Prospectus for the Western Riverside County SAMP/MSAA In-Lieu Fee Program
(DRAFT 5/25/09)

The Western Riverside County Special Area Management Plan ("SAMP") is an alternate regulatory framework that views regulatory actions authorized by Section 404 of the Clean Water Act in the context of the larger watershed. The Corps of Engineers ("Corps) is developing the SAMP in conjunction with a master streambed alteration agreement (MSAA) with the California Department of Fish and Game ("Department"). Within the San Jacinto River Watershed and the Upper Santa Margarita River Watershed, the SAMP would provide more intelligent regulatory decision-making for both permits and for compensatory mitigation. An important component of the SAMP is the development of a compensatory mitigation approach that would result in more effective compensatory mitigation through implementation of a watershed approach.

The Corps' mitigation rule (33 CFR 332) defines a watershed approach as "an analytical process for making compensatory mitigation decisions that support the sustainability or improvement of aquatic resources in a watershed." Through this approach, the Corps would consider watershed needs and how locations and types of compensatory mitigation would address those needs, relying on a landscape perspective to make more informed decisions on how specific types and locations of compensatory mitigation would benefit the watershed and offset losses of aquatic resource functions and services permitted through the Corps regulatory program. In fulfilling the watershed approach, the mitigation rule discusses different options including mitigation banks, in-lieu fee programs, and permittee responsible mitigation.

As part of the SAMP, the Corps is proposing to establish of an in-lieu fee program to help make more effective decisions on compensatory mitigation. The mitigation rule expresses a higher degree of preference for coordinated compensatory mitigation programs such as in-lieu fee programs, partly because coordinated compensatory mitigation programs can reduce risk and uncertainty through more advanced planning and because the additional requirements necessitated by the mitigation rule for such programs would help insure success.

This document serves as the prospectus for the SAMP In-Lieu Fee Program ("Program"). As required under 33 CFR 332.8(d)(2), a prospectus must be provided for review before production of a in-lieu fee instrument. The prospectus outlines in more detail the objectives, feasibility, and the compensatory planning framework of the Program. The prospectus also details the qualification of the _____ as the sponsor of the Program, and hereafter known as the "Sponsor."

1. Need and Technical Feasibility of the Program

The Corps and the Department require compensatory mitigation to offset lost functions and services for aquatic resources in their respective jurisdictions. Within the proposed service area, the Corps authorized permits impacting 11.6 acres of waters of the U.S./year from 2002-2007. The Department probably authorizes similar amounts of impacts to streambeds and riparian habitats. The Corps expects similar magnitude of impacts in future years with a projection of about 600 acres of impacts over 50 years. The impacts would require compensatory mitigation of at least 12 acres/year, depending on the mitigation ratio required by the Corps, the

Department, and other regulatory agencies. An average compensatory mitigation ratio of 1.5:1 would result in 900 acres of compensatory mitigation over 50 years. An average compensatory mitigation ratio of 2:1 would result in 1,200 acres of compensatory mitigation over 50 years.

There is a need for compensatory mitigation for both permittees and the environmental community. Permittees need compensatory mitigation to address impacts to aquatic resources. The new mitigation rule does not allow the Corps to issue a standard individual permit unless compensatory mitigation is included as special conditions (33 CFR 332.3(k)(2)) and does not allow work under a general permit until compensatory mitigation plans are finalized (33 CFR 332.3(k)(3)). For permittees to undertake permitted work in a timely manner, practicable compensatory mitigation opportunities are needed. The environmental community needs compensatory mitigation to be effective in replacing lost aquatic resource functions and services. Recent evaluations of compensatory mitigation projects have shown reviewed mitigation sites were not comparable to reference sites (Ambrose et al. 2007), necessiating a different approach to compensatory mitigation site selection and design. In some cases, compensatory mitigation is not implemented in a timely manner or fails to offset lost functions and services.

Given the need to provide practicable and effective compensatory mitigation and the requirement for a watershed approach by the new mitigation rule, there is a need to provide a more watershed-based framework for compensatory mitigation. Rather than relying on a series of individual compensatory mitigation site throughout the watershed, the Corps has determined that a watershed approach using an in-lieu fee program would allow for more well-informed site selection of compensatory mitigation sites. Individual compensatory mitigation sites selected on an ad-hoc basis may not conform with a watershed approach because individual applicants or individual regulatory project managers may not have access to appropriate landscape evaluation to allow for a watershed approach. With the Program, the Corps and the Department can provide more upfront planning to allow for better mitigation within a watershed context.

In preparation for the watershed approach, the Corps has already undertaken watershed-wide assessment of the proposed service area. Through a planning level delineation and a landscape level functional assessment, the Corps has determined the quantity and condition of existing aquatic resources (Lichvar et al. 2003, Smith 2003). The Corps has evaluated all potential riverine restoration sites with the service area (Smith and Klimas 2006a, Smith and Klimas 2006b) with recommended restoration templates for various geomorphic zones. The Corps further identified potential restoration sites throughout the watershed based on considerations of connectivity, location within open space, and sensitive species, as well as considerations for habitat, water quality, and flood control. Although advanced identification of restoration sites does not guarantee that a particular site would be restored because of uncertainties related to site acquisition, it does provide a menu of restoration opportunities that allow for targeted efforts in the context of upfront planning as part of an in-lieu fee program.

2. Objectives of the Program

The primary purpose of the Program is to accept monies generated as in-lieu-fee funding requirements for authorized activities, as well as monies generated by enforcement and compliance actions initiated by the Corps and the Department, and to serve as a funding source

for wetland and/or riparian restoration, establishment (creation), enhancement, and preservation of wetlands and other aquatic resources in the context of watershed needs of the San Jacinto River Watershed and the Upper Santa Margarita River Watershed. Sites for these restoration, establishment, enhancement, and preservation activities would be selected through a watershed approach to insure future aquatic resource creation and restoration activities would be more likely to offset lost aquatic resource functions and services authorized under Section 404 of the Clean Water Act of 1972 and California Fish and Game Code 1601/1603.

A central feature of the Program is to direct compensatory mitigation to areas within the watershed to address specific functions related to habitat, water quality, and flood control. Such an approach is conceptualized in Figure 1, where specific compensatory mitigation sites would address one or more functions. As acknowledged in the mitigation rule and Figure 1, a restoration site does not necessarily need to address all functions with some sites addressing water quality and flood reduction functions with other sites addressing habitat functions.

In addition, the Program would prioritize compensatory mitigation site selection based on a soft hierarchy of specific goals. The first goal is to restore connectivity between two areas of natural open space in order to create a continuous open space feature. Restoring connectivity would be done mainly in a riverine hydrogeomorphic context to allow for a riverine/riparian feature that would allow for the movement of wildlife, sediments, and nutrients. The second goal is to provide compensatory mitigation that would benefit sensitive species. Many species spend some time in aquatic resources as part of their life cycle either as obligate or facultative users. Siting compensatory mitigation within a specific species' range would promote a species' habitat needs. The third goal is to provide compensatory mitigation to increase water quality and flood control functions and services, particularly in urban areas. Although the urban landscape may limit the achievement of all or most aquatic resource habitat functions, siting of compensatory mitigation within urban areas would at least provide for some water quality or flood control functions while providing local human populations with non-ecological functions and services such as aesthetics and recreation. The fourth goal is to provide compensatory mitigation adjacent to open space areas. In restoring, creating, or enhancing aquatic resources adjacent to existing open space, the open space provides buffer benefits on one or more side, minimizing on indirect effects on at least a partial basis. Also, providing compensatory mitigation adjacent to existing open space would allow for the creation of a larger open space parcel with consequent ecological benefits to larger habitat islands. The fifth goal is to provide compensatory mitigation in natural open space areas. Open space areas are already protected, allowing for more effective long-term protection and management of any compensatory mitigation project located in this open space. Also, open space areas are already amenable to compensatory mitigation because there would be less conflict with proposed land uses. Areas not within open space would face additional hurdles related to property acquisition from landowners who many not be amenable to transfer of ownership. The last goal is to provide compensatory mitigation that provides the greatest lift of ecological integrity. Given that there are methods to determine ecological integrity of existing aquatic resources as well as determining gains in ecological integrity after restoration, it is desirable to prioritize compensatory mitigation in areas where there would be a substantial gain in ecological integrity as opposed to areas where there would be a marginal gain in ecological integrity.

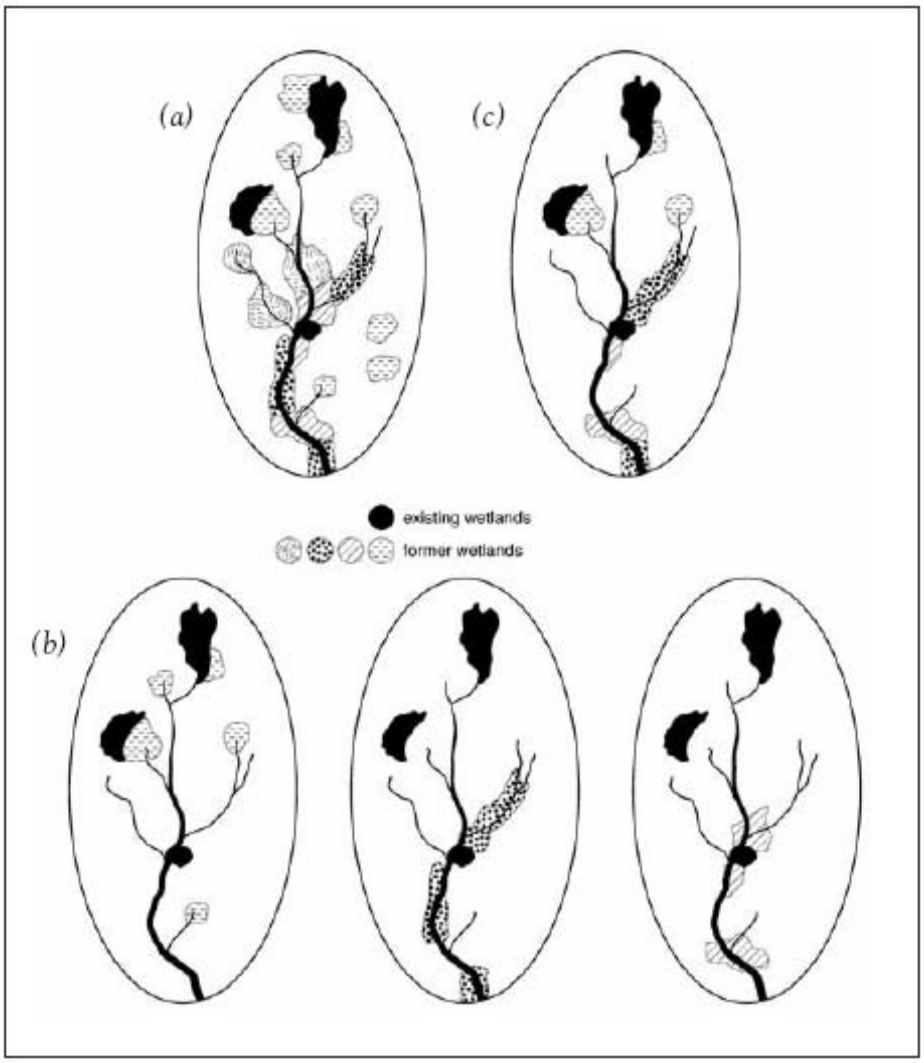

Figure 1. Conceptualized approach to directing compensatory mitigation to address specific aquatic resource functions. Given the presence of aquatic resources in the watershed historically (a), specific aquatic resources may be restored to address habitat functions ((b, left)), flood control functions ((b), center)), and water quality functions ((b), right). The suite of all three possible restoration objectives are shown in (c). (Figure from Zedler, 2003)

3. Proposed Service Area

The proposed service area is the western Riverside County SAMP Study Area, which consists of the San Jacinto River Watershed (765 square miles) and the Upper Santa Margarita River Watershed (542 square miles) (Figure 2). Collectively, these two watersheds possess about 31,540 acres of probable Corps jurisdiction, including about 18,790 acres in the San Jacinto River Watershed and about 12,750 acres in the Upper Santa Margarita River Watershed (Table 1). The most common habitat types include native shrub habitats (about 5,390 acres), native trees/woodlands/forest habitats (about 2,560 acres), and unvegetated washes (about 2,540 acres). The landscape level functional assessment determined that about 10% consists of low ecological integrity (Table 1). Major waterways within the San Jacinto River Watershed include

the San Jacinto River, Salt Creek, Perris Valley Stormdrain, Poppet Creek, Indian Creek, and Bautista Creek. Major waterways within the Upper Santa Margarita River Watershed include Murrieta Creek, Warm Springs Creek, Tucalota Creek, Santa Getrudis Creek, Temecula Creek, Wilson Creek, and Pechanga Creek.

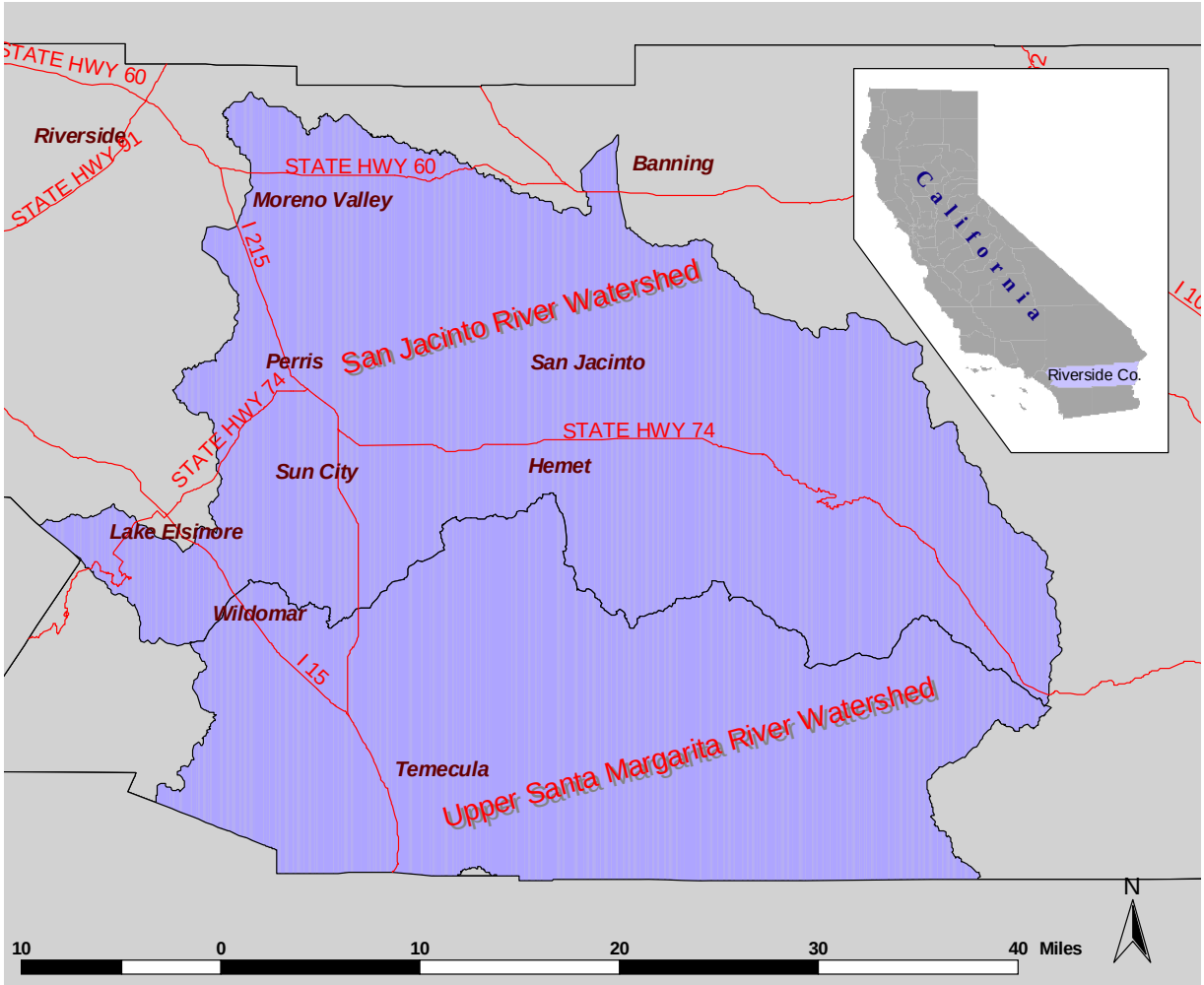

Figure 2. Proposed service area for the Western Riverside County SAMP/MSAA In-lieu Fee Mitigation Program.

The service area would be subdivided into two smaller service areas based on an eight digit hydrologic unit classification (HUC) codes, a delineation consistent with the new mitigation rule (33 CFR 332.8(d)(6)(ii)(A)). The two smaller service areas would allow for watershed-specific compensatory mitigation. Impacts in the San Jacinto River Watershed (HUC Code 18070202) would require compensatory mitigation in the San Jacinto River Watershed. Impacts in the Upper Santa Margarita River Watershed (HUC Code 18070302) would require compensatory mitigation in the Upper Santa Margarita River Watershed.

Table 1. Probable Corps jurisdictional features in the Western Riverside County SAMP.

	Study Area Total			Low Integrity[1]		
	San Jacinto	**Santa Margarita**	**Total**	**San Jacinto**	**Santa Margarita**	**Total**
Alkali Marsh	16.8	1.2	18.0	16.8		16.8
Artificial Structure	1,892.2	573.8	2,466.0	373.3	96.3	469.6
Chaparral	8.6	14.2	22.8			
Freshwater Marsh	471.2	313.5	784.7	67.3	16.0	83.3
Grassland, Native	0.5	5.7	6.1			
Grassland, Non-Native	721.2	45.6	766.8	256.4	3.1	259.5
Herbaceous Native	571.1	318.8	889.9	71.8	7.1	79.0
Herbaceous Non-Native	306.4	70.5	376.9	8.3	7.9	16.2
Juncus Meadow	50.2	219.1	269.3			
Shrub Native	3,772.1	1,622.2	5,394.3	941.8	43.1	984.8
Shrub, Non-Native	242.2	219.7	461.9	72.7	1.3	74.0
Trees/Woodland/Forest, Native	851.3	1,712.7	2,564.0	26.6	20.9	47.5
Trees/Woodland/Forest, Non-Native	9.9	21.5	31.4	0.2	0.1	0.4
Unvegetated > 10 ft	731.0	233.6	964.6	47.1	49.8	96.9
Unvegeated < 10 ft	1,642.1	839.2	2,481.3	157.2	35.6	192.9
Water Body	7,507.9	6,533.8	14,041.7	774.3	8.1	782.4
Grand Total	**18,794.8**	**12,745.0**	**31,539.8**	**2,813.9**	**289.3**	**3,103.2**

[1] Low integrity aquatic resources are those with integrity scores less than 0.7 for hydrologic and water quality integrity and less than 0.4 for habitat integrity.

4. Establishment and Operation of the Program

The Program would be established in conjunction with the SAMP. In advance of the completion of the SAMP, the prospectus for the Program would be provided to probable members of the interagency review team (IRT) including the Department, the U.S. Environmental Protection Agency (EPA), the U.S. Fish and Wildlife Service (FWS), the State Water Resources Control Board (SWRCB), and the San Diego and Santa Ana Regional Water Quality Control Boards (RWQCBs). Comments on the prospectus would be incorporated into a final prospectus. The prospectus would be made available to the public with the draft Environmental Impact Statement (EIS)/Environmental Impact Report (EIR) in order to solicit feedback from the public with a minimum comment period of 30 days. Comments received on the prospectus within the context of the EIS/EIR would then be provided to the Corps in order for the Corps to make evaluation on whether to proceed with the development of the draft instrument. If the Corps determines the ILF has the potential to provide compensatory mitigation opportunities, then the draft instrument may be written. Upon completion of the draft instrument, copies would be provided to members of the IRT with a comment period of 30 days. Afterwards, the Corps and the rest of the IRT would resolve any differences, if any. Upon the Corps' determination that the instrument is acceptable, the final instrument would be written. The Corps would then notify the rest of the IRT of the intent to approve the final instrument. Once the Corps decides to approve the final instrument, the public would be notified at the time of the final EIS that the Program would be established. The Program would be established once the ROD is signed by the District Engineer.

