



## Appendix B

### Aquatic Habitat Target Methodologies

This appendix provides a more detailed description of how the aquatic habitat targets were determined.

To the extent possible, all aquatic habitat targets were calculated in a transparent manner using quantitative data sources. Inevitably, there are limitations in the data used to calculate these targets; some of these limitations are described below. Two specific examples where future work could dramatically improve the data sources are (1) the historical extent of aquatic habitats, and (2) the National Wetland Inventory of current aquatic habitat extent. As better data become available, the habitat targets could easily be updated to reflect these data by applying the methods described here.

#### **Databases used**

Three main databases were used as the foundation for calculating aquatic habitat targets. These databases are described in the following sections.

#### **California Protected Area Database**

The California Protected Area Database (CPAD) is a mostly parcel-based data set that tracks all known parks and open space lands in the state. Land ownership categories in the CPAD include city, county, state, federal, special district, and non-profit. We used CPAD Release 1.7, from September 2011). More detailed metadata about the CPAD is available at <http://www.calands.org/data.php>.

CPAD may not accurately reflect private ownership. For example, CPAD does not include the majority of lands owned by agencies such as the Los Angeles County Flood Control District for the primary purpose of flood control. It would be possible to obtain a more accurate estimate of private ownership by searching ownership on a parcel-by-parcel basis; however, an effort such as this was beyond the scope of this project. To the extent that the CPAD database includes public lands, the targets for protection will be too high.

#### **National Wetlands Inventory**

Current aquatic habitat extent was determined using the National Wetlands Inventory (NWI), September 2011 release, from the USFWS. Metadata for the NWI database are available at [http://www.fws.gov/aquatic\\_habitats/Data/metadata.html](http://www.fws.gov/aquatic_habitats/Data/metadata.html). The NWI



database reports aquatic habitat extent in acres. Although the NWI database represents the best date for aquatic habitat extent in the region, it has definite limitations. NWI data are not precise; detailed mapping would require on-the-ground mapping using a Global Positioning System (GPS). Not all aquatic habitats are included in normal NWI mapping. NWI maps include aquatic habitats that can be identified by experienced photointerpreters from aerial photographs, but may not include some ephemeral aquatic habitats or other habitats that are not visually distinct from non-aquatic habitats. Some of the areas in the GLAC region have been mapped using an enhanced NWI methodology. Ideally, the enhanced NWI methodology would be applied for all areas in the region, but these data were not available when the present targets were calculated.

NWI categorizes aquatic habitats according to the Cowardin aquatic habitats classification scheme. The classification scheme is shown in Figure 1. Note that NWI uses two high-level classifications that include marine and estuarine habitats: Estuarine and Marine Deepwater, and Estuarine and Marine Aquatic habitat. For tidal aquatic habitats, we included all estuarine habitats, both subtidal and intertidal, which cut across both of the high-level classifications. There may be some aquatic habitat types included in estuarine habitats that would not typically be considered tidal aquatic habitats, but these would be very minor in this region.

### **Rairdan (1998)**

The calculation of aquatic habitat losses requires a data source with consistent data for current and historical aquatic habitat extent for the region. There are no available data for the entire region, but Rairdan (1998) presented data for all subregions except North Santa Monica Bay (NSMB). For the other four regions, losses were calculated using data layers provided by Rairdan (U.S. Army Corps of Engineers, Sacramento, CA). The historical extent was based on maps and other sources from circa 1870; current extent was in 1986. To calculate loss, the two layers for each subregion were overlaid to show the difference between the current extent and historical extent. This allowed the identification of areas that historically supported aquatic habitats but no longer do, areas that historically supported aquatic habitats and still do, and areas that did not historically support aquatic habitats but currently do.

Rairdan's riverine data are presented as miles instead of acres. Arguably, miles better represent the extent of linear features such as rivers and streams, especially because the lateral extent of these systems can vary considerably from year to year and can be difficult to discern from maps. However, in order to maintain consistency with NWI data, riverine extent was converted to acres. To make this conversion, a current aquatic habitat extent from the Rairdan data (presented in miles) and the NWI data (presented in



acres) was compared. The ratio of miles to acres between these two data sources was as a conversion factor Rairdan's historical data.

