

Field, these species do not occur there. None were observed during the field survey.

American peregrine falcons (*Falco peregrinus anatum*) (endangered under the California and federal ESAs) and bald eagles (*Haliaeetus leucocephalus*) (endangered under the California ESA and threatened under the federal ESA) are seen occasionally flying over the bay, but Crissy Field has no peregrine falcon or bald eagle nesting sites and has low-quality foraging habitats. Neither of these species were observed during the field survey.

The mission blue butterfly (*Icaricia icariodes missionensis*) (endangered under the federal ESA) occurs in the hills of the San Francisco peninsula, and San Bruno elfin butterfly (*Incisalia mossii bayensis*) (endangered under the federal ESA) occurs in the San Bruno Mountains only. No suitable habitat for these butterflies exists at Crissy Field.

The San Francisco dusky-footed woodrat (*Neotoma fuscipes annectens*) (California species of special concern), Bell's sage sparrow (*Amphispiza belli belli*) (California species of special concern), and California horned lizard (*Phrynosoma coronatum frontale*) (California species of special concern) occur in coastal scrub habitats. No coastal scrub habitats exist at Crissy Field, and none of these species were observed during the field surveys.

The California red-legged frog (*Rana aurora draytoni*) (threatened under the federal ESA), northwestern pond turtle (*Clemmys marmorata marmorata*) (California species of special concern), southwestern pond turtle (*Clemmys marmorata pallida*) (California species of special concern), foothill yellow-legged frog (*Rana boylei*) (California species of special concern), California tiger salamander (*Ambystoma californiense*) (candidate for listing under the federal ESA), tricolored blackbird (*Agelaius tricolor*) (California species of special concern), and willow flycatcher (*Empidonax traillii brewsteri*) (endangered under the California ESA) occur in freshwater creeks, riparian habitats, or ponds. No suitable habitat exists at Crissy Field for these species. None of these species were observed during field surveys.

### 3.6.3.3 Special-Status Fishery Resources

Special-status fish are species that are legally protected under the state and federal ESAs or other regulations, and species that are considered sufficiently

rare by the scientific community to qualify for such listing. Special-status fishery resources are species in the following categories:

- fish listed or proposed for listing as threatened or endangered under the federal ESA and various notices in the Federal Register (proposed species),
- fish that are candidates for possible future listing as threatened or endangered under the federal ESA (61 FR 40:7596-7613, February 28, 1996),
- animals listed or proposed for listing by the State of California as threatened or endangered under the California ESA (14 CCR 670.5), and
- California species of special concern.

Sacramento River winter-run chinook salmon (*Oncorhynchus tshawytscha*) (threatened under the federal ESA and endangered under the California ESA) and steelhead (*Oncorhynchus mykiss gairdnerii*) (California species of special concern) occur in San Francisco Bay and could visit the shoreline along Crissy Field. San Francisco Bay is also within critical habitat for winter-run chinook salmon.

Coho salmon (*Oncorhynchus kisutch*) (California species of special concern), delta smelt (*Hypomesus transpacificus*) (threatened under the federal and California ESAs), and Sacramento splittail (*Pogonichthys macrolepidotus*) (proposed for listing as threatened under the federal ESA) do not occur in this portion of San Francisco Bay.

## 3.7 Transportation

### 3.7.1 Crissy Field Roadway System

Regional access to Crissy Field is provided by U.S. 101 and U.S. Highway 1. These routes cross the Golden Gate Bridge at the northwest corner of the Presidio, pass through the park, and continue south and east through San Francisco. Although both routes connect with most intersecting streets in the city, their only direct connection with Crissy Field is at the Golden Gate Bridge viewing area near the Golden Gate Bridge. Access to U.S. 101, also called Doyle Drive in the vicinity of Crissy Field, is also available immediately outside the Presidio near the Mason Street, Gorgas Avenue, and Lombard Street gateways. Access to U.S. Highway 1 is available south of the Presidio. Inside the Presidio boundary, U.S. 101 currently carries 89,000 to 116,000 vehicles per day, and U.S. Highway 1 carries 67,000 vehicles per day (California Department of Transportation 1994).

Mason and Old Mason Streets provide east-west access through the Crissy Field area. Mason Street has one of the nine gateways that serve as entrances to the Presidio. Each gateway operates in tandem with the others to allow traffic into the Presidio (National Park Service 1994b). As described below under "Current Traffic Conditions", a little more than 8% of the traffic entering the Presidio typically passes through the Mason Street entrance gateway. Mason Street is also the primary access to the commissary and PX. It is also a historic road corridor that served as the link between the city and Fort Point, and it is still an important roadway connecting a variety of land use areas along the waterfront.

Mason Street averages 51 feet in width with two 20-foot-wide travel lanes on an 11-foot shoulder. This road has no sidewalks or striped bicycle lanes. This road connects with Marina Boulevard and Doyle Drive at the Mason Street gateway. At their western terminus, Mason and Old Mason Streets indirectly connect with Lincoln Boulevard by way of Crissy Field Avenue, McDowell Avenue, and Cowles Street. Lincoln Boulevard has access to/from U.S. 101 and U.S. Highway 1 at the Golden Gate Bridge viewing area near the Golden Gate Bridge. All intersections within Crissy Field are unsignalized and have sufficient capacity for existing traffic loads (National Park Service 1994d).

### 3.7.2 Current Traffic Conditions

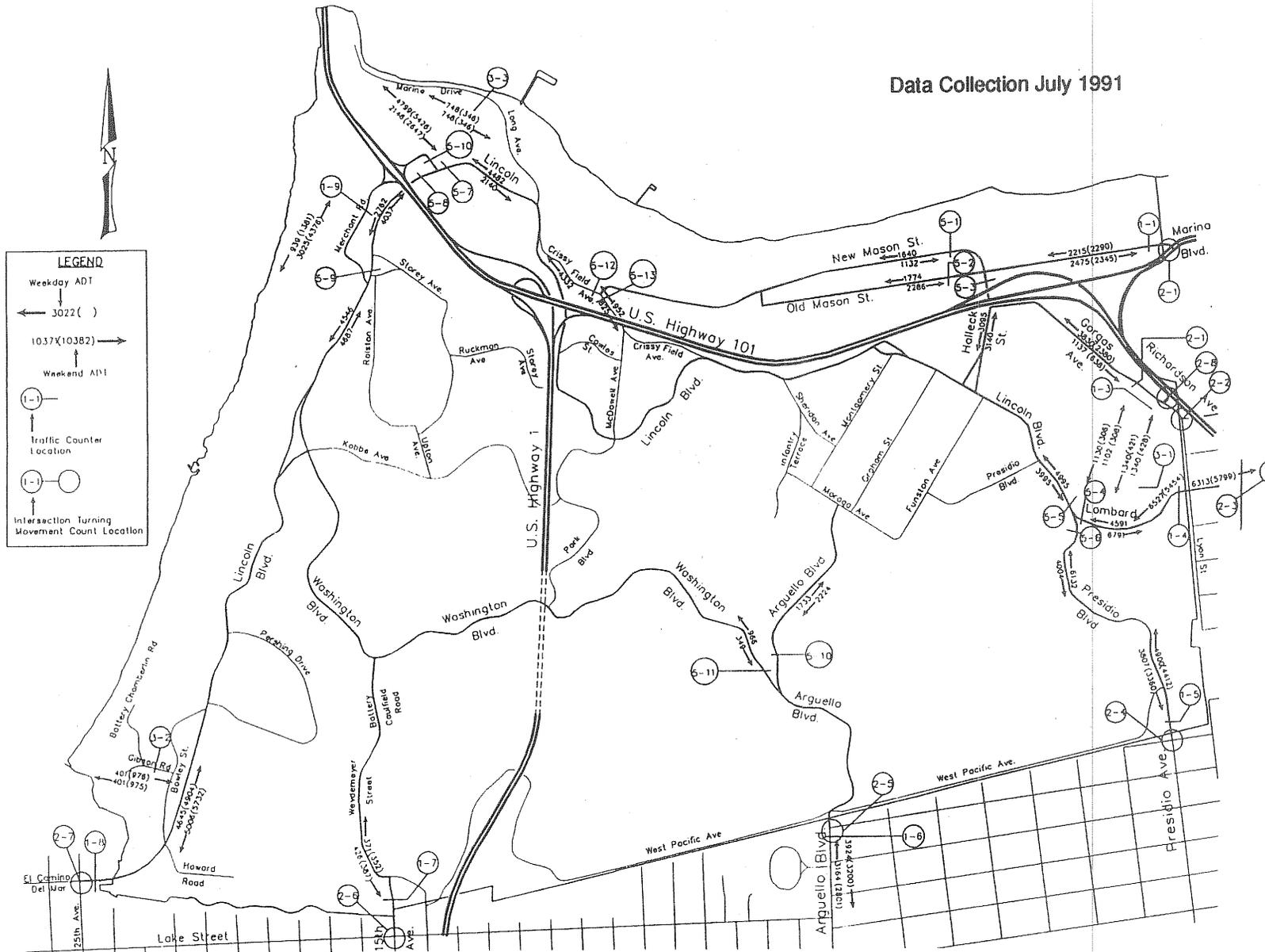
Traffic at the Presidio and Crissy Field includes a mix of commuter trips, recreation and other non-work-related trips, and through trips.

NPS operates a permanent traffic counter at the entrance to Fort Point, a National Historic Landmark located at the far west end of Crissy Field, which generates a large volume of tourism-related traffic within the boundaries of the Presidio. Data from this machine indicate that attendance peaks in or around July of each year. Figure 3-8 shows the most recent (July 1991) weekday and weekend average daily traffic (ADT) volumes for the Crissy Field and other Presidio roadways. These traffic counts provide a general indication of the number of vehicles traveling on each of the major roadways in and around Crissy Field on the average weekday and the average weekend of the expected month of peak visitation.

The 1991 traffic counts indicated that 57,996 vehicles crossed the Presidio gateways on an average weekday in July. About 8.1% of this traffic used the Mason Street gateway, and 18.8% used the entrances at the Golden Gate Bridge viewing area. On an average July weekend, the counts indicated that 56,063 vehicles crossed Presidio gateways. About 8.3% of this traffic used the Mason Street gateway, and 24.7% used the entrances at the Golden Gate Bridge viewing area.

Onsite observations and collected ADTs and peak-hour volumes indicate that several of the major roadways within the Presidio are used as commuter routes when U.S. 101 is congested. This results in higher ADT values, higher traffic demand during peak commuter travel periods, and more aggressive driving characteristics on these routes. Within Crissy Field, the traffic volumes on Crissy Field Avenue and Lincoln Boulevard indicate that these roads appear to carry traffic from Crissy Field, the main post, and possibly the Letterman Complex to westbound U.S. 101 at the Golden Gate Bridge viewing area. The Mason Street and Gorgas Avenue gateways also serve the traffic moving between the Presidio and U.S. 101. In addition, these routes are used by San Francisco traffic passing through the Presidio to get to the Golden Gate Bridge from east of the Presidio. These routes are less direct than U.S. 101, but they provide an alternate route for traffic when U.S. 101 is congested. Weekday daytime observations in June 1992

Data Collection July 1991



Source: National Park Service 1994c.

**Figure 3-8**  
Weekend and Weekday Average Daily Traffic Volumes for Crissy Field Roadways

indicated that during normal-flow conditions on U.S. 101, westbound and eastbound cut-through traffic on the Crissy Field roadways was very light. Samples taken in mid- to late afternoon on a Saturday and Sunday in June 1992, however, showed significant westbound cut-through traffic on the Crissy Field roadways, amounting to 35% of the Saturday sample, and 65% of the Sunday sample. These data suggest that during the period of peak congestion westbound on U.S. 101, the Crissy Field bypass route is being used by a number of vehicles that is insignificant compared with U.S. 101 traffic volumes, but that is a significant portion of Crissy Field traffic. No notable eastbound cut-through traffic was observed along this route during these observation periods. (Robert Peccia & Associates 1995.)

### 3.7.3 Transit Service

The San Francisco Municipal Railway (MUNI) provides regular scheduled service within the Presidio. The main line serving Crissy Field is Line 29, which connects Crissy Field to southern, central, and western portions of San Francisco. This line provides weekday and weekend service from about 7:00 a.m. to 6:30 p.m. Lines 28 and 29 stop near the Golden Gate Bridge toll plaza.

MUNI service is most extensive around the Main Post and the eastern half of the post along the Lombard Street area. Transfers between lines are allowed without additional charge. Most MUNI buses and trolleys accommodate wheelchairs.

Golden Gate Transit provides regional bus and ferry service in and between San Francisco, Marin, and Sonoma Counties. Many of the bus routes pass through the Presidio, stopping at the Golden Gate Bridge viewing area near the toll plaza, allowing transfers to MUNI lines at this location. None of these routes stop within Crissy Field. None of Golden Gate Transit's ferry routes serve the Presidio.

In addition to MUNI and Golden Gate Transit, many private tour bus and charter bus companies carry visitors to and from Crissy Field and other Presidio attractions.

Event-sponsored shuttle services are often used to support special events at the Presidio and Fort Mason.

