Owner or Operator and ETSGSA for implementation of the Rewilding Project, or the larger project in which the Rewilding Project is included as a component (the Project Agreement);
- Comply with flow down terms of any grant agreement from which the Rewilding Project obtains any funding and any applicable public contracting requirements;
- Comply with the requirements prescribed within any permits issued for the Rewilding Project; and
- Comply with all monitoring and mitigation measures specified in the CEQA documentation for the Rewilding Project.

Projects may include multiple land repurposing strategies or components (i.e., other than Rewilding). Refer to the respective ETSGSA *Implementation Standards and Management Practices* for those components for other requirements associated with the project.

Site Review

Rewilding Project Application and Implementation Agreement

The following requirements related to site review apply to applications submitted for Rewilding Projects to participate in one of ETSGSA's Multi-Benefit Land Repurposing Program (MLRP) and Project Agreements developed between ETSGSA and Owners or Operators for implementation of Rewilding Projects:

- For incentive program applications, demarcate on a map and in the field the area(s) proposed for Rewilding in accordance with Rewilding Project design, and provide the map to ETSGSA with the incentive program application;
- For Project Agreements that include Rewilding Projects, update the map and field demarcation as needed for if the project extent has been adjusted;
- For documentation of Rewilding Project implementation, document existing (pre-construction) conditions in the area(s) proposed for the Rewilding Project in accordance with the application requirements and the monitoring requirements included in the implementation agreement, at a minimum:
    - Take a set of representative pre-construction photographs from locations (designated "photo points") that will be accessible after Rewilding Project construction; and
    - Prepare a brief written description of the pre-construction conditions that is keyed to an aerial image of the Project area, indicating type and age of crop(s), and any man-made features that will be affected by implementation of the Rewilding Project.

Site Assessment

ETSGSA will conduct any necessary resource investigations and studies, and complete a review of the Project in compliance with the California Environmental Quality Act (CEQA).

Site assessment is required for Rewilding Projects to support Rewilding area demarcation, vegetative cover, and surface drainage modification design (if any). Site assessment for Rewilding Projects may vary from project to project but shall include, at a minimum:

- One or more site visits including the Owner or Operator and ETSGSA or RCD staff to assess existing areas proposed for rewilding, and develop a Rewilding layout that avoids disturbance to adjacent orchard operations or sensitive habitat areas around the rewilded area, and to assess design considerations for any surface drainage modifications that may be included in the Rewilding Project; and
- Documentation of pre-construction conditions in accordance with the monitoring requirements contained in the implementation agreement for the Rewilding Project.

Additional Site Assessment activities may include, but are not limited to:

- Topographic survey to support swale identification, planning for hydrologic modifications and rewilding area demarcation;
- Hydrologic analysis and or soil testing to determine infiltration capacity and runoff potential;

- Evaluation of irrigation system modifications needed to implement Rewilding (e.g., drip line removal, rerouting, or capping, or installation of temporary irrigation systems to support establishment of hedgerows or shrubs); and
- Evaluation of beneficial vegetation assemblages to support vegetative cover design and planning.

Planning and Design

General

The following general design requirements shall apply for Rewilding Projects:

- Design plans shall be developed for the Rewilding Project, including, at a minimum, a map showing the location and dimensions of the area specified for Rewilding, principal features in the area, access routes and ongoing land uses in adjacent areas, and a written description of the Rewilding Project.
- For Rewilding Projects that are part of a larger project that features multiple project components in addition to Rewilding, the design plans and project descriptions shall specify the land area planned for each project component, and include the details and planning documents required under the applicable *Implementation Standards and Management Practices* for each component type.
- Existing underground utilities (if any) in the vicinity of and areas in which earthwork is conducted shall be demarcated in the field.
- A construction cost estimate shall be prepared and submitted to ETSGSA, or a minimum of two (2) itemized bids shall be obtained from a qualified contractor, in accordance with ETSGSA's Incentive Payment Procedures and the requirements of the ETSGSA's MLRP Plan.

Water Management

The following water management design requirements shall apply for Rewilding Projects under ETSGSA's MLRP:

- Cease irrigation in the rewilded area in accordance with the Rewilding Project design and project description. Note that irrigation may be necessary during establishment of hedgerows or shrubs if they are a planned component within or around the edges of Rewilded areas;
- Incorporate appropriate drainage management in the design plans to avoid erosion during all phases of Project construction; and If the Project includes structures for water control (e.g., weirs, culverts, etc.), such structures shall comply with any applicable permit requirements and implementation standards.