Because the Program is an ILF, no compensatory mitigation would be implemented until the Sponsor receives funds for compensatory mitigation or for enforcement actions. The goal of the Program is to provide establishment, restoration, and enhancement opportunities at multiple sites throughout the service area with the compensatory mitigation occurring within the same watershed as the impact site and/or at a site nearest to the impact site, as appropriate. Upon approval of the instrument, the Corps would allow the release of advanced credits (33 CFR 332.8(n)) for 90 acres for the Sponsor to sell based on the expectation that i) there would be 12 acres of impact/year with compensatory mitigation ratios exceeding 1:1 for certain projects and ii) it would take about 5 years before the restoration would be deemed successful enough to re-allocate those credits back for re-sale.

As detailed later, the Sponsor would operate two aspects of the program. The first part of the Program is the administration of the Program, accounting for credit sales, disbursement of funds for project expenditures, management of financial holdings, negotiations with land owners, and overseeing of the site protection instruments. The second part of the Program is the implementation of the physical establishment, restoration, or enhancement including developing site specific mitigation plans, execution of the site-specific mitigation plan, monitoring the work in accordance with the mitigation plan, and undertaking long-term management activities to insure the compensatory mitigation maintains functions and services in perpetuity. The Sponsor may delegate one or both aspects of the program to outside agents with final responsibility residing with the Sponsor.

5. Ownership Arrangements and Long-Term Management

The possible sites include both public and private lands. Any efforts to use a site for compensatory mitigation is dependent upon the willingness of the owner to allow such activities. Some owners may enter into appropriate real estate arrangements that allow for sale of the lands in fee title, offer the lands through a conservation easement or deed restriction, or allow for such activities in the context of program level protection assurances. It is the preference of the Sponsor that the sites would be completely owned by the Sponsor. Negotiations would examine what legal arrangements can be made to insure the execution of appropriate protection instruments outlined by the mitigation rule. The end result is that some of the sites would be completely owned by the Sponsor and some of the sites would not be owned by the Sponsor. Given the attempt at a comprehensive approach to address compensatory mitigation for the probable impacts to 600 acres within the service area with 900 to 1,200 acres of compensatory mitigation, depending on the mitigation ratio, negotiations would result in a mix of ownership arrangements.

For public lands, objectives of the current owners vary. In some cases, the nature of the public ownership (e.g., open space for conservation) could be consistent with efforts to create and restore aquatic resources. In other cases, the nature of the public ownership (e.g., active recreational activities) could be inconsistent with efforts to create and restore aquatic resources for some types of functions and services such as habitat functions, although it may be appropriate for water quality functions. As a result, the type of objectives of the current owner would affect the type of aquatic resource compensatory mitigation that could be allowed on the project site.

For private lands, ownership objectives also vary. However, it is expected more often than not that the objectives are to serve private interests, which may not be conducive to aquatic resource conservation. Consequently, private lands that are restored would be either acquired in fee title or a conservation easement or deed restriction would be required.

Long-term management would be funded through an endowment and overseen by the Sponsor. It is expected that costs for all compensatory mitigation would include in perpetuity financing of long term management. Based on the Corps' past experience with endowments, the cost for fully funding an endowment to manage for trash removal, signage, and exotics removal is about $13,000-$14,000 per acre of aquatic resource. The Sponsor has experience with long-term management issues and financing such activities through its obligations through other environmental programs. Any financing of long-term management for compensatory mitigation for aquatic resources would be kept in separate accounts such that other financial assets of the Sponsor would be distinct from the financial assets kept for long-term maintenance for aquatic resource compensatory mitigation.

6. Qualifications of the Sponsor

[If the ownership is the Western Riverside County Resource Conservation Authority]. The Western Riverside County Resource Conservation Authority (RCA) is the sponsor of the Program. The Sponsor has several years of experience in resource management. As the principal resource management authority serving the Western Riverside County Multiple Species Habitat Conservation Plan (MSHCP), the RCA is responsible for acquisition of new conservation properties, management of finances including endowments, hiring of contractors to undertake specific tasks including habitat restoration and monitoring, and providing reports to regulatory agencies. To date, they have acquired XX acres of habitat, including XX acres of aquatic resources. The RCA manages XX dollars for long-term management of acquired habitats. On an annual basis, the RCA provides reports to regulatory agencies demonstrating compliance with terms and conditions of past agreements.

The Sponsor has relied on the Santa Ana Watershed Association of Resource Conservation Districts (SAWA) to undertake aquatic system restoration and creation in the past. SAWA has the experience and expertise in these matters because they have been part of past in-lieu fee programs, implementing the restoration and overseeing the monitoring and reporting including vegetation monitoring and sensitive species surveys. They have numerous biologists on staff to undertake the activities as well as favorable relationships with local communities to allow for access to properties.

7. Compensation Planning Framework

The compensatory planning framework of the Program supports a watershed approach. By considering goals and needs in the watershed context of the San Jacinto River Watershed and the Upper Santa Margarita River Watershed, the compensatory mitigation framework would allow for more informed decision-making for siting compensatory mitigation.

i. Geographic service area including watershed-based rationale

The geographic service area is the San Jacinto River Watershed and the Upper Santa Margarita River Watershed that are within Riverside County. The basis of the service are the two major watersheds in the western Riverside County area. These two watersheds have lost functions and services from impacts in the respective watersheds. Consequently, there are specific restoration needs within each watershed. In using these two watersheds as the basis for the Program, impacts within these two watersheds would be offset by compensatory mitigation within the same watersheds, promoting the goal of no-net loss of functions on a watershed basis.

ii. Description of threats to the aquatic resources in the service area(s), including how the in-lieu fee program will help offset impacts resulting from those threats

The types of expected impacts stem from several sources. The activities that the Corps has permitted from 2002-2007 provide insights to the types of threats faced by aquatic resources. Given the recent history of these actions, it is expected that these types of actions would be seen again in the near future. Typical permit actions with a small amount of impact have included maintenance, outfall structures, utility lines, temporary construction access, and stormwater management. These types of activities would continue to have an extremely limited impact on aquatic resources. Activities with more substantial amount of impacts include flood management activities, linear transportation projects, residential developments, and commercial and institutional developments. Based on the permits issued from 2002-2007, it is expected that 12 acres of impacts to waters of the U.S. would occur annually, resulting in impacts to 600 acres of waters of the U.S. over 50 years to the 31,540 acres of aquatic resources mapped in 2001 within the service area (1.9%).

The Program would help offset these impacts through more intelligent decision-making of compensatory mitigation. Through a watershed approach, the functions and services lost would be offset in a manner that there would be a greater likelihood of success. Specific needs within the watershed would be identified and compensatory mitigation would be directed at these areas with a specific need. Consideration of nearby landscape stressors would allow for more effective site-selection to reduce indirect effects of surrounding land uses on particular functions such as habitat functions.

iii. An analysis of historic aquatic resource loss in the service area

To understand historic aquatic resource loss, it is important to understand the amount existing at some baseline timepoint and the actual loss over time. For the 765-square mile San Jacinto River Watershed and 542-square mile Upper Santa Margarita River Watershed, the overall watershed area totals 837,000 acres. It is generally understood that historically 1-5% of a watershed consists of aquatic resources prior to any human disturbance. Thus, there were probably 8,370 to 41,850 acres of aquatic resource historically. Currently, there are about 31,540 acres of aquatic resources, of which about 14,000 consists of impoundments and lakes, which generally consists of created waters of the U.S. except for about 3,800 acres of open water in Lake Elsinore, and about 17,500 acres of non-impounded waters of the U.S.

consisting of 2,500 acres of artificial structures and 15,000 acres of relatively natural aquatic resources. In supposing aquatic resource accounted for about 3% of the watershed historically (25,100 acres), the remaining relatively natural aquatic resources of 18,800 acres (15,000 acres of relatively natural non-impounded waters and 3,800 acres of Lake Elsinore) represents about 75% historical aquatic resources remaining.

The losses of aquatic resources within the service area can be illustrated partially by the Corps permit record. From the first permit records within the Los Angeles District up to July of 2001 for the service area of the San Jacinto River Watershed and the Upper Santa Margarita River Watershed, there were 1,300 acres of impacts authorized. From 2002-2007, there were about 60 acres of permits authorized. The total impacts authorized under Section 404 of the Clean Water Act for the service area amounts to about 1,400 acres.

This total does not account for several types of impacts. First, the total does not account for impacts that occurred before the Clean Water Act. The Clean Water Act was authorized in 1973 and implementation did not begin until 1977. Thus, before 1977, there were impacts to aquatic resources that did not require an authorization. Second, the total does not account for activities that were below specific reporting thresholds allowed under specific time periods. Prior to 1997, the reporting threshold was discharge to greater than 1 acre of waters of the U.S. As a result, impacts to waters of the U.S. below 1 acre of fill were not required to notify the Corps. Third, the total does not account for unauthorized activities. The extent of unauthorized activities may never be known and the clandestine nature of these activities make comprehensive determination difficult.

In looking at the time period of 1985-2003 for permits authorized by the Corps within the Upper Santa Margarita River Watershed, a majority of the impacts came from a few permit actions. Of the 358 acres of impacts authorized by the Corps, about 284 acres of impact came from permit actions with impacts greater than 10 acres of impact (Stein and Ambrose 1998). The smaller permit actions individually impacting less than 10 acres did not result in more 20% of the total permit impacts. Most of these permits with large impacts were for flood control activities, which involves channelization, including lining of waterways with concrete with impacts to habitat and water quality functions.

iv. An analysis of current aquatic resource conditions in the service area, supported by the appropriate level of field documentation

The aquatic resources in the service area have been assessed through a landscape level functional assessment (Smith 2003). The landscape level functional assessment uses field and landscape level indicators at reach, local drainage, and drainage basin scales to assess ecological integrity for hydrology, water quality, and habitat. Although this methodology departs from complete reliance on field-based data, the landscape-level basis is consistent with literature that finds landscape-level considerations largely explain site-specific conditions (Chung 2006; Sundell-Turner and Rodewald 2008). The landscape level functional assessment relies on the landscape approach supplemented by field data, resulting in a robust assessment of riparian ecological integrity. The landscape level functional assessment was further compared with an avian index of biological integrity (IBI), a more

traditional site-specific assessment tool, for the study area, which found that there was high correlation between the avian IBI and the landscape level functional assessment for the San Jacinto River Watershed (r = 0.78) and the Upper Santa Margarita River Watershed (r = 0.77) (Smith 2006). To provide some context, one study comparing three purely field-based methods (rapid bioassessment protocol (RBP), qualitative habitat evaluation index (QHEI), and riparian, channel, and environmental inventory (RCE)), found that correlation coefficients in pair-wise evaluations ranged from 0.83 to 0.85 (Stauffer and Goldstein 1997).

Table 1 shows some of the results of the landscape level functional assessment. About 10% of the aquatic resources of the entire watershed were determined to have low integrity. The Corps has additional data for all aquatic resources that tabulates the integrity scores for hydrologic, water quality, and habitat integrity.

v. Statement of aquatic resource goals and objectives for each service area, including a description of the general amounts, types and locations of aquatic resources the program will seek to provide

The goal of the Program is rehabilitatation or re-establishment (collectively known as restoration) of lost aquatic resource functions and services of riverine ecosystems particularly as it relates habitat, water quality, and flood control. Rehabilitation or re-establishment are preferred because of the greater likelihood of success. In some cases, enhancement would be chosen if the functional benefits are clear and apparent. Lastly, establishment (creation) could be an option, but not as likely given the difficulties of trying to establish riverine systems.

In determining the goal of the compensatory project, there needs to be an understanding of the landscape position of the proposed restoration site (Figure 3). Within the study area, there are seven types of geomorphic zones incuding v-shaped valleys (zone 1), colluvial valleys (zone 2), boulder dominated floodplains and terrace complexes (zone 3), steep alluvial fan (zone 4), alluvium with meandering stream (zone 5), valley fill (zone 6), and sandy wash (zone 7). In siting compensatory projects, it would be counterproductive to design designing a riparian system resembling alluvium with a meandering stream in a v-shaped valley (zone).

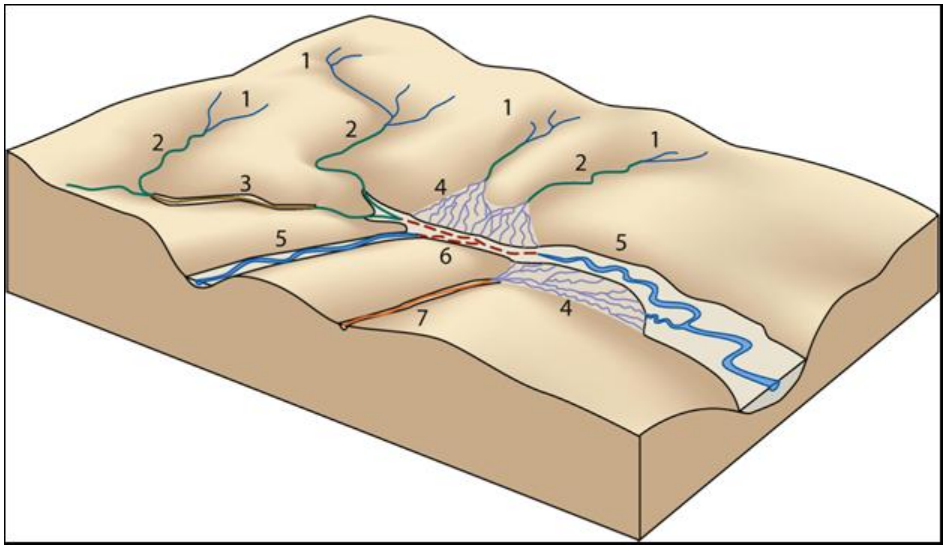

Figure 3. Generalized representation of landscape settings associated with geomorphic zones.

For compensatory mitigation that involves restoration, the Sponsor would rehabilitation or re-establishment aquatic resources based on local riparian reach condition to achieve specific goals and objectives. The condition of the local riparian reach and the conditions of the adjacent lands would inform the type of compensatory mitigation that would occur. As a result, generic templates have been developed to guide the restoration work in light of local conditions based on whether the riparian reach is relatively natural (Figure 4), incised (Figure 5), constrained (Figure 6), aggraded (Figure 7), or engineered (Figure 8). Although actual implementation of the restoration may deviate from these initial conceptual templates, the implementation would be cognizant of surrounding conditions such that inappropriate objectives would not be attempted, e.g., implementing a template such for natural conditions in a constrained scenario.

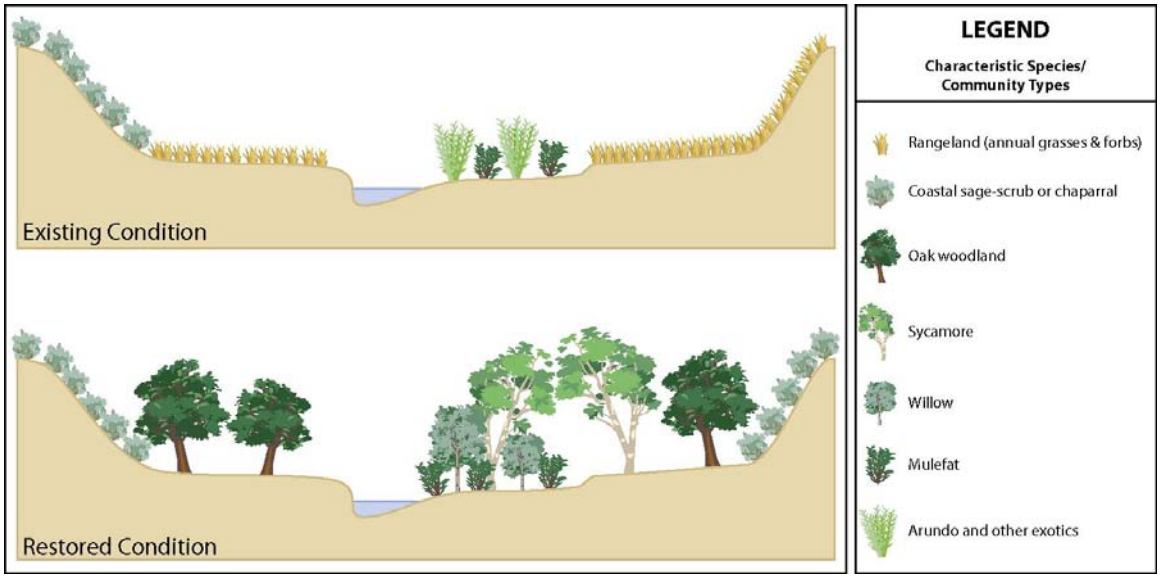

Figure 4. Typical pre- and post-restoration conditions of the Natural Template.

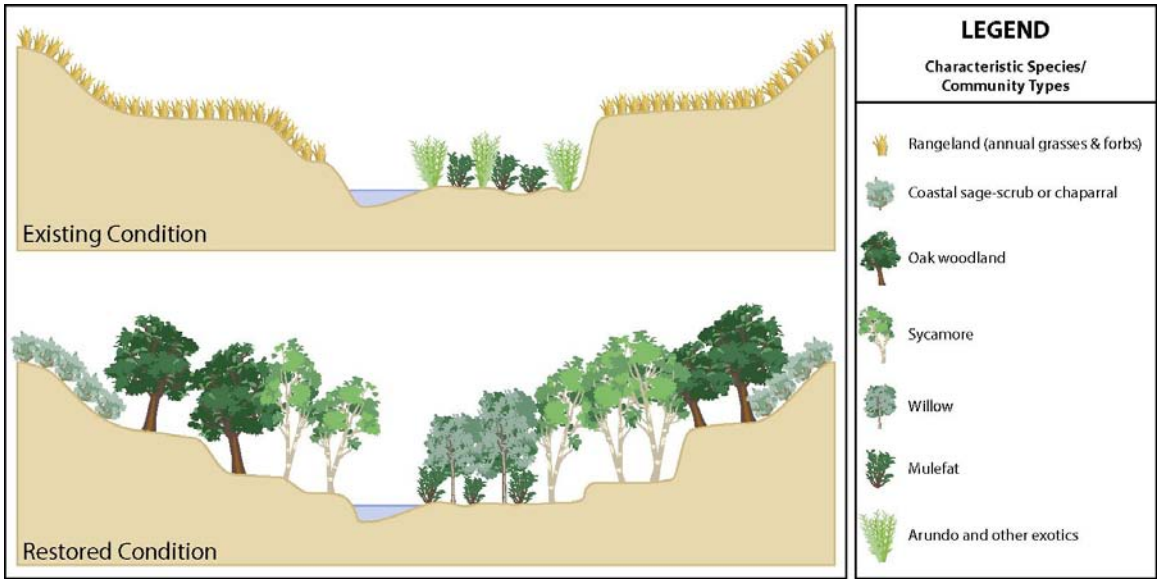

Figure 5. Typical pre- and post-restoration conditions of the Incised Template.

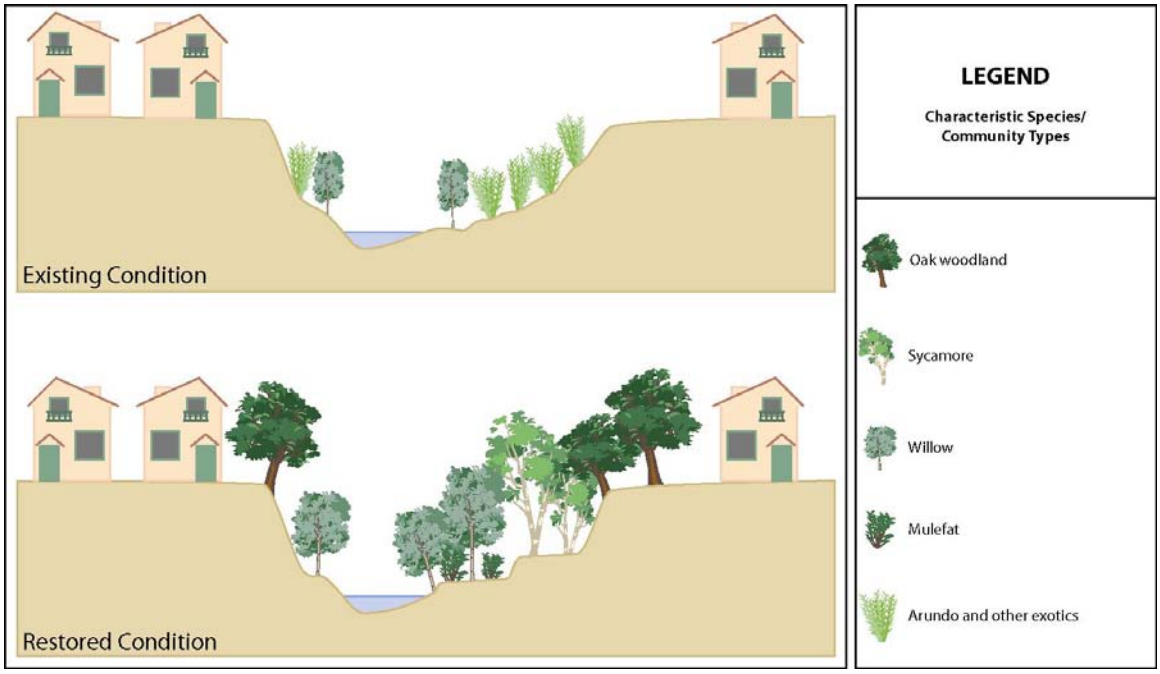

Figure 6. Typical pre- and post-restoration conditions of the Constrained Template.