### 3.7.4 Bicycle and Pedestrian Traffic

Crissy Field is a popular location for trail walking, jogging, and bicycling. Much of this activity takes place on the Golden Gate Promenade (the Bay Trail). This popular route runs along the northern coast of Crissy Field, connecting San Francisco's Marina District and Fort Point. This trail varies in width from 6 feet to 30 feet and is surfaced with a combination of crushed stone, asphalt, and asphalt gravel. The trail is used by pedestrians and bicyclists.

Figure 1-2 shows the pedestrian trails and bicycle routes at Crissy Field and the rest of the Presidio.

Roadways within Crissy Field and the rest of the Presidio provide the only access for nonmotorized travel between San Francisco and the Golden Gate Bridge; therefore, the Crissy Field roadways are often used by through bicycle traffic, especially during commute hours. Crissy Field, however, does not have a continuous system of sidewalks and bicycle lanes on its streets. As a result, pedestrians and bicyclists are forced to mix with vehicles on the street system to move from one area to another.

### 3.7.5 Parking

Currently, marked and unmarked space accommodates parking for more than 3,400 vehicles in the areas under and north of Doyle Drive. The area north of Mason Street accounts for 1,755 of these spaces, primarily in unmarked paved and open space areas. Most day-to-day recreational parking demand is at the east end of the site, where marked and unmarked paved parking can accommodate as many as 490 cars. Additional parking occurs on dirt and grass in this area. This area serves a wide variety of recreational users, including boardsailors. Parking in this area is usually unorganized and vehicles are often spaced out to leave room for assembly of sailboard equipment. Counts done in 1995 show a peak of 460 cars parked in this location on a non-event day. Parking in other areas north of Mason Street is

accommodated on paved and unpaved open space, including the former airfield, space between Mason and New Mason Streets, and a small lot east of the U.S. Coast Guard station.

The GMPA calls for a total of 1,760 parking spaces in the entire 150-acre greater Crissy Field planning area (including 50 acres outside the current planning area and the Palace of Fine Arts area) by 2010.

Crissy Field provides shuttle staging parking for GGNRA events at Fort Mason Center and other park locations. Fort Mason Center event sponsors are currently required to obtain a use permit from the GGNRA Bay District to use Crissy Field whenever their attendance is expected to exceed 1,000 people. Shuttle bus service is provided by the sponsor during these events.

GGNRA permits use of Crissy Field for a variety of other events, such as organized runs and walk-a-thons, throughout the year. Attendance ranges from less than 100 to thousands of people, creating a wide range of parking demand for Crissy Field. In addition, large-scale events such as the San Francisco Blues Festival at Upper Fort Mason, and the San Francisco Marathon have generated demand for parking at Crissy Field.

A parking count performed in April 1995 for the Earth Day celebrations at the Presidio indicated that the Crissy Field parking usage reached a maximum of about 1,220 vehicles parked simultaneously. This event had over 5,000 participants.

The Presidio of San Francisco Transportation Demand Management Program Recommendations report includes a number of strategies for addressing special event parking issues, as well as a hierarchy of parking priorities and locations, strategies for implementing parking management at the Presidio, and funding sources for administering and implementing parking programs (Robert Peccia & Associates 1996).

## 3.8 Air Quality

This chapter describes the applicable air quality regulations and the existing regional air quality conditions in the project vicinity.

### 3.8.1 Air Quality Regulatory Framework

The federal Clean Air Act (42 USC 7401 et seq.) and the California Clean Air Act mandate the establishment of national and state ambient air quality standards. The acts establish maximum allowable increments beyond baseline concentrations of sulfur dioxide (SO<sub>2</sub>), nitrogen dioxide (NO<sub>2</sub>), and inhalable particulate matter (PM<sub>10</sub>). Areas in which the standards are not met are known as nonattainment areas. The county of San Francisco has been designated a federal nonattainment area for ozone and carbon monoxide (CO) and a state nonattainment area for ozone, CO, and PM<sub>10</sub>.

After the Presidio became a part of the GGNRA in September 1994, the Presidio's air quality designation changed from Class III to a Class II clean air area as defined by the federal Clean Air Act and amendments. Class II designation allows for smaller amounts of degradation of existing air quality within limits based on the standards compared to Class III. The Clean Air Act requires federal land managers to protect a park's air quality values from adverse impacts. Section 118 of the act requires that federal facilities comply with existing federal, state, and local air pollution control laws and regulations. GGNRA managers must ensure that all in-park activities meet existing laws and regulations and that external sources of air pollution are controlled to the extent possible to protect the air quality and resource values of the Presidio, including Crissy Field.

### 3.8.2 Air Quality Pollutants and Ambient Air Quality Standards

Both the State of California and the federal government have established ambient air quality standards for several different pollutants. For some

pollutants, separate standards have been set for different periods. Most standards have been set to protect public health. For some pollutants, standards have been based on other values (such as protection of crops, protection of materials, or avoidance of nuisance conditions). The pollutants of greatest concern in San Francisco are CO, ozone, and PM<sub>10</sub>. A summary of state and federal ambient air quality standards is shown in Table 3-3.

### 3.8.3 Existing Air Quality Conditions

Crissy Field's location allows for excellent air circulation because of the prevailing west and northwest winds. Because there are no pollution sources west of Crissy Field, the air moving into the area is of very high quality.

The primary source of air pollution at Crissy Field is motor vehicle traffic. When extreme traffic congestion coincides with stagnant air, localized CO levels may exceed state and federal standards. High traffic volumes and congestion occur regularly on U.S. Highway 1 and U.S. 101 near Crissy Field. Additionally, the surface streets near Crissy Field sometimes carry a substantial amount of traffic during the peak traffic hours when U.S. 101 is congested. However, violations of the CO standards at sensitive receptors at Crissy Field would not be expected because of the generally good air quality and the distance from congested roadways.

### 3.8.4 Air Quality Monitoring

The Bay Area Air Quality Management District (BAAQMD) operates a regional air quality monitoring network for the Bay Area Air Basin. The district has 29 sites in the greater Bay Area, including two in San Francisco. The closest monitoring data available are from the downtown San Francisco station, which is downwind of Crissy Field and is not representative of the expected superior air quality at the Presidio. NPS is not conducting any additional air quality monitoring within the GGNRA at this time. A summary of recent air quality monitoring data from the downtown San Francisco monitoring station is shown in Table 3-4. These data indicate that between 1991 and 1993, CO and ozone levels were within state and federal standards, while PM<sub>10</sub> levels have exceeded the state 24-hour standard 8%-25% of the time. Federal PM<sub>10</sub> standards were not exceeded during this period.

Table 3-3. Ambient Air Quality Standards Applicable in California

Pollutant	Symbol	Average Time	Standard, as parts per million		Standard, as micrograms per cubic meter		Violation Criteria	
			California	National	California	National	California	National
Ozone	O <sub>3</sub>	1 hour	0.09	0.12	180	235	If exceeded	If exceeded on more than 3 days in 3 years
Carbon monoxide (Lake Tahoe only)	CO	8 hours	9.0	9	10,000	10,000	If exceeded	If exceeded on more than 1 day per year
		1 hour	20	35	23,000	40,000	If exceeded	If exceeded on more than 1 day per year
		8 hours	6	N/A	7,000	N/A	If exceeded	N/A
Nitrogen dioxide	NO <sub>2</sub>	Annual average 1 hour	N/A	0.053	N/A	100	N/A	If exceeded
			0.25	N/A	470	N/A	If exceeded	N/A
Sulfur dioxide	SO <sub>2</sub>	Annual average	N/A	0.03	N/A	80	N/A	If exceeded
		24 hours	0.04	0.14	105	365	If exceeded	If exceeded on more than 1 day per year
		1 hour	0.25	N/A	655	N/A	N/A	N/A
Hydrogen sulfide	H <sub>2</sub> S	1 hour	0.03	N/A	42	N/A	If equaled or exceeded	N/A
Vinyl chloride	C <sub>2</sub> H <sub>3</sub> Cl	24 hours	0.010	N/A	26	N/A	If equaled or exceeded	N/A
Inhalable particulate matter	PM10	Annual geometric mean	N/A	N/A	30	N/A	If exceeded	N/A
		Annual arithmetic mean	N/A	N/A	N/A	50	N/A	If exceeded
		24 hours	N/A	N/A	50	150	N/A	If exceeded on more than 1 day per year
Sulfate particles	SO <sub>4</sub>	24 hours	N/A	N/A	25	N/A	If equaled or exceeded	N/A
Lead particles	Pb	Calendar quarter	N/A	N/A	N/A	1.5	N/A	If exceeded no more than 1 day per year
		30 days	N/A	N/A	1.5	N/A	If equaled or exceeded	N/A

Notes: All standards are based on measurements at 25°C and 1 atmosphere pressure.  
 National standards shown are the primary (health effects) standards.  
 N/A = not applicable.

Table 3-4. Summary of Carbon Monoxide, Ozone, and PM10 Monitoring Data

Pollutant	1991	1992	1993
<b>Carbon Monoxide</b>			
Highest 1-hour concentration (ppm)	9	8	7
Highest 8-hour concentration (ppm)	6.5	6.4	5.1
Hours above standard <sup>a</sup>	0	0	0
Days above standard <sup>b</sup>	0	0	0
<b>Ozone</b>			
1st high (ppm)	0.05	0.8	0.08
2nd high (ppm)	0.05	0.6	0.08
Days above standard <sup>c</sup>	0	0	0
<b>PM10</b>			
Highest 24-hour concentration ( $\mu\text{g}/\text{m}^3$ )	109	81	69
Geometric mean ( $\mu\text{g}/\text{m}^3$ )	29.7	27.6	25.1
Arithmetic mean ( $\mu\text{g}/\text{m}^3$ )	34.9	31.6	28.8
Percentage of days above standard <sup>d</sup>	25%	10%	8%

Notes: Data are from the downtown San Francisco monitoring station.

ppm = parts per million.

$\text{mg}/\text{m}^3$  = micrograms per cubic meter.

<sup>a</sup> Hours above standard = number of hours during which the state 1-hour standard of 20 ppm was exceeded.

<sup>b</sup> Days above standard = number of days on which the state and federal 8-hour standard of 9 ppm was exceeded.

<sup>c</sup> Days above standard = number of days on which the state 1-hour standard of 0.09 ppm was exceeded.

<sup>d</sup> Percentage of days above standard = number of days above the state 24-hour standard of  $50 \mu\text{g}/\text{m}^3$  divided by the number of days sampled.

Source: California Air Resources Board 1994.

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## 3.9 Noise

### 3.9.1 Noise Regulatory Framework

Guidelines for assessing noise impacts of traffic have been established by the Federal Highway Administration. These standards, known as noise abatement criteria (NAC) and contained in 23 CFR 772, must be followed by an agency that is performing noise studies for actions involving federal-aid funds. The standards specify design noise levels and relate them to various land uses and/or activities. Land use category B of the NAC includes noise-sensitive receptors, such as outdoor recreation areas. The standard for this category is 72 decibels (dBA).

The GMPA EIS also commits NPS to comply with the San Francisco noise ordinance. The local ordinance stipulates that during construction, contractors and other equipment operators will comply with the San Francisco noise ordinance. The noise ordinance limits construction noise between 7 a.m. and 8 p.m. to 80 dBA at 100 feet and between 8 p.m. and 7 a.m. to 5 dBA above the ambient noise levels at the property.

### 3.9.2 Existing Noise Conditions

Most of the Presidio is generally quieter than the surrounding urban environment; however, there are more sources of noise at the north end of the Presidio, where Crissy Field is located. Managing ambient urban noise is difficult because of the unpredictability of the sources and the dispersal throughout the landscape. Elimination or significant reduction of noise not related to traffic might not be possible and is probably not expected by park users. A noise survey conducted in 1992 indicates that typical background noise levels at the Presidio range from about 50 dBA to 65 dBA. The higher levels were measured near U.S. Highway 1 (Park Presidio Boulevard) and U.S. 101. (Doyle Drive). (National Park Service 1993.)

The existing noise environment at Crissy Field is dominated by traffic noise on U.S. 101 and natural sources such as wind and waves. Background noise levels at Crissy Field are in the range of 55-60 dBA.

Aircraft were once a notable source of noise at the Crissy Field. The airfield was formerly used by aircraft, and the helipad is still used occasionally; currently, the helipad is used primarily for medical and military flights. The helipad was used 161 times during 1995. (Hornor pers. comm.)

### 3.9.3 Noise-Sensitive Areas

Noise-sensitive areas are land uses that are sensitive to environmental noise. Such land uses include residences, schools, libraries, hospitals, parks, and open space. Within and adjacent to the Crissy Field site plan area, noise-sensitive areas include only the park and open space for this project that currently exist and are planned for the future. The NPS residential use at the former Coast Guard Station is the closest residential use. Other residential land uses are located to the south of U.S. 101.

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## 3.10 Hazardous Substances and Environmental Remediation

Crissy Field is the site of several ongoing cleanup programs for areas contaminated with hazardous waste products during the years of military activities. Contamination of soil and groundwater that could affect implementation of the proposed land uses, development of recreational facilities, and restoration of wetlands occurred in several areas at Crissy Field. The purpose of this section is to present a summary of hazardous waste sites and the status of environmental remediation efforts at Crissy Field in the proposed site plan area. Analysis of the remediation efforts is covered in separate environmental documentation. The primary sources of information used for this report are reports generated by Army consultants for hazardous substance cleanup activities at the Presidio (Argonne National Laboratory 1989, Watkins-Johnson Environmental et al. 1993, Watkins-Johnson Environmental 1994, Earth Technology Corporation 1995, Montgomery Watson 1995) and material provided by Army consultants (Dames & Moore 1995b and 1996) and NPS staff (Blank pers. comm.).