Although Rairdan's data provide a valuable resource for calculating habitat targets, there are limitations in the data. Rairdan could only include data for aquatic habitats that were reliably mapped. Vernal pools, for example, are important in the region but not well mapped. Rairdan (1998) indicated general locations of notable vernal pool complexes but could not provide quantitative estimates of their extent.

Perhaps more importantly, Rairdan completed his analysis nearly 15 years ago and more modern, detailed historical ecology analyses can be completed today. There have been some recent historical ecology studies done in the region (e.g., Stein et al. 2007 for the San Gabriel River watershed; Dark et al. 2011 for the Ballona Creek watershed). Although these provide much more detailed information for their particular study areas, that level of detail is not available for the entire region, or even an entire subregion, and so they cannot be used to establish targets.

There are also more detailed data available for the current extent of aquatic habitats (i.e., the most recent NWI maps). However, the current NWI maps were not used in the estimate of aquatic habitat losses because the methods used to generate these maps differed from the methods used by Rairdan. For consistency, we used Rairdan's data for both historical and current (1986) aquatic habitat extent.

The use of Rairdan's data for establishing habitat targets needs to be viewed in the context of its use. The calculation of habitat targets does not require detailed information about the extent and location of historical and current aquatic habitats, just a reasonable estimate of the loss of different aquatic habitat types. Rairdan's data provide a reasonable estimate of loss, as well as being the only estimate currently available for most of the region. If future studies provide more detailed estimates of loss for the entire region, the targets can be adjusted appropriately. Additionally, it should be noted that while the total acreage of historical aquatic habitats was used to establish targets, the locations of historical aquatic habitats are shown merely for informational purposes, and are not intended to mandate where restoration/creation targets should be achieved.

### **Protection**

The target for protection of existing aquatic habitat was calculated as 20 percent of the privately held aquatic habitats.



The target is based on privately held aquatic habitats because it was assumed that aquatic habitats already in public or non-profit ownership are protected from destruction or degradation. This might not always be the case, but there is no database available to categorize the level of protection for each aquatic habitat in the region. We used the CPAD to determine ownership.

Current aquatic habitat extent was determined using the National Wetlands Inventory (NWI).

To calculate the extent of existing aquatic habitats in private ownership, the NWI and CPAD data layers were intersected in each of the five subregions. Any lands not in CPAD (that is, not city, county, state, federal, special district, or non-profit) were assumed to be private. Thus, the basis for the calculation of protection targets is acres of each aquatic habitat type in private ownership.

### **Enhancement**

The target for the enhancement of existing aquatic habitat was calculated as 25 percent of the existing aquatic habitat area.

The enhancement target was based on the current extent of existing aquatic habitats in each region. Current extent, in acres, was provided by the NWI database. For the enhancement targets, we did not consider ownership since enhancement could be appropriate in privately or publicly owned aquatic habitats. In addition, actual enhancement projects would only focus on degraded aquatic habitats, but there is no regional database that characterizes the condition of all the aquatic habitats in the region. It is believed, however, that many aquatic habitats are moderately to severely degraded in the region, so there is no doubt much more than 25 percent of the existing aquatic habitats could benefit from enhancement projects. Because the NWI database includes a large acreage of “lakes,” many if not all of which are man-made, we did not include lakes when calculating the enhancement target.

Adjustments to the aquatic habitat extent data had to be made for USGRH and ULAR subregions because the NWI mapping did not cover the entire subregions. (Note: these adjustments were not made for the Protection targets because the adjustments were based on Angeles National Forest land, which is publically owned.)

For the USGRH subregion, 172,405 acres (96% of the Angeles National Forest area in the subregion) was mapped and 6,408 acres (4%) was not mapped. All of the subregion that was not mapped was in the mountains of the Angeles National Forest. The extent



of aquatic habitats missed in the unmapped area was estimated by calculating the fraction of the mapped area that was covered by aquatic habitats. There were 3,398 acres of freshwater aquatic habitats in the mapped area, indicating approximately 126 acres in the unmapped area. The 126 acres was added to the freshwater aquatic habitat extent in the subregion to get an adjusted total extent of freshwater aquatic habitats. There were 2,940 acres of riverine aquatic habitats in the mapped area, indicating approximately 109 acres in the unmapped area. The 109 acres was added to the riverine aquatic habitat extent in the subregion to get an adjusted total extent of freshwater aquatic habitats.