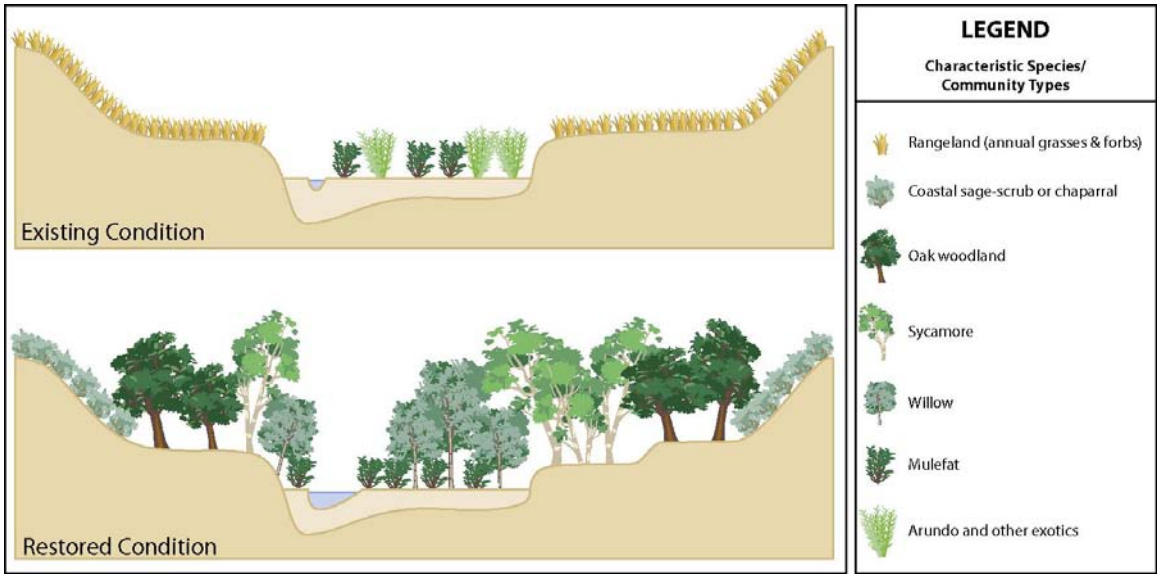

Figure 7. Typical pre- and post-restoration conditions of the Aggraded Template.

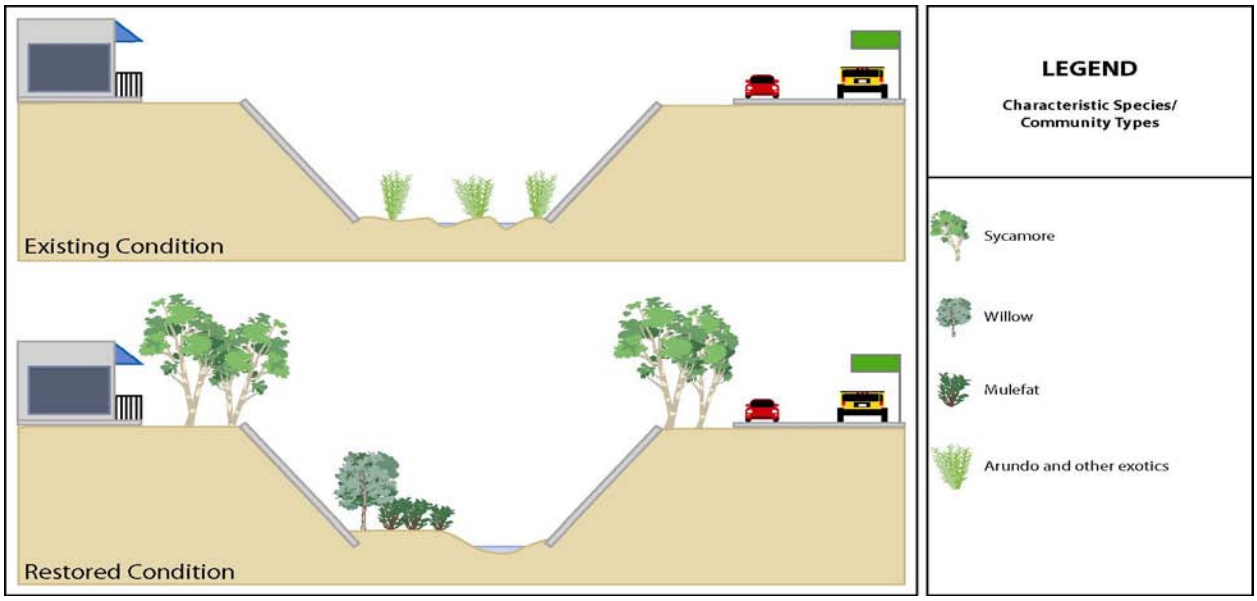

Figure 8. Typical pre- and post-restoration conditions of riparian reaches assigned to the Engineered Template

For compensatory mitigation involving establishment (creation) and/or enhancement, the Sponsor would require additional site-specific conditions in order to undertake the work. Establishment would require more concrete description of the water budget compared to restoration which is more likely to use existing sources of water. Enhancement would require additional considerations on what type of work would should be implemented to increase one or two functions. Nevertheless, these options for compensatory mitigation would be less preferred than restoration.

Through the Program, the Sponsor would direct compensatory mitigation to restore connectivity in key locations, promote habitat used by sensitive species, restore water quality and flood control functions with an emphasis on urban areas, restore/create aquatic resources adjacent to existing and targeted natural open space and within natural open space, and maximize ecological integrity overall in the service area. The realization of these broad sets of functions depends on conditions of the local site, the buffer, and the larger landscape with the conditions at these scales providing constraints and opportunities. Of these broad sets of functions and services, provision of habitat for resident animals and plants has the most constraints. Given the sensitivity of various fish, amphibians, and birds to conditions of the buffer and the larger landscape (Blair 1996; Richards et al. 1997; Rottenborn 1999; Fischer and Fishenich 2000; Trombulak and Frissell 2000; Wang et al. 2001; Semlistch and Brodie 2003; Walsh et al. 2005; Rodewald and Bakerans 2006), restoration of habitat functions will face many constraints if the site is located in inappropriate landscape positions. Restoration for flood control functions also face some constraints namely the availability of adjacent floodplains. Since restoration of substantial flood control functions would not be achievable without some floodplains, full restoration of flood control functions faces constraints if there is not enough space lateral to the main channel. Water quality functions can be restored in any setting even when there are degraded conditions that would adversely affect realization of habitat functions and even in constrained conditions that would affect realization of flood control functions. Nevertheless, water quality functions can be maximized with achievement of restoration of flood control functions since extended detention from flood control restoration would benefit water quality processes that promote settling of sediments and chemical cycling of pollutants.

There are 45 restoration opportunities for the Upper Santa Margarita River Watershed (Figure 9 and Table 2) and 121 restoration opportunities for the San Jacinto River Watershed (Figure 10 and Table 3). The restoration opportunities are broken down by the different priorities including connectivity, sensitive species, flood control and water quality, adjacency to existing and targeted open space, and presence within open space. The San Jacinto River Watershed has more opportunities because that watershed has greater degradation and because agricultural areas have not been converted to urban uses, allowing for more unconstrained options. Although the exact amounts can only be determined with more detailed field reconnaissance, the menu of opportunities should provide for sizable amounts of restoration. Further field work would help clarify if there is sufficient acreage to allow for restoration of up to 1,200 acres of compensatory mitigation needs. Appendix A illustrates the sample sites addressing each of the restoration objectives with both an aerial view and with a topographic map.

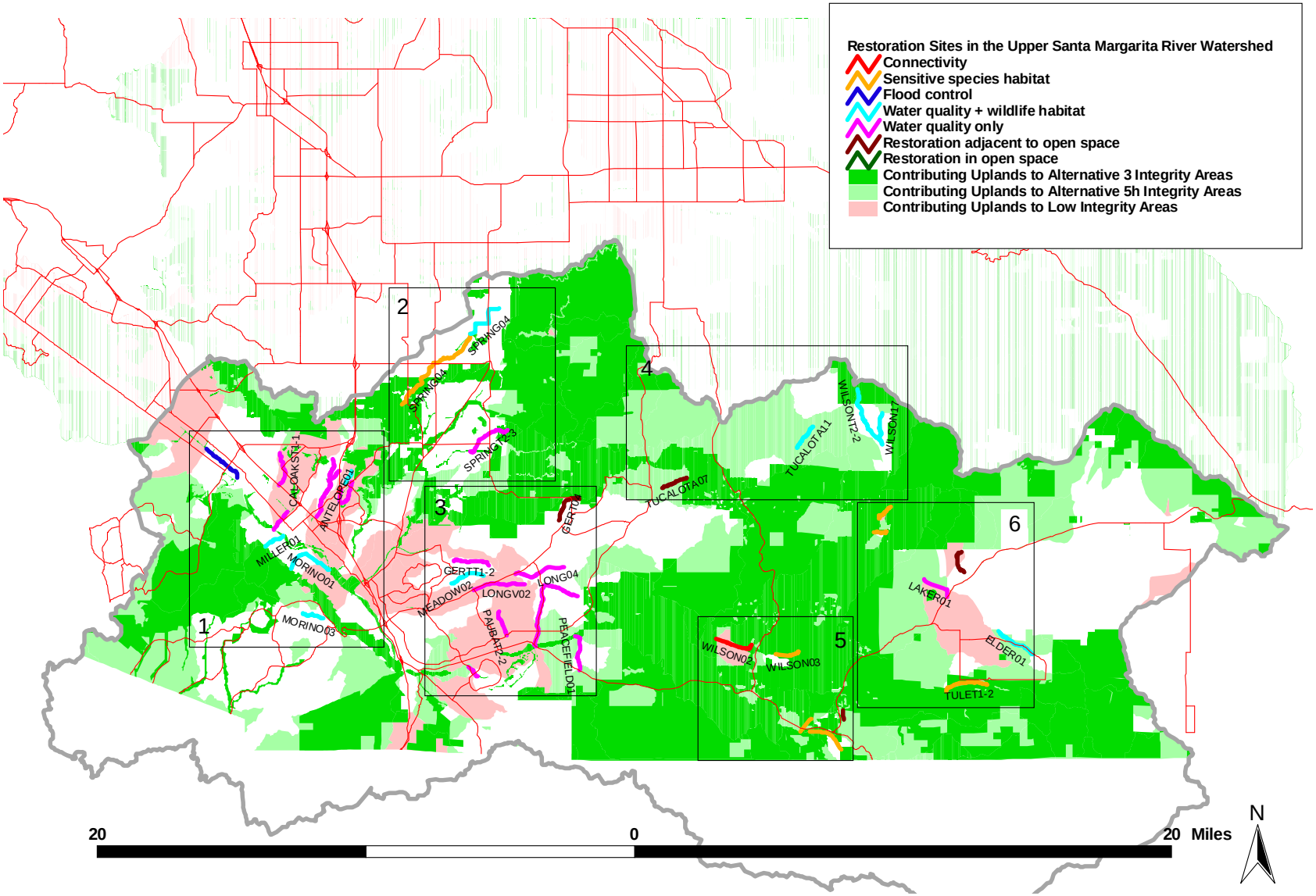

Figure 9. Restoration opportunities in the Upper Santa Margarita River Watershed based on restoration category.

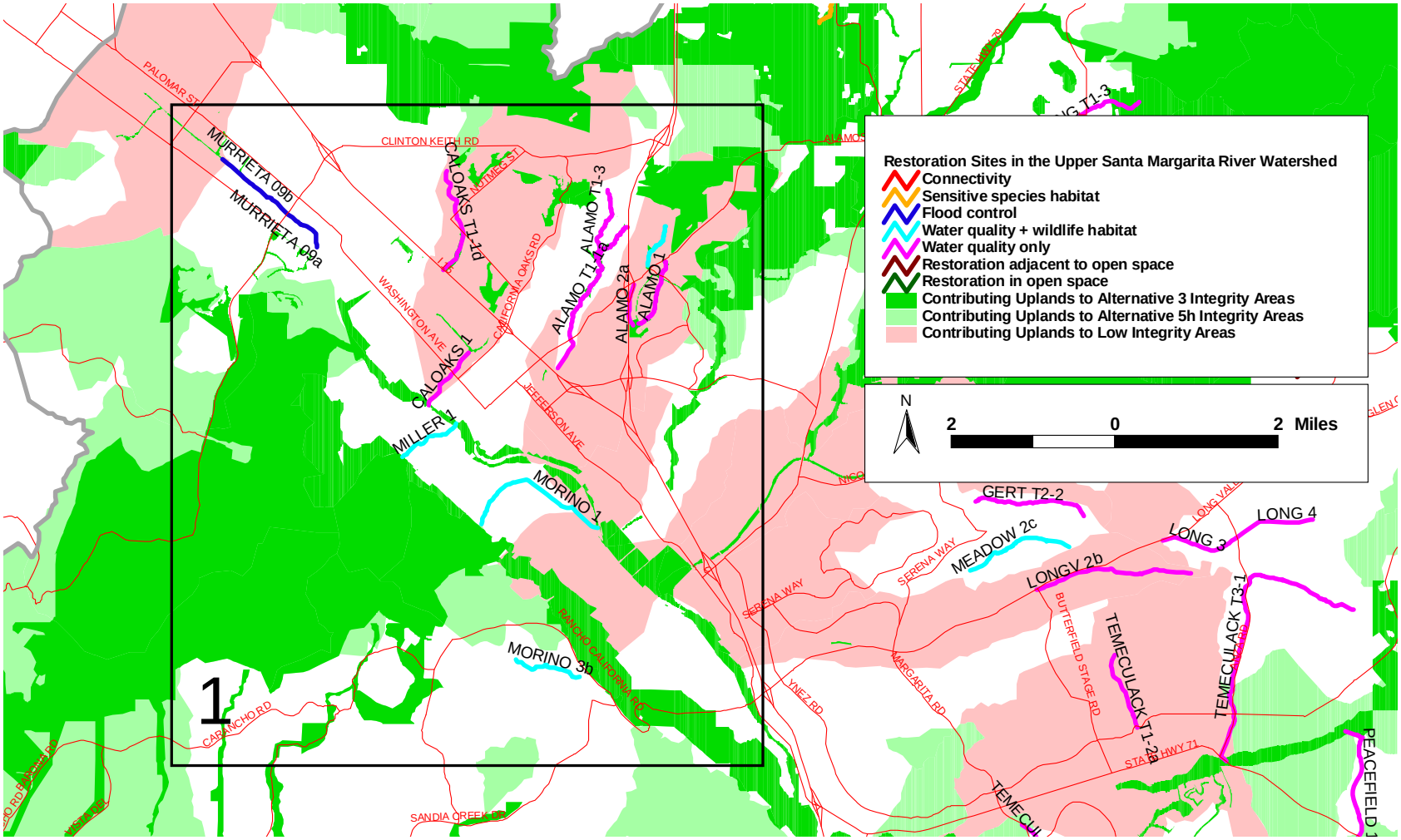
Restoration Sites in the Upper Santa Margarita River Watershed
Connectivity
Sensitive species habitat
Flood control
Water quality + wildlife habitat
Water quality only
Restoration adjacent to open space
Restoration in open space
Contributing Uplands to Alternative 3 Integrity Areas
Contributing Uplands to Alternative 5h Integrity Areas
Contributing Uplands to Low Integrity Areas
N
2
0
2 Miles
1
MURRIETA 09b
MURRIETA 09a
CALOAKS T1-1d
CALOAKS 1
MILLER 1
ALAMO T1-1a
ALAMO T1-3
ALAMO 2a
ALAMO 1
MORINO 1
MORINO 3b
GERT T2-2
MEADOW 2c
LONG 3
LONG 4
LONGV 2b
TEMECULACK T1-2a
TEMECULACK T3-1
PEACEFIELD
PALOMAR ST
CLINTON KEITH RD
WASHINGTON AVE
CALIFORNIA OAKS RD
JEFFERSON AVE
SERENA WAY
MARGARITA RD
BUTTERFIELD STAGE RD
YNEZ RD
CARANCHO RD
SANDIA CREEK RD
STATE HWY 71

Figure 9a. Restoration opportunities in the Upper Santa Margarita River Watershed Area 1 based on restoration category.

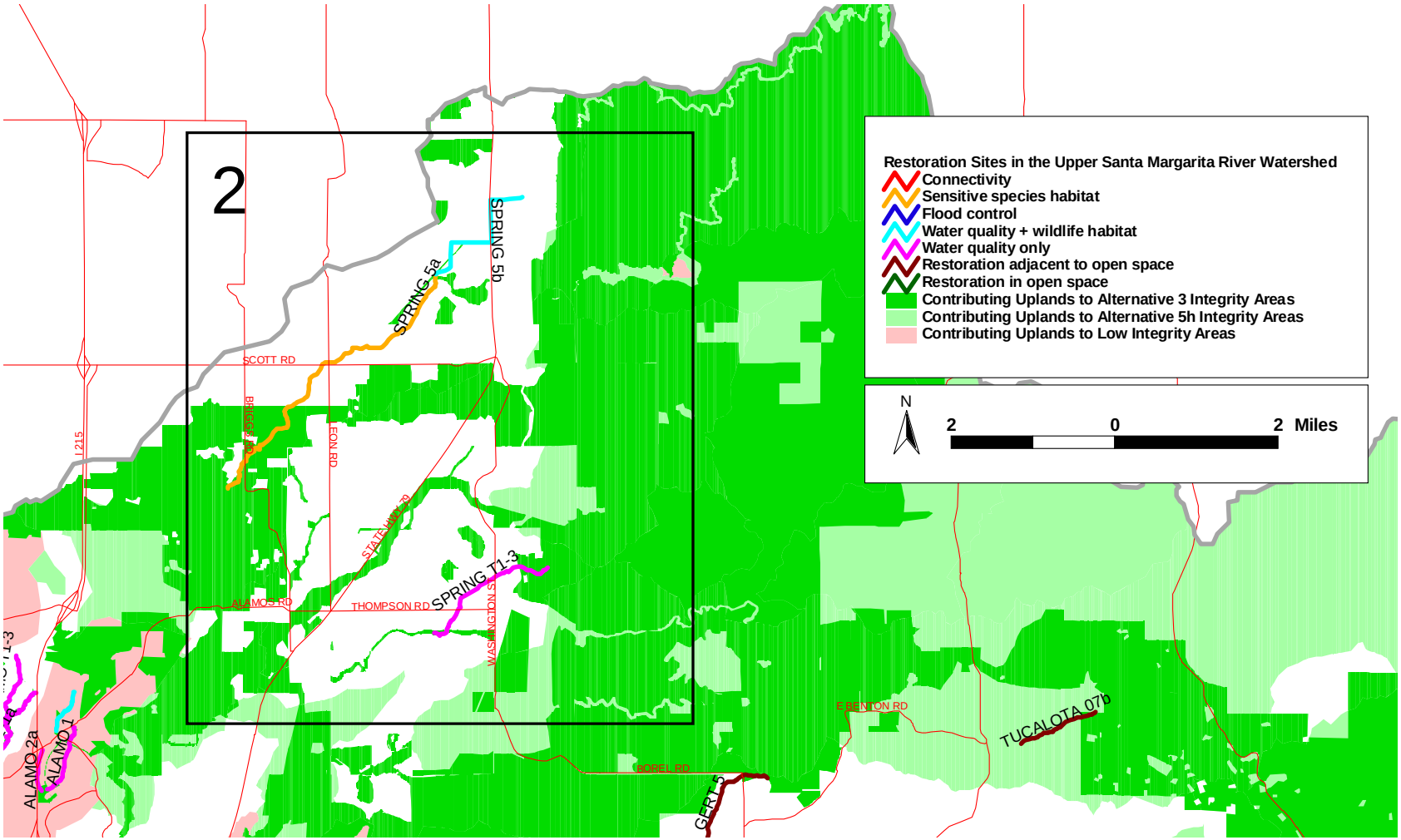

Figure 9b. Restoration opportunities in the Upper Santa Margarita River Watershed Area 2 based on restoration category.