Earthwork Design

- If the Project design includes earthwork (e.g., grading, compaction, ripping, contouring), such work shall follow the requirements described in ETSGSA's *Implementation Standards and Management Practices for General Earthwork*; and
- If the Project design includes stormwater pond(s), such work shall follow the requirements described in ETSGSA's *Implementation Standards and Management Practices for Stormwater Ponds*.

Vegetative Cover Selection

The following references shall be consulted at a minimum to inform decisions regarding the selection of optimal commercial seed mixes for vegetated cover in rewilded areas:

- For planting of native vegetation, USDA NRCS Conservation Practice Standard (CPS) 327 "Conservation Cover" and CPS 420 "Wildlife Habitat Planting." Select from species found in the California Vegetation Guide (https://www.calflora.org/nrcs/index.html)
- For cover crop selection, the Cover Crop Species Selector developed by the Western Cover Crop Council tool, available at: Cover Crop Decision Tools – Western Cover Crops Council.

Vegetative Cover Management

The following vegetative cover management design Requirements shall apply for Rewilding Projects under ETSGSA's MLRP:

- Existing annual crops must be removed, mowed or disced into the soil;
- Orchards and vineyards must be removed from the site for beneficial use in compliance with San Joaquin Valley Air Pollution Control District (SJVAPCD) Rule 4103, incorporated into the soil following Whole Orchard Recycling (WOR) or Whole Vineyard Recycling (WVR) methods consistent with the guidelines published by the Almond Board of California (ABC, 2021) and the California Department of Food and Agriculture (CDFA, 2020), or removed from the site; and
- Vegetative cover shall be established and maintained within Rewilded areas, with vegetation that provides benefits including, but not limited to, pollinator habitat, habitat for beneficial insects, bird or other habitat, or native vegetation, in accordance with ETSGSA's *Implementation Standards and Management Practices for Vegetated Cover.*

Habitat-Related Design

The following habitat-related design Requirements shall apply for Rewilding Projects under ETSGSA's MLRP:

- Incorporate vegetation appropriate for local habitat, soil, topographic and hydrologic conditions;
- Consider habitat transition and connectivity in the design; and
- Incorporate wildlife-friendly features such as owl boxes and raptor stands.

Environmental Compliance

Depending on Project specifics, implementation of Rewilding Projects may trigger environmental compliance requirements under the California Environmental Quality Act (CEQA). It is the responsibility of the Owner or Operator to ensure the Project is compliant with the following requirements:

- The Owner or Operator shall facilitate ETSGSA's completion of any resource studies, CEQA compliance and permitting analysis by ETSGSA as the Lead Agency, which includes but is not limited to conducting Requirements as outlined in the Site Review, Planning and Design, and Permitting sections of this *Implementation Standard*; and

- The Owner or Operator shall comply with all monitoring and mitigation measures applicable to the Project, as prescribed under the Project's CEQA documentation and included in the Project Agreement.

Permitting

Depending on Project specifics, implementation of Rewilding Projects may trigger environmental permitting requirements. Potentially applicable permitting programs may include, but are not limited to: National Pollutant Discharge Elimination System (NPDES) Construction General Permit, Streambed Alteration Agreement (Section 1600 of the Fish and Wildlife Code), Clean Water Action Section 401 and 404, Waste Discharge Requirements (WDRs), and other required permits and consultations. The permitting process will include the following steps and requirements:

- ETSGSA will conduct an initial permitting analysis of all selected MLRP project applications based on an initial site reconnaissance, a biological and aquatic resources records search, and a cultural and historical resources records search.
- If potentially sensitive resources are identified, ETSGSA may require performance of an Aquatic Resources Delineation, Cultural Resources Survey, or other resources study to determine whether sensitive resources are present that may trigger special permitting or consultation requirements. Prior to conducting these resource investigations, ETSGSA will consult with the Owner and Operator to determine if they wish to proceed with the work, modify the project to avoid potentially sensitive resources, or withdraw the application.
- If the Owner and Operator choose to proceed, based on the results of the resources studies, ETSGSA will determine what permitting requirements apply and develop a Permit Management Plan. The Permit Management Plan will describe the permits that are needed and application process, and identify any additional recommended resource studies and surveys that need to be completed. Prior to conducting these resource investigations, ETSGSA will consult with the Owner and Operator to determine if they wish to proceed with the work, modify the project to avoid potentially sensitive resources, or withdraw the application.
- If the Owner and Operator choose to proceed, ETSGSA would complete the required studies, assist the Owner and Operator in completing the necessary permit applications, and manage the overall permitting process. The Owner and Operator would be responsible to submit the permit applications, provide additional information as may be requested, and participate in key permitting meetings and agency consultations.
- The cost of permit fees, special resource investigations and management of the permitting process may be borne entirely by ETSGSA or split between ETSGSA and the Owner/Operator. The Owner/Operator cost share, if any would be agreed to prior to performing the work.
- It is the responsibility of the Owner or Operator to comply with all requirements of any permits issued for the Project.