The adjustment for the ULAR subregion followed the same procedure, with the complication that not all of the unmapped area was mountains in the Angeles National Forest. Although we could apply the same procedure for the Angeles National Forest area, there were additional “flatlands” for which aquatic habitat extent could not be estimated. Comparing the ULAR and USGRH maps, it is apparent that the vast majority of the aquatic habitats are in the mountainous regions, but there are some aquatic habitats of both types (freshwater and riverine) in the flatlands. In addition, there are some mountainous areas (e.g., the hills north of Burbank and hills around the western and southern borders of the subregion) that are not part of the Angeles National Forest. Thus, our calculation of additional aquatic habitats underestimates the true extent of aquatic habitats in the unmapped area of the subregion. To account for this underestimate, we added 20% to the calculation based on the Angeles National Forest unmapped area. Finally, we applied the fraction of mapped area covered by aquatic habitats from the USGRH subregion because it was based on a much larger mapped area (172,405 acres compared to 8,883 acres). This procedure resulted in estimates of an additional 2,628 acres of freshwater aquatic habitat and 2,274 acres of riverine aquatic habitat for the ULAR.

### **Restoration or Creation**

The goal of aquatic habitat restoration or creation in the region is to increase the extent of functioning aquatic habitats to partially compensate for the losses that have occurred in the past. Thus, the restoration/creation targets are based on the extent of aquatic habitat losses. Two kinds of losses are considered: (1) aquatic habitats that were destroyed and replaced by non-aquatic habitat, and (2) aquatic habitats that were converted from natural aquatic habitat to man-made aquatic habitat, such as a flood control basin or a concrete lined channel. The target for the restoration or creation of aquatic habitat was calculated as 10 percent of lost aquatic habitat plus 10 percent of



converted habitats. Creation would occur in historical aquatic habitat areas that have been destroyed, while restoration would occur in the converted aquatic habitat areas.

The loss of aquatic habitats was calculated using data from Rairdan (1998). Figures 6 and 7 of the main report show the historical and current extent of aquatic habitats for the entire region except NSMB where historical information is not available. Several regional trends are apparent. Some of the greatest losses occurred in the Upper Los Angeles River and Upper San Gabriel and Rio Hondo Rivers subregions, where extensive dry washes have been eliminated. There were also substantial losses of tidal aquatic habitats in the Lower San Gabriel and Los Angeles Rivers and the South Santa Monica Bay subregions. The South Bay subregion also lost a large area of depressional marsh/ephemeral lake. Note that there is no image for the North Santa Monica Bay subregion as the data for comparing historical to current extent are not available. A discussion on how the analyses and targets were set for this subregion can be found later in this section.

We used Rairdan's data to calculate the extent of natural aquatic habitats converted to man-made aquatic habitats. For tidal marsh, the converted aquatic habitat calculation was based on the current extent of harbors and marinas. For freshwater aquatic habitats, the converted aquatic habitat calculation was based on the current extent of flood control basins and spreading grounds. Two man-made aquatic habitat types, constructed lake/pond and reservoir/recreational lake, were not included in the calculation of converted freshwater aquatic habitats because they likely represent the construction of new aquatic habitat types rather than a conversion of natural aquatic habitats. For riverine aquatic habitats, the converted aquatic habitat calculation was based on concrete-lined channels and soft-bottom channels.

Although the aquatic habitat restoration/creation targets were generally calculated as 10 percent of the lost aquatic habitat plus 10 percent of converted habitats, there are a few exceptions. On principle, the acreage was adjusted to include known large restoration projects in the late stages of planning since setting a target below current plans for the subregion did not seem useful. For example, in the South Bay, the calculated tidal marsh target was 389 acres. However, the Ballona Aquatic habitats restoration will be approximately 400 acres (the actual acreage of the project is not yet determined), so the South Bay target was set at 400 acres. The Lower San Gabriel and Los Angeles Rivers tidal aquatic habitat target was calculated as 332 acres. A restoration project is being planned for the Los Cerritos aquatic habitat, which may match the size of the subregion's restoration target acreage. However, at this time, the project's plans are still in the early stages and there is not enough information available to quantify the





project's full extent. Due to this uncertainty, the subregion's target was not adjusted to include the project.