### 3.10.1 Regulatory Framework for Hazardous Substances

The U.S. Army is the lead agency conducting the investigation and cleanup of areas at the Presidio and Crissy Field contaminated by hazardous materials as a result of the long period of military operations. The Army is conducting investigation and remediation actions in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), the Resource Conservation and Recovery Act (RCRA), the Base Realignment and Closure Act, the California Health and Safety Code, the California Water Code, and other relevant authorities. The California Department of Toxic Substances Control (DTSC) is the lead agency for oversight of the Army cleanup activities, and the San Francisco RWQCB works in conjunction with the DTSC on issues of water quality.

Preliminary cleanup efforts began in 1982 with an installation assessment that addressed past and present use of hazardous materials. An Enhanced Preliminary Assessment was prepared in 1989, providing more detail on hazardous waste conditions at the Presidio (Argonne National Laboratory 1989). A remedial investigation (RI) report provided detailed characterization of sites based on analyses of waste site samples and recommended remedial actions (Watkins-Johnson Environmental et al. 1993). Subsequent sampling to further characterize specific sites was conducted in 1994 and 1995; this includes sampling of stormwater outfalls to the bay for analysis of contaminated sediments. The results of sediment sampling in the bay were presented in an Ecological Sampling and Analysis Program (ESAP) report (Dames & Moore 1996).

A secondary revised draft final RI was completed in November 1995 (Dames & Moore 1995b). Results of the RI were used to support a draft final feasibility study (FS) that was released in January 1996 (Dames and Moore 1996). A remedial action plan (RAP) and record of decision (ROD) for the preferred alternative will be developed and approved. Remedial actions (RAs) of sites will then proceed. In some instances, interim remedial actions (IRAs) have been implemented to accelerate the cleanup.

In addition, the Army has an underground storage tank (UST) and fuel distribution system (FDS) program, which has its own reporting process. This includes removal or closure in place of USTs and the FDS and investigation of releases of petroleum products to soil and groundwater. A final Fuel Product Action-Level Development Report (FPALDR) released in October 1995 provides the framework to determine soil cleanup levels for petroleum contamination throughout the Presidio. A final Basewide CAP released in January 1996 evaluates appropriate cleanup methods for the UST/FDS sites. Individual CAPs will be developed to address site-specific cleanups where groundwater contamination occurs. In May 1996, the San Francisco Bay Regional Water Quality Control Board issued an order to the Army for cleanup of the petroleum-contaminated sites, which establishes the regulatory requirements and framework for the cleanup based on the FPALDR and Basewide CAP (San Francisco Regional Water Quality Control Board 1996).

Overall, once begun, the cleanup of CERCLA, UST, and FDS sites will occur over a 2- to 3-year construction period, followed by longer-term operation and maintenance for some sites.

### **3.10.2 Sites at Crissy Field**

In its sampling programs, the Army has detected the presence of volatile and semivolatile organic compounds (VOCs and SVOCs), petroleum products (TPH), pesticides, metals, polychlorinated biphenyls (PCBs), and polycyclic aromatic hydrocarbons (PAHs) in various locations and concentrations at Crissy Field.

The sites at or near the Crissy Field site plan area include areas within the Directorate of Engineering and Housing (DEH) yard, Fill Site 7, the U.S. Coast Guard station, numerous USTs, a segment of the FDS, and several small arms firing ranges. The Building 637, 937, and 231 sites are not located within the site plan area but may contribute pollutants to the soils, groundwater, or Tennessee Hollow riparian corridor that could migrate to the plan area.

The CERCLA risk assessment performed by the Army as part of the RI report evaluated future land use scenarios planned by NPS and is taking these into account when determining which sites require cleanup. Sites at Crissy Field for which the Army intends to perform cleanup actions, based on the results of the risk assessment, as presented in the Army's FS, include the following (Figure 3-9):

- ppDDE and ppDDT in soil at Fill Site 7 in two locations;
- lead in soil at the Building 640/643 area, 923-931 area, 950/973/974 area, and Buildings 283 and 286 at the DEH yard;
- chlordane in soil at the Building 269/293 site in the DEH yard; and
- PAHs in soil at the Building 995/996 area at the Fort Point Coast Guard station site.

In the draft final FS, the Army proposes to remediate inorganics and organics in soil by confirmation sampling, excavation, disposal at an offsite landfill, and backfilling.

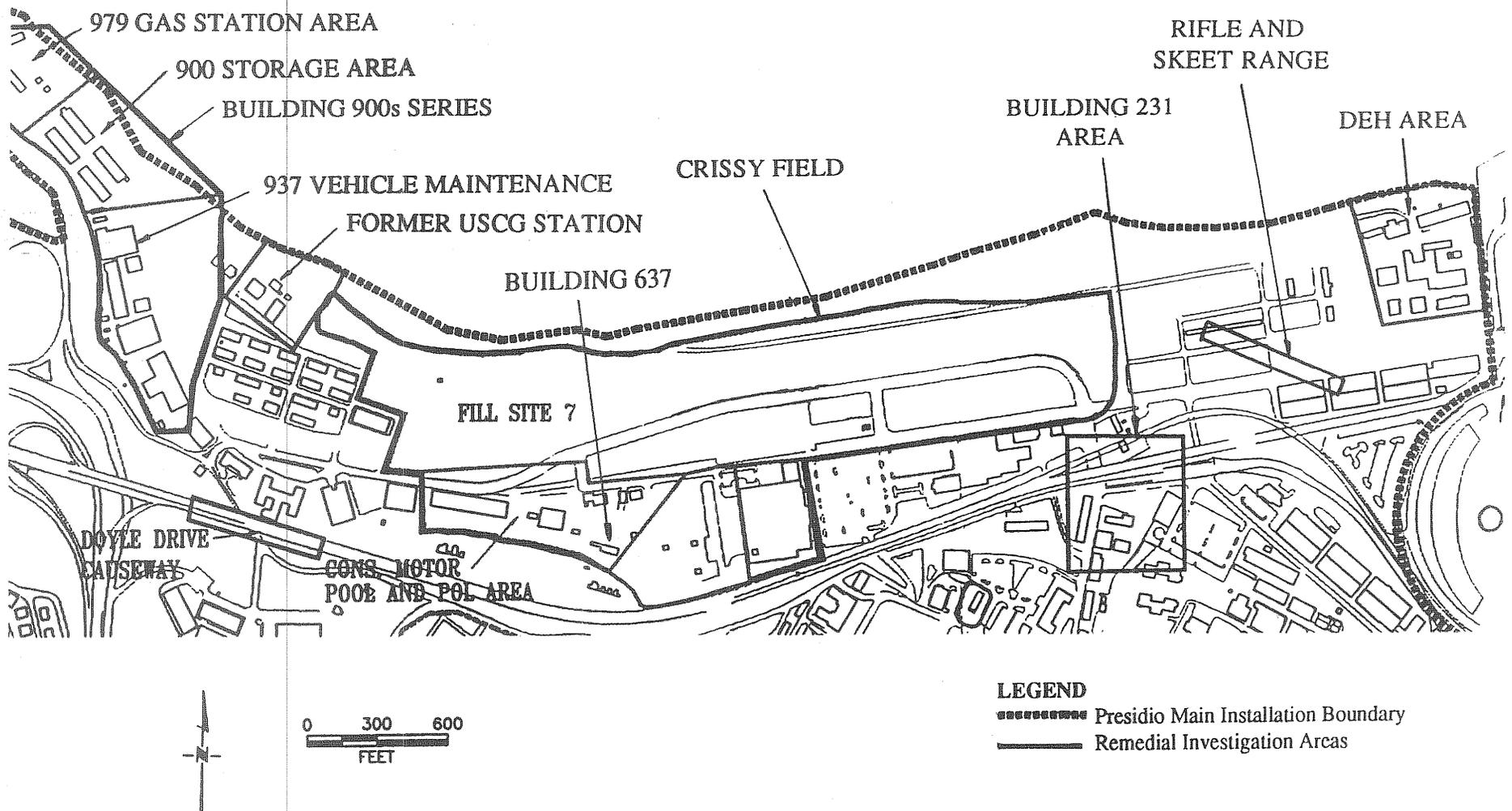
At the 937 site, groundwater contamination is being treated by a vacuum vaporization well as an interim measure. An evaluation will be conducted on the effectiveness of this system and the need for additional treatment.

Because the final version of the Army's RI/FS has not been released or approved, remedies for CERCLA sites at Crissy Field have not been finally selected. Final decisions for cleanup will be made in a ROD, after the RI/FS is final.

Under the petroleum program component of the Army cleanup, numerous USTs in the Crissy Field vicinity, including associated contaminated soil, are being removed. The FDS segment from Torpedo Wharf to Long Avenue is also scheduled for removal.

At the Building 637 and Building 231 sites and in areas of contaminated groundwater under the petroleum program, tank and soil removal and interim groundwater treatment actions have been implemented, and the need for groundwater remediation is under evaluation.

NPS and the Army are coordinating on the issues of plan implementation and remediation projects. Soil removal actions will be planned to occur before construction activities associated with the Crissy Field site plan implementation. Long-term groundwater remediation facilities will be planned and located to preclude their interfering with the features of the plan and will be accounted for in the plan design phase.



Source: Modified from Earth Technology Corporation 1995.

**Figure 3-9**  
**Hazardous Substances and Environmental Remediation Areas at Crissy Field**

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## 3.11 Scenic Resources

Crissy Field occupies a prominent position along San Francisco's waterfront just inside the entrance to the bay. Appropriately referred to as the "front yard" of the Presidio, this flat and generally open area serves as an important transition between the bay and the diverse topography and urban habitat of the city. Crissy Field's bayfront location affords awe-inspiring views of the scenic landscape of the Bay Area and is itself highly visible from the surrounding area.

The process for assessing the impacts of the project on scenic resources includes (1) the identification and description of key viewer groups and their level of sensitivity with respect to alterations in views of or from the project site, and (2) the existing visual character and quality of the project site and surrounding region from key viewing locations (e.g., roads, trails, and overlooks). The following paragraphs describe views of the site, both from within and outside the site plan area, as well as views of the surrounding area from the site.

### 3.11.1 Viewer Groups

Crissy Field attracts visitors for various recreational uses, such as bayfront activities, celebrations, competitions, and enjoying the area's impressive views. Viewer groups consist largely of visitors partaking in recreation opportunities, including walking, jogging, bicycling, dog walking, fishing, boardsailing, and picnicking. Travelers using the Doyle Drive and Golden Gate Bridge portions of U.S. 101 are also key viewers.

### 3.11.2 Views of the Site Plan Area from within Crissy Field

Visitors to Crissy Field have access to areas throughout the site plan area and therefore view the site from numerous locations. However, principal viewing locations are the roadways, such as Old Mason Street, and the shoreline Promenade, which both run east-west through Crissy Field. Generally, recreationists place a high level of importance on views in designated natural

and recreation areas (U.S. Forest Service 1974). Therefore, it is assumed that visitors to Crissy Field would be highly sensitive to adverse changes in the visual quality of views of the site resulting from the project.

The existing visual character of Crissy Field itself is presently less than optimal. Visitors entering Crissy Field from the east entrance near the Marina Green travel along Old Mason Street, the primary access to the site plan area. Views throughout the eastern portion of the site are of the building demolition site, a large paved parking lot, and sparse vegetation.

Farther west along Old Mason Street, the central area of the project site opens up into a broad field that includes the Golden Gate Promenade, a helicopter pad, and a weedy grassland area. The Promenade has an asphalt and gravel surface and runs along the northern edge of the area near the bay. The helicopter pad consists of concrete and is surrounded by a deteriorated chain-link fence. The broad areas of pavement and weedy vegetation detract from the area's visual variety or interest. Both the uniform lines of palm trees along Mason and Old Mason Streets and a small grove of cypress trees along the waterfront stand out prominently and contrast with the surrounding flat landscape. The western portion of Crissy Field contains a number of buildings and vegetation that are diverse in form and provide visual interest and variety to the landscape character.

### 3.11.3 Views of the Site Plan Area from Surrounding Areas

In addition to the site plan area being viewed from within Crissy Field itself, the site is visible from surrounding areas. Important locations with views of Crissy Field include the Golden Gate Bridge, the bay (e.g., views of boaters and windsurfers), and the roadways bordering the site to the south. Crissy Field figures prominently in scenic views from the Golden Gate Bridge for pedestrians and bicyclists overlooking the bay and San Francisco skyline.

Motorist traveling along Doyle Drive and U.S. 101 have brief views of Crissy Field from the roadway. Only pedestrians and passengers in buses and automobiles with higher seating placement have unobstructed views of Crissy Field from Doyle Drive.

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Many of the smaller roadways surrounding the site plan area, such as Lincoln Boulevard, are used by recreationists and people traveling for pleasure. This viewer group generally has a high sensitivity for visual quality (U.S. Forest Service 1974). Although views of the site from these smaller roadways are somewhat limited, one important viewing location of Crissy Field is the overlook from a point on Lincoln Avenue near its intersection with Crissy Field Avenue.