Projects may include multiple land repurposing practices (i.e., other than Rewilding). Potential permitting requirements for other practices that may be part of a given project are discussed in the *Implementation Standards and Management Practices* for those practices.

Construction and Implementation

The following construction and implementation Requirements shall apply to Rewilding Projects, as applicable to the Project's design:

- The Owner or Operator, or their contractor, shall implement construction Best Management Practices (BMPs) as required to comply with the NPDES Construction General Permit;
- The Owner or Operator, or their contractor, shall implement any avoidance and minimization measures, or mitigation measures (if any) in accordance with the CEQA documentation for the Project;
- The Owner or Operator, or their contractor, shall be responsible to comply with the conditions of any additional permits issued for the project;
- The Owner or Operator shall implement and maintain vegetative cover and habitat-related features in accordance with the approved project design and the Project Agreement;
- Earthwork and stormwater ponds, if incorporated in the Project, shall be designed and constructed in accordance with design specifications and requirements of the respective *Implementation Standards and Management Practices*;
- Payment for project implementation shall be in accordance with the ETSGSA's Project Incentive Payment Procedures and the Project Agreement; and
- Documentation shall be provided to ETSGSA describing post-implementation conditions, including photographs taken at the same locations as the pre-Project baseline condition photographs (photo points), as well as written documentation of conditions at the Project site, in accordance with the Project Agreement.

Projects may include multiple land repurposing practices (i.e., other than Rewilding). Potential construction and implementation requirements for other practices that may be part of a given project are discussed in the *Implementation Standards and Management Practices* for those practices.

Maintenance

The Owner or Operator is responsible for maintaining the Rewilding Project in accordance with the specifications in the Project Agreement and in compliance with all permitting and CEQA requirements, as applicable.

The Owner or Operator shall be responsible to implement the following additional maintenance requirements, as applicable based on the Rewilding Project's design:

- Provide for incidental, temporary irrigation to establish hedgerows and shrubs, as needed;
- Maintain the intended beneficial function of vegetative cover through periodic re-seeding, as needed;

- Avoid vehicular traffic into rewilded areas to the extent feasible; and
- Avoid application of agricultural chemicals in rewilded areas.

Monitoring

It is the responsibility of the Owner or Operator to ensure that all monitoring requirements for the Rewilding Project are met, including those specified herein, required under the CEQA documentation, required pursuant to permits that include the Rewilding Project, and specified in the Monitoring Requirements attached to the Project Agreement. The Owner and Operator shall maintain adequate access, facilities, instruments, and personnel to meet these requirements.

The following minimum monitoring Requirements shall apply to Rewilding Projects:

- Monitor vegetation conditions through geo-tagged, date and time-stamped photographs taken from the same locations as the pre-and post-Project photographs (designated photo points), as specified in the Monitoring Requirements attached to the Project Agreement; and
- Any additional monitoring specified in the Monitoring Requirements attached to the Project Agreement.

Reporting

It is the responsibility of the Owner or Operator to conduct all reporting as specified in the Monitoring Requirements attached to the Project Agreement, including, but not limited to, the following:

- Any documentation and reporting requirements associated with permits issued for the Project;
- Any documentation and reporting requirements under the Project's CEQA documentation and submit to ETSGSA, as specified in the Monitoring Requirements attached to the Project Agreement; and
- Submittal of required photo documentation to ETSGSA by January 15th of each year of the Project Agreement.

Best Practices and Guidelines

General

The following best practices and guidelines for Rewilding Projects are recommended but not required. Additional best practices and guidelines for project components other than Rewilding (e.g., General Earthwork, Stormwater Ponds, Basins) are discussed in the *Implementation Standards and Management Practices* for those components.