As noted previously, Rairdan's data did not cover the NSMB subregion, so a different approach was used to calculate aquatic habitat restoration/creation targets. We describe the approaches below:

- For **tidal marsh**, the target was set at 25 acres based on the planned Malibu Lagoon restoration and other possible lagoon restoration projects, including the tidal aquatic habitat at Topanga.
- For **freshwater aquatic habitats**, a quantitative analysis is difficult because there are no data on the loss of freshwater aquatic habitats in the subregion. The NWI data indicate there currently are 1,152 acres of freshwater aquatic habitats in the subregion (excluding lakes). Although there have been no studies of impacts to freshwater aquatic habitats in the region, Lilien (2001) conducted a comprehensive analysis of impacts to riverine aquatic habitats in Malibu Creek watershed. It is reasonable to assume the same proportional loss of riverine and freshwater aquatic habitats since they are mainly impacted by the same types of activities; freshwater aquatic habitats may be slightly more likely to be impacted because they are flat areas and not located in the active stream channel, but they are not channelized, which was the dominant impact to riverine aquatic habitats. If we assume the loss of freshwater aquatic habitats has been equivalent to riverine aquatic habitats, with the riverine losses determined as described below based on Lilien (2001), then we assume a loss of 25% of the original freshwater aquatic habitats. Thus, we estimate there was originally 1,536 acres of freshwater aquatic habitats, with a loss of 384 acres. Therefore, the freshwater aquatic habitat restoration/creation target was calculated as 10% of 384 acres, or 38 acres. We did not adjust this estimate for converted habitats because Lilien included these conversions in his analysis.
- For **riverine aquatic habitats**, there was little quantitative information on which to base the target, particularly because riverine aquatic habitats are so extensive in the subregion. The most detailed study of impacts to riverine aquatic habitats in the region is Lilien (2001), which provides a comprehensive assessment of impacts to riverine habitats in the Malibu Creek watershed. Lilien documented over 200 projects undertaken in the Malibu Creek watershed that impacted 54 km of riparian habitat, approximately 50% of the total length of the catchment's major tributaries. Many of the documented impacts did not destroy the affected habitat, however, since they included activities such as vegetation clearing. However, 14



channelization projects accounted for over 13 km of impacts. Other substantial impacts were caused by recreation facilities including golf course, lakes, and reservoirs, transportation projects, bank stabilization projects, and residential and commercial development. The substantial impacts documented by Lilien comprised 26.3 km of impacts, or approximately 25% of the major tributaries in the watershed. As Lilien notes, this is likely an underestimate because of limitations in the data he had available for his analysis. According to the NWI database, there are currently 590 acres of riverine habitat in the North Santa Monica Bay subregion. If we assume that habitat impacts for the Malibu Creek watershed are representative of the entire subregion, then the existing riverine habitat is 75% of the original riverine habitat in the subregion. The assumption that 25% of all existing habitat was lost may be high, since there is more development in the Malibu Creek watershed than in most other areas in the subregion. On the other hand, Lilien identifies a number of reasons why his analysis underestimates impacts, including the fact that early impacts were not documented and he only recorded impacts along the main tributaries, whereas most of the impacts have occurred along the smaller tributaries. The impact to smaller tributaries likely overwhelms the other factors, but we have no quantitative estimate of their extent. Thus, 25% seems like the best estimate we have at the moment. Therefore, we estimate that there were originally 787 acres of riverine habitat, and 197 acres have been lost. The target we set at 10% of 197 acres, or 20 acres. We did not adjust this estimate for converted habitats because Lilien included these conversions in his analysis.





Figure 1. Classification scheme used in the National Wetlands Inventory.

