# APPENDIX J

## Strategy Selection

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# APPENDIX J. STRATEGY SELECTION

Jurisdictional strategies were selected based on their ability to (a) effectively and efficiently eliminate non-storm water discharges to the municipal separate storm sewer system (MS4), (b) reduce pollutants in storm water discharges in the MS4 to the maximum extent practicable (MEP), and (c) achieve the interim and final numeric goals. Efficiency in pollutant reduction is based on identifying the known and suspected areas and sources likely contributing to the highest priority water quality condition and then targeting those sources. To assist in the geographical identification of sources, watershed modeling and geographical information system (GIS) tools were used to estimate the relative bacteria loading within the San Dieguito WMA, land ownership and availability of public land for implementation, and physical watershed characteristics (such as slope and soil types) for selection of best management practices (BMPs).

The MS4 Permit requires identifying known and suspected areas and sources that cause or contribute to the highest priority water quality condition within the following Responsible Agency inventories: MS4 outfalls, priority development projects, construction sites, and existing developments. Results of the analysis of relative wet and dry weather bacteria pollutant loadings may be used to meet this permit requirement by strategically focusing nonstructural programs and activities in these areas. The pollutant loading was also combined with other factors to determine potential locations for structural BMP implementation.

## J.1 Bacteria Source Prioritization

To identify potential geographic areas where bacteria-generating activities are contributing to watershed pollutant loads, subwatersheds delineated in recent modeling were prioritized, based on the modeled bacteria loading results. The model estimated the bacteria loading, based on physical watershed characteristics (e.g. slope, soil types, and precipitation zones) and land-use-based runoff parameters, and was calibrated to measured receiving water results. The model used best available data at the time the model was created. The prioritization estimates the relative bacteria loading; as more data are gathered through implementation of the San Dieguito River WMA Water Quality Improvement Plan, the prioritized areas may change.

All modeled bacteria results were averaged for both wet weather and dry weather, and then quintiles were established for each subwatershed and assigned to each pollutant. The individual quintile scores (1–5) for *Enterococcus*, fecal coliform, and total coliform were averaged to create a dry composite bacteria score and a wet composite bacteria score (Table J-1). A score of “5” indicates a subwatershed pollutant loading in the top 20$^{th}$ percentile (high pollutant loading), whereas a score of “1” indicates a subwatershed loading in the bottom 20$^{th}$ percentile (low pollutant loading). The dry and wet composite scores are shown in Figure J-1 and Figure J-2, respectively.

**Table J-1**
**Water Quality Prioritization**

| TMDL Pollutant | Dry Composite Score (1–5)* | Wet Composite Score (1–5)* | Composite Water Quality Score |
|---|---|---|---|
| Bacteria, Sediment | Bacteria $_{dry}$** | Bacteria $_{wet}$** | Dry Composite Score + Wet Composite Score |

Note:
* The 1–5 score represents the area loading's quintile, as determined by the modeling results. A score of "5" indicates that the area loading was in the top 20 percentile, whereas a score of "1" indicates an area loading in the bottom 20 percentile. Quintiles were established for each watershed.
**Bacteria$_{dry/wet}$ is the average of the dry *Enterococci*, fecal coliform, and total coliform scores.
TMDL = total maximum daily load

In Figure J-1, areas that are expected to contribute the highest bacteria loading (and are therefore suspected to have more bacteria sources) are shaded darker; areas that are less likely to contribute to bacteria loads are lightly shaded. Subwatersheds with more development (the western part of the watershed) are expected to contribute more bacteria than less-developed open spaces. The model simulates bacteria loading based on land use. Sources identified in Section 3 of the Water Quality Improvement Plan are generally associated with land use types, but are not explicitly represented in this prioritization. For example, sources such as the episodic sanitary sewer overflows are not explicitly included in the model, however residential areas or areas with general development do have a higher bacteria load associated than undeveloped areas. This prioritization is meant as a guideline for identification of geographic areas within which to investigate sources. Each Responsible Agency may have additional information to inform its jurisdictional strategies.