The higher elevation at this overlook, just outside the site plan area, affords a 180-degree view to the north of the diverse landscape of the Bay Area in the background and the flat and generally open landscape of Crissy Field in the foreground. Patches of vegetation and light-colored buildings with red tile roofs are easily visible in the view of the site. These elements give the site a unified and somewhat orderly appearance. Large evergreen trees, including eucalyptus, pine, and cypress, provide visual interest and diversity and contribute to the area's natural open space character. The historic U.S. Coast Guard station northeast of the overlook and Torpedo Wharf are prominent landmarks near the edge of Crissy Field. Paved areas and sparse low-growing grass contribute to the open character of the western area of the project site. Views of San Francisco Bay, including the Golden Gate Bridge in the background, are vivid and impressive.

### *3.11.4 Views of Surrounding Areas from the Crissy Field Site Plan Area*

Crissy Field's bayfront location affords expansive views of the surrounding landscape of the Bay Area. Visitors generally come to Crissy Field to engage in the various recreational activities that take advantage of the outstanding views of San Francisco Bay. These viewer groups would generally be highly sensitive to changes made to Crissy Field that might block or diminish these impressive views of the surrounding area.

The primary viewing locations of San Francisco Bay from the site plan area are along the length of the shoreline and Promenade. Impressive views from the Promenade are of San Francisco Bay west to the Golden Gate Bridge, Alcatraz Island, the Presidio, the San Francisco skyline, and the Palace of Fine Arts.

Other important views of the bay are from the interior of the site. The recent removal of buildings from the site provides new and expansive views to the bay, the San Francisco skyline, Alcatraz Island, and the Golden Gate Bridge.

The openness of the central area of the site provides unobstructed views of the waterfront, its sparsely vegetated sand dunes, the Golden Gate Bridge, the Presidio, and the San Francisco skyline. Views of the surrounding natural resources of the beach and ocean are generally intact.

Section 4.0  
Environmental  
Consequences

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## 4.1 Summary of Environmental Consequences

In this section, the potential environmental effects associated with construction of the Proposed Action or the Dune Alternative are described. Also included is a description of effects associated with the No-Action Alternative.

This analysis evaluates three general categories of environmental effects: direct, indirect, and cumulative effects. Direct effects are those that would be caused by the Proposed Action and would occur at the time the project is constructed or over time as the plan is put in place. Indirect effects also would be caused by the Proposed Action and may also occur at a future time or are physically removed from the project site, but are reasonably foreseeable. Cumulative effects would occur when the Proposed Action provides an incremental contribution to an environmental effect that is generated by past, present, or reasonably foreseeable actions.

Table 4-1 summarizes the impacts associated with the Proposed Action and alternatives evaluated in this EA.

The analysis is presented by alternative. Section 4.2 discloses the potential environmental effects of the Proposed Action, Section 4.3 discloses the potential environmental effects of the Dune Alternative, and Section 4.4 is a discussion of the environmental effects of the No-Action Alternative. Within these sections, environmental effects are organized into resource topics, as follows:

- land use impacts;
- recreation impacts;
- cultural resource impacts;
- geomorphology and soil impacts;
- water resource impacts;
- biological resource impacts;
- transportation impacts;
- air quality impacts;
- noise impacts;

- impacts on human health, safety, and the environment;
- scenic resource impacts; and
- cumulative impacts.

The results of the analysis conclude that the Proposed Action would not result in any significant adverse environmental effects. Overall, the Proposal would result in substantial improvement to the environment. Most of the environmental effects associated with land use, recreation opportunities and facilities, biological resources, cultural resources, transportation, and scenic resources would be beneficial. Environmental commitments included as part of the site plan design address potential environmental impacts. Adverse environmental effects would be minor. Most of the adverse effects would be temporary, occurring during the construction phase of the project.

**Table 4-1. Summary of Environmental Consequences**

<b>Proposed Action</b>	<b>Dune Alternative</b>	<b>No-Action Alternative</b>
<b>Land Use Impacts</b>		
Most consistent with NPS Management Policies: beneficial	Generally consistent with most NPS Management Policies: beneficial	Generally consistent with NPS Management Policies: less than significant
Most consistent with relevant land use plans and policies: beneficial	Generally consistent with relevant land use plans and policies: beneficial	Generally consistent with relevant land use plans and policies: less than significant
Change in availability of the helipad: less than significant	Change in availability of helipad: less than significant	No change from current use
<b>Recreation Impacts</b>		
Construction/improvement of visitor facilities: beneficial	Construction/improvement of visitor facilities: beneficial	No change in current facilities
Improvements to the Golden Gate Promenade: beneficial	Improvements to the Golden Gate Promenade: beneficial	No change in current facility
Temporary loss of recreational use/access during construction: less than significant	Temporary loss of recreational use/access during construction: less than significant	No construction, not applicable
Increase in total open space area accessible for recreation: beneficial	Increase in total open space area accessible for recreation: beneficial	Some increase in open space area as a result of building demolition program, limited accessibility
Improved safety and amenities for recreationists along Mason Street: beneficial	Improved safety and amenities for recreationists along Mason Street: beneficial	No change from current conditions
Change in parking location for recreationists at the west end: beneficial	Change in parking location for recreationists at the west end: beneficial	No change from current conditions

**Table 4-1. Continued**

<b>Proposed Action</b>	<b>Dune Alternative</b>	<b>No-Action Alternative</b>
<b>Cultural Resource Impacts</b>		
Restoration of Crissy Field airfield: beneficial	Restoration of Crissy Field airfield: beneficial	No change from current conditions
Restoration of Old Mason Street: beneficial	Restoration of Old Mason Street: beneficial	No change from current conditions
Planting of trees along Mason Street: beneficial	Planting of trees along Mason Street: beneficial	No change from current conditions
Construction activities in the vicinity of the Old Mason Street railroad tracks: less than significant	Construction activities in the vicinity of the Old Mason Street railroad tracks: less than significant	No construction, not applicable
Potential to disturb archeological resources: less than significant	Potential to disturb archeological resources: less than significant	No construction, not applicable
<b>Geomorphology and Soil Impacts</b>		
Potential changes in shoreline configuration resulting from removal and reconfiguration of bayshore rubble and construction of the tidal marsh inlet channel: less than significant	Potential changes in shoreline configuration resulting from removal and reconfiguration of bayshore rubble: less than significant	No rubble to be removed
Potential for closure of the proposed tidal marsh inlet channel: less than significant	Not applicable	Not applicable
<b>Water Resource Impacts</b>		
Potential short-term water quality impacts associated with construction activities: less than significant	Potential short-term water quality impacts associated with construction activities: less than significant	No construction, not applicable
Potential for increased saltwater intrusion to shallow groundwater aquifers: less than significant	Not applicable	Not applicable
Potential exposure of aquatic organisms to hazardous substances from tidal marsh construction: less than significant	Not applicable	Not applicable

**Table 4-1. Continued**

Proposed Action	Dune Alternative	No-Action Alternative
<b>Vegetation and Wildlife Resources Impacts</b>		
Ecological and educational benefits of construction of a tidal marsh: beneficial	Not applicable	Not applicable
Potential land use conflict between intense visitor use areas and natural habitat of the created wetland within the proposed site plan area: less than significant	Not applicable	Not applicable
Conversion of 11.0 acres of developed and landscaped area, 6.4 acres of annual grassland, and 2.6 acres of disturbed dune to tidal marsh: beneficial	Conversion of 12.2 acres of developed and landscaped areas and 7.8 acres of annual grassland to dune scrub in the central dune field: beneficial	No change from current conditions
Conversion of 10.1 acres of developed and landscaped area and 16.9 acres of beach areas to native dune communities: beneficial	Conversion of 10.1 acres of developed and landscaped area and 16.9 acres of beach areas to native dune communities: beneficial	No change from current conditions
Conversion of 0.4 acre of annual grassland and 2.4 acres of developed and landscaped areas to 2.8 acres of dune scrub in the east beach area: beneficial	Conversion of 0.4 acre of annual grassland and 2.4 acres of developed and landscaped areas to 2.8 acres of dune scrub in the east beach area: beneficial	No change from current conditions
Conversion of 33.9 acres of developed and landscaped areas and 11.3 acres of annual grassland areas to landscaped grassland: beneficial	Conversion of 33.9 acres of developed and landscaped areas and 11.3 acres of annual grassland areas to landscaped grassland: beneficial	No change from current conditions
Temporary disturbance to and long-term enhancement of beach habitat areas: less than significant/beneficial	Temporary disturbance to and long-term enhancement of beach habitat areas: less than significant/beneficial	No change from current conditions
Removal of non-native trees and shrubs: less than significant	Removal of non-native trees and shrubs: less than significant	No vegetation removal
Effects on fisheries: beneficial	Not applicable	Not applicable

**Table 4-1. Continued**

Proposed Action	Dune Alternative	No-Action Alternative
<b>Transportation Impacts</b>		
Potential addition of traffic to the roadway system as a result of visitor trips and construction-related trips: less than significant	Potential addition of traffic to the roadway system as a result of visitor trips and construction-related trips: less than significant	No change from current trends and conditions
Changes in traffic speeds and patterns along Mason Street: beneficial	Changes in traffic speeds and patterns along Mason Street: beneficial	No changes to Mason Street
Improvements to the pedestrian and bicycle facilities: beneficial	Improvements to the pedestrian and bicycle facilities: beneficial	No changes in facilities
Improvements to the east beach parking facility: beneficial	Improvements to the east beach parking facility: beneficial	No changes in facility
Reduction of total available parking for day-to-day use at Crissy Field north of Mason Street: less than significant	Reduction of total available parking for day-to-day use at Crissy Field north of Mason Street: less than significant	No change from current conditions
Reduction of total available parking space at Crissy Field for special events: less than significant	Reduction of total available parking space at Crissy Field for special events: less than significant	No change from current conditions
<b>Air Quality Impacts</b>		
Increased air pollutant emissions from construction activities: less than significant	Increased air pollutant emissions from construction activities: less than significant	No construction, not applicable
Air pollutant emissions from ongoing operations at Crissy Field: less than significant	Air pollutant emissions from ongoing operations at Crissy Field: less than significant	No change from current conditions
<b>Noise Impacts</b>		
Increased noise levels during construction: less than significant	Increased noise levels during construction: less than significant	No construction, not applicable
Potential noise effects from ongoing operations at Crissy Field: less than significant	Potential noise effects from ongoing operations at Crissy Field: less than significant	No change from current conditions

**Table 4-1. Continued**

Proposed Action	Dune Alternative	No-Action Alternative
<b>Impacts on Human Health, Safety, and Environment</b>		
Coordination of timing of Crissy Field site plan construction activities with Army remediation activities: beneficial	Coordination of timing of Crissy Field site plan construction activities with Army remediation activities: beneficial	Ongoing Army remediation activities at the site
Potential for mosquito generation: less than significant	No substantial change from current conditions	No change from current conditions
<b>Scenic Resource Impacts</b>		
Enhancement of existing views and provision of new high-quality views of the project site from within the site plan area: beneficial	Enhancement of existing views and provision of new high-quality views of the project site from within the site plan area: beneficial	No change from current conditions
Enhancement of existing views of the project site from surrounding areas: beneficial	Enhancement of existing views of the project site from surrounding areas: beneficial	No change from current conditions
Enhancement of existing views and provision of new high-quality views of the surrounding area from the project site: beneficial	Enhancement of existing views and provision of new high-quality views of the surrounding area from the project site: beneficial	No change from current conditions
<b>Cumulative Impacts</b>		
See Section 4.2.12	See Section 4.3.12	No change from current conditions

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## 4.2 Environmental Consequences of the Proposed Action

### 4.2.1 Land Use Impacts

Because the basic land use of the area (public park and open space) would not change, implementation of the Proposed Action would not result in any significant land use conflicts or inconsistencies with relevant plans or policies.

#### 4.2.1.1 Consistency with National Park Service Management Policies

The Proposal includes reestablishment of tidal wetlands, restoration of the historic airfield, restoration of native dune habitats, and provision of recreation and interpretive facilities for visitors. The Proposal would adhere to the NPS Management Policies by recreating, rehabilitating, and maintaining wetlands and perpetuating native plant life as part of natural ecosystems. It also would preserve and foster appreciation of cultural resources through restoration and interpretation and provide trails and facilities to assist park visitors in enjoying the park and understanding its significance. This effect is considered beneficial because, compared with existing conditions, this alternative is more consistent with the NPS Management Policies (National Park Service 1988).

#### 4.2.1.2 Consistency with Relevant Land Use Plans and Policies

Of the three alternatives evaluated in this EA, the Proposal is the most consistent with relevant land use plans and policies. The GMPA specifies that the design for Crissy Field will incorporate a grass landing strip restored to its historic appearance and stipulates that, based on results of a feasibility study, tidal wetlands should be reestablished toward the east end of Crissy

Field (National Park Service 1994b). This alternative is the only one that incorporates all of the elements and objectives envisioned for Crissy Field in the GMPA.