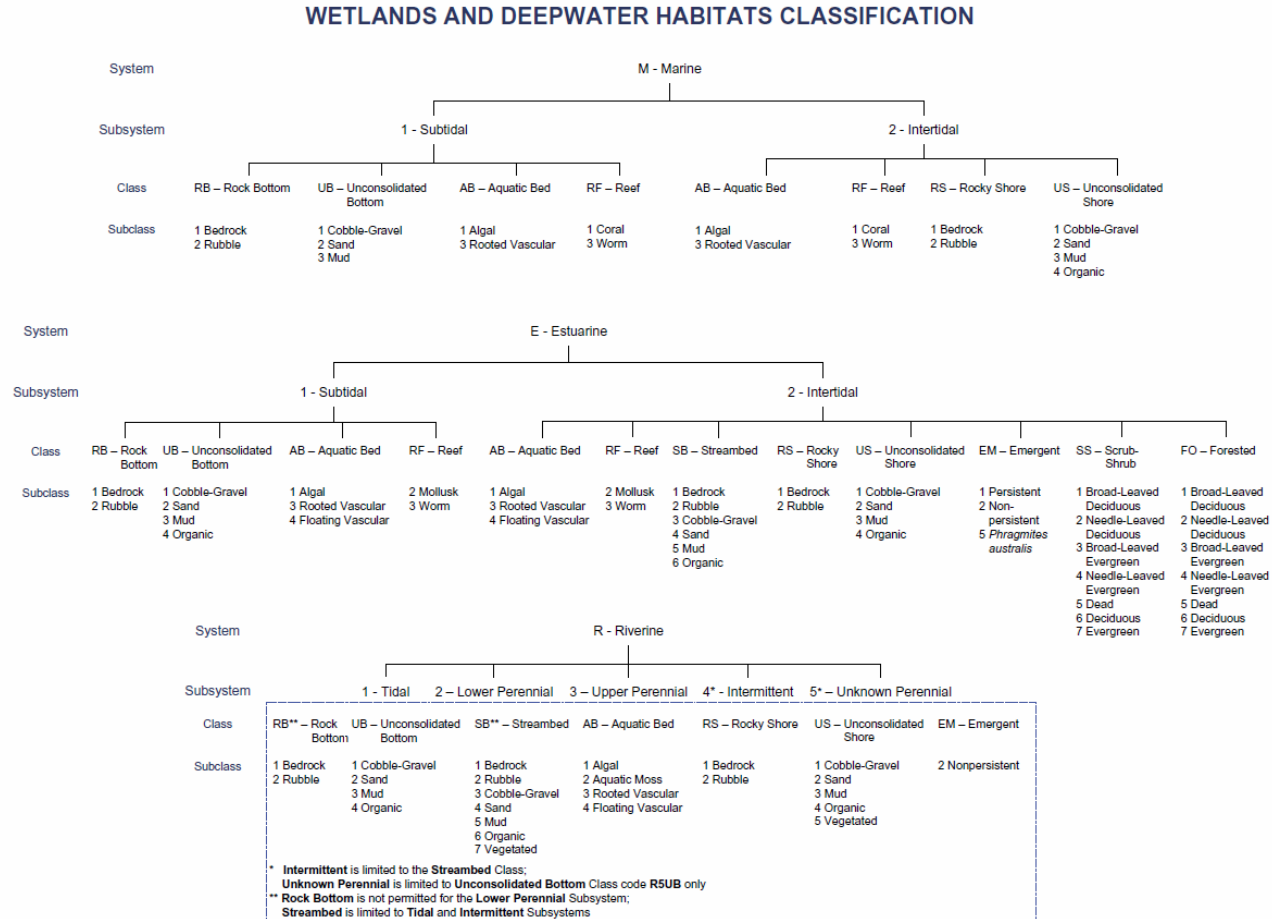




Table 1. Values used for the calculation of aquatic habitat targets for the North Santa Monica Bay subregion.

Target for Protection or Preservation:	Current Extent of Privately Held Areas	Calculated Target	Target	Basis		
Tidal Wetland (acres)	2	0	0	20% of privately held habitat, NWI and GPAD data		
Freshwater Wetland (acres)	840	168	168	20% of privately held habitat		
Riverine (acres)	262	52	52	20% of privately held habitat.		
Targets for Enhancement		Calculated Target	Target	Basis		
Tidal Wetland (acres)	38	9	9	25% of existing habitat, NWI data		
Freshwater Wetland (acres)	1152	288	288	25% of existing freshwater wetlands minus lakes, NWI data		
Riparian (riverine)(acres)	590	147	147	25% of existing riverine habitat.		
Targets for Restoration or Creation	Loss	Calculated Target	Previously Converted Wetland	Calculated Target based on Converted Wetland	Target	Basis
Tidal Wetland (acres)	0	0			25	General target is 10% of lost tidal marsh, but in the absence of this information the target is based on the planned Malibu Lagoon restoration and other possible lagoon restoration projects
Freshwater Wetland (acres)	384	38	0	0	38	General target is 10% of depressionnal wetland and ephemeral lake and pond (data do not include historical extent of vernal pools), but in the absence of that information, using an estimate of 384 acres of freshwater wetland habitat lost based on Lilien (2001)'s estimate of riverine wetland loss.
Depressionnal marsh	NA	NA			NA	
Ephemeral lake/pond	NA	NA			NA	
Riparian (riverine)(acres)	197	20	0	0	20	General target is 10% of lost braided, upper and lower riverine and dry wash, but in the absence of that information, using an estimate of 190 acre of riverine habitat lost based on Lilien (2001).
Braided lower riverine (acres)	NA	NA			NA	
Lower riverine (acres)	NA	NA			NA	
Upper riverine (acres)	NA	NA			NA	
Dry wash (acres)	NA	NA			NA	