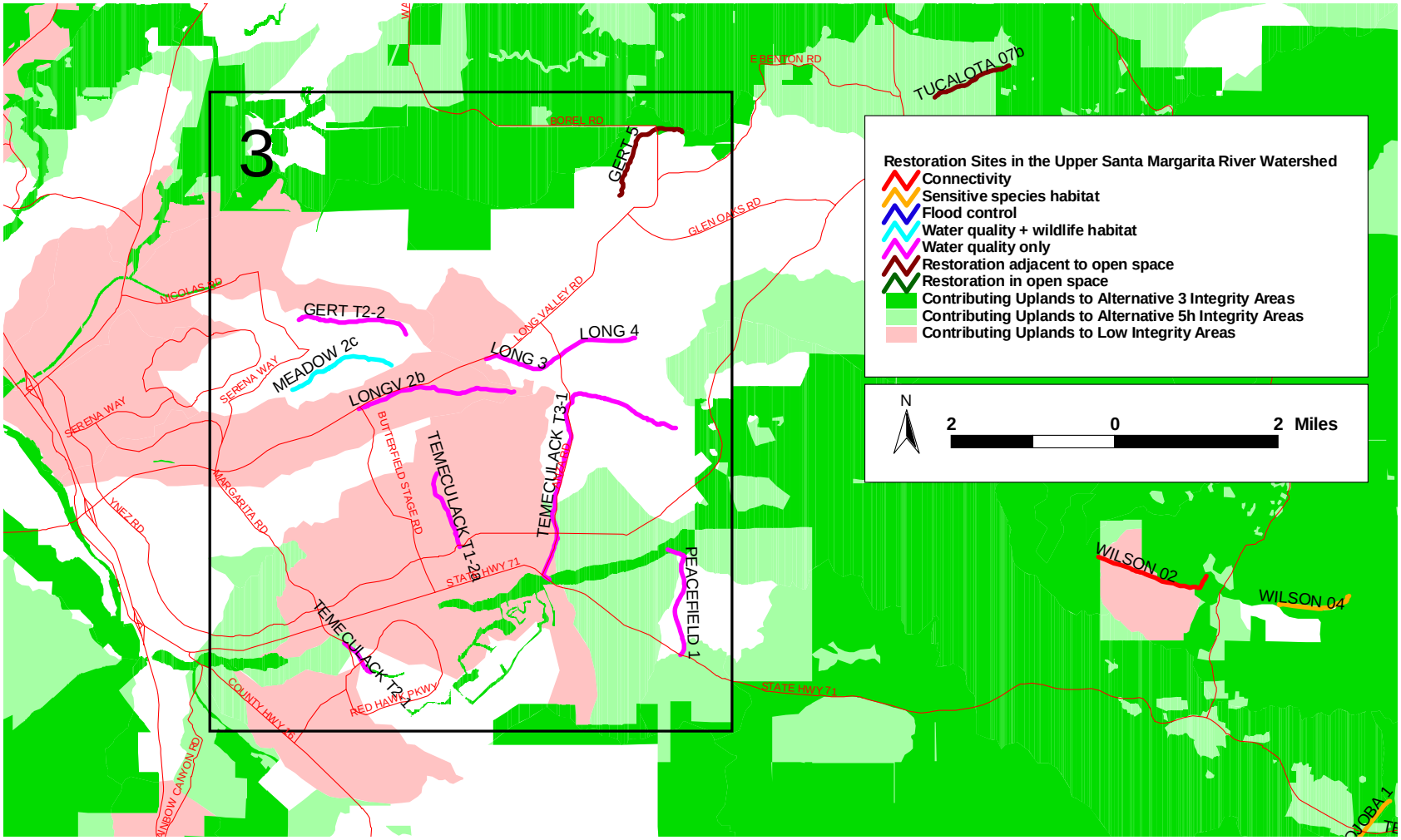

Figure 9c. Restoration opportunities in the Upper Santa Margarita River Watershed Area 3 based on restoration category.

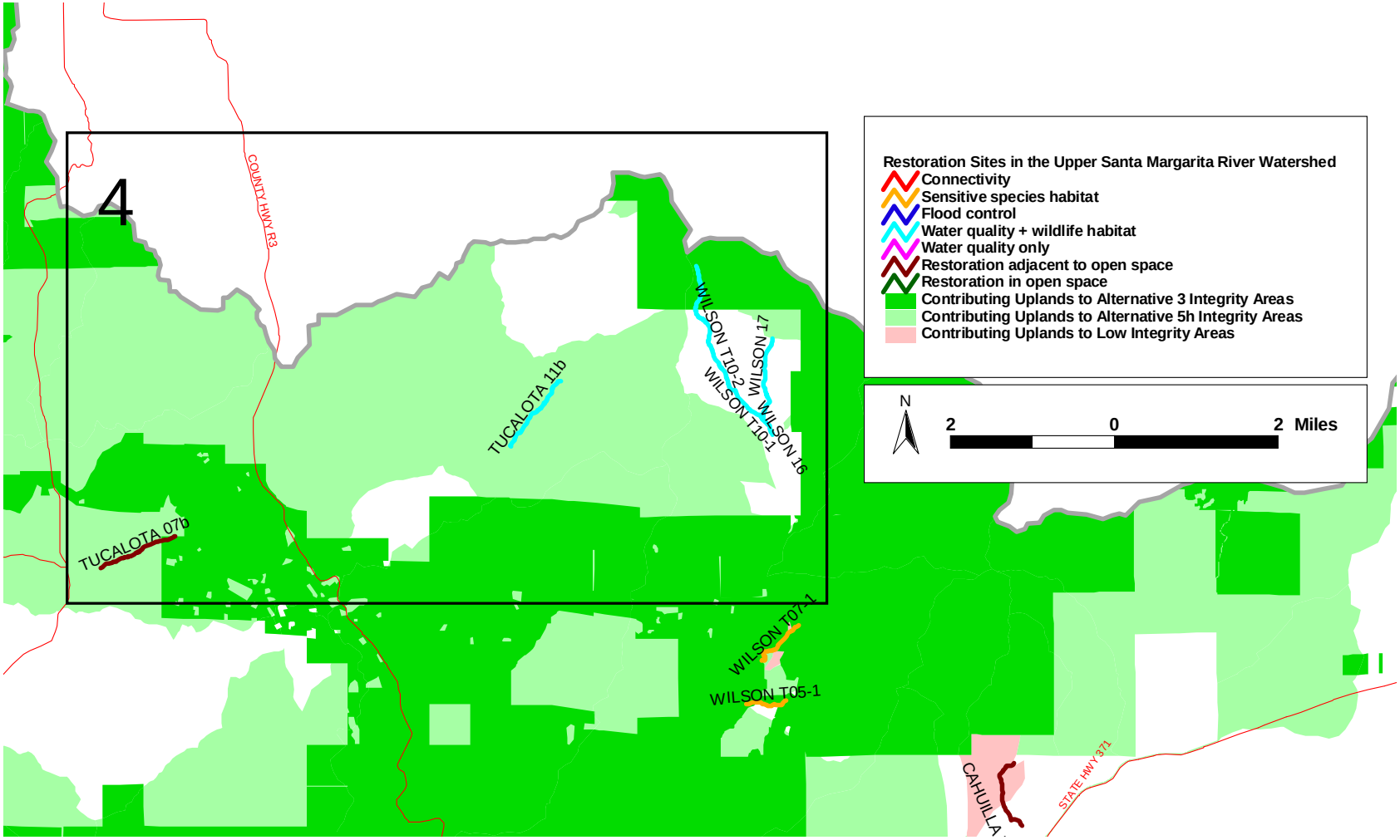

Figure 9d. Restoration opportunities in the Upper Santa Margarita River Watershed Area 4 based on restoration category.

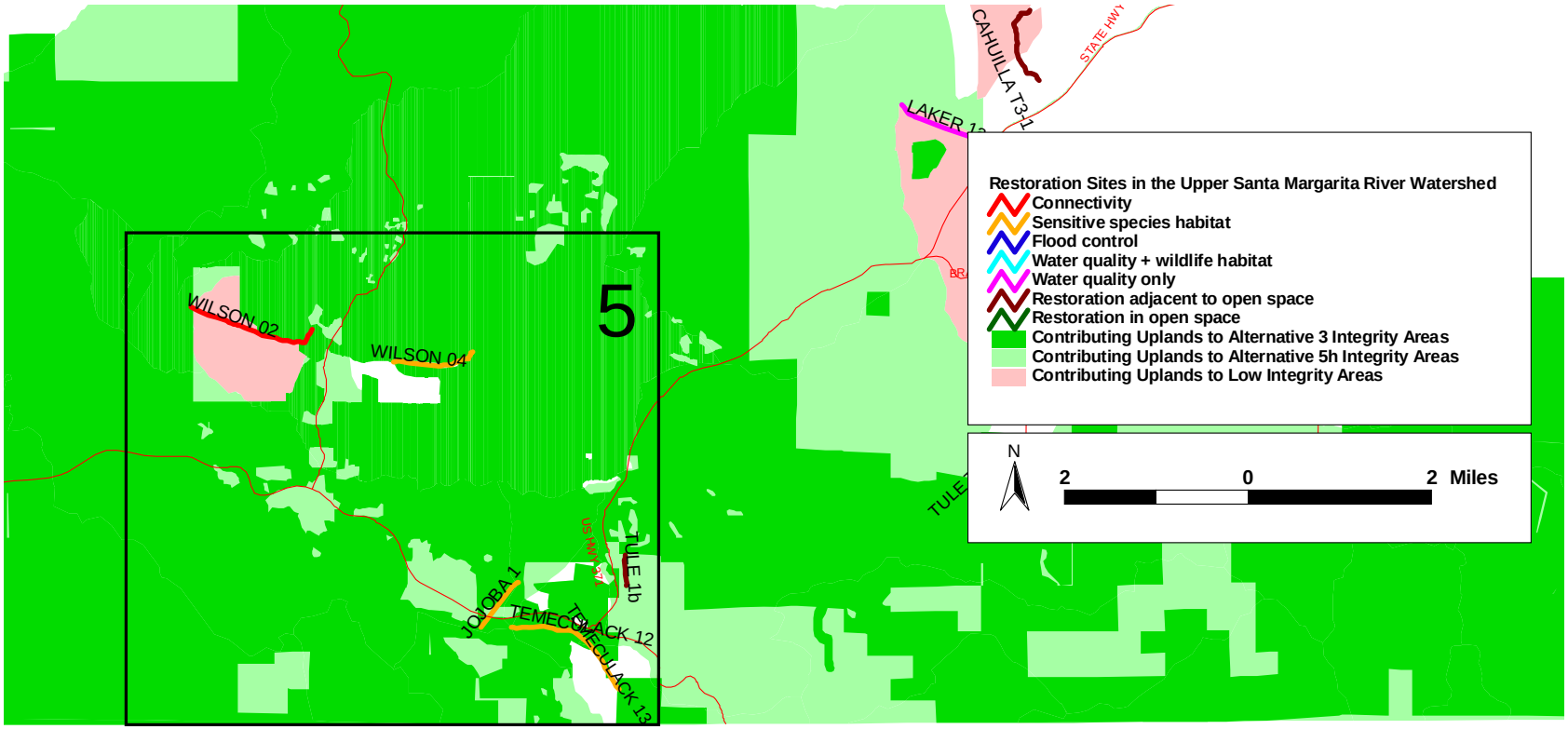

Figure 9e. Restoration opportunities in the Upper Santa Margarita River Watershed Area 5 based on restoration category.

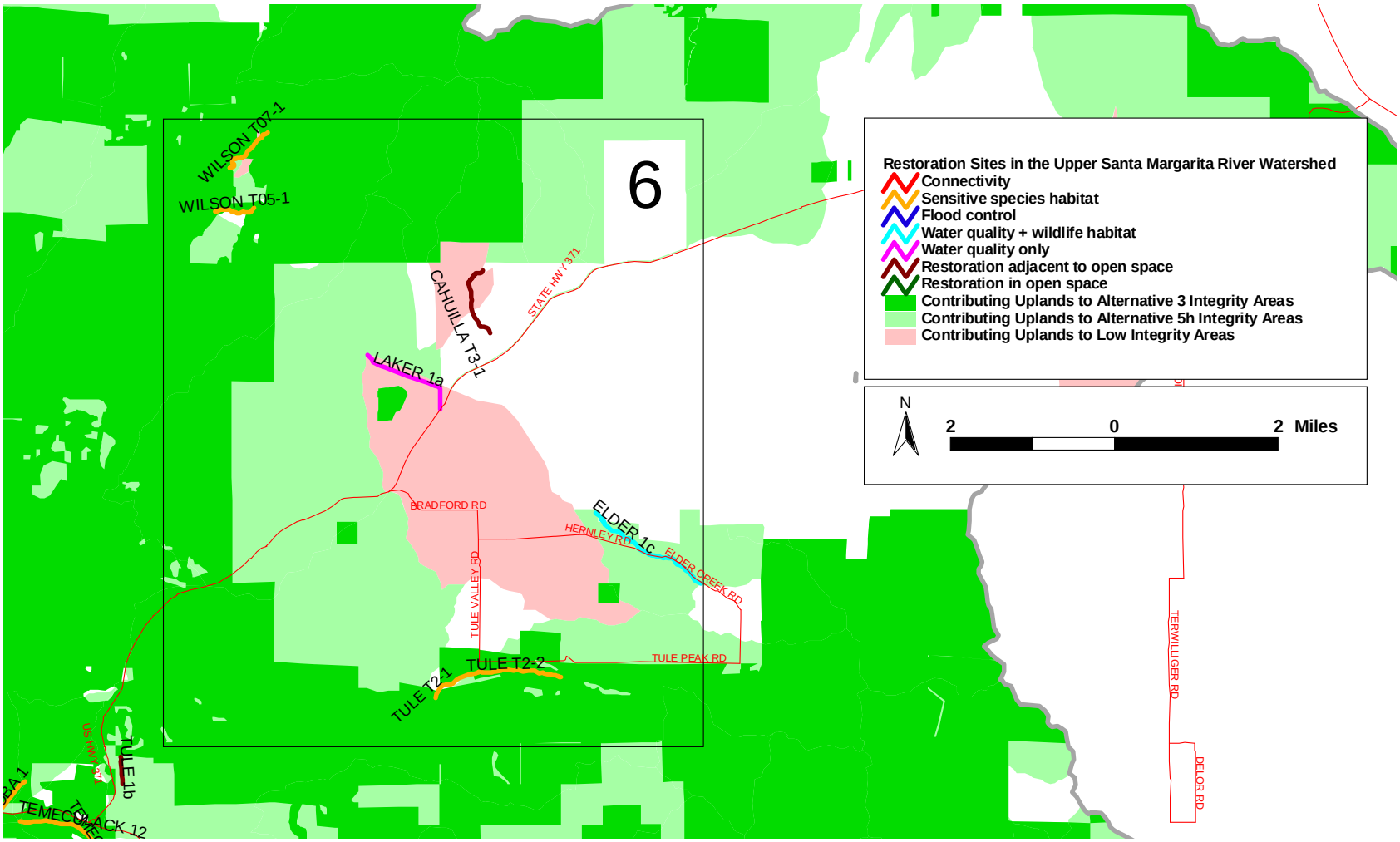

Figure 9f. Restoration opportunities in the Upper Santa Margarita River Watershed Area 6 based on restoration category.

Table 2. Restoration opportunities in the Upper Santa Margarita River Watershed based on restoration category. For full explanation of geomorphic zone, template, and level of effort, please see Smith and Klimas 2006a.

Reach	Geomorphic Zone[1]	Template[2]	Level of Effort[3]	Riparian Connector	Sen. Species Habitat	Water Quality/ Flood Control	Adjacent to Open Space	Within Open Space	Total Functional Lift[4]	Contributing Watershed Size (acres)
WILSON 02	Alluvium w/ Meandering Stream	natural	heavy earth	Yes					0.76	85209
SPRING 5a	Alluvium w/ Meandering Stream	natural	moderate earth		Yes	Water qual + hab	Yes		0.36	15657
WILSON T07-1	Steep Alluvial Fan	natural	light plant		Yes				0.45	922
WILSON 04	Alluvium w/ Meandering Stream	natural	heavy earth		Yes				0.40	77576
TEMECULACK 13	Sandy Wash	natural	light plant		Yes				0.38	48257
TULE T2-1	Valley Fill	natural	moderate earth		Yes				0.33	1248
WILSON T05-1	Steep Alluvial Fan	natural	light earth		Yes				0.32	677
TEMECULACK 12	Sandy Wash	natural	light plant		Yes				0.30	65157
JOJOBA 1	Steep Alluvial Fan	natural	moderate earth		Yes				0.19	615
TULE T2-2	Valley Fill	natural	moderate earth		Yes				0.13	670
MURRIETA 09b	Alluvium w/ Meandering Stream	natural	heavy earth			Flood control		PQP	0.45	8661
MURRIETA 09a	Alluvium w/ Meandering Stream	natural	light earth			Flood control			0.32	10087
MORINO 1	Alluvium w/ Meandering Stream	incised	moderate earth			Water qual + hab	Yes		0.47	2281
WILSON T10-2	Valley Fill	incised	light earth			Water qual + hab	Yes		0.47	418
WILSON 17	Valley Fill	natural	light plant			Water qual + hab	Yes		0.39	2797
MILLER 1	Colluvial Valley	incised	moderate earth			Water qual + hab	Yes		0.38	835
MEADOW 2c	Colluvial Valley	incised	moderate earth			Water qual + hab			0.95	373
SPRING 5b	Alluvium w/ Meandering Stream	natural	heavy earth			Water qual + hab			0.72	11312
WILSON 16	Alluvium w/ Meandering Stream	incised	moderate earth			Water qual + hab			0.52	3568
WILSON T10-1	Valley Fill	incised	light earth			Water qual + hab			0.43	714
MORINO 3b	Colluvial Valley	incised	moderate earth			Water qual + hab			0.41	198
TUCALOTA 11b	Sandy Wash	natural	light earth			Water qual + hab			0.39	2036
ELDER 1c	Colluvial Valley	natural	moderate earth			Water qual + hab			0.33	1989
ALAMO 2a	Alluvium w/ Meandering Stream	engineered	moderate earth			Water qual + hab			0.27	531
CALOAKS 1	Alluvium w/ Meandering Stream	incised	heavy earth			Water qual only	Yes	PQP	0.59	4954
SPRING T1-3	Alluvium w/ Meandering Stream	natural	heavy earth			Water qual only	Yes		0.65	761
PEACEFIELD 1	Steep Alluvial Fan	constrained	light earth			Water qual only	Yes		0.37	1480
LONGV 2b	Colluvial Valley	incised	moderate earth			Water qual only			0.89	717
CALOAKS T1-1d	Alluvium w/ Meandering Stream	natural	moderate earth			Water qual only			0.54	1757
LONG 4	Valley Fill	natural	light earth			Water qual only			0.45	6499
TEMECULACK T1-2a	Steep Alluvial Fan	natural	light plant			Water qual only			0.45	1159
LAKER 1a	Valley Fill	incised	moderate earth			Water qual only			0.42	3450
GERT T2-2	Sandy Wash	natural	light earth			Water qual only			0.41	262
ALAMO T1-1a	Alluvium w/ Meandering Stream	natural	light plant			Water qual only			0.40	1221
TEMECULACK T2-1	Steep Alluvial Fan	constrained	heavy earth			Water qual only			0.35	1581
TEMECULACK T2-1	Steep Alluvial Fan	constrained	heavy earth			Water qual only			0.35	1581
TEMECULACK T3-1	Sandy Wash	natural	light earth			Water qual only			0.34	1112
LONG 3	Colluvial Valley	natural	moderate earth			Water qual only			0.30	6862
ALAMO 2a	Alluvium w/ Meandering Stream	engineered	moderate earth			Water qual only			0.27	531

Reach	Geomorphic Zone[1]	Template[2]	Level of Effort[3]	Riparian Connector	Sen. Species Habitat	Water Quality/ Flood Control	Adjacent to Open Space	Within Open Space	Total Functional Lift[4]	Contributing Watershed Size (acres)
ALAMO T1-3	Alluvium w/ Meandering Stream	constrained	light earth			Water qual only			0.11	321
ALAMO 1						Water qual only				
CAHUILLA T3-1	Valley Fill	natural	light plant				Yes		0.62	1181
GERT 5	Colluvial Valley	natural	moderate earth				Yes		0.47	361
TUCALOTA 07b	Alluvium w/ Meandering Stream	natural	heavy earth				Yes		0.45	14048
TULE 1b	Valley Fill	natural	moderate earth				Yes		0.18	14295

[1] Geomorphic zone represents the the lanscape position of the restoration site (See Figure 3).
[2] Template refers to the type of restoration activities that would occur at the restoration site (See Figures 4-8).
[3] Level of effort refers to the amount of work needed to undertake the restoration. Light planting involves planting with little earthwork. Light earthwork involves involves grubbing, tilling, and similar site preparation followed by heavy planting. Moderate earthwork involves excavation of less than 6-feet of soil followed by heavy planting. Heavy earthwork involves substantial earth work including re-creation of floodplains and terrace systems, grading back of vertical banks, and/or cutting of new channels.
[4] The total functional lift is the sum of functional lift for hydrologic, water quality, and habitat integrity indices. Functional lift was calculated by modeling the effect of proposed restoration activities on each of the three indices.