Further analysis to determine the site suitability for structural strategies is discussed in Section J.2.

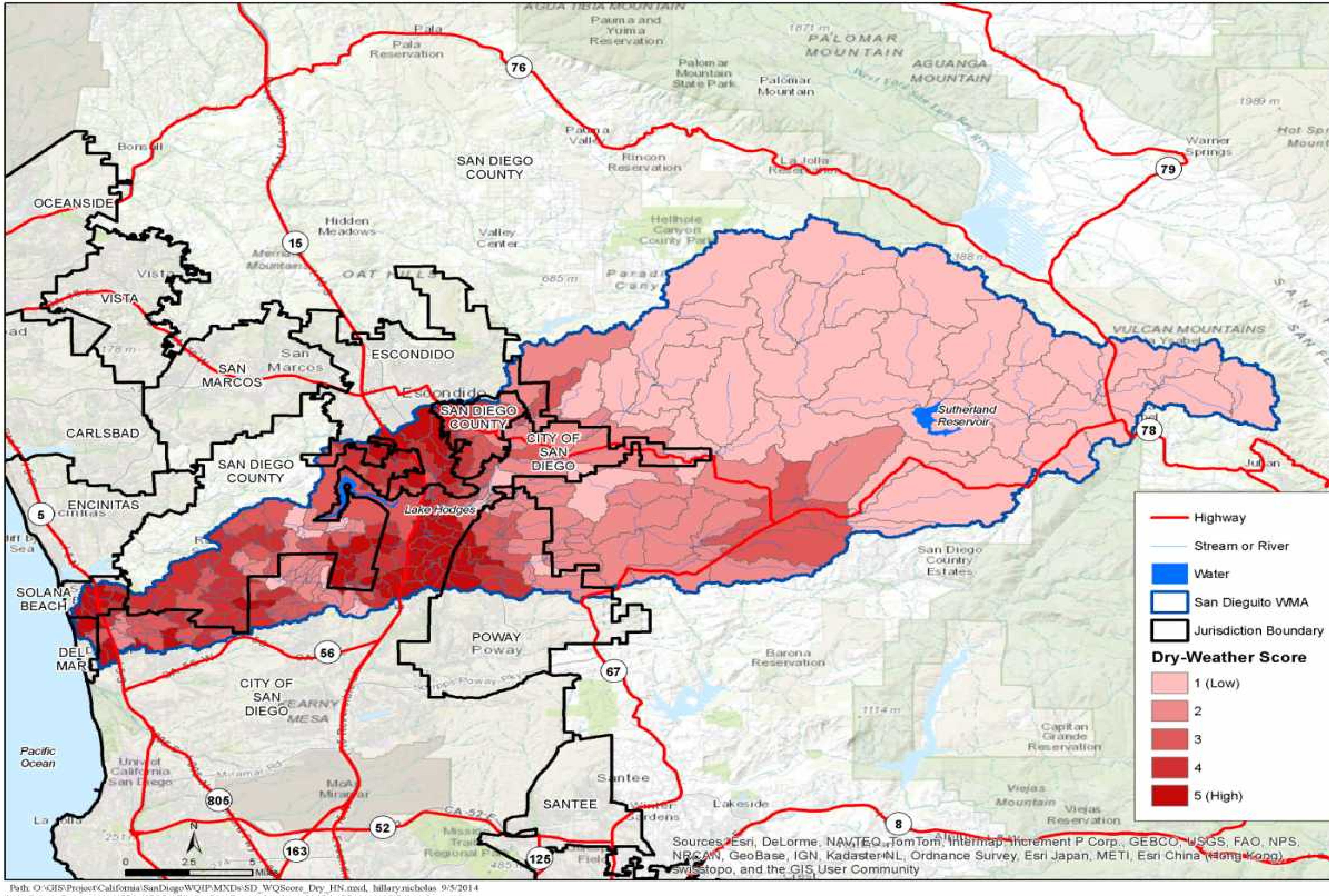


**Figure J-1**
**Water Quality Composite Scores