Table 2. Values used for the calculation of aquatic habitat targets for the Upper Los Angeles River subregion.

Target for Protection or Preservation:	Current Extent of Privately Held Areas	Calculated Target	Target	Basis		
Tidal Wetland (acres)	0	0	0	20% of privately held habitat		
Freshwater Wetland (acres)	569	114	114	20% of privately held habitat		
Riverine (acres)	342	68	68	20% of privately held habitat.		
<b>Targets for Enhancement</b>						
	Current Extent	Calculated Target	Target	Basis		
Tidal Wetland (acres)	0	0	0	25% of existing habitat, NWI data		
Freshwater Wetland (acres)	3262	816	816	25% of existing freshwater wetlands minus lakes, NWI data adjusted to account for the area not mapped		
Riparian (riverine)(acres)	2815	704	704	General target is 25% of existing riverine habitat adjusted to account for the area not mapped		
<b>Targets for Restoration or Creation</b>						
	Loss	Calculated Target	Previously Converted Wetland	Calculated Target based on Converted Wetland	Target	Basis
Tidal Wetland (acres)	0	0	0	0	0	10% of lost tidal marsh
Freshwater Wetland (acres)	15	1	2440	244	245	10% of depressional wetland and ephemeral lake and pond. Note the this does not include historical extent of vernal pools. Plus 10% of previously converted wetland.
Depressional marsh	15	1			1	
Ephemeral lake/pond	0	0			0	
Riparian (riverine)(acres)	7507	751	833	83	834	10% of lost braided, upper and lower riverine and dry wash, plus 10% of previously converted wetland. Used conversion factor to convert from miles to acres for riverine habitats.
Braided lower riverine (acres)	50	5			5	
Lower riverine (acres)	505	50			50	
Upper riverine (acres)	303	30			30	
Dry wash (acres)	6650	665			665	



Table 3. Values used for the calculation of aquatic habitat targets for the Upper San Gabriel and Rio Hondo subregion.

Target for Protection or Preservation:	Current Extent of Privately Held Areas	Calculated Target	Target	Basis		
Tidal Wetland (acres)	0	0	0	20% of privately held habitat		
Freshwater Wetland (acres)	2121	424	424	20% of privately held habitat		
Riverine (acres)	1376	275	275	20% of privately held habitat.		
<b>Targets for Enhancement</b>						
	Current Extent	Calculated Target	Target	Basis		
Tidal Wetland (acres)	0	0	0	25% of existing habitat, NWI data		
Freshwater Wetland (acres)	4981	1245	1245	25% of existing freshwater wetlands minus lakes, NWI data adjusted to account for the Angeles National Forest area not mapped		
Riparian (riverine)(acres)	4716	1179	1179	25% of existing riverine habitat, NWI data adjusted to account for the Angeles National Forest area not mapped		
<b>Targets for Restoration or Creation</b>						
	Loss	Calculated Target	Previously Converted Wetland	Calculated Target based on Converted Wetland	Target	Basis
Tidal Wetland (acres)	0	0	0	0	0	10% of lost tidal marsh
Freshwater Wetland (acres)	17	2	2002	200	202	10% of depressionnal wetland and ephemeral lake and pond. Note the this does not include historical extent of vernal pools. Plus 10% of previously converted wetland.
Depressional marsh	0	0			0	
Ephemeral lake/pond	17	2			2	
Riparian (riverine)(acres)	8080	808	757	76	884	10% of lost braided, upper and lower riverine and dry wash. Plus 10% of previously converted wetland. Used conversion factor to convert from miles to acres.
Braided lower riverine (acres)	3	0			0	
Lower riverine (acres)	414	41			41	
Upper riverine (acres)	139	14			14	
Dry wash (acres)	7525	752			752	



Table 4. Values used for the calculation of aquatic habitat targets for the Lower San Gabriel and Los Angeles River subregion.