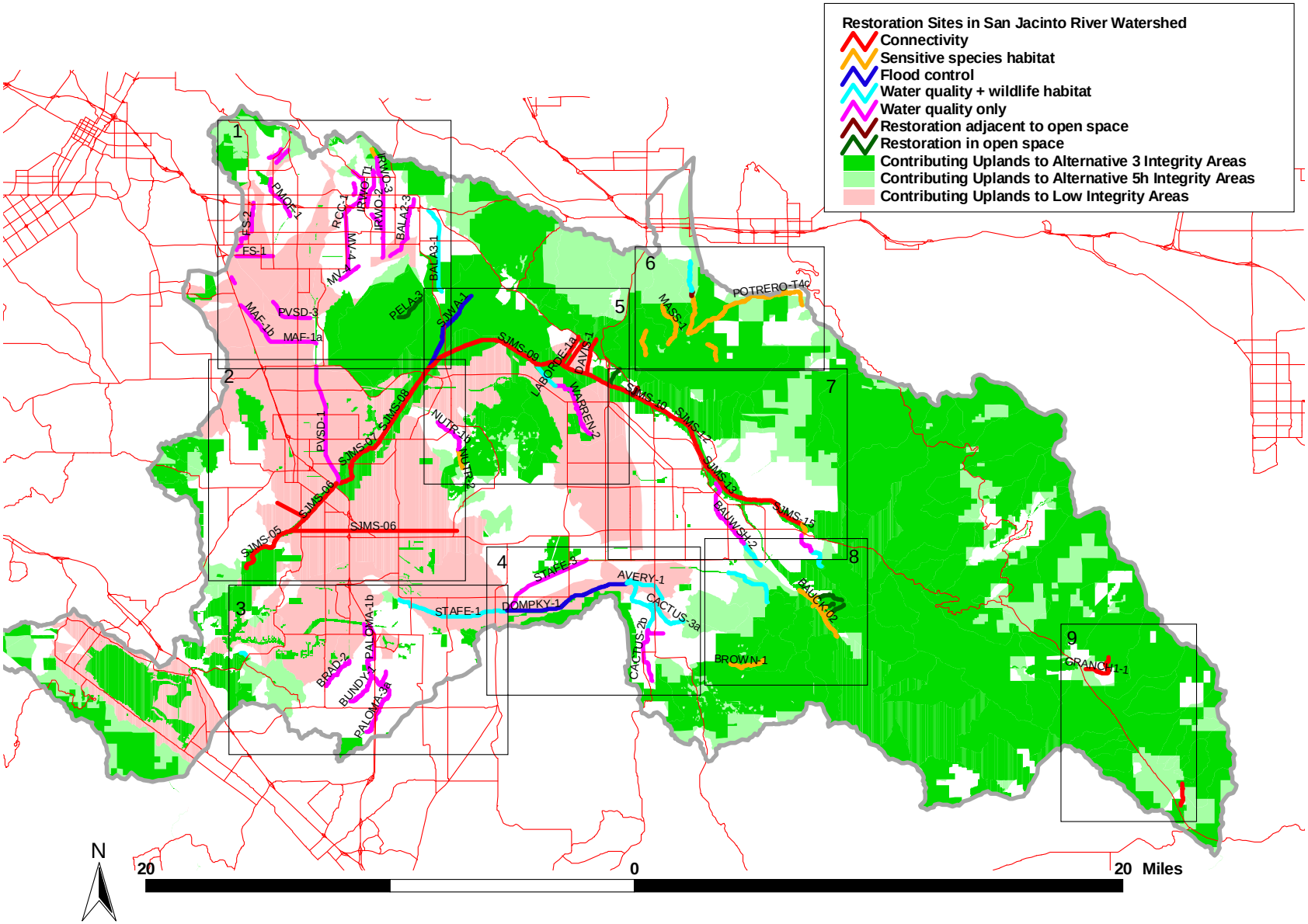

Figure 10. Restoration opportunities in the San Jacinto River Watershed based on restoration category.

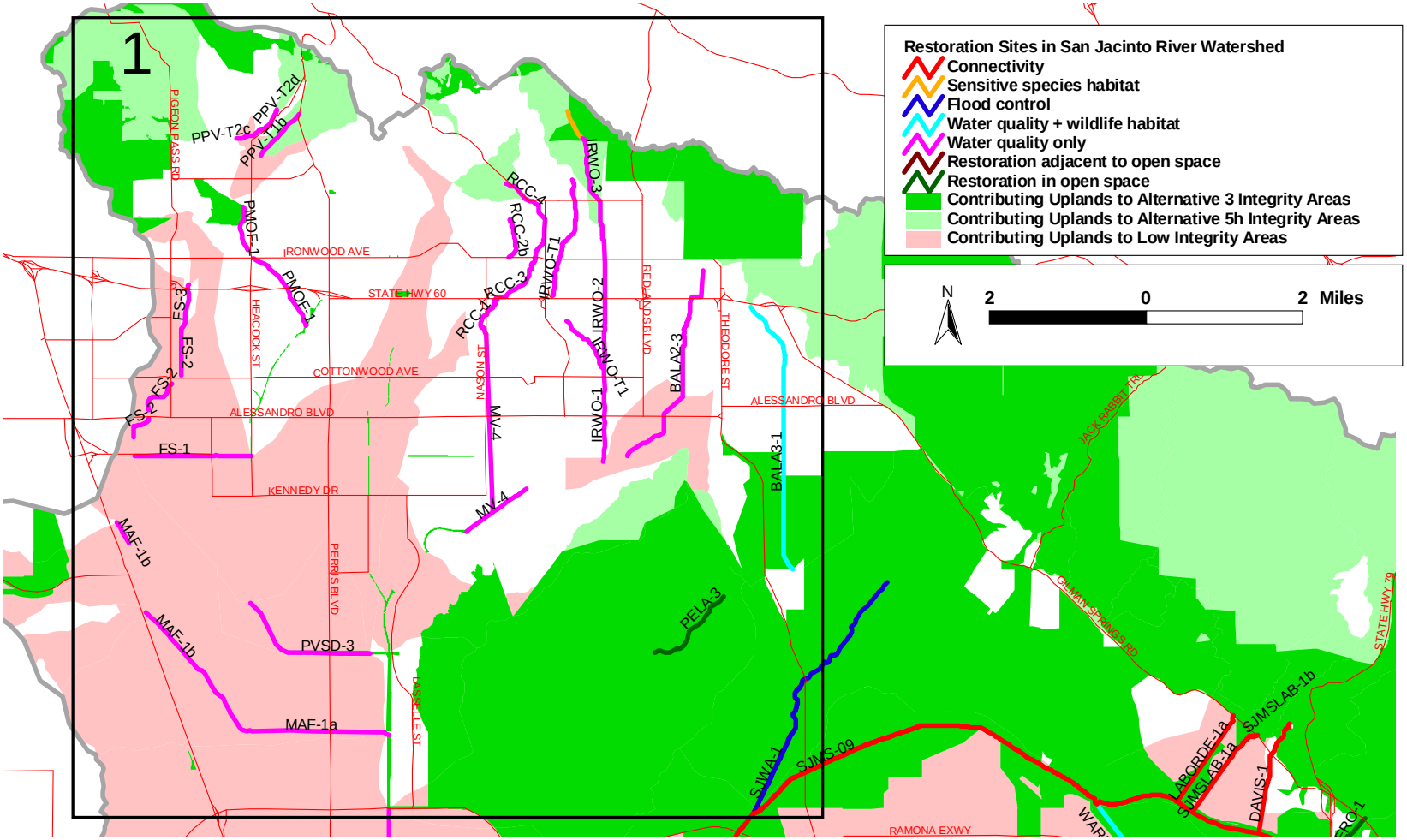

Figure 10a. Restoration opportunities in the San Jacinto River Watershed Area 1 based on restoration category.

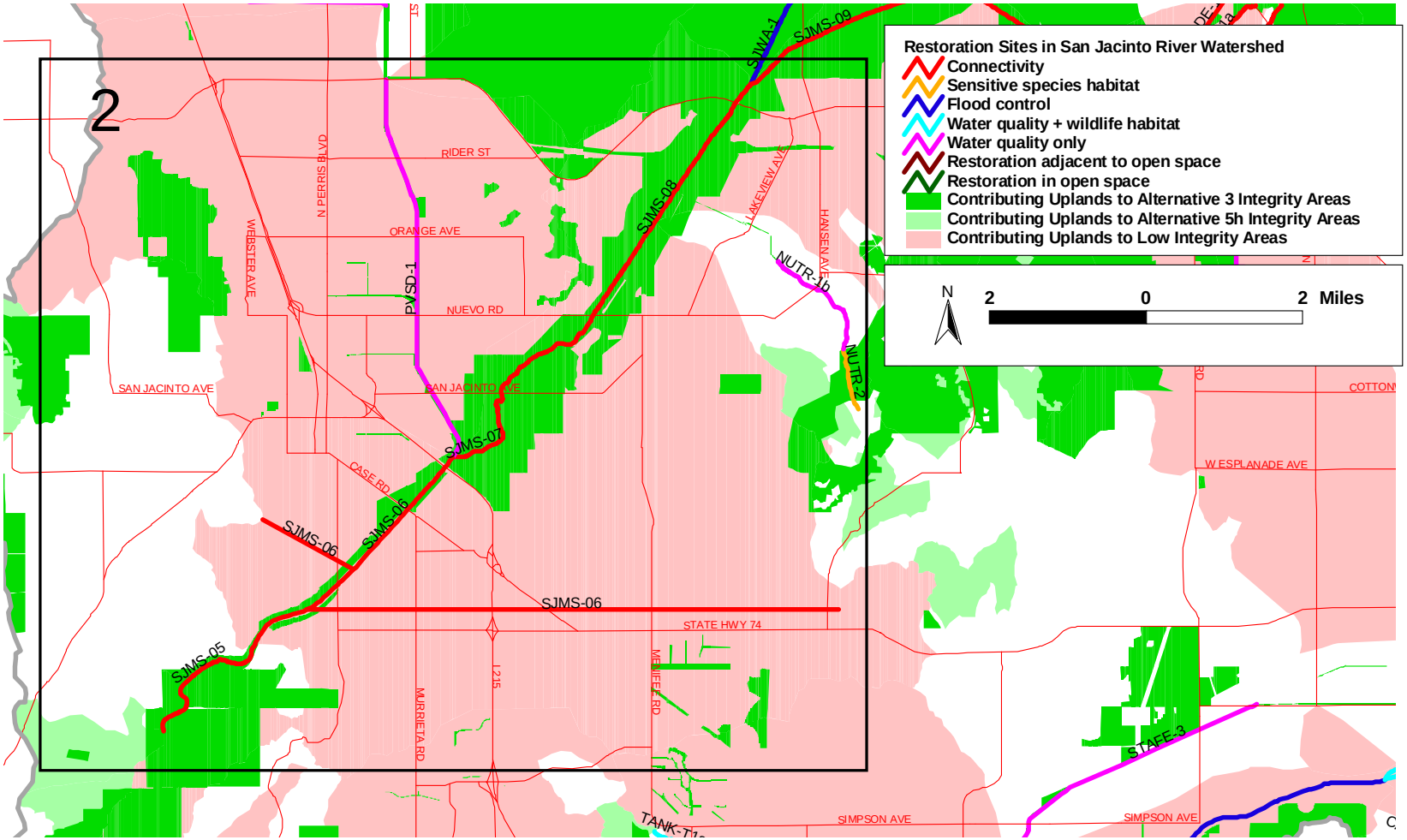

Figure 10b. Restoration opportunities in the San Jacinto River Watershed Area 2 based on restoration category.

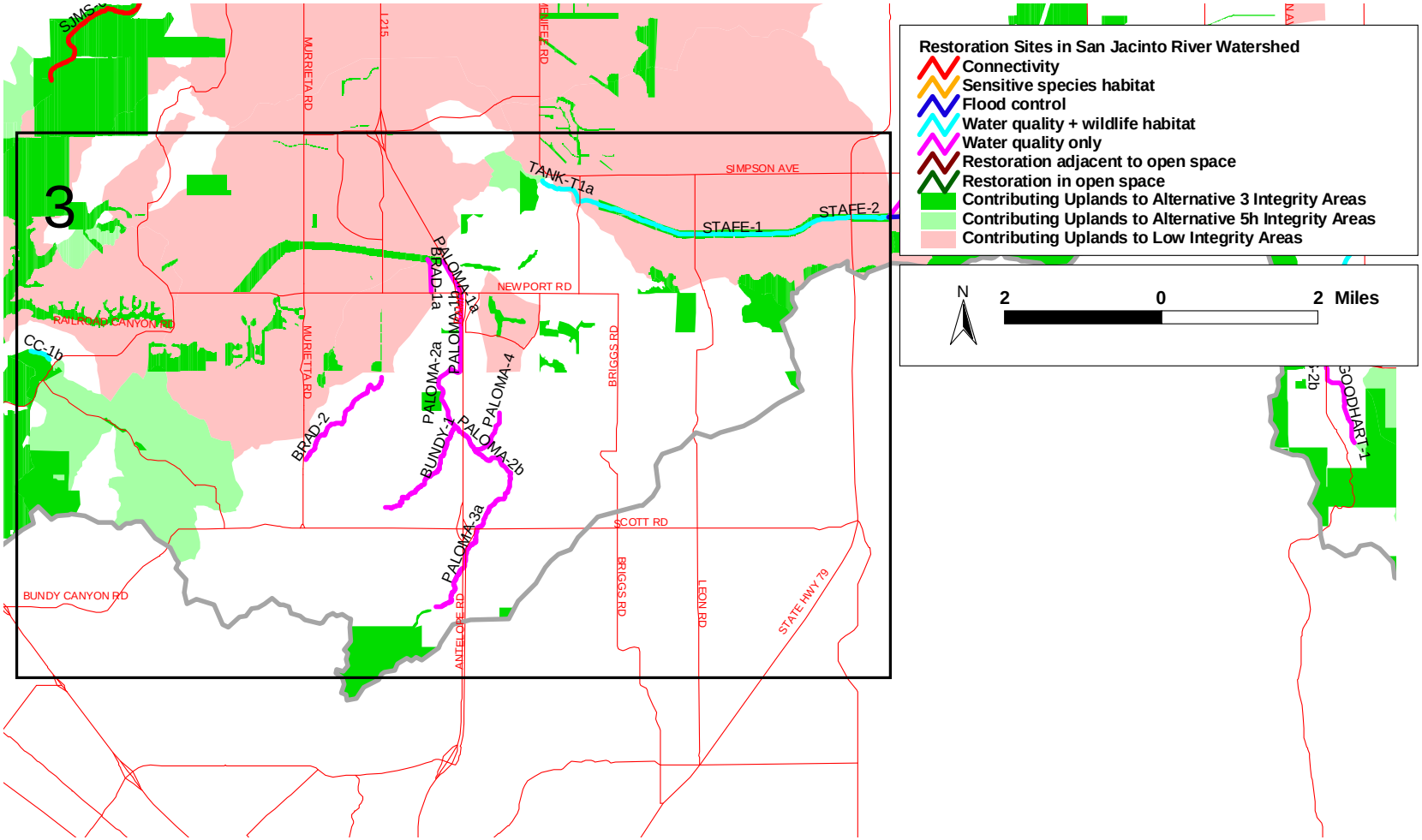

Figure 10c. Restoration opportunities in the San Jacinto River Watershed Area 3 based on restoration category.

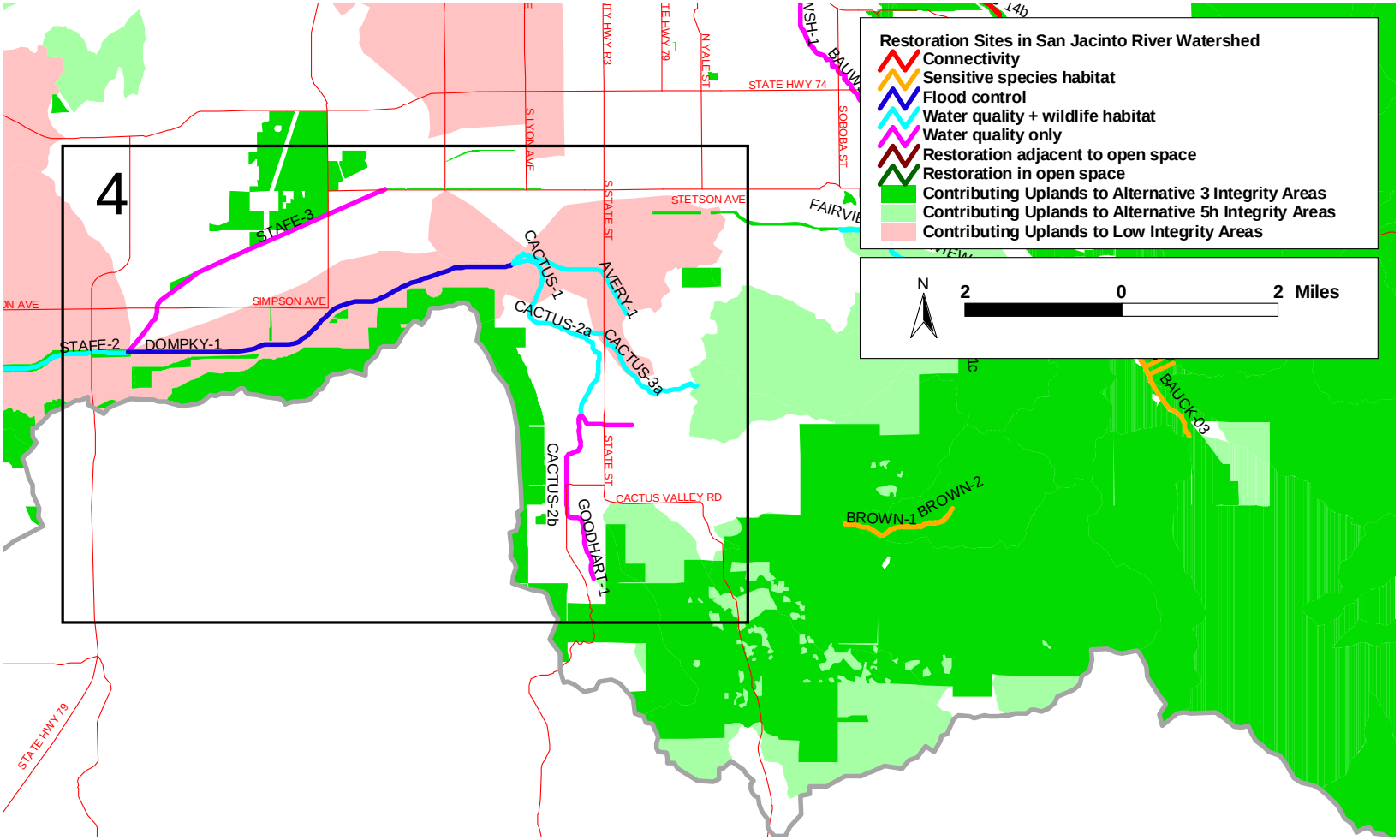

Figure 10d. Restoration opportunities in the San Jacinto River Watershed Area 4 based on restoration category.