The Proposal is also consistent with policies of the San Francisco Master Plan and the San Francisco Bay Plan. It furthers the objectives stated in the San Francisco Master Plan related to improving shoreline areas, promoting public recreation and open space along the shoreline, and providing habitat for many species. It achieves objectives in the Bay Plan related to protecting the coast as a natural resource; managing the use of the shoreline so as to best meet the needs of the public; and striving to increase public access to the bay, while restricting development that would have adverse impacts on the bay.

This effect is considered beneficial because, compared with existing conditions, the Proposal is not only consistent with, but further achieves the objectives of, the GMPA, the San Francisco Master Plan, and the San Francisco Bay Plan.

#### 4.2.1.3 Change in Availability of the Helipad

Implementation of the Proposal would result in the removal of the existing concrete helipad and associated fencing, as called for in the GMPA, for restoration of the historic grass airfield. This helipad has been used for military purposes, emergency medical transport, and disaster relief. Although the permanent features would be removed, the configuration of the restored airfield would provide a considerable amount of open space that could continue to be used to accommodate emergency helicopter landing. To reduce helicopter traffic at Crissy Field, NPS will work with the City of San Francisco to identify other options to accommodate emergencies not related to the operation of the park and will phase out these uses as other options are identified.

This impact is considered less than significant because the helipad is a nonconforming use within the recreational open space and is generally disruptive to recreational use and wildlife. Reducing the use of this facility to park-related emergencies and disaster relief will reduce a conflicting land use. Elimination of the fencing and concrete pad will allow restoration of the historic airfield.

#### **4.2.1.4 Land Use Conflicts between Intense Human Use Areas and Natural Habitat within the Tidal Marsh**

See Section 4.2.6.2 for a discussion of this issue.

#### **4.2.1.5 Executive Order on Environmental Justice**

Under Executive Order No. 12898, federal agency analysis of actions under NEPA must include evaluation of the potential for disproportionate environmental, social, or economic effects on minority and low-income communities. The Proposal is not expected to result in any disproportionate adverse effects on minority or low-income communities.

### ***4.2.2 Recreation Impacts***

Table 4-2 presents a comparison of recreational opportunities under each site plan alternative.

#### **4.2.2.1 Construction/Improvement of Visitor Facilities**

Under the Proposed Action, visitor facility improvements would include removal of excess pavement, including several existing streets; providing paved and grass parking areas for vehicles and sailboard equipment; constructing a new entrance gateway; and constructing a new restroom with outdoor showers at the east end of the site. The Proposal would enhance the boardsailing capability and important beach access of the site by providing facilities and expanding the rubble-free beach. Boardwalks, overlooks, and wildlife viewing blinds would be constructed in the central (tidal marsh) area of the site. Additional parking, picnic facilities, and festival/event space would be constructed in the western portion of the site. New facilities for special events would include provision of electricity and water, in addition to the space for events and parking. Provision of these amenities is considered a beneficial effect because it would improve the quality of facilities at Crissy Field for recreationists.

#### **4.2.2.2 Improvements to the Golden Gate Promenade**

Under both construction alternatives, the Promenade would be altered to accommodate, enhance, and complement the restored natural habitat areas. The Promenade would be altered to a uniform 20 feet in width with stabilized aggregate or a crushed oyster shell surface. It would provide ample room for pedestrians and cyclists. The surface material would also improve safety by discouraging cyclists from moving at excessive speeds. Recreationists requiring a harder surface, such as in-line skaters and faster moving cyclists, would likely be more attracted to the Mason Street pedestrian and bicycle paths. Data from visitor use surveys indicate that the highest recreational use at Crissy Field, by far, is pedestrian use (Clemons pers. comm.), so it is important to provide an improved safe and attractive facility for this use. Seating and overlooks would be created along the Promenade. Shifting the Promenade away from the shoreline at the east end would reduce or eliminate the potential for wave damage. This effect is considered beneficial, because redesign and improvement of the existing Promenade facility would be appropriate and attractive for the most popular recreational activities at Crissy Field (walking and jogging).

#### **4.2.2.3 Temporary Loss of Recreational Use/Access during Construction**

During the 12- to 18-month construction period, access to and use of the site would be disrupted by grading activities, construction of facilities, and revegetation. Because detours and temporary parking areas will be provided to ensure that as much of the site as possible will remain accessible, this minor and temporary inconvenience is not considered significant.

#### **4.2.2.4 Increase in Total Open Space Area Accessible for Recreation**

Under the Proposed Action, the amount of open space available for multiple recreational activities, (e.g., dog walking, beach use, bird watching) would increase compared with present conditions. Although creation of the tidal marsh would limit certain types of recreation in that area, the overall amount

**Table 4-2. Comparison of Recreational Opportunities**

Recreational Opportunities	Proposed Action	Dune Alternative	No-Action Alternative
Site components	30 acres of improved Promenade and beach	30 acres of improved Promenade and beach	30 acres of Promenade and beachfront
	28 acres of grassy field	28 acres of grassy field	70 acres of asphalt, roads, and buildings (of which almost 30 acres are closed to the public)
	20 acres of tidal marsh	20 acres of stabilized dune	
	22 acres of picnic areas, visitor amenities, parking	22 acres of picnic areas, visitor amenities, parking	
Multi-use event space	28-acre airfield	28-acre airfield	17.9 acres
Golden Gate Promenade	1.5 miles, 20-foot width, uniform surfacing	1.5 miles, 20-foot width, uniform surfacing	1.5 miles, width varies from 6 to 30 feet, various surfaces
Mason Street Bicycle and pedestrian path	1.2 miles	1.2 miles	0.2 mile
Visitor support facilities	Restrooms, showers, bicycle facilities	Restrooms, showers, bicycle facilities	Portable toilet
Picnicking facilities	Tables at east end, group picnic facilities at west end	Tables at east end, group picnic facilities at west end	Two tables at central beach
Allowable area for off-leash dog activities	70 acres	70 acres	38 acres
Rubble-free beach area	4,500 linear feet	4,500 linear feet	2,000 linear feet
Facilities meeting accessibility standards	All trails and visitor amenities	All trails and visitor amenities	0.2-mile trail, portable toilet
Total area	Approximately 100 acres	Approximately 100 acres	Approximately 100 acres

of space accessible for these activities (80 acres) would be more than currently exists (66 acres) (Table 4-2). Large areas in the West Bluff improvements area, east of the wetland, on the grass airfield, and along the shoreline and beach area would be opened up and improved to accommodate a variety of recreation activities. This effect is considered beneficial.

#### **4.2.2.5 Improved Safety and Amenities for Recreationists along Mason Street**

Mason Street would be realigned slightly in three locations and the width of the travel lanes narrowed from 20 feet to 12 feet. A separate bicycle path for higher speed through-traffic bicycles and an 8-foot-wide pedestrian path would also be added along Mason Street. A 5-foot-wide median strip would separate vehicular traffic from bicycle and pedestrian traffic, and another 5-foot-wide median would separate the bicycle path from the pedestrian path. The proposed width changes and curved alignment adjacent to the airfield are expected to result in lower traffic speeds and make this road less attractive as a through-traffic shortcut to the Golden Gate Bridge. This effect is considered beneficial because it would allow safer travelways for Crissy Field cyclists and pedestrians.

#### **4.2.2.6 Change in Parking Location at the West End**

The small parking lot east of the U.S. Coast Guard station would be eliminated, and a larger parking lot would be constructed at the West Bluff. This impact is beneficial because it would eliminate vehicle traffic crossing the Promenade to access parking areas and it would improve parking at the west end of the site. However, launching of watercraft would not be permitted through the waterbird protection area, as stipulated in the GMPA.

#### **4.2.2.7 Optional Management Scenarios for Off-Leash Dog Activities**

Under the proposed scenario for off-leash dog use areas, the allowable area for off-leash dog activities would be nearly double (70 acres) compared with current conditions (38 acres). As described in Section 2.2.4, "Dog Management Options", this and other dog use area options that would enhance, maintain, or reduce the amount of space available for this activity

are still being considered. Any of the dog management scenarios could be implemented with either the Proposed Action or the Dune Alternative.

Under the proposed dog management scenario, the area allowed for off-leash dog activities would increase from existing conditions, allowing dog activities on the airfield, the Promenade and beach east of the U.S. Coast Guard station, and in the East Beach area. This would be a beneficial impact on recreation opportunities for dog enthusiasts.

An alternative management scenario being considered would allow off-leash dog activities on the airfield, the Promenade, and the beach east of the U.S. Coast Guard station—an area also larger than is available presently for this activity. This option would also result in a beneficial impact on recreation opportunities for dog enthusiasts.

A second alternative management scenario would allow off-leash dog activities on the airfield and the beach and Promenade adjacent to the airfield only. This area would be slightly smaller than the size of the area currently available for dog activities. The slightly smaller area available would be roughly the same as the area currently available; therefore, the impact on recreation opportunities for dog enthusiasts would be less than significant under this option. More area would be available for wildlife use and for recreationists who want more space without potential dog conflicts. This option would have beneficial effects on wildlife and other recreationists.

A third alternative management scenario would allow off-leash dog activities on the Promenade and beach areas east of the U.S. Coast Guard station only. The effect on recreation opportunities for dog enthusiasts would result in less area available for dog use and more area available for recreationists who want more space without potential dog conflicts; therefore, this impact would be less than significant.

### **4.2.3 Cultural Resource Impacts**

#### **4.2.3.1 Compliance with Section 106 of the National Historic Preservation Act**

In 1994, a programmatic agreement (PA) was developed to address the effects of implementation of the GMPA on historic properties at the Presidio. All effects of the Proposed Action were addressed in the PA.

#### **4.2.3.2 Restoration of Crissy Field Airfield**

Crissy Field airfield has national significance as the first air coast defense station on the Pacific Coast and because of its association with important aviation milestones and famous aviators. It is the only such airfield in the entire nation that retains integrity. All landscape features and support structures of this important military airfield still exist at the west end of Crissy Field. Crissy Field airfield operated at three distinct time periods over 55 years, starting with the initial designation as a military airfield in 1919 and ending with the final closure in 1974. The earliest operational period was the time when the airfield had the greatest influence on the nation's history.

The existing airfield site includes multiple layers of construction representing continual expansion through time. The large asphalt runway remains as the last of a series of landing strips that became successively longer over time. Most of the structures that remain at the site relate to the military airfield; however, there are other structures that were constructed during periods when the airfield was not in operation.

The restoration of Crissy Field airfield will create excellent opportunities to enhance the historic qualities of the airfield and to provide educational and interpretive benefits. The restoration of the site will be guided by the time frame of the airfield's period of national influence (1920-1930), when the landing field consisted of a grass surface over a clay base. Educational opportunities will be facilitated by the removal of some structures that were constructed later and reconstruction of the configuration and dimensions of the earlier landing field.

In addition, restoration of Crissy Field will also enhance the historic setting for structures and landscape features outside of the plan area because the restoration will provide a better context for appreciation of the air base as a whole. Restoration of Crissy Field airfield is considered a beneficial impact.

#### **4.2.3.3 Restoration of Old Mason Street**

In 1917 and 1919, Fort Mason's supply depot expanded into the Lower Presidio, resulting in the construction of 13 warehouses. These warehouses were served by the State Belt Railroad of California, which was extended from Fort Mason for that purpose. One set of the warehouses was constructed adjacent to what would become Old Mason Street.

Old Mason Street was built in 1920, probably to facilitate access to the warehouses. The realignment of Mason Street, constructed between 1946 and 1963 (Adams 1995), resulted in a change to the original street layout of the Crissy Field area. The Proposed Action would result in the restoration of Old Mason Street to its historical alignment, which followed the curving south edge of the airfield. This restoration would provide better context and continuity for the Crissy Field historic setting and would also enhance the restoration of Crissy Field airfield. Restoration of Old Mason Street to its original alignment is considered a beneficial impact.

#### **4.2.3.4 Planting of Trees along Mason Street**

The Army's 1992 removal of a commissary along the north side of Mason Street at the Marina Gate entrance created a void where a linear streetscape had been before. Under the Proposal, development at the Marina Gate would be compatible with the historic entrance treatment elsewhere on the Presidio, which attempted to define a distinct border using groves of trees associated with formal gates. The former linear quality of the entrance would be restored through landscaping, without loss of the vista toward the Golden Gate because of appropriate spacing between the newly planted trees. The entrance gate itself will be treated in a manner more appropriate to a major entrance to the former military post and national park.

#### **4.2.3.5 Construction Activities in the Vicinity of the Old Mason Street Railroad Tracks**

The warehouses at Crissy Field were originally served by the railroad, which had tracks extending down both Gorges Avenue and Old Mason Street. The tracks on Gorges Avenue have been removed, but the tracks on Old Mason Street are intact/remain in place approximately halfway along the distance of Old Mason Street (Adams 1995). The Proposal would require excavation work in the vicinity of the Old Mason Street railroad tracks; however, the location of the tracks is known and the tracks will be avoided during construction. The tracks will be covered with asphalt or soil to protect them from future disturbance. No adverse effects on the Old Mason Street railroad tracks are anticipated, and no additional mitigation is necessary.

#### **4.2.3.6 Potential to Disturb Archeological Resources**

Based on archival and other historical research, several areas of high archeological sensitivity have been identified that could be affected by implementation of the Proposal. These areas, described in Section 3.3, "Cultural Resources", of "Affected Environment", have been generally located and plotted on maps and the information has been incorporated into the design plans for the Proposal.