Target for Protection or Preservation:	Current Extent of Privately Held Areas	Calculated Target	Target	Basis		
Tidal Wetland (acres)	557	111	111	20% of privately held habitat, NWI and GPAD data		
Freshwater Wetland (acres)	1200	240	240	20% of privately held habitat, NWI and GPAD data		
Riverine (acres)	1686	337	337	20% of privately held habitat, NWI and GPAD data		
Targets for Enhancement		Current Extent	Calculated Target	Target	Basis	
Tidal Wetland (acres)	659	165	165	25% of existing habitat, NWI data		
Freshwater Wetland (acres)	1711	428	428	25% of existing freshwater wetlands minus lakes, NWI data		
Riparian (riverine)(acres)	1901	475	475	25% of existing riverine habitat, NWI data		
Targets for Restoration or Creation	Loss	Calculated Target based on Loss	Previously Converted Wetland	Calculated Target based on Converted Wetland	Target	Basis
Tidal Wetland (acres)	2885	289	439	44	332	10% of lost tidal habitat. Plus 10% of previously converted wetland. (Note: Los Cerritos restoration may be about this area.)
Freshwater Wetland (acres)	357	36	2524	252	288	10% of depressional wetland and ephemeral lake and pond. Note the this does not include historical extent of vernal pools. Plus 10% of previously converted wetland.
Depressional marsh	0	0			0	
Ephemeral lake/pond	357	36			36	
Riparian (riverine)(acres)	2576	258	730	73	331	10% of lost braided, upper and lower riverine and dry wash. Plus 10% of previously converted wetland. Used conversion factor to change miles to acres for riverine habitats.
Braided lower riverine (acres)	156	16			16	
Lower riverine (acres)	638	64			64	
Upper riverine (acres)	80	8			8	
Dry wash (acres)	1703	170			170	



Table 5. Values used for the calculation of aquatic habitat targets for the South Santa Monica Bay subregion.

Preservation:	Privately Held Areas	Target	Target	Basis		
Tidal Wetland (acres)	491	98	98	20% of privately held habitat		
Freshwater Wetland (acres)	309	62	62	20% of privately held habitat		
Riverine (acres)	322	64	64	20% of privately held habitat.		
		<b>Calculated</b>				
<b>Targets for Enhancement</b>	<b>Current Extent</b>	<b>Target</b>	<b>Target</b>	<b>Basis</b>		
Tidal Wetland (acres)	634	158	158	25% of existing habitat, NWI data		
Freshwater Wetland (acres)	1057	264	264	25% of existing freshwater wetlands minus lakes, NWI data		
Riparian (riverine)(acres)	575	144	144	25% of existing riverine habitat.		
		<b>Calculated</b>	<b>Previously Converted Wetland</b>	<b>Calculated Target based on Converted Wetland</b>		
<b>Targets for Restoration or Creation</b>	<b>Loss</b>	<b>Target</b>		<b>Target</b>	<b>Basis</b>	
Tidal Wetland (acres)	3285	328	610	61	400	Target based on Ballona Wetlands restoration plan (approximately 400 ac). 10% of depressional wetland and ephemeral lake and pond. Note the this does not include historical extent of vernal pools. Plus 10% of previously converted wetland.
Freshwater Wetland (acres)	2813	281	0	0	281	10% of lost braided, upper and lower riverine and dry wash. Plus 10% of previously converted wetland. Used conversion factor to convert from miles to acres for riverine habitats and dry wash.
Depressional marsh	1243	124			124	
Ephemeral lake/pond	1571	157			157	
Riparian (riverine)(acres)	1175	118	288	29	146	
Braided lower riverine (acres)	0	0			0	
Lower riverine (acres)	448	45			45	
Upper riverine (acres)	409	41			41	
Dry wash (acres)	318	32			32	