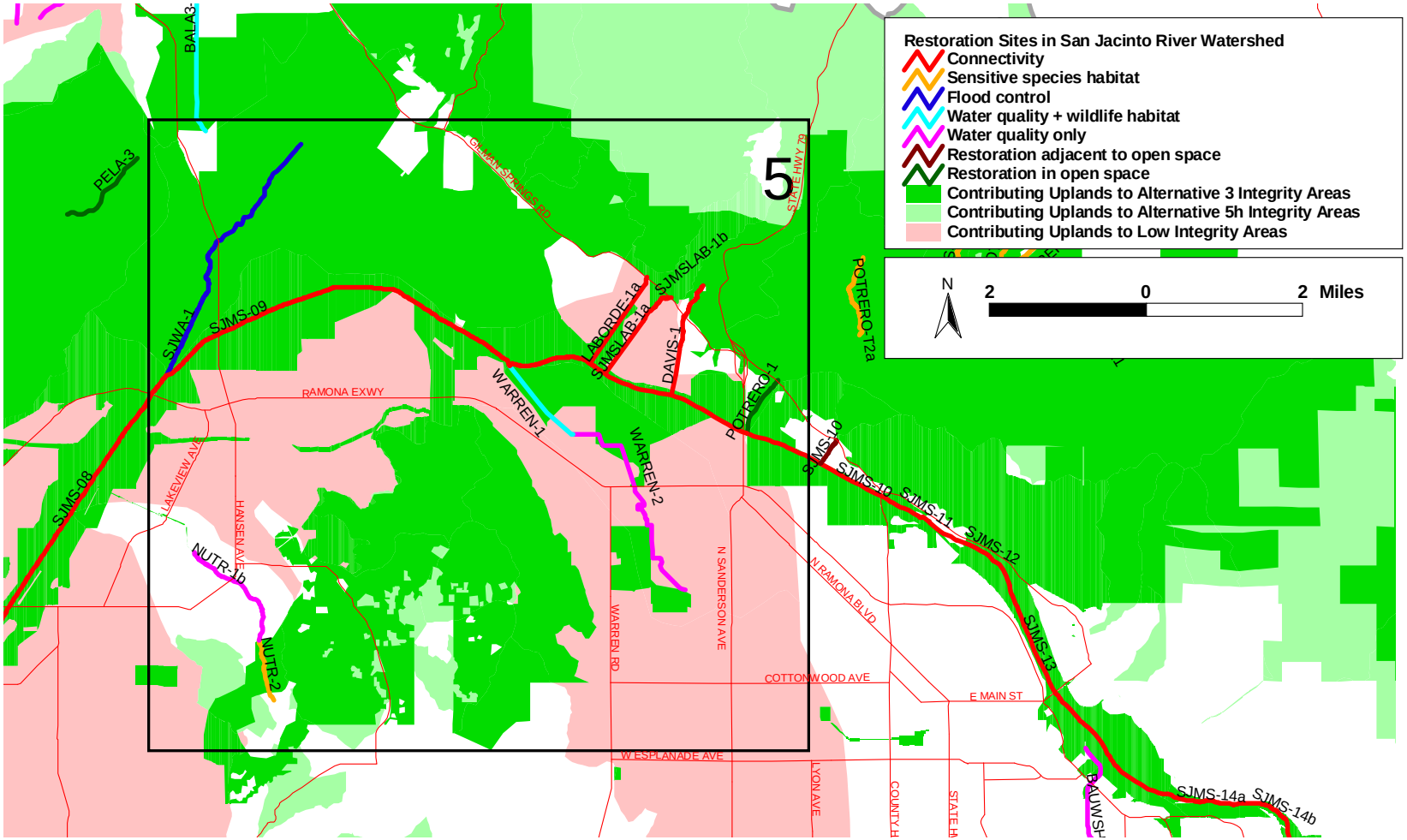

Figure 10e. Restoration opportunities in the San Jacinto River Watershed Area 5 based on restoration category.

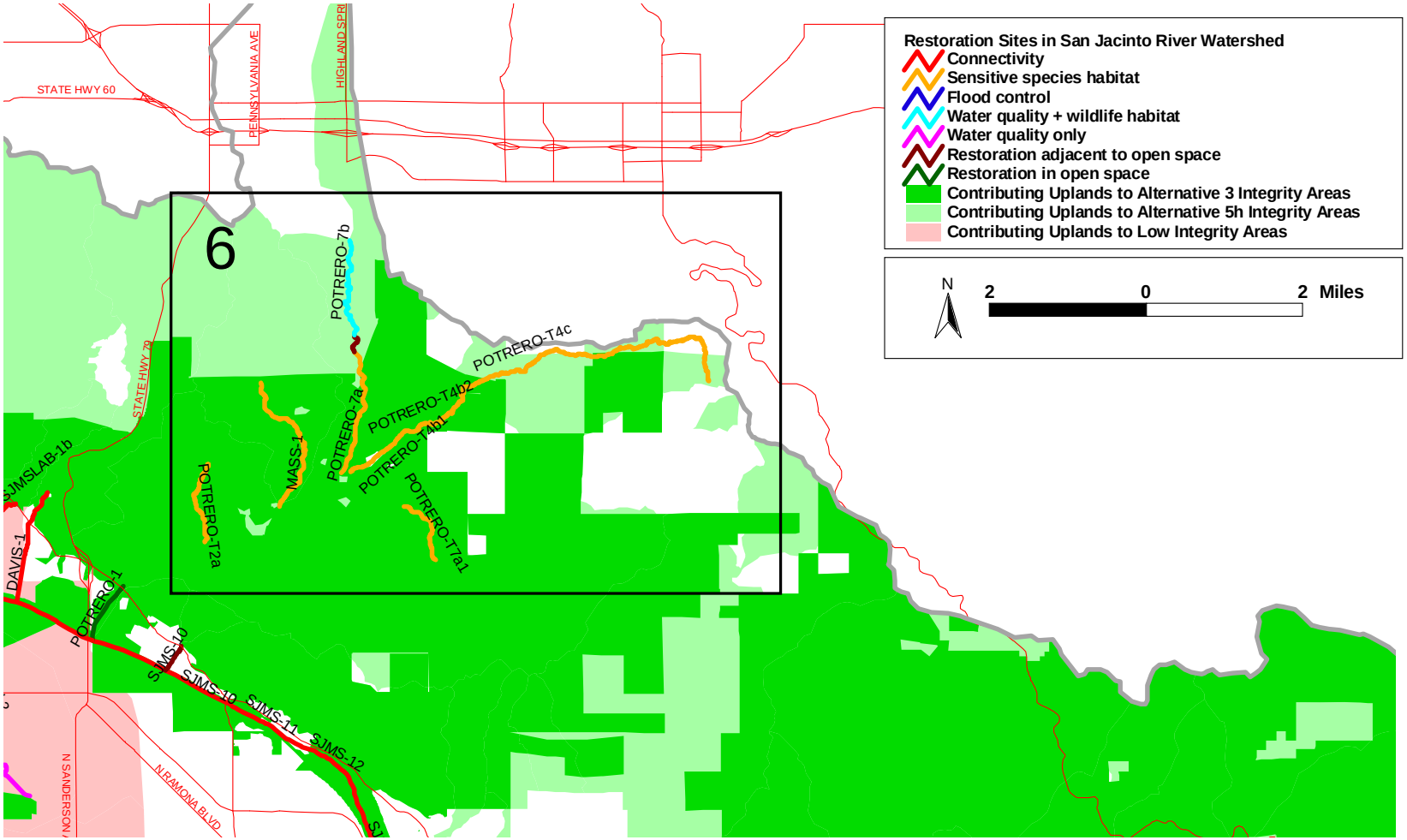

Figure 10f. Restoration opportunities in the San Jacinto River Watershed Area 6 based on restoration category.

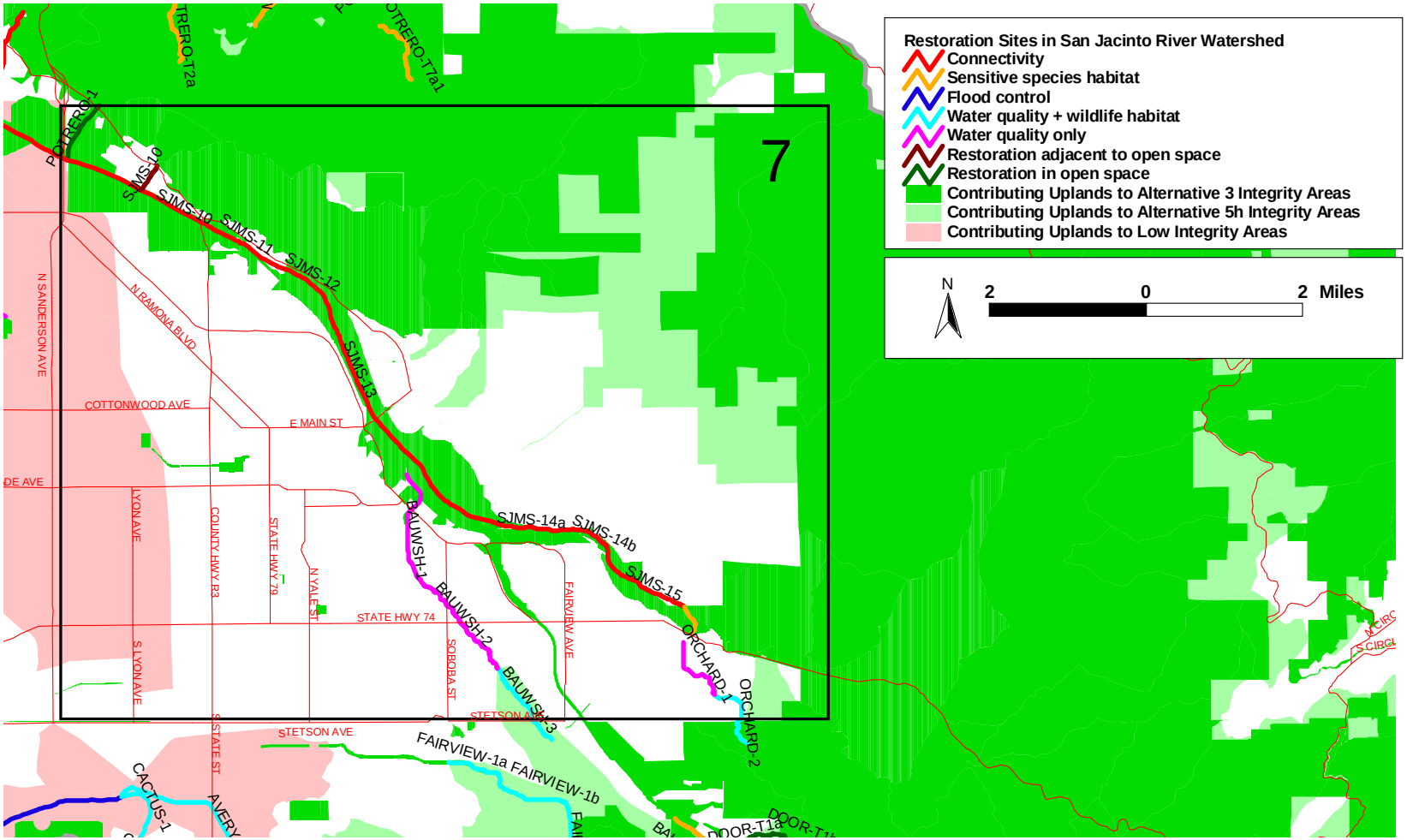

Figure 10g. Restoration opportunities in the San Jacinto River Watershed Area 7 based on restoration category.

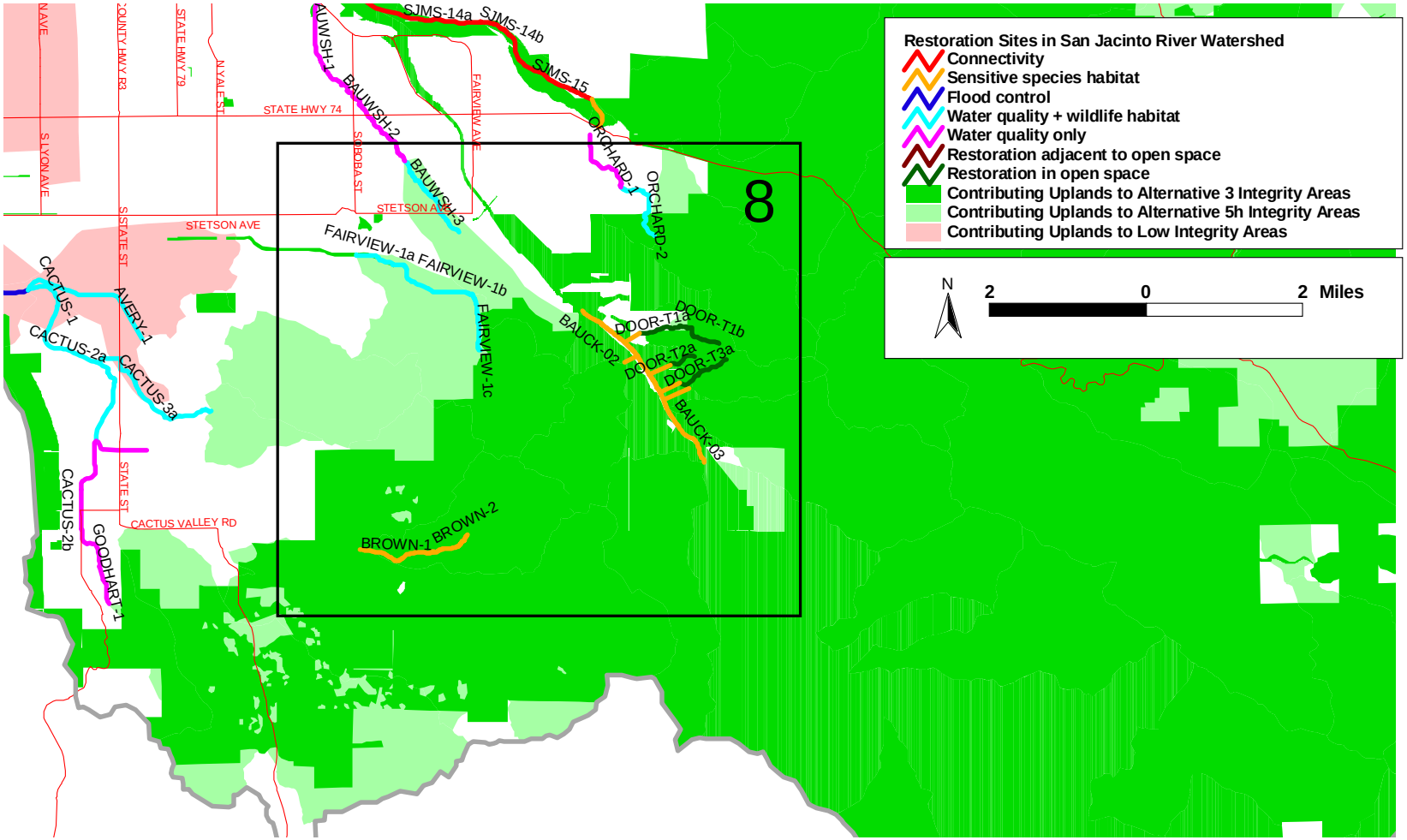

Figure 10h. Restoration opportunities in the San Jacinto River Watershed Area 8 based on restoration category.

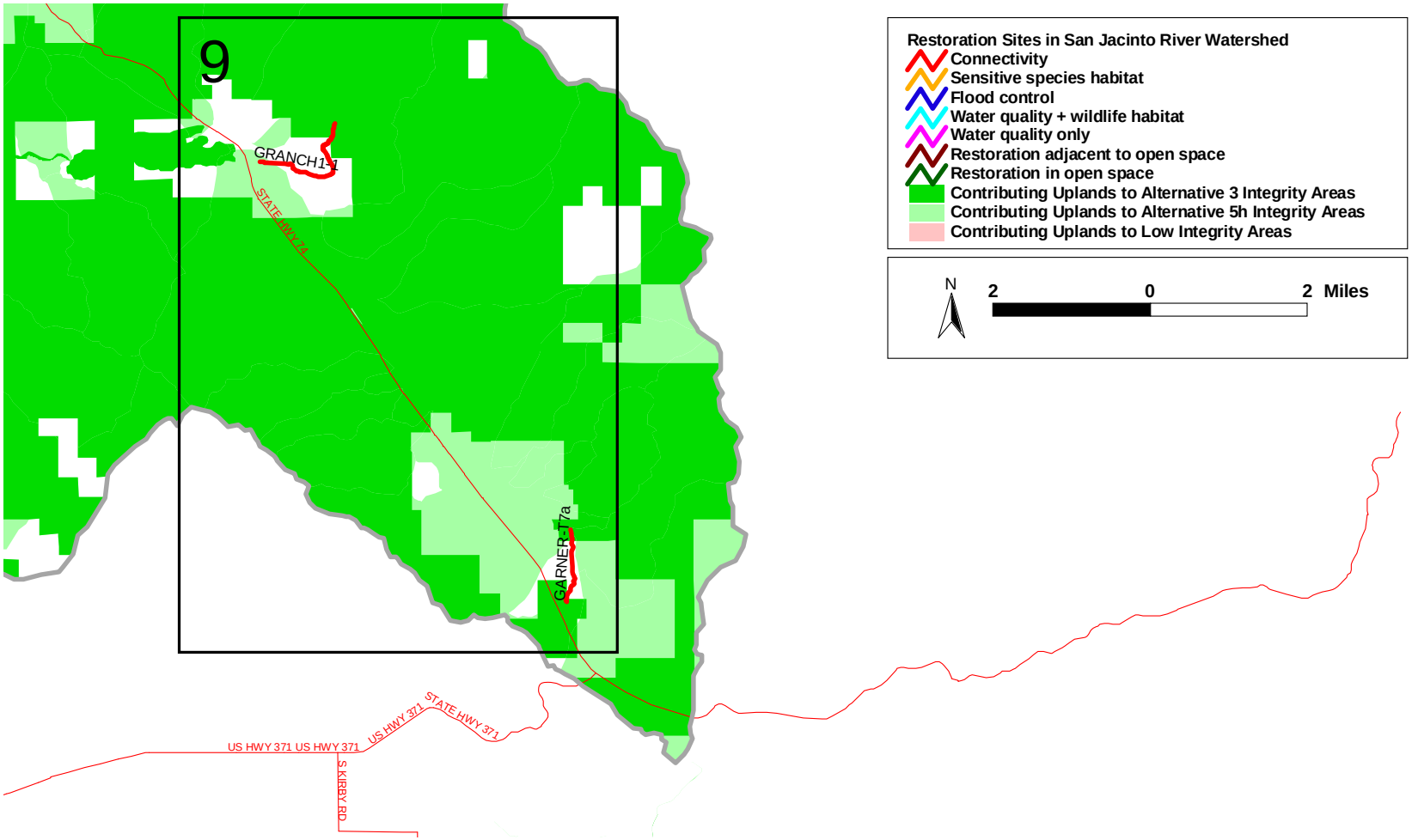

Figure 10i. Restoration opportunities in the San Jacinto River Watershed Area 9 based on restoration category.

Table 4. Restoration opportunities in the San Jacinto River Watershed based on restoration category. For full explanation of geomorphic zone, template, and level of effort, please see Smith and Klimas 2006b; see Table 3 notes for explanation of headings.