for Dry-Weather Bacteria**

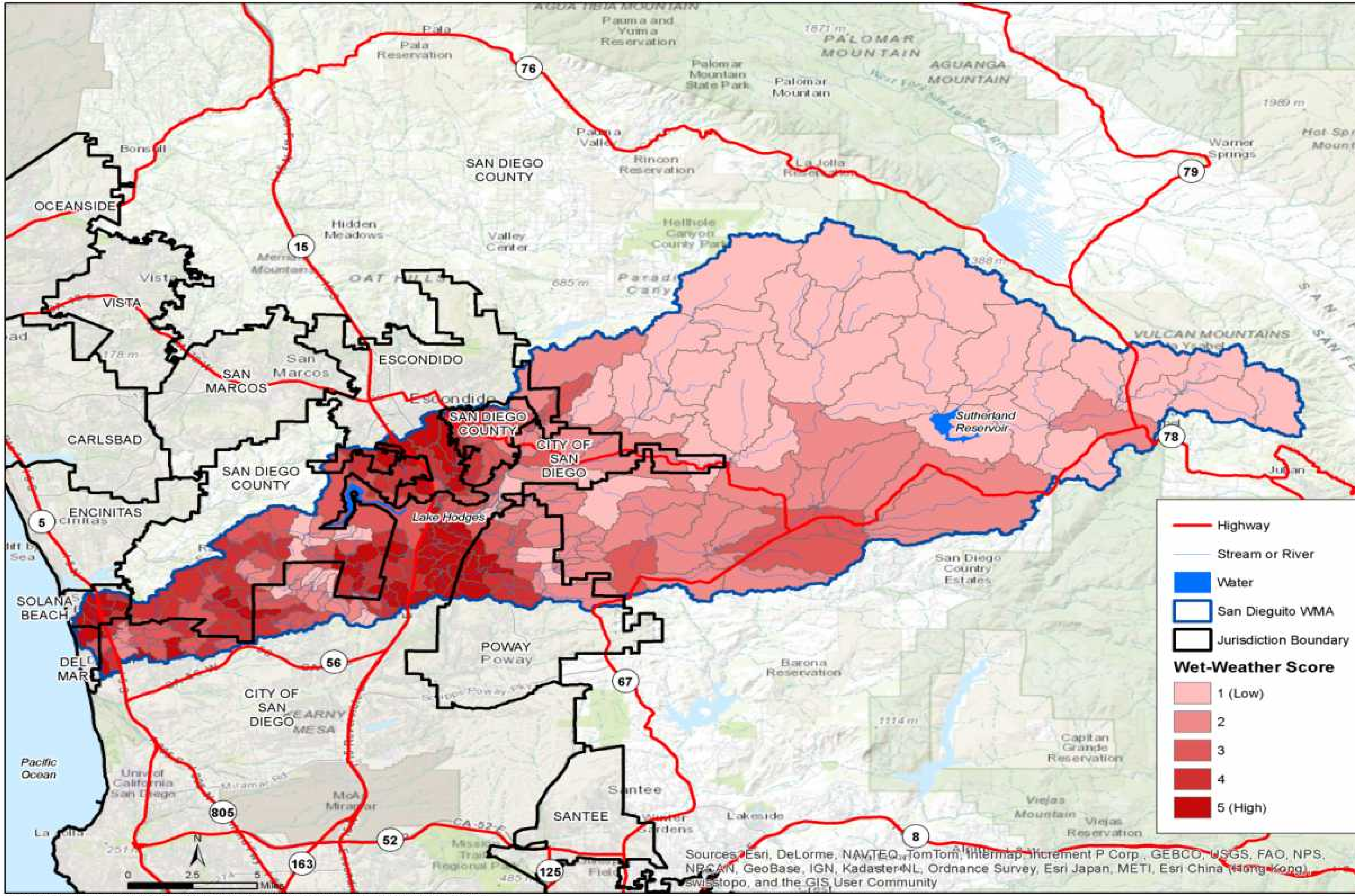


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**Figure J-2**
**Water Quality Composite Scores for Wet-Weather Bacteria**