Plans have been designed to avoid affecting specific areas known to contain archeological resources. Documentary research and test excavations will be conducted in the location of the historic Quartermaster wharves and prehistoric site CA-SAR-6 to assist in identifying and avoiding significant remains at these sites during project implementation. An archeological monitoring program designed in accordance with the 1994 Programmatic Agreement will be used to evaluate and record historic features that may be discovered during the project, as noted in Section 3.3.

In the event of discovery of either prehistoric sites or burials, consultation will be initiated with appropriate Native American groups in accordance with the National Historic Preservation Act and the Native American Graves Protection and Repatriation Act.

### ***4.2.4 Geomorphology and Soil Impacts***

The site plan alternatives were evaluated to determine whether impacts on the existing soils and geomorphologic features in the project area would result. Potential impacts of the Proposal related to erosion, sand deposition and removal, siltation, and soil quality and productivity are disclosed in this section.

#### **4.2.4.1 Potential Changes in Shoreline Configuration Resulting from Removal and Reconfiguration of Bayshore Rubble**

Based on an evaluation of existing rubble and need for shore protection, several segments of the Crissy Field bayshore would be affected by rubble removal/beach restoration (Figure 2-14) (Philip Williams & Associates 1996b). About 600 feet of engineered shoreline protection would be installed at the far western (Torpedo Wharf) and easternmost (Lyon Street boundary) portions of the shoreline. The rubble at the eastern end would be replaced with a stepped stone and concrete structure. Six hundred feet of terraced rubble would be retained in a section along the shoreline of the West Bluff picnic area and a section just east of the tidal marsh inlet channel. The Proposal also includes removal of 4,500 linear feet of existing rubble along the Crissy Field bayshore, exposing more sand beach in areas where shore protection is not needed. Exposed isolated occurrences of rubble protruding from the sand along a 1,400-foot length of shoreline just west of the tidal marsh inlet channel would also be removed.

These actions would result in alteration of the shoreline configuration as shown in Figure 4-1. The primary effect would be to expand the extent of natural beach along the Crissy Field shoreline through removal of rubble. Generally, removal of rubble would allow the beach to adopt a flatter slope and widen. This, in turn, would allow windblown sand to sustain and develop coastal dune ecosystems behind the beach along more of the shoreline, as shown. The East Beach would be extended by about 800 feet as a result of rubble removal.

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Rubble would be retained or replaced with engineered structures where needed for shore protection. The existing outfall at the East Beach would be replaced with a groin structure to protect the beach.

Rubble removal and dune restoration would have a negligible effect on net littoral transport of sand to the east and would not affect current siltation problems in the yacht harbor. This is because existing rubble is mainly on the upper part of the beach and does not impede the littoral transport of sand. Also, while creation of foredunes would increase the capture of sand from the beach, the volume would be small compared with littoral transport rates (Philip Williams & Associates 1996b).

### 4.2.4.2 Potential for Closure of the Proposed Tidal Marsh Inlet Channel

Flushing of the marsh through tidal action is important to the marsh ecosystem health and function. Extensive evaluation of its ability to sustain an open channel to the bay was conducted (Dames & Moore 1995a, Philip Williams & Associates 1996b).

The Proposal includes a natural tidal inlet channel as the means to introduce and maintain tidal flow into the created tidal wetland. Initially, the tidal marsh would have sufficient tidal prism (the volume of water moving in and out on a tidal cycle)—approximately 62 acre-feet—to maintain an open entrance channel, scouring and clearing any sand deposited by wave action. Over time, estuarine sedimentation would occur within the site, decreasing the tidal prism. Based on measurements of sedimentation near the St. Francis Yacht Harbor, it appears that sedimentation rates are low. Eventually, as the tidal marsh matures, tidal scouring and wind action would balance sedimentation, maintaining an equilibrium tidal prism of about 18 acre-feet. Based on detailed calculations of the tidal prism over time, it is predicted that the tidal prism of the marsh would be sustained above 25 acre-feet (sufficient to maintain an open channel) for at least 30 to 50 years (Philip Williams & Associates 1996b). Existing rubble under the beach that would remain would provide additional stability to the channel inlet system.

As the tidal prism is reduced, the risk of closure increases during rare periods of high wave action, when sand movement is high, and during neap tides

(monthly tide of lowest daily range), when tidal scouring is low. Typically, a closure may occur during the flood tide, when wave action creates a sand berm higher than the tide level in the marsh. In most instances, it is expected that the berm would be breached during succeeding spring tides (monthly tide of highest daily range) and low wave action or as a result of the outflow of fresh water eroding the berm (Philip Williams & Associates 1996b).

To avoid potential problems associated with the scenario described above, the Proposal also includes the following elements to prevent extended periods of closure of the entrance channel as key design and management criteria:

- designing for as large a tidal prism as possible in the wetland;
- discharging freshwater flows through the tidal marsh entrance channel;
- mechanically excavating accumulated beach sand requiring several hours of backhoe use, if necessary; and
- designing the tidal marsh to allow for its possible expansion south of Mason Street to 30 acres in a future phase, ensuring that the tidal prism would always be greater than 25 acre-feet.

The Proposal also includes the possible future construction and extension into the bay (to low-tide level) of an open culvert in the event of frequent channel blockage to increase the efficiency of the tidal opening. It would be removed if the marsh is expanded, restoring the tidal prism to levels that are self-sustaining. Because these contingent plans for any needed maintenance or extension of the infrastructure are included as part of the Proposed Action, this impact is considered less than significant.

### 4.2.5 Water Resource Impacts

Potential impacts of the Proposed Action related to water quality, drainage, and hydrology are disclosed in this section.

#### **4.2.5.1 Potential Short-Term Water Quality Impacts Associated with Construction Activities**

Construction activities that would be required for Crissy Field site improvements have the potential to cause short-term water quality impacts on nearshore areas of San Francisco Bay, natural drainageways, or the stormwater system as a result of increased soil erosion and discharges of construction-related materials (e.g., fuels, lubricants, solvents, and cleaners) to surface waters. Activities that could disturb and expose soil to forces of erosion include earthmoving and grading operations, road construction, and long-term maintenance activities within the tidal marsh to remove accumulated sands and maintain adequate tidal flushing. Erosion and related construction impacts could result from various cut, fill, and grading activities; removal of asphalt from the existing airfield; and beach restoration and rubble removal along the bay shoreline.

The total amount of soil disturbance for construction is estimated to be 284,500 cubic yards, including approximately 7,000 cubic yards that would be excavated to create the channel inlet for the tidal marsh. The excavated sediments would be used as fill for other features at Crissy Field, such as the airfield restoration. Because the site is relatively flat, the potential for erosion is considered low. Furthermore, the site was not identified as having high or moderate erosion potential in the Presidio of San Francisco Storm Water Management Plan (Dames & Moore 1994). Although the potential for soil erosion during construction is low, NPS will comply with conditions of National Pollutant Discharge Elimination System (NPDES) general construction activity stormwater permits, including implementing erosion control plans and stormwater pollution prevention plans (SWPPPs). Measures used will include best management practices (BMPs) to minimize soil erosion, including structural, management, and vegetation measures (Dames & Moore 1994). NPS will minimize the discharge of soil and pollutants during excavation by requiring contractors to employ measures to contain disturbances within localized areas, including use of turbidity barriers, use of silt curtains, or equivalent measures. Routine monitoring and reporting of BMP performance will be conducted by NPS pursuant to the NPDES permits. Compliance with the BMPs included in the plans will result in a minimal amount of soil erosion, and discharges of construction-

related pollutants would be minimized. This potential impact is considered less than significant.

#### **4.2.5.2 Potential for Increased Saltwater Intrusion to Shallow Groundwater Aquifers**

Excavation of the wetland would expose inland subsurface strata to tidal action and could subsequently increase saltwater intrusion to shallow aquifers and degrade the quality of potential domestic water supplies. Potential impacts of saltwater intrusion are considered less than significant because the existing shallow aquifer in the proposed tidal marsh footprint is not currently used for domestic supply purposes. The nearest existing well is more than 1 mile to the south near Mountain Lake. Furthermore, the movement of groundwater is toward the bay to the north and saltwater intrusion therefore would not contaminate downgradient supply wells. Hydraulic conductivity and gradient of the water-bearing strata are relatively low and would resist the movement of saltwater from the tidal marsh. It is also unlikely that future potential beneficial uses of the groundwater in the tidal marsh footprint would be impaired, because existing secondary taste and odor conditions and the potential for subsidence would deter use of the water supply in the tidal marsh vicinity (Hiett pers. comm.). Additionally, tidal marsh creation should not negatively affect future usability of groundwater in other areas of Crissy Field that do not have these characteristics beyond the tidal marsh vicinity.

#### **4.2.5.3 Potential Exposure of Aquatic Organisms to Hazardous Substances from Tidal Marsh Construction**

Excavation for the tidal marsh could create areas that intercept shallow groundwater containing hazardous substances from historical waste discharges and potentially expose aquatic flora and fauna to toxic substances. Groundwater that contains hazardous substances could cause acute and chronic toxicity to sensitive aquatic organisms if concentrations exceeded the established thresholds. Risk-based analyses conducted for NPS for the feasibility of tidal marsh restoration (Dames & Moore 1995a) suggest that observed groundwater concentrations of aluminum, chromium, copper, magnesium, manganese, and zinc are present in levels that could cause toxicity to organisms. The report concluded that risks to aquatic organisms would be low because the wetland would have substantial exchange of

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seawater from the daily tidal cycle in relation to freshwater sources, and would therefore dilute any contaminants to negligible concentrations (Dames & Moore 1995a). In addition, the tidal marsh would be designed to sufficiently maintain the open channel naturally for 30 to 50 years. If the tidal inlet channel were to be closed for longer than several days, NPS would monitor conditions and, if necessary, perform mechanical maintenance to open the channel to ensure adequate tidal flushing, thus eliminating any potential for extended closure.

The most recent remedial investigation (RI) (Dames & Moore 1995b) prepared for the Army performed a more general risk-based analysis and concluded that moderate risks existed for certain receptor organisms at Crissy Field. However, the study assumed a very conservative scenario of receptors exposed only to groundwater with no dilution from water that has low or negligible contaminant concentrations. Given the normal conditions of tidal exchange that would exist in the proposed wetland, the potential for accumulations of concentrations toxic to susceptible flora and fauna that inhabit the wetland is considered low.

Although the risk of toxic contamination of aquatic organisms is considered low, contaminant levels in the project area will be monitored. Corrective measures will be implemented if areas are found to exceed risk criteria. These measures could include subsurface barriers, impermeable soil caps, or interceptor drains. The Army's final RI, feasibility study (FS), and Ecological Sampling and Analysis Program investigations have not been completed and, therefore, more precise analyses of the potential effects and appropriate corrective measures are pending results of the reports. As noted in Section 3.5.3.3, at the 637 site the Army has already initiated remedial actions for contaminated soil and the need for a groundwater treatment system to be installed is under evaluation. Tidal marsh construction activities will not begin until the necessary cleanup activities in the affected project area are complete.

### ***4.2.6 Biological Resource Impacts***

No special-status plants are known to exist at Crissy Field. In addition, no special-status wildlife species are known to breed at Crissy Field or use the site on a regular basis. The Proposed Action would not result in any adverse

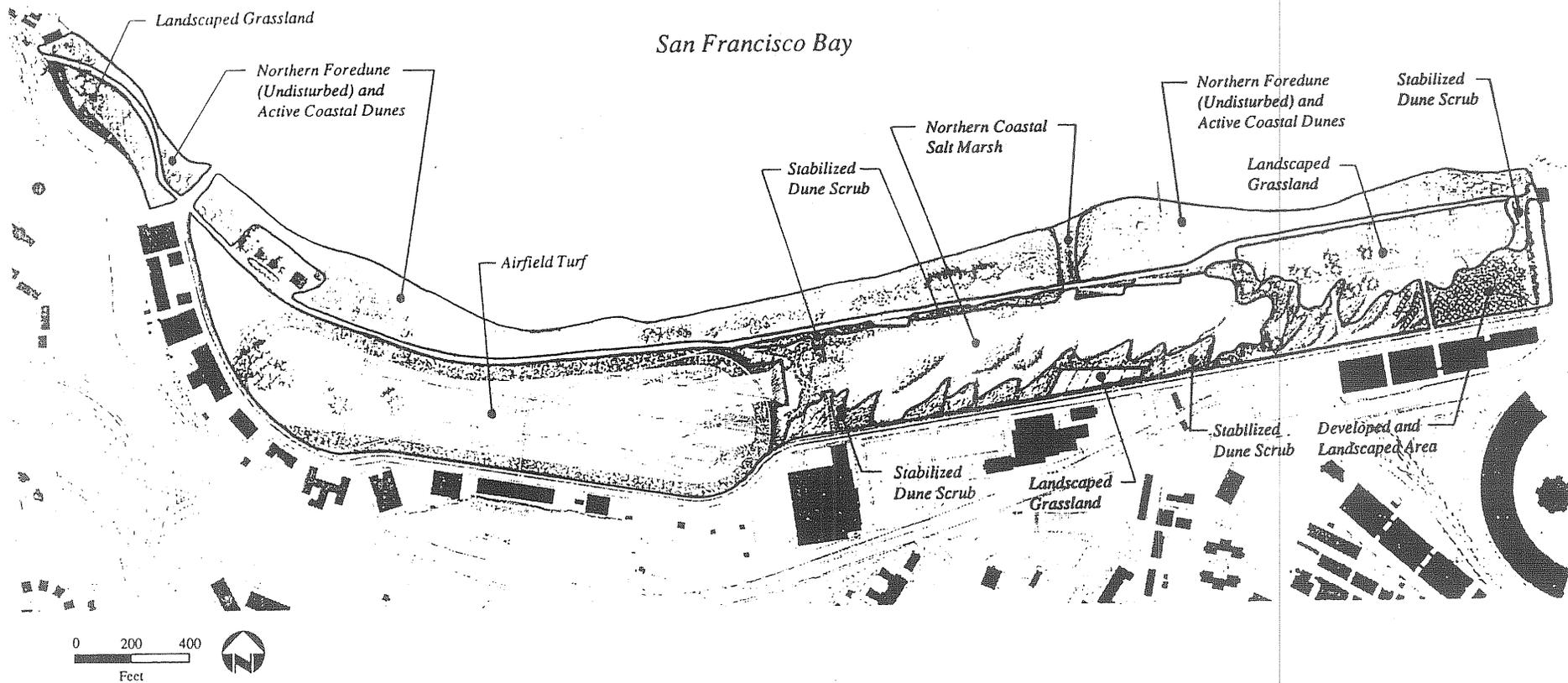
effects on threatened or endangered species. Although the tidal marsh and associated upland buffer areas would provide increased potential natural habitat for special-status wildlife species such as California clapper rail, black rail, and salt marsh yellow throat, it is not likely that these species would inhabit this area because of the isolated nature of the tidal marsh and the intensity of human activity in the area. NPS does not intend to introduce any threatened or endangered species into the area.