Reach	Geomorphic Zone	Template	Level of Effort	Riparian Connector	Sen. Species Habitat	Water Quality/ Flood Control	Adjacent to Open Space	Within Open Space	Total Functional Lift	Contributing Watershed Size (acres)
SJMS-06	Alluvium w/ Meandering Stream	natural	moderate earth	Yes	Yes	Flood control		PQP	0.77	18380
SJMS-08	Alluvium w/ Meandering Stream	natural	heavy earth	Yes	Yes	Flood control		PQPOS	0.71	5646
SJMS-08	Alluvium w/ Meandering Stream	natural	heavy earth	Yes	Yes	Flood control		PQPOS	0.71	5646
SJMS-09	Alluvium w/ Meandering Stream	natural	heavy earth	Yes	Yes	Flood control		PQPOS	0.57	8951
SJMS-07	Alluvium w/ Meandering Stream	natural	heavy earth	Yes	Yes	Flood control		PSPOS	0.54	3536
SJMS-06	Alluvium w/ Meandering Stream	natural	moderate earth	Yes	Yes	Flood control			0.77	18380
SJMS-06	Alluvium w/ Meandering Stream	natural	moderate earth	Yes	Yes	Flood control			0.77	18380
SJMS-11	Alluvium w/ Meandering Stream	natural	heavy earth	Yes	Yes			OS	0.44	428
SJMS-15	Alluvium w/ Meandering Stream	natural	light earth	Yes	Yes			OS	0.10	828
SJMS-05	Alluvium w/ Meandering Stream	natural	light earth	Yes	Yes			PQP	0.32	1696
SJMS-10	Alluvium w/ Meandering Stream	natural	heavy earth	Yes	Yes			PQPOS	0.53	15143
SJMS-14a	Alluvium w/ Meandering Stream	natural	light earth	Yes	Yes			PQPOS	0.45	1207
SJMS-12	Alluvium w/ Meandering Stream	natural	light earth	Yes	Yes			PQPOS	0.39	1158
DAVIS-1	Steep Alluvial Fan	incised	moderate earth	Yes	Yes				0.61	822
SJMSLAB-1b	Alluvium w/ Meandering Stream	incised	heavy earth	Yes	Yes				0.35	136
SJMS-14b	Alluvium w/ Meandering Stream	incised	heavy earth	Yes				OS	0.18	553
SJMS-13	Alluvium w/ Meandering Stream	natural	heavy earth	Yes				PQPOS	0.45	2994
DAVIS-1	Steep Alluvial Fan	incised	moderate earth	Yes					0.61	822
DAVIS-1	Steep Alluvial Fan	incised	moderate earth	Yes					0.61	822
GARNER-T7a	Valley Fill	incised	light earth	Yes					0.51	412
GRANCH1-1	Steep Alluvial Fan	incised	light plant	Yes					0.38	1423
SJMSLAB-1a	Alluvium w/ Meandering Stream	engineered	heavy earth	Yes					0.33	291
LABORDE-1a	Alluvium w/ Meandering Stream	engineered	heavy earth	Yes					0.30	411
ORCHARD-1	Steep Alluvial Fan	natural	moderate earth		Yes	Water qual only			0.79	567
NUTR-2	Colluvial Valley	natural	light plant		Yes	Water qual only			0.47	244
BAUCK-02	Boulder Floodplain/Terrace	incised	heavy earth		Yes				0.66	818
BAUCK-02	Boulder Floodplain/Terrace	incised	heavy earth		Yes				0.66	818
BAUCK-02	Boulder Floodplain/Terrace	incised	heavy earth		Yes				0.66	818
BAUCK-02	Boulder Floodplain/Terrace	incised	heavy earth		Yes				0.66	818
BAUCK-02	Boulder Floodplain/Terrace	incised	heavy earth		Yes				0.66	818
BAUCK-02	Boulder Floodplain/Terrace	incised	heavy earth		Yes				0.66	818
IRWO-3	Valley Fill	natural	light earth		Yes				0.50	480
POTRERO-T2a	Colluvial Valley	natural	light earth		Yes				0.41	270
MASS-1	Sandy Wash	incised	moderate earth		Yes				0.40	1921
BAUCK-03	Boulder Floodplain/Terrace	natural	heavy earth		Yes				0.37	404
POTRERO-T4b2	Colluvial Valley	natural	light plant		Yes				0.35	647
POTRERO-T4b1	Steep Alluvial Fan	incised	moderate earth		Yes				0.34	385
POTRERO-7a	Valley Fill	incised	light earth		Yes				0.34	1114
POTRERO-T7a1	Boulder Floodplain/Terrace	natural	light plant		Yes				0.33	149

Reach	Geomorphic Zone	Template	Level of Effort	Riparian Connector	Sen. Species Habitat	Water Quality/ Flood Control	Adjacent to Open Space	Within Open Space	Total Functional Lift	Contributing Watershed Size (acres)
POTRERO-T4c	Colluvial Valley	incised	moderate earth		Yes				0.32	1593
BROWN-1	Valley Fill	natural	light earth		Yes				0.32	200
BROWN-2	Boulder Floodplain/Terrace	natural	light earth		Yes				0.31	384
DOMPKY-1	Alluvium w/ Meandering Stream	natural	heavy earth			Flood control		PQP	0.85	3221
SJWA-1	Alluvium w/ Meandering Stream	natural	light earth			Flood control		PQPOS	0.48	11704
CC-1b	Alluvium w/ Meandering Stream	constrained	heavy earth			Water qual + hab	Yes		0.34	230
FAIRVIEW-1c	Valley Fill	natural	light plant			Water qual + hab	Yes		0.12	194
WARREN-1	Alluvium w/ Meandering Stream	natural	heavy earth			Water qual + hab		OS	0.82	884
BALA3-1	Steep Alluvial Fan	incised	moderate earth			Water qual + hab		PQP	0.91	2565
ORCHARD-2	Colluvial Valley	natural	light plant			Water qual + hab		PQP	0.85	133
STAFE-2	Alluvium w/ Meandering Stream	natural	heavy earth			Water qual + hab		PQP	0.83	1158
STAFE-1	Alluvium w/ Meandering Stream	natural	moderate earth			Water qual + hab		PQP	0.63	7059
TANK-T1a	Colluvial Valley	incised	moderate earth			Water qual + hab			0.70	50
FAIRVIEW-1b	Valley Fill	natural	moderate earth			Water qual + hab			0.64	725
AVERY-1	Steep Alluvial Fan	natural	heavy earth			Water qual + hab			0.55	1791
AVERY-1	Steep Alluvial Fan	natural	heavy earth			Water qual + hab			0.55	1791
CACTUS-3a	Steep Alluvial Fan	natural	light earth			Water qual + hab			0.49	472
CACTUS-2a	Alluvium w/ Meandering Stream	natural	heavy earth			Water qual + hab			0.44	2437
CACTUS-1	Alluvium w/ Meandering Stream	natural	heavy earth			Water qual + hab			0.39	190
POTRERO-7b	Colluvial Valley	incised	light plant			Water qual + hab			0.32	1530
FAIRVIEW-1a	Valley Fill	constrained	moderate earth			Water qual + hab			0.31	124
BAUWSH-3	Valley Fill	incised	moderate earth			Water qual + hab			0.24	458
IRWO-3	Valley Fill	natural	light earth			Water qual only	Yes		0.50	480
NUTR-1b	Steep Alluvial Fan	natural	light earth			Water qual only	Yes		0.47	958
STAFE-3	Alluvium w/ Meandering Stream	engineered	heavy earth			Water qual only	Yes		0.38	10893
PVSD-1	Alluvium w/ Meandering Stream	natural	heavy earth			Water qual only		PQP	0.58	16285
PVSD-3	Alluvium w/ Meandering Stream	natural	heavy earth			Water qual only		PQP	0.57	1169
WARREN-2	Alluvium w/ Meandering Stream	natural	heavy earth			Water qual only			0.92	1971
MAF-1a	Alluvium w/ Meandering Stream	natural	heavy earth			Water qual only			0.86	1224
MAF-1b	Alluvium w/ Meandering Stream	natural	heavy earth			Water qual only			0.84	3238
MAF-1b	Alluvium w/ Meandering Stream	natural	heavy earth			Water qual only			0.84	3238
BALA2-3	Valley Fill	incised	moderate earth			Water qual only			0.80	1951
BALA2-3	Valley Fill	incised	moderate earth			Water qual only			0.80	1951
BALA2-3	Valley Fill	incised	moderate earth			Water qual only			0.80	1951
ORCHARD-1	Steep Alluvial Fan	natural	moderate earth			Water qual only			0.79	567
BRAD-1a	Alluvium w/ Meandering Stream	natural	heavy earth			Water qual only			0.78	132
IRWO-1	Valley Fill	incised	moderate earth			Water qual only			0.68	995
PALOMA-1b	Alluvium w/ Meandering Stream	natural	heavy earth			Water qual only			0.67	476
PALOMA-4	Colluvial Valley	natural	light earth			Water qual only			0.57	150
PMOF-1	Valley Fill	incised	moderate earth			Water qual only			0.56	1370
PMOF-1	Valley Fill	incised	moderate earth			Water qual only			0.56	1370

Reach	Geomorphic Zone	Template	Level of Effort	Riparian Connector	Sen. Species Habitat	Water Quality/ Flood Control	Adjacent to Open Space	Within Open Space	Total Functional Lift	Contributing Watershed Size (acres)
PMOF-1	Valley Fill	incised	moderate earth			Water qual only			0.56	1370
MV-4	Alluvium w/ Meandering Stream	incised	moderate earth			Water qual only			0.55	2557
MV-4	Alluvium w/ Meandering Stream	incised	moderate earth			Water qual only			0.55	2557
BRAD-2	Steep Alluvial Fan	natural	light earth			Water qual only			0.55	1156
BRAD-2	Steep Alluvial Fan	natural	light earth			Water qual only			0.55	1156
BRAD-2	Steep Alluvial Fan	natural	light earth			Water qual only			0.55	1156
IRWO-T1	Colluvial Valley	incised	heavy earth			Water qual only			0.54	777
IRWO-T1	Colluvial Valley	incised	heavy earth			Water qual only			0.54	777
RCC-2b	Valley Fill	natural	light earth			Water qual only			0.48	129
PALOMA-2b	Alluvium w/ Meandering Stream	natural	heavy earth			Water qual only			0.45	2207
PALOMA-3a	Alluvium w/ Meandering Stream	natural	heavy earth			Water qual only			0.41	1537
PALOMA-2a	Colluvial Valley	natural	light plant			Water qual only			0.41	760
PALOMA-1a	Alluvium w/ Meandering Stream	constrained	heavy earth			Water qual only			0.40	89
PPV-T2c	Colluvial Valley	constrained	moderate earth			Water qual only			0.40	45
IRWO-2	Valley Fill	incised	moderate earth			Water qual only			0.40	1223
GOODHART-1	Valley Fill	natural	moderate earth			Water qual only			0.38	1493
FS-1	Alluvium w/ Meandering Stream	constrained	light earth			Water qual only			0.37	826
RCC-3	Valley Fill	natural	light earth			Water qual only			0.37	164
BAUWSH-2	Valley Fill	incised	moderate earth			Water qual only			0.37	666
BUNDY-1	Steep Alluvial Fan	incised	light earth			Water qual only			0.36	239
PPV-T1b	Alluvium w/ Meandering Stream	incised	moderate earth			Water qual only			0.34	220
PPV-T2d	Colluvial Valley	incised	moderate earth			Water qual only			0.33	115
RCC-4	Valley Fill	natural	light earth			Water qual only			0.33	420
CACTUS-2b	Steep Alluvial Fan	engineered	light earth			Water qual only			0.30	1421
CACTUS-2b	Steep Alluvial Fan	engineered	light earth			Water qual only			0.30	1421
CACTUS-2b	Steep Alluvial Fan	engineered	light earth			Water qual only			0.30	1421
RCC-1	Colluvial Valley	incised	moderate earth			Water qual only			0.29	384
FS-2	Valley Fill	constrained	light earth			Water qual only			0.29	849
FS-2	Valley Fill	constrained	light earth			Water qual only			0.29	849
FS-2	Valley Fill	constrained	light earth			Water qual only			0.29	849
FS-2	Valley Fill	constrained	light earth			Water qual only			0.29	849
FS-3	Valley Fill	constrained	light earth			Water qual only			0.28	182
BAUWSH-1	Valley Fill	engineered	light earth			Water qual only			0.25	602
SJMS-10	Alluvium w/ Meandering Stream	natural	heavy earth				Yes	OS	0.53	15143
POTRERO-7a	Valley Fill	incised	light earth				Yes		0.34	1114
POTRERO-1	Boulder Floodplain/Terrace	incised	heavy earth					OS	0.50	135
DOOR-T1a	Valley Fill	natural	light earth					PQP	0.69	180
DOOR-T2a	Colluvial Valley	natural	exotic removal					PQP	0.50	38
PELA-3	Valley Fill	natural	light earth					PQP	0.39	1715
DOOR-T3a	Colluvial Valley	natural	exotic removal					PQPOS	0.52	108
DOOR-T1b	V-shaped Valley	natural	exotic removal					PQPOS	0.50	171

vi. Prioritization strategy for selecting and implementing compensatory mitigation activities

There are several criteria to help prioritize selection of compensatory mitigation activities. The prioritization is based on the concept that different objectives can be addressed by different sites. A compensatory mitigation site would not be expected to provide a gamut of different functions related to flood control, water quality, and habitat services. The prioritization strategy is a soft preference that would factor in the availability of the land for compensatory mitigation, ability to undertake the work, the applicability of the mitigation site for expected impacts, and other factors.

The overarching priority is to restore connectivity of degraded aquatic resources separating higher integrity aquatic resources. Through restoration of these connectors, exchange of biological and other materials would allow for increased functions and services of these higher integrity aquatic resources. These connectors also have value as irreplaceable sites, such that if they become further degraded or completely lost, there would be no way to replicate the lost functions and services the connectors provide. Their strategic value in a landscape setting make these the highest priority among restoration sites.

The second priority is the restoration for provision of habitat for sensitive species. Sensitive species habitat is not easily replaced and there needs to be greater effort to restore habitat that would be used by sensitive species. Degraded aquatic resources with known sensitive species in the vicinity would more likely be used by sensitive species with the expectation that the overall population size of these species would increase from these types of restoration activities. Restoring in locations now known to have sensitive species within or near the prospective site would benefit sensitive species. In lieu of detailed field data on species presence or absence, sites within the FWS's conceptual reserve design (CRD) areas were identified as probable locations of sensitive species.

The third priority is to restore for water quality and flood control functions. Opportunities to restore water quality functions and flood control functions are not as urgent compared to some of the above priorities because functions for water quality and flood control area more easily replaced compared to functions for connectivity and sensitive species habitat. Opportunities to restore for flood control functions would still be important to alleviate flood risks in downstream areas. The restoration of flood control functions would also have simultaneous benefits to water quality because sites that detain water for flooding also have simultaneous benefits to water quality through detention of nutrients and sediments. Stand-alone opportunities to restore water quality functions would still be important in order to improve water quality of receiving waters. This particular priority allows for restoration in urban areas which often have water quality issues. Even among potential restoration sites for water quality functions, there are those sites located in urban areas with moderate to high density of home units or that parallel roads, making the restoration work to not likely result in compensatory mitigation that would attract appreciable levels of wildlife due to indirect effects from humans, noise, and lighting. In contrast, there are potential restoration sites located in low density residential areas or agriculture areas, making any restoration for water quality functions more amenable to habitat for wildlife. For compensatory mitigation within urban areas where stressors from roads, residences, nutrients, and exotics may preclude

meaningful habitat functions, long-term management objectives for these mitigation projects aimed at promoting water quality functions and services would be different than for habitat mitigation. For all potential water quality restoration sites, an additional distinction is made on whether the site would have additional habitat benefits.

The fourth priority is to provide compensatory mitigation adjacent to open space areas or targeted open space. In restoring, creating, or enhancing aquatic resources adjacent to existing and targeted open space, the open space provides buffer benefits on one or more side, minimizing on indirect effects on at least a partial basis. Also, providing compensatory mitigation adjacent to existing open space would allow for the creation of a larger open space parcel with consequent ecological benefits to larger habitat islands. Targeted open space areas are those have been identified by the FWS's CRD.

The fifth priority involves functions and services of aquatic resources in existing and targeted natural open space. These aquatic resources are not threatened with irreparable loss. Consequently, opportunities to restore sites within open space are not expected to go away given the existing protections these sites already have. Thus, imminent threat of loss is not there and restoration is not as urgent compared to some of the above priorities.

The last priority is to provide compensatory mitigation that provides the greatest lift of ecological integrity. Given that there are methods (namely the landscape level functional assesment) to determine ecological integrity of existing aquatic resources as well as determining gains in ecological integrity after restoration, it is desirable to prioritize compensatory mitigation in areas where there would be a substantial gain in ecological integrity as opposed to areas where there would be a marginal gain in ecological integrity.

Overall, all restoration sites need to face minimal local opposition and be practicable. Restoration activities can only be performed on properties with willing landowners. Restoration of these sites cannot be forced, even if the proposal has great ecological benefits. Thus, willingness is critical in order for the restoration to be realized. In some situations, restoration of some engineered channels may be perceived as an act that would subject adjacent residences to increased flood risks. In such situations, local considerations have tremendous weight.

vii. Explanation of how preservation address 332.3(h)

The Program does not propose the use of only preservation to satisfy compensatory mitigation requirements of individual projects. Any compensatory mitigation would have a component for long-term protection, which in essence would preserve created, restored, or enhanced aquatic resources.

viii. Description of any public and private stakeholder involvement in plan development and implementation

There has been some public stakeholder involvement in plan development. The Corps has been meeting monthly with the Department, the EPA, the FWS, the SWRCB, and the

RWQCB as well as local organizations such as the RCA, the Riverside County Flood Control District, and the Riverside County Transportation Commission. The meetings included lengthy discussions on the SAMP's approach to restoration and compensatory mitigation, including some of the same ideas discussed in the compensatory planning framework of this document. Some of the ideas have changed after the Corps received input from the various agencies.

The Corps would engage the public separately in a series of workshops. Prior to publication of the draft EIS, input from the private sector would shape some of the elements of the Program. The Corps will hold workshops discussing the basic foundational work done to delineate and assess aquatic resources and the identification of restoration opportunities within the context of an in-lieu fee program.

ix. Description of long-term protection and management strategies for activities conducted by the ILF

All sites would have long-term protection and management. The preference of the Sponsor is to acquire the properties in fee title. The Sponsor is also willing to add a deed restriction to the restoration sites and mapping of the restoration sites on the internet to provide another levels of protection.

As an added level of protection, all compensatory mitigation sites would be identified on the Corps' internet site. Shapefiles of the compensatory mitigation sites would be converted to kml files stored on the Corps' internet site to facilitate drawing of compensatory mitigation site boundaries over Google™ maps. The disclosure of the location of compensatory mitigation sites allows the public to alert the Regulatory agencies of any adverse actions affecting compensatory mitigation site, facilitating enforcement by the Corps.

The Sponsor would oversee all management activities with funding provided by a non-wasting endowments. Through an endowment funding long-term protection and management, the Sponsor would undertake activities to maintain aquatic ecosystem functions and services for the foreseeable future. The endowment would fund trash removal, signage, and removal of invasive vegetation.

x. Strategy for periodic evaluation and reporting on the progress of the program in achieving the goals and objectives in (v), including revising the compensation framework

The Sponsor would provide annual reports on the Program. Annual reports would include accounting of impacts authorized by the respective programs and the compensatory mitigation that was required, implemented, and successfully completed. In addition, the annual reports would help keep track of the financial status of the Program.

Every five years, the Program would be formally evaluated with the intent to revise the Program. The collective status of all compensatory mitigation projects would be reviewed to evaluate successfully implemented projects, partially successful projects, and unsuccessful projects to determine causal factors in success and/or failure. This type of review will assist

in revision of future compensatory mitigation plans, particularly in light of any new scientific understanding of aquatic resource restoration science.

Also, the menu of potential compensatory mitigation sites would be revised. Potential compensatory mitigation sites would be removed to account for compensatory mitigation sites that have been successfully restored or have been permanently impacted. The potential area available for compensatory mitigation would be calculated in order to determine if additional sites need to be added to the menu of restoration sites.

Lastly, the financial status of the program would be evaluated. The main focus of this evaluation would be the adequacy of the endowment for future long-term management activities especially after considering changes that occurred in the past five years due to changes in economic outlook, interest rates, and costs related to compensatory mitigation. Based on these changes, the unit fee charged for compensatory mitigation may need to be increased. Although these changes may have occurred between cycles, a formal evaluation every five years would be performed.

8. Description of the In-Lieu Fee Program Account

The Sponsor will establish the in-lieu fee program account. Because the Sponsor undertakes multiple activities including management of funds not related to the Program, the program account will be held in a account separate from other activities undertaken by the Sponsor. The Sponsor will hold the program account in _____, a member of the Federal Deposit Insurance Corporation, and will accrue interest. The program account will track impacts and mitigation separately for the Santa Margarita River Watershed and for the San Jacinto River Watershed. Also, all funds will be tracked by permit authorization and by compensatory mitigation site. The in-lieu fee agreement would clarify that the program account and the earnings and interest would be used for selection, design, acquisition, implementation, and management of in-lieu fee compensatory mitigation projects, except for about 10%, which may be used for administrative costs.