<u>Site Assessment</u>

- A hydrogeological assessment may be conducted prior to rewilding to determine site suitability, rewilded area size, and management practices. United States Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) Soil Quality Test

Kit Guide for soil infiltration capacity evaluation. Assistance may be available from ETSGSA or the local Resource Conservation Districts.

Planning and Design

- Design plans for Rewilding Projects should be developed prior to construction and should include all specifications and details related to crop removal and establishment of vegetative cover. The design plans should include the following, as applicable:
    - Description of the work and methods of crop removal;
    - Description of the work and methods of vegetative cover establishment (e.g., seeding, planting);
    - Plan-view layout map showing the location and extent of Rewilded areas, berms, channels, and other hydrologic modifications;
    - Berm profiles; and
    - Erosion control details, such as fiber rolls or straw wattles, including size, distance between erosion control components, and entrenchments.
- If drainage is modified using check dams or other measures, design should include surface drainage control including a stable outlet or other stormwater management practices to handle runoff;
- Removal of orchard trees and clearing or contouring the land surface according to natural grades for rewilded swales may be evaluated uniquely for each site. USDA NRCS CPS 460 "Land Clearing" may be used as reference sources to remove trees from swale zones to facilitate land repurposing;
- Selection of vegetation for Rewilded areas may consider the following:
    - Benefits to local ecosystems including habitat for wildlife, pollinators, and other beneficial insects;
    - Compatibility with local climate and hydrology, with preference for vegetation with low or zero supplemental water requirement after initial establishment; and
    - Benefits to soil health including soil microbes.
- For planting of native vegetation, USDA NRCS Conservation Practice Standard (CPS) 327 "Conservation Cover" and CPS 420 "Wildlife Habitat Planting" may be used as a reference. Key CPS include:
    - Select perennial plants adapted to the site and hydrologic conditions
    - Select from species found in the California Vegetation Guide (https://www.calflora.org/nrcs/index.html) specific to that MLRA; native species are preferred
    - Use viable, high quality and site-adapted planting stock
    - Include forbs and legumes that provide pollen and nectar for native bees; use a diverse mix of plant species that bloom at different times throughout the year
    - If mowing occurs, it should be outside of nesting and fawning season
    - Control invasive trees and shrubs
- The Western Cover Crop Council has developed a Cover Crop Species Selector tool that recommends cover crops based on your cover cropping objectives, local climate

and soil type. This tool and other useful references area available at the following link: Cover Crop Decision Tools – Western Cover Crops Council. We recommend this resource be consulted in the selection of cover crop seed mixes that produce the desired benefits.

- A buffer strip around the Rewilded areas may be included in Rewilding Project design plans to allow for vehicular traffic, maintenance, and monitoring;
- A hedge row of drought resistant, perennial shrubs and bushes, established around the Rewilding Project area may be used to provide additional habitat benefits and act as a buffer for wind to reduce dust. USDA NRCS CPS 386 "Field Border" and CPS 422 "Hedgerow Planting" may serve as a reference guide for design and implementation of vegetation around the perimeter of the Rewilding Project area; and
- If structures for water control (i.e., drops, chutes, turnouts, outlets, head gates, or pump boxes) are needed for water conveyance into or out of the Project area, USDA NRCS CPS 587 "Structure for Water Control" may be used as a reference source for design of structures to control diversion or measurement of transported water.

References

Almond Board of California (ABC), 2021. Whole Orchard Recycling, Guide for California Almond Growers.

USDA, NRCS, 2001. Soil Quality Test Kit Guide for soil infiltration capacity evaluation. https://www.nrcs.usda.gov/sites/default/files/2022-10/Soil%20Quality%20Test%20Kit%20Guide.pdf

United States Department of Agriculture (USDA), Natural Resources Conservation Service (NRCS), 2016. Conservation Practice Standard: Conservation Cover, Code 327.

https://www.nrcs.usda.gov/resources/guides-and-instructions/conservation-cover-ac-327-conservation-practice-standard

USDA, NRCS, 2017. Conservation Practice Standard: Hedgerow Planting, Code 422.

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USDA, NRCS, 2017. Conservation Practice Standard: Structure for Water Control, Code 587.

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USDA, NRCS, 2019. Conservation Practice Standard: Wildlife Habitat Planting, Code 420.

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USDA, NRCS, 2020. Whole Orchard Recycling (WOR), Inclusion in the CDFA Healthy Soils Incentive Program: A report for the Environmental Farming Act Science Advisory Panel Final Report, February 27.

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