The Proposal would, however, provide a number of benefits related to biological resources, including public education, increased biological diversity of the area, and an increase in areas occupied by natural habitats on the site, compared with present conditions. Table 4-3 compares the acreages of habitat types under each alternative. Figure 4-1 shows the habitat types that would exist under the Proposal.

#### **4.2.6.1 Ecological and Educational Benefits of Construction of a Tidal Marsh**

The Proposal includes construction of a 20-acre tidal marsh in the central portion of the site. After the basic construction is completed, the tidal marsh would continue to develop over time as plant propagules are brought in on the tides and through NPS management of the site. Diversity of wildlife expected to use the marsh should be moderate to high, especially for shorebirds and wading birds, such as American avocet, plovers, herons, egrets, marbled godwits, and sandpipers, and for dabbling ducks and diving ducks, especially in winter. Wildlife diversity would not be as high, however, as in a larger marsh that is surrounded by natural habitats and undisturbed by human activity. The site is accessible by MUNI, in close proximity to a large urban population, and near the future Presidio shuttle stop. Because the proposed marsh is isolated from other marshes, many animals, including special-status species such as the saltmarsh harvest mouse, would not be able to reach or occupy the site. Some of the ecological benefits of the wetland include providing habitat for marsh plants, wildlife, invertebrates, and juvenile fish rearing. Appendix A provides a list of plant and wildlife species that could occur at Crissy Field.

The tidal marsh area would also include overlooks that would allow visitors to view this area and experience the wetland environment. Interpretive



**Figure 4-1**  
**Habitat Types under the Proposed Action**

Table 4-3. Comparison of Habitat Acreages

Habitat Type	Proposed Action	Dune Alternative	No-Action Alternative
Northern foredune (undisturbed) and active coastal dunes*	27.0 acres	27.0 acres	2.6 acres
Northern foredune (disturbed) and active coastal dunes*	None	None	16.9 acres
Stabilized dune scrub	8.0 acres	28.0 acres	None
Airfield turf	28.0 acres	28.0 acres	None
Landscaped grassland	12.0 acres	12.0 acres	18.1 acres
Developed and landscaped areas	5.0 acres	5.0 acres	62.4 acres
Tidal marsh	20.0 acres	None	None
Total	100 acres	100 acres	100 acres

\* Includes beach.

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stations would enhance the educational opportunities provided by the marsh. From an educational perspective, it would provide a great place for people to learn about marsh restoration, tides, tidal marsh zones, marsh evolution, birds, invertebrates, and plants. Educational opportunities associated with the tidal marsh would be unique in San Francisco. Also, many interactive opportunities for community involvement in restoration activities, such as revegetation, would be provided. The ecological benefits and the public educational opportunities that would be afforded by the tidal marsh are considered beneficial.

### **4.2.6.2 Potential Land Use Conflict between Intense Visitor Use Areas and Natural Habitat of the Created Wetland within the Proposed Site Plan Area**

Because of the intense visitor uses along the Promenade and the proposed access, there is a potential conflict with the ecological values of the wetland. At the three proposed Promenade overlooks at the north end of the site plan area, intense visitor use would interface with the natural environment of the wetland. Overlooks would be provided along approximately 600 feet of the marsh perimeter. Of that 600 feet, only the 200 feet of eastern overlook would allow direct access to the edge. All other overlooks would be separated by buffering vegetation to minimize visitor disturbance. The boardwalk would cross 320 feet of the marsh.

The created wetland would serve four basic functions or values: ecological, educational, historical, and aesthetic. The proximity of visitor uses affects the degree to which the wetland would meet each of these functions. The plan achieves a good balance between maximizing the ecological benefits described above with allowing visitors access to the area to interpret the historical values and experience the aesthetic and educational values of the wetland. Approximately 90% of the shoreline of the tidal marsh would be surrounded by buffering vegetation, minimizing the impact of visitor use. Because of the lack of direct access to some of the perimeter of the tidal marsh, even with the boardwalk and three Promenade overlooks (some of which are designed as blinds), the tidal marsh would still serve important ecological functions.

The hidden barrier fencing and vegetation buffer would be constructed to keep people and dogs out of sensitive natural areas. No dogs would be allowed in the tidal marsh, and interpretive signs would be installed to educate users about appropriate uses. Self-closing gates would be installed at boardwalk and overlook entrances to prevent access by dogs. It is not expected that the marsh would become established habitat for endangered species, such as the California clapper rail or the saltmarsh harvest mouse, because of the intensive human use of that area, the limited size and isolation of the tidal marsh, and the lack of adjacent upland habitat.

The level and diversity of bird use of the area would also be expected to increase from current conditions. If the Promenade were relocated away from the tidal marsh or the overlooks removed, the aesthetic and educational values to the public would be diminished and there would probably be only a negligible and unnoticeable increase in wildlife use of the tidal marsh as a result of decreased disturbance from people. Through the design features described above, the potential for conflicts between visitors and natural values has been minimized; therefore, the impact of this potential conflict is considered less than significant.

### **4.2.6.3 Conversion of 11.0 Acres of Developed and Landscaped Areas, 6.4 Acres of Annual Grassland, and 2.6 Acres of Disturbed Dune to Tidal Marsh**

A 20-acre tidal marsh, consisting of an open water lagoon, sand flats, mud flats, and vegetated marsh plain, would be created on Crissy Field, primarily displacing non-native developed and landscaped areas and annual grassland. The 20-acre marsh system would include 11.3 acres of intertidal and subtidal marsh, 2.4 acres of transitional marsh, 3.5 acres of sand/mud flat, and 2.8 acres of associated upland habitat.

Because of its connection with the Bay, the tidal marsh would also displace a small amount of native restored dune and beach and non-native disturbed dune. About 2.6 acres of existing foredune habitat would be removed for construction of the tidal marsh inlet channel. The effect on dune vegetation would be minor because of the small amount of dune that would be affected; because native plants would be salvaged; and because, overall, the project would result in a net increase in native dune habitat restored.

The impact of converting the developed and landscaped areas and grassland to tidal marsh is considered beneficial because non-native habitat areas would be converted to native habitats, creating a native community that is in decline, and it would greatly increase the biological diversity of the site. It would also create habitat for wetland-dependent native plant and wildlife species such as Virginia rail, sora, song sparrow, and marsh wren. Because the tidal marsh would be isolated from other wetlands, it is difficult to predict whether native small mammals, reptiles, or amphibians would use the site. A more complete list of native plant and animal species that could occupy the tidal marsh is included in Appendix A.

#### **4.2.6.4 Conversion of 10.1 Acres of Developed and Landscaped Area and 16.9 Acres of Disturbed Fore-dune Areas to Native Dune Communities**

Restoring native fore-dune communities north of the Promenade would result in the conversion of degraded beach areas and developed and landscaped areas to native fore-dune habitat occupied by native plant species. This action is considered beneficial because it would replace non-native habitat with native habitat and would promote the occurrence of native plant species. Wildlife habitats dominated by non-native plants would be replaced with wildlife habitats dominated by native plants. Native wildlife would benefit from habitat restoration because native plants provide food and cover for native animals, especially insects.

Dune restoration would also be implemented along the Promenade in disturbed dune and beach habitat. This action is also considered beneficial because it would result in a plant community and associated wildlife habitat currently dominated by non-native plant species being replaced by a community dominated by native plant species.

Because Crissy Field is disturbed by a high level of human activity, it is difficult to determine future wildlife use of Crissy Field. Potential native wildlife species that could potentially occur in the dune habitat include the killdeer, ring-billed gull, western gull, house finch, mourning dove, Brewer's blackbird, and reptiles.

#### **4.2.6.5 Conversion of 5.6 Acres of Annual Grassland and 2.4 Acres of Developed and Landscaped Areas to Dune Scrub in the East Beach Area**

About 5.6 acres of non-native annual grassland and 2.4 acres of developed and landscaped areas would be converted to 8.0 acres of native dune scrub in the East Beach area. This impact is considered beneficial because non-native plant communities would be replaced with native plant communities. Implementing this action would create habitat for dependent native dune scrub plant and wildlife species. As noted above, native wildlife would benefit from dune scrub restoration, because native plants provide food and cover for native animals, especially insects. Native wildlife species that could potentially occur in the dune scrub habitat include the mourning dove, house finch, song sparrow, and reptiles.

#### **4.2.6.6 Conversion of 33.9 Acres of Developed and Landscaped Areas and 6.1 Acres of Annual Grassland Areas to Landscaped Grassland**

Restoring the airfield and creating other maintained grassy areas would result in the conversion of 33.9 acres of developed and landscaped areas and 6.1 acres of annual grassland habitat to 40.0 acres of landscaped grassland. This impact is considered less than significant because developed and landscaped areas and annual grassland are common regionally and statewide and do not support special-status species at Crissy Field. Also, the existing developed and landscaped areas have low wildlife value and, overall, the site plan would result in a net increase in native habitats.

#### **4.2.6.7 Temporary Disturbance to and Long-Term Enhancement of Beach Habitat Areas**

Rubble removal and beach reconfiguration would be performed along the Crissy Field shoreline to promote natural beach and dune formation processes. Approximately 4,500 linear feet of beach front would be affected by rubble removal. This impact is not considered significant because of the current absence of vegetation and special-status species along the beaches. Although invertebrates using the rubble as cover could possibly be displaced

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and mortality could occur from rubble removal, this impact is not considered significant because there are no special-status species associated with the rubble areas. In addition, the impact would be temporary in duration and current wildlife use of the beach is low because of human disturbance. This action is expected to have a long-term beneficial effect on native beach and dune habitats by creating sites for native plant establishment and wildlife habitat.

### 4.2.6.8 Removal of Non-Native Trees and Shrubs

The proposed site plan calls for removing some non-native trees and shrubs. The Proposal would include removing approximately 48 palm trees and 10 eucalyptus trees from the airfield area and 10 cypress and 5 palm trees from the East Beach parking area. Palm trees would be relocated to other Presidio or offsite locations. Other existing non-native trees would be retained. Although many of the existing non-native trees would be retained or made available for transplanting to other areas of the Presidio or elsewhere, palm tree removal could affect potential nesting habitat. This impact is considered less than significant because the trees are common non-native species. Other trees would be planted as part of implementing the Proposal, and it is NPS policy to avoid removal of trees during the breeding season.

### 4.2.6.9 Effects on Fish and Other Aquatic Species

Several special-status fish species could occur in the tidal area along Crissy Field, but none are known to breed there; therefore, there would be no impacts on special-status fish. Restoration of tidal marsh habitat along Crissy Field could benefit fish species in the long term by providing habitat for rearing of juvenile fish, such as Pacific herring, and dungeness crab.

### 4.2.6.10 Potential for Mosquito Generation

A discussion of this issue is presented in Section 4.2.10, "Impacts on Human Health, Safety, and the Environment".

## 4.2.7 Transportation Impacts

This impact analysis evaluates the impacts of the Proposal on roadway operations, parking, bicycle and pedestrian travel, and safety.

Crissy Field may experience a slight increase in traffic as a result of increased visitor use because of increased attractiveness and accessibility of the area. However, large-scale events that have historically occurred at Crissy Field will no longer take place there, as established in the GMPA. Also, the site will no longer be used as a large parking lot for other events. Group events and festivals will be small to medium-sized. As noted in the GMPA, large events, such as the Fourth of July Independence Day celebration, that typically generated a large amount of traffic and demand for parking will no longer be held at Crissy Field.

For the reasons described above, the Proposed Action is not expected to result in a substantial increase in traffic on the Crissy Field roadways or affect neighborhood parking. Therefore, the operating conditions of the roadways and intersections within and around Crissy Field are not expected to significantly change from existing conditions.

### 4.2.7.1 Potential Addition of Traffic to the Roadway System as a Result of Visitor Trips and Construction-Related Trips

Restoration and enhancement of Crissy Field may result in an increase in the number of people visiting and using this site as a result of the increased attractiveness and accessibility of the site and future growth in population and park visitors. Traffic projections for 2000 and 2010 were estimated in the GMPA EIS. The expected increase resulting from the Proposed Action is within these projections. Traffic increases that would result from implementation of the Proposal are not expected to be substantial in relation to the existing number of visitors because the existing land use of park/open space/recreation would not change and does not generate a significant contribution to the projected cumulative traffic increases. The addition of traffic on the existing roadways and intersections resulting from

implementation of the Proposed Action is expected to be less than significant.

Project construction activities are expected to result in additional traffic on the surrounding roadways and intersections. However, this increase would be temporary and small and is considered to be less than significant. Because most of the excavated material would be used onsite, disposal haul trips will be minimized.

#### **4.2.7.2 Changes in Traffic Speeds and Patterns along Mason Street**

Under the Proposed Action, Mason Street would be realigned in two locations. In addition, the vehicular lanes on Mason Street would be narrowed from the existing 20-foot lanes to 12-foot lanes.

The realignment and narrowing of Mason Street is expected to result in lower traffic speeds and make this road less attractive as a through-traffic shortcut to the Golden Gate Bridge. This is consistent with the GMPA concept for circulation at Crissy Field, as well as public desires to reduce through-traffic on Mason Street. The addition of traffic on Mason Street through to the West Bluff area would not be substantial because Mason Street would terminate in the parking lot. This impact is considered beneficial.

#### **4.2.7.3 Improvements to the Pedestrian and Bicycle Facilities**

The Proposal builds on the existing use of the Promenade by many people as a recreation corridor for activities such as jogging and dog walking. The existing Promenade varies in width from 6 feet to 30 feet. This alternative proposes a uniform width of 20 feet, allowing ample room for walkers, runners, and slow-moving bicyclists. Stabilized aggregate or crushed oyster shell would replace the sporadic mix of asphalt and gravel, providing a consistent surface. The surfacing material would discourage faster moving bicycles from mingling with pedestrians. Mason Street would also be redesigned to include a 10-foot-wide separated bikeway and an 8-foot-wide pedestrian path. These improvements to the Promenade and Mason Street would provide a safer recreation corridor to its users and are considered to be

beneficial. See Section 4.2.2, "Recreation Impacts", for additional discussion of improvements to the Promenade.

#### **4.2.7.4 Improvements to the East Beach Parking Facility**

The East Beach parking area is currently arranged in a rectilinear grid of asphalt streets in varying degrees of disrepair. Under the Proposal, the East Beach parking area would continue to provide for vehicular access close to the bay for active recreational users, such as boardsailors, and casual visitors to Crissy Field. The proposed changes to this parking area include the removal of parking pavement along with several existing streets. Approximately 120 oversized surfaced parking spaces are included in the eastern portion of the site plan. The more efficient design allows for more parking in less space than under the current configuration. In addition, parking for 280 vehicles in oversized spacing would be provided on grass. Additional grass space would accommodate rigging and picnicking. Grass parking is consistent with the current use of the East Beach parking area by boardsailors who park on the grass and use it for rigging and staging their equipment. Restroom and shower facilities would be constructed at this location. Improvement of this parking area is considered to be a beneficial impact.

#### **4.2.7.5 Reduction of Total Available Parking for Day-to-Day Use at Crissy Field North of Mason Street**

Currently, there are approximately 3,415 marked and unmarked parking spaces at Crissy Field under and north of Doyle Drive, about 1,755 of which are north of Mason Street. Observations of parking use at Crissy Field indicate that peak weekday use generally does not exceed 26% of area available for parking north of Mason Street. This equates to about 460 spaces being used on a peak day. Most of the existing spaces at Crissy Field are not used on a day-to-day basis and are surplus spaces.

The GMPA calls for a total of 1,760 parking spaces within the entire 150-acre greater Crissy Field planning area (including 50 acres outside the current site plan area) by 2010. Under the Proposed Action, about 560 spaces would exist on Crissy Field north of Mason Street and a new 100-car lot would be constructed south of Mason Street. The remaining 1,100 spaces called for in

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the GMPA would be accommodated in existing and new parking areas south of Mason Street. The GMPA identifies several areas south of Mason Street for parking. The locations and sizes of the parking lots shown in the GMPA were conceptual; however, the remainder of the Crissy Field parking requirements can easily be met south of Mason Street. The supply of parking is adequate to ensure that adjacent Presidio neighborhoods are not adversely affected by Crissy Field parking demands. Prime waterfront space would be used for recreation and restoration of natural values rather than expansive parking lots. Because of the existing surplus parking space and existing and future parking supply south of Mason Street, the reduction in parking areas would not be restrictive for day-to-day activities. This impact is considered less than significant.

### 4.2.7.6 Reduction of Total Available Parking Space at Crissy Field for Special Events

Under the Proposed Action, 560 spaces are planned for the northern portion of Crissy Field north of Mason Street and a new 100-car lot would be constructed south of Mason Street at the east end. As noted in the GMPA EIS, the Presidio has more than enough parking space to accommodate existing facilities and activities within its boundaries. Existing Presidio parking supply is 13,000 spaces and projected future supply is 8,386. The area south of Mason Street, including under Doyle Drive, contains 1,660 spaces now and will provide 1,100 spaces in the future, consistent with the GMPA. Because special events and festivals at Crissy Field will be more moderate in size compared with some past large events (e.g., Fourth of July celebration), parking demand will be reduced.

The Presidio of San Francisco Transportation Demand Management Program recommendations include a comprehensive array of parking management strategies to be implemented through park partner-lease provisions, the GGNRA special event permitting process, Presidio Tenant Association Transportation Management Program policies and activities, and GGNRA administration of park-sponsored activities. These transportation demand management (TDM) measures are recommended to encourage alternative modes of travel and maximize use of the parking spaces that are provided. Special events that could result in overflow parking will be coordinated to ensure that parking supplies are not saturated. Special event schedules will

be based on parking availability, and events will be regulated to ensure that supply meets expected demand. Events requiring large amounts of parking will not be scheduled concurrently with other events if combined parking demand would exceed the available supply within the park. Sponsors may be required to provide special transit services during their events to reduce expected parking demand and promote use of public transit and remote parking lots.

Because of the projected reduction in demand for parking from reduced-scale events at Crissy Field, availability of parking supply south of Mason Street and other Presidio locations, and implementation of the TDM measures, this impact is not considered to be significant.

## 4.2.8 Air Quality Impacts

The main types of air pollution generated by construction are tailpipe emissions from construction machinery, dust emissions generated by heavy machinery operation on unpaved surfaces, emissions of dust and other particulate matter from earthmoving and grading, and dust emissions from wind erosion of unpaved surfaces and stockpiles. Tailpipe emissions were estimated by multiplying the number of hours of operation of each type of equipment by an emission rate for each pollutant taken from the U.S. Environmental Protection Agency (EPA) document "Compilation of Air Pollutant Emission Factors" (U.S. Environmental Protection Agency 1985). This document contains emission rates for a broad range of pollutant-producing activities. Dust emissions were estimated by multiplying the area expected to be disturbed in any single day of construction by an EPA dust emission rate (U.S. Environmental Protection Agency 1985).

### 4.2.8.1 Conformity with State Implementation Plans

The federal Clean Air Act mandated the establishment of ambient air quality standards and requires areas that violate these standards to prepare and implement plans to achieve them. These plans are called state implementation plans (SIPs). A separate SIP must be prepared for each nonattainment pollutant. Projects involving federal funding or federal approval are required to show conformity with state implementation plans if they would emit more than a certain level of nonattainment pollutants.

The San Francisco Bay Area is designated as a moderate ozone nonattainment area, and the urban area is designated as a moderate nonattainment area for carbon monoxide (CO). The San Francisco Bay Area is an attainment area for the federal particulate (PM10) standards. The de minimis emission levels are the threshold levels used to determine conformity with the SIPs. These levels are 50 tons per year (tpy) for reactive organic gases (ROG) and 100 tpy for oxides of nitrogen (NO<sub>x</sub>) and CO. Because the basin is in attainment for PM10, a threshold for PM10 has not been set. (See Section 3.8, "Air Quality", of "Affected Environment" for a description of criteria pollutants.)

Construction of the project is estimated to result in temporary and intermittent emissions of 2.1 tpy of ROG, 33.2 tpy of NO<sub>x</sub>, and 11.6 tpy of CO. Operation of the project is expected to result in emissions similar to those currently generated at the site. Because project-related emissions are below levels requiring a conformity finding, no further analysis of conformity of this project with SIPs is required.

#### **4.2.8.2 Increased Air Pollutant Emissions from Construction Activities**

According to the BAAQMD's New Source Review Rule, if a project would emit more than 150 pounds per day (ppd) of ROG, NO<sub>x</sub>, or PM10 it is considered to have a significant impact. This project has the potential to result in temporary construction-related emissions equaling 11.7 ppd of ROG, 181.7 ppd of NO<sub>x</sub>, and 345.1 ppd of PM10. These estimates are based on the assumption that a typical day of construction would require two graders, two scrapers, two trucks, two tractors, one loader, and one compactor and that 10 acres would be actively worked each day.

Because, under these assumptions, NO<sub>x</sub> and PM10 emissions would exceed the BAAQMD threshold level, NPS would require construction contractors to use construction equipment that adheres to stricter emissions standards for NO<sub>x</sub>. The ARB has established more stringent emission standards for construction equipment built after 1995. It is expected that this equipment will be commonly used to meet environmental requirements. If construction trucks and heavy-duty diesel equipment used at the construction site meet the 1996 emission standard of 6.9 grams/hp-hour, total NO<sub>x</sub> emissions would be

reduced to approximately 126 ppd, which is below the significance threshold. An alternative would be to use standard equipment and reduce the quantity of equipment being operated each day so that NO<sub>x</sub> emissions do not exceed the threshold of 150 ppd. This would require eliminating two or three pieces of equipment from the ten pieces assumed for the analysis.

To reduce PM10 emissions, measures would be implemented to reduce fugitive dust emissions. Watering the construction site will reduce fugitive dust emissions by about 50%. However, watering alone will not reduce PM10 emissions to less-than-significant levels. Another dust-control measure is the use of dust palliatives. A dust palliative is an agent to control particulate matter that is usually generated by wind or construction equipment, and is usually applied on the ground. Water or cellulose-based chemical stabilizers are commonly used. Other acceptable materials that may be used include petroleum, resins, asphaltic emulsions, acrylics, and adhesives. These materials are generally accepted as being environmentally safe. These substances can generally provide a 90% reduction of fugitive dust emissions. A combination of watering 75% of the construction site and applying dust palliatives on the remaining 25% would reduce total PM10 emissions to approximately 147 ppd. This quantity is less than the significance threshold of 150 ppd.

Daily covering of exposed areas not undergoing construction activity would also help control particulate emissions.

#### **4.2.8.3 Air Pollutant Emissions from Ongoing Operations at Crissy Field**

Implementation of the Proposed Action would result in a similar amount of emissions as from the existing facility. Traffic-related emissions and emissions from routine landscape maintenance are expected to be minor and similar to current levels. Because operation-related emissions under the Proposed Action are expected to be similar to current emissions, this impact is considered less than significant.

### 4.2.9 Noise Impacts

Noise impacts resulting from activities occurring on a temporary basis, such as project construction activities, are evaluated somewhat differently than permanent noise sources, such as highway traffic noise. Potential for speech interference during the daytime or sleep disturbance at night are the most appropriate criteria for the assessment of temporary noise impacts. As specified in the City of San Francisco's noise ordinance, construction-noise impacts are considered significant if noise levels exceed 80 dBA at a distance of 100 feet during daytime, or are 5 dBA or more higher than ambient noise levels during nighttime.

The potential reaction of the public to a change in noise conditions that results from a project is used as a factor in determining significance of operation-related noise impacts. Research into the human perception of changes in sound level indicates the following (Bies and Hansen 1988):

- a 3-dB change is just perceptible,
- a 5-dB change is clearly perceptible, and
- a 10-dB change is perceived as being twice or half as loud.

These factors and other factors relating to the duration and frequency of project-related noise events are considered when the significance of changes in sound levels is evaluated. In general, a permanent noise level increase of 5 dBA or more would be considered significant.

#### 4.2.9.1 Increased Noise Levels during Construction

Construction would result in increased noise levels from earthmoving and construction activities. The types of construction equipment used for this project will typically generate noise levels of 75-85 dBA at a distance of 50 feet, which equates to 70-80 dBA at a distance of 100 feet, while the equipment is operating (U.S. Environmental Protection Agency 1971, Toth 1979, Gharabegian et al. 1985).

Construction equipment operations can vary from intermittent to fairly continuous, with multiple pieces of equipment operating concurrently