## J.2 Structural Strategy Site Identification

To identify suitable sites, structural strategies were developed using information regarding each Responsible Agency's existing, proposed, or planned structural BMPs that could contribute to future load reduction. Potential sites for construction of additional structural BMPs were also screened and prioritized, using the processes outlined below. This site identification process was completed for potential green infrastructure and multiuse treatment areas. Site suitability was not evaluated for water quality improvement BMPs because they were not the preferred structural solution for addressing wet weather flows at a watershed scale (i.e. water quality improvement BMPs do not tend to provide multiuse benefits to the community and typically treat smaller areas during wet weather flows than multiuse treatment areas and green infrastructure). Site selection was conducted in two phases, primary screening then prioritization.

### J.2.1 Primary Screening

The primary screening process identified parcels potentially suitable for BMP implementation for both green infrastructure and multiuse treatment area BMPs. The primary screening process began with preliminary screening based on two parameters:

- ***Parcel Ownership and Zoning and Land Use:*** Land costs generally can be minimized by using existing public lands; therefore, all privately owned parcels were eliminated as potential BMP sites. All classifications of zoning and land use, and all indications of public ownership for public parcels were considered.
- ***Slope:*** Parcels with a slope greater than 15 percent were not considered for BMP opportunities. The screening was expanded to include areas in and around canyons for multiuse treatment area BMPs in order to maximize the potential treatment from canyon areas.

The results of the primary screening process provided a base list of parcels potentially suitable for BMP implementation. To further determine the suitability of each parcel, the base list of parcels was prioritized separately for green infrastructure and multiuse treatment areas, as described in the subsequent sections.

### J.2.2 Green Infrastructure Prioritization Process

A geographic information system (GIS) was used to rank parcels by their relative suitability. To determine the optimal suitability, various criteria (such as pollutant loadings of the drainage areas) were considered, along with site parameters (such as soil infiltration rates). The characteristics used are presented below and the respective ranking criteria are listed in Table J-2. The results of the screening and prioritization process are shown in Figure J-3, in which areas that are most suitable for green infrastructure have the lightest green shading and areas that are least suitable have the darkest green shading.

- **Pollutant Loading:** Parcels where estimated pollutant loadings are greatest were given a higher priority. Land-based pollutant loadings were obtained from the CLRP Task 2 Pollutant Source Characterization modeling results. Pollutant loading percentiles were determined on a watershed basis, and represent the average pollutant loading scores. A composite wet- and dry-weather areal loading score was developed for each applicable TMDL pollutant in each watershed.
- **Parcel Zoning and Ownership:** Land costs generally are minimized by using existing public lands; therefore, a higher priority was placed on publicly-owned parcels.
- **Hydrologic Soil Groups:** The mapped hydrologic soils groups were used as an initial estimate of the infiltration rate and storage capacity of the soils. Sites where mapped hydrologic soils groups have infiltration rates suitable for infiltration BMPs received higher priority.
- **Wells, Water Supplies, and Contaminated Sites:** Areas near contaminated sites received lower priority because of their potential for increased costs and complications during implementation.
- **Environmentally Sensitive Areas:** Areas where runoff can be treated before draining to an ESA were given a higher priority.
- **Total Impervious Area:** Parcels with a larger total impervious area typically generate more runoff and greater pollutant loads, and so were given a higher priority. Where impervious data were not available, the impervious area was estimated using aerial imagery.
- **Percent Impervious:** Parcels with a higher percentage of impervious area also typically produce more runoff, and so were targeted on the basis of their greater potential to reduce volume and improve water quality.
- **Proximity to Existing BMPs:** To distribute treatment opportunities effectively throughout the watershed, areas close to existing or planned future BMPs were given a lower priority.
- **Proximity to Parks and Schools**: Areas closest to parks and schools were given a higher priority, in part to provide a greater opportunity for public outreach and education.
- **Proximity to the Storm Drainage Network:** Areas close to the storm drain network were given a higher priority. Green infrastructure BMPs on poorly draining soils require underdrain systems that tap into existing infrastructure, and siting these near the storm drain network can minimize cost.

**Table J-2**
**Prioritization Criteria for Potential Green Infrastructure BMP Sites**

| Criterion | Score (1 = Worst; 5 = Best) | | | | |
|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 |
| Wet weather areal pollutant loading (Table G-1) | <20th percentile | 20–40th percentile | 40–60th percentile | 60–80th percentile | >80th percentile |
| Dry weather areal pollutant loading (Table G-1) | <20th percentile | 40-20th percentile | 60-40th percentile | 80-60th percentile | >80th percentile |
| Parcel zoning, land use, and ownership | — | — | — | Other-owned public parcels (schools and universities, state and federal facilities, utilities, etc.) were given a priority score of 8. | City- or county-owned public parcels and rights-of-way were given a priority score of 10. |
| Hydrologic soil group (HSG) | D | | C | — | A, B |
| Proximity to wells, water supplies, and contaminated soils (feet) | < 100 | — | > 100 | — | — |
| Proximity to environmentally sensitive area (ESA) (optional) | — | — | — | Drains to | Adjacent to |
| Impervious area (acres) | — | > 0.1 | > 0.25 | > 0.5 | > 1 |
| % imperviousness | < 50 | — | — | 80–90 | 60–80 |
| Proximity of existing or proposed BMP site (miles) | < 2 | 2–3 | 3–4 | 4–5 | > 5 |
| Proximity to park or school (feet) | > 1,000 | | < 1,000 | — | — |
| Proximity to storm drainage network (feet) | > 300 | < 300 | < 100 | — | — |

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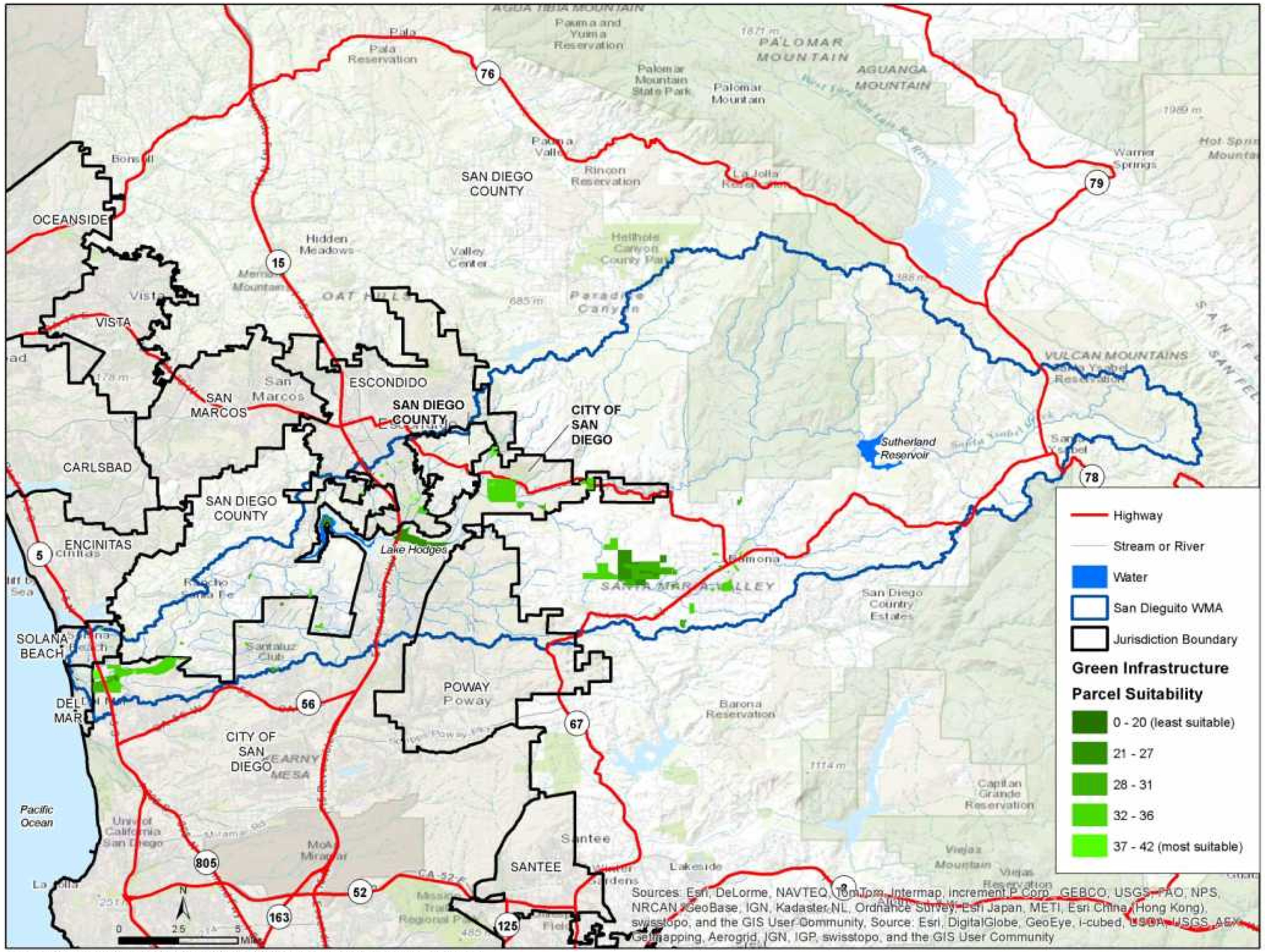


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**Figure J-3**
**Green Infrastructure Parcel Suitability**

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### J.2.3 Multiuse Treatment Area Prioritization Process

Following the primary screening process, potential sites for multiuse treatment areas were evaluated and prioritized on the basis of (a) site characteristics that can affect BMP design or construction and (b) potential multiuse features, as presented in Table J-3. As with the primary screening, criteria were ranked with scores from 1 to 5, with “1” indicating low suitability and “5” indicating ideal conditions. Then the validity of the site was assessed, based on a review of aerial photography, to verify that the site visually meet the requirements of Table J-3. Next, potential multiuse treatment areas were subjected to a more detailed evaluation and site investigation. Implementation requirements were developed and assessed for each of these sites (including land acquisition requirements, permitting challenges, construction considerations, and preliminary cost estimates) and each site was ranked for implementation feasibility. Fact sheets summarizing each potential site were developed to guide future implementation.

The candidate multiuse treatment area BMP opportunities are denoted in Figure J-4.

**Table J-3**
**Prioritization Criteria for Multiuse Treatment Area BMP Implementation**

| Criterion | Score (1 = Worst; 5 = Best) | | | | |
|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 |
| Parcel type | — | — | — | Other-owned public parcels (schools/ universities, state and federal facilities, utilities, etc.) were assigned a priority score of 8. | City- or county-owned public parcels were assigned a priority score of 10. |
| Hydrologic soil group (HSG) | D | — | C | — | A, B |
| Proximity to wells and water supplies, and contaminated soils (feet) | < 100 | — | > 100 | — | — |
| Proximity to environmentally sensitive area (ESA) | — | — | — | Drains to | Adjacent to |
| % imperviousness | > 40% | — | — | 30%–40% | ≤ 30% |
| Parcel size (acres) | < 1 | 1–100 | 100–150 | 150–200 | ≥ 200 |
| Proximity to existing or proposed best management practice (BMP) site (miles) | < 2 | 2–3 | 3–4 | 4–5 | > 5 |
| Proximity to park or school (feet) | > 1,000 | — | < 1,000 | School | Park |
| Proximity to storm drainage network (feet) | > 300 | < 300 | < 100 | — | — |
| Contributing area (acres) | < 50 | > 50 | > 100 | > 150 | > 250 |
| % imperviousness of contributing area | < 40 | > 40 | > 50 | > 60 | > 70 |
| Proximity to corrugated metal pipe (CMP) systems (only in City of San Diego jurisdiction) | CMP requiring no action | — | CMP needing rehabilitation | — | CMP needing replacement |

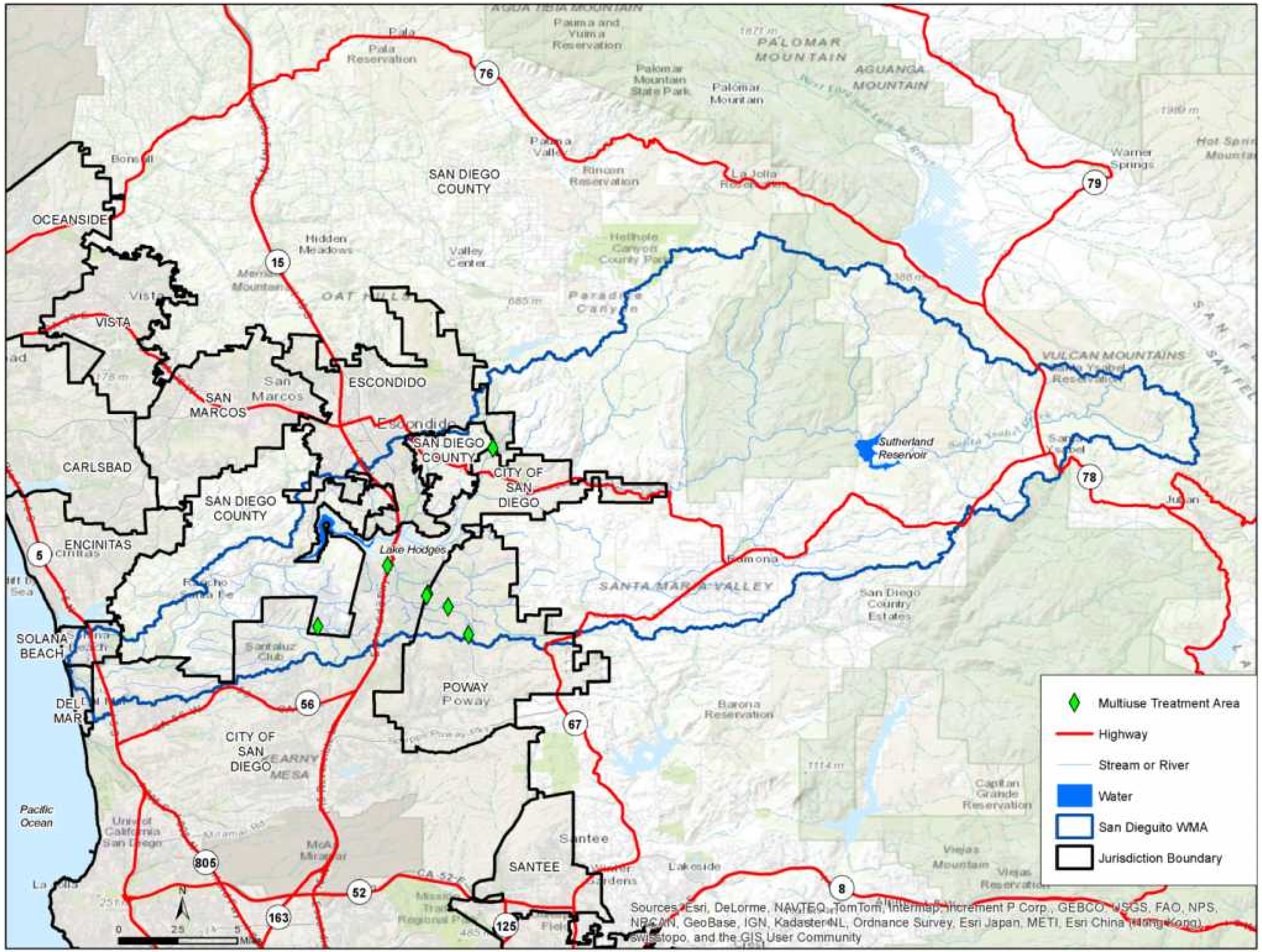


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**Figure J-4**
**Potential Sites for Multiuse Treatment Areas**

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