For each compensatory mitigation project, funds will be separated by operating accounts and an endowment account (see Table 4 for a sample ledger based on hypothetical numbers). The operating account will be held in a money market account in order to maximize the interest rate with sufficient liquidity to fund specific tasks for mitigation design, implementation, management, and administration. If a compensatory mitigation project reaches performance criteria ahead of schedule, then the remaining funds would be transferred into the endowment account. The endowment account will be held in a higher-yielding account for the purpose of funding long-term management after all mitigation performance criteria have been met for the mitigation project. Funds from the endowment account will not be used until all performance criteria for the compensatory mitigation have been met.

In order to start expending funds at a particular restoration site, the Sponsor would submit to the Corps and the Department a request for funding approval and project-specific details on the restoration site design including estimate of costs, an implementation plan, performance standards, and a monitoring plan. Upon approval of the restoration plan, the Corps and the

Department would provide written approval to allow disbursement of funds from the operating account to be used at that site.

For long-term management, the Sponsor would not have to request funding approval from the Corps or the Department. Expenditures from the account would need to insure the endowment is maintained as a non-wasting account that would grow at a rate to offset inflation and to provide funds for long-term management.

The Sponsor would provide an annual report to the Corps and the Department regarding the program account. The report would include all incomes received, disbursements, and interest earned; a list of permits for which in-lieu fee funds were accepted and the corresponding compensatory mitigation site location, including acres authorized for impacts and acres of compensatory mitigation required as well as amount and date of funds received from the permittee; description of program expenditures including acquisition, design, implementation, monitoring, maintenance, administration, and other costs; and a balance of advanced credits and released credits.

Table 4. Sample ledger for projects and the in-lieu fee program.

	Project A (SPL-2010-XXXXX-YJC)[1]						Project B (SPL-2010-XXXXX-JAM)[2]					Total ILF Program Account					
Calendar Year	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2011**	**2012**	**2013**	**2014**	**2015**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**
Project/Program Year	**Y1**	**Y2**	**Y3**	**Y4**	**Y5**	**Y6**	**Y1**	**Y2**	**Y3**	**Y4**	**Y5**	**Y1**	**Y2**	**Y3**	**Y4**	**Y5**	**Y6**
Acres of Compensatory Mitigation	3						4					3	4				
Income from In-Lieu Fee	$270						$550					$270	$550				
Operating Account																	
Operating Accounty Balance Carryover		$73	$55	$37	$19	$0		$94	$67	$0	$0						
Long-Term Management (Endowment)						$2				$3	$3						
Expenditures																	
- Administrative Costs[3]	($7)	($5)	($5)	($5)	($5)		($15)	($10)	($10)								
- Land Acquisition Costs							($200)										
- Legal	($3)						($3)										
- Site Design Plans	($10)						($20)										
- Site Implementation Plans	($110)						($130)										
- Monitoring	($5)	($5)	($5)	($5)	($5)		($7)	($7)	($7)								
- Maintenance	($12)	($9)	($9)	($9)	($9)	($2)	($16)	($12)	($12)	($3)	($3)						
Total Expenses	($147)	($19)	($19)	($19)	($19)	($2)	($391)	($29)	($29)	($3)	($3)						
Net Annual Income/Expense	$123	$54	$36	$18	$0		$159	$65	$38								
Money Market Int. on Account (3.0%)[4]	$4	$2	$1	$1	$0		$5	$2	$1								
Net Annual Balance	$127	$55	$37	$19	$0		$164	$67	$39[7]								
Transfer to Endowment Account[5]	($54)						($70)										
Year-End Operating Account Balance	$73	$55	$37	$19	$0	$0	$94	$67	$39	$0	$0	$73	$149	$104	$58	$0	$0
Endowment Account																	
Income	$54						$70		$39								
Endowment Account Carryover		$57	$61	$64	$68	$72		$74	$79	$124	$128						
Expense						($2)				($3)	($3)						
Net Annual Income/Expense	$54	$57	$61	$64	$68	$70	$70	$74	$117	$121	$125						
ROI (Interest) (5.90%)[6]	$3	$3	$4	$4	$4	$4	$4	$4	$7	$7	$7						
Year-End Endowment Account Balance	$57	$61	$64	$68	$72	$74	$74	$79	$124	$128	$133	$57	$135	$143	$192	$200	$207

[1]Project A consists of restoration with no land acquisition costs that takes 5 years to reach performance standards
[2]Project B consists of resotraiton with land acquisition costs that takes 3 yearas to reach performance standards
[3]Assumes 10% of cost is for administration
[4]Assumes 3% return for a money market account
[5]Assumes 20% of non-acquisition costs is for endowment for long-term management
[6]Assumes 3% of endowment is used for long-term management and 2.9% is to offset inflation
[7]Mitigation reached final success criteria by year 3, resultin transfer of remaining monies to endowment account.

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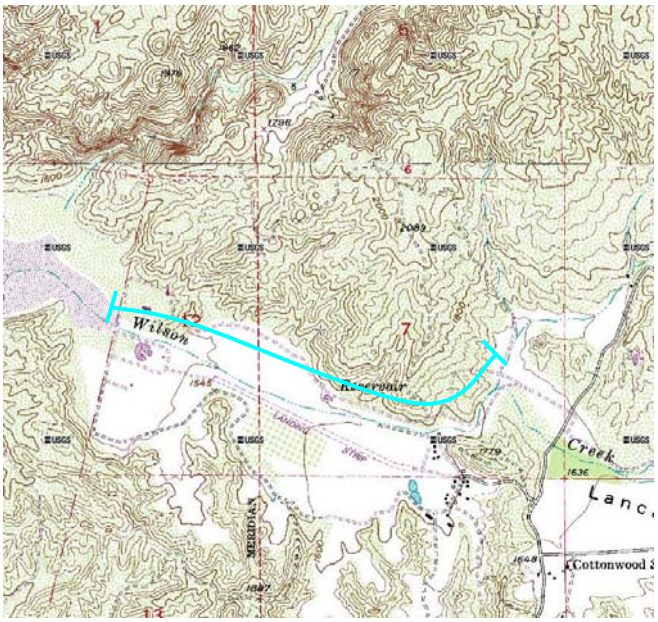
Appendix A. Sample potential restoration sites addressing restoration objectives of connectivity, sensitive species habitat, water quality/flood control, and adjacency to open space for the Upper Santa Margarita River Watershed and the San Jacinto River Watershed.

Restoration for Connectivity-Upper Santa Margarita River Watershed

Name: WILSON 02, Wilson Creek
Length: 7,800 feet
Geomorphic zone: Alluvium with meandering stream
Level of effort: Heavy earthwork

Contributing watershed size: 29,984 acres
Area (assume 75' width): 13.4 acres
Template: Natural template
Total functional lift: 0.76



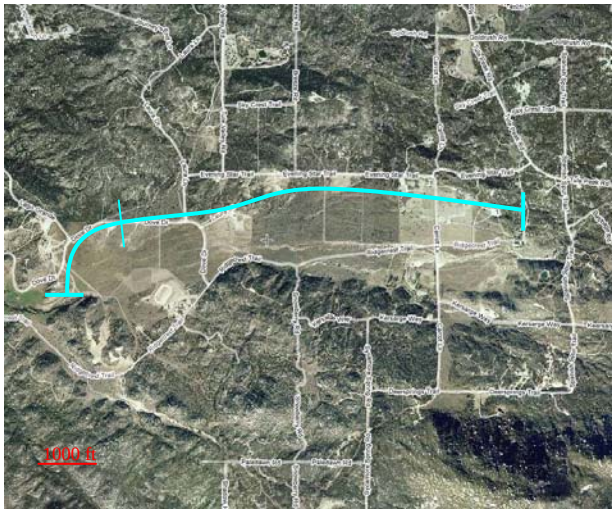
Restoration for Sensitive Species Habitat-Upper Santa Margarita River Watershed

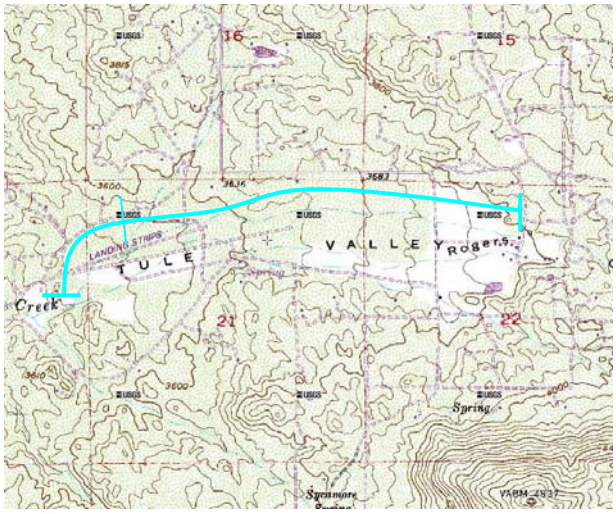
Name: TULET2-1, Tule Creek Trib (downstream end)
Length: 1,600 feet
Geomorphic zone: Valley Fill
Level of effort: Moderate earthwork

Contributing watershed size: 1,248 acres
Area (assume 40' width): 1.5 acres
Template: Natural template
Total functional lift: 0.33

Name: TULET2-2, Tule Creek Trib (upstream end)
Length: 7,300 feet
Geomorphic zone: Valley Fill
Level of effort: Moderate earthwork

Contributing watershed size: 670 acres
Area (assume 25' width): 4.2 acres
Template: Natural template
Total functional lift: 0.13





Water Quality-Upper Santa Margarita River Watershed

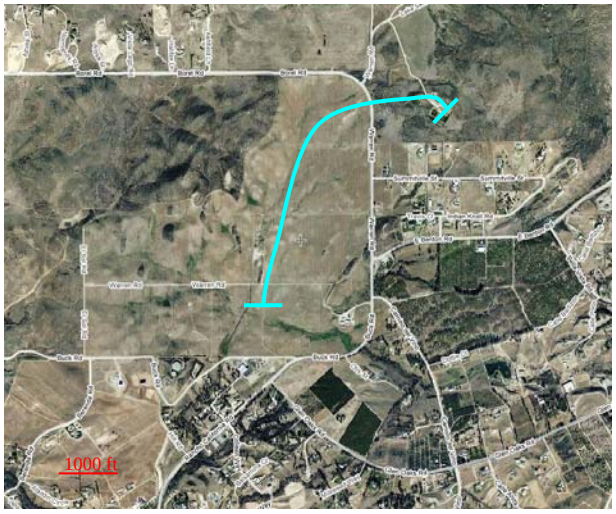
Name: ALAMO 2a, Unnamed tributary (Alamo Road)
Length: 800 feet
Geomorphic zone: Alluvium with meandering stream
Level of effort: Moderate earthwork

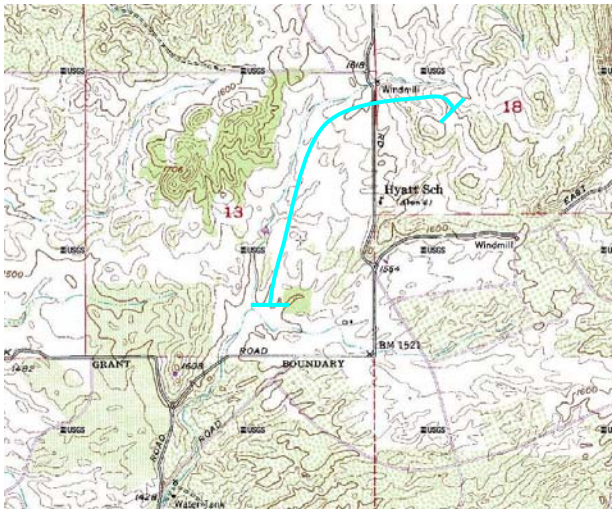
Contributing watershed size: 531 acres
Area (assume 25' width): 0.5 acre
Template: Engineered
Total functional lift: 0.27

Restoration Adjacent to Open Space-Upper Santa Margarita River Watershed

Name: GERT 5, Santa Gertrudis Creek
Length: 7,300 feet
Geomorphic zone: Colluvial Valley
Level of effort: Moderate earthwork

Contributing watershed size: 361 acres
Area (assume 20' width): 3.4 acres
Template: Natural template
Total functional lift: 0.47





Restoration for Connectivity-San Jacinto River Watershed

Name: LABORDE-1a, Laborde Canyon
Length: 7,000 feet
Geomorphic zone: Alluvium with meandering stream
Level of effort: Heavy earthwork

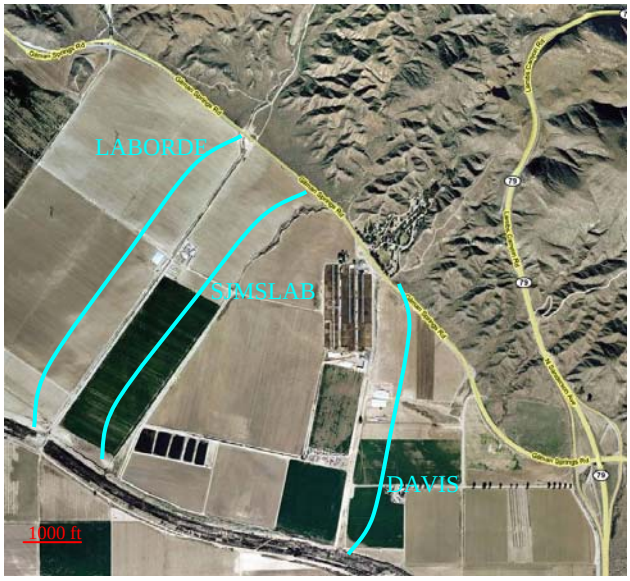
Contributing watershed size: 4,797 acres
Area (assume 50' width): 8.0 acres
Template: Engineered template
Total functional lift: 0.30

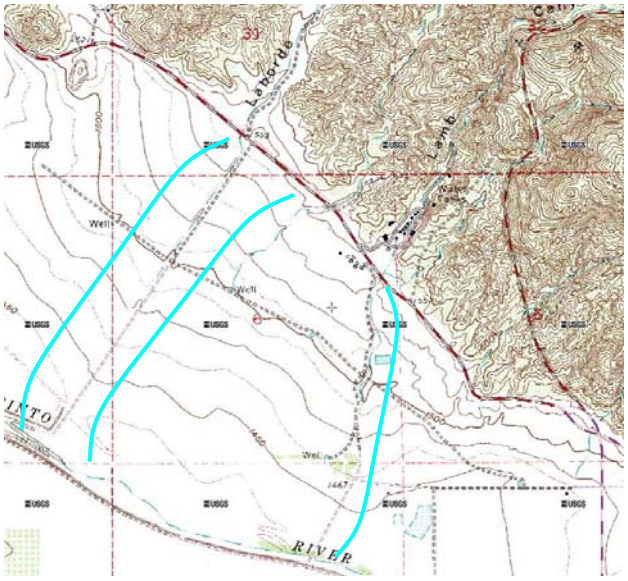
Name: SJMSLAB-1a, Unnamed tributary
Length: 7,200 feet
Geomorphic zone: Alluvium with meandering stream
Level of effort: Heavy earthwork

Contributing watershed size: 612 acres
Area (assume 25' width): 4.1 acres
Template: Engineered template
Total functional lift: 0.33

Name: DAVIS-1, Lamb Canyon
Length: 7,900 feet
Geomorphic zone: Steep alluvial fan
Level of effort: Moderate earthwork

Contributing watershed size: 2,647 acres
Area (assume 50' width): 9.1 acres
Template: Incised template
Total functional lift: 0.61

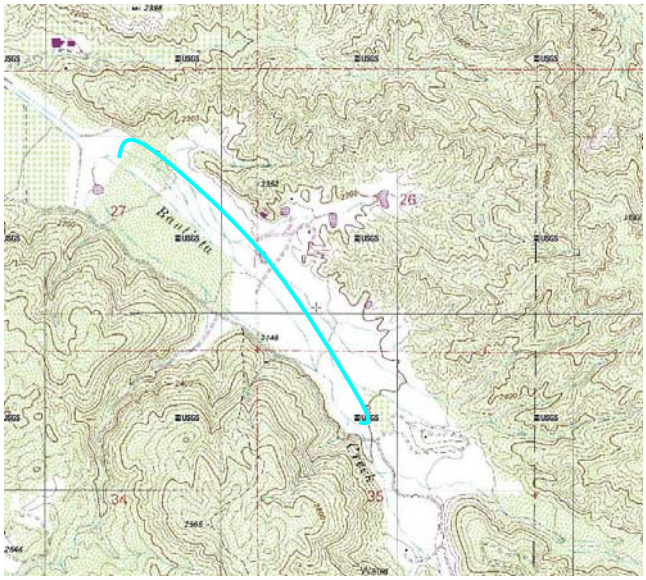




Restoration for Sensitive Species Habitat-San Jacinto River Watershed

Name: BAUCK-02, Bautista Creek
Length: 8,900 feet
Geomorphic zone: Boulder Floodplain/Terrace
Level of effort: Heavy earthwork

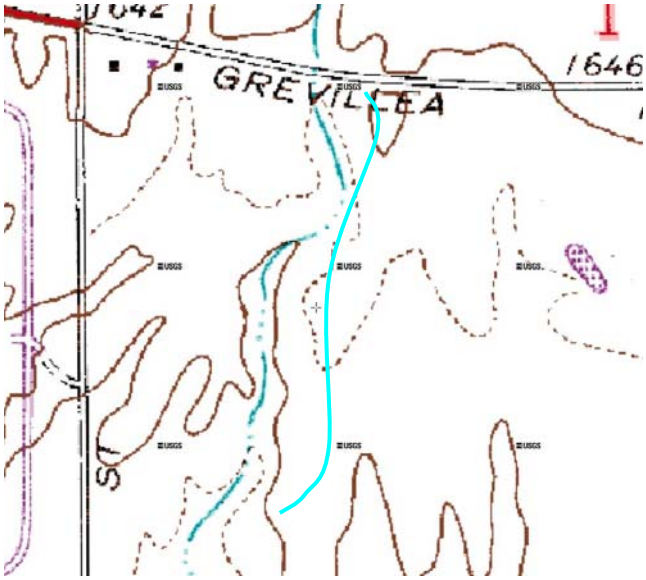
Contributing watershed size: 24,888 acres
Area (assume 50' width): 10.2 acres
Template: Incised template
Total functional lift: 0.66



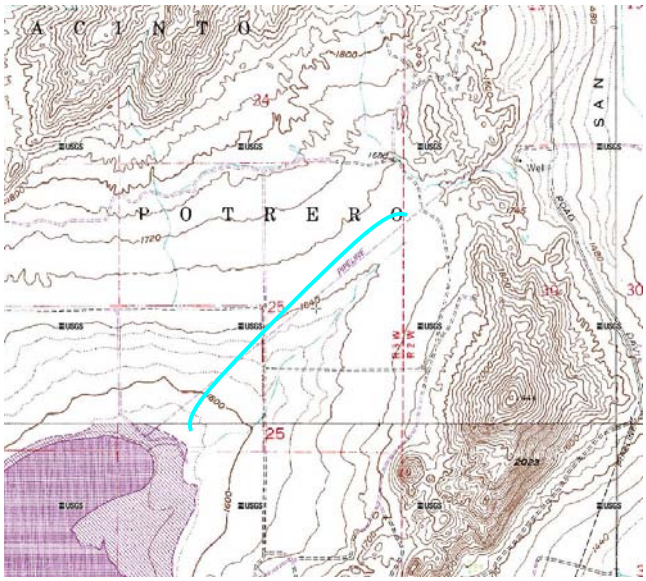
Restoration for Water Quality-San Jacinto River Watershed

Name: FS-3, Unnamed tributary
Length: 2,800 feet
Geomorphic zone: Valley Fill
Level of effort: Light earthwork

Contributing watershed size: 409 acres
Area (assume 25' width): 1.6 acres
Template: Constrained template
Total functional lift: 0.28



Restoration within Open Space-San Jacinto River Watershed

Name: PELA-3, Unnamed triburary
Length: 6,700 feet
Geomorphic zone: Valley Fill
Level of effort: Light earthwork

Contributing watershed size: 1,715 acres
Area (assume 50' width): 7.7 acres
Template: Natural template
Total functional lift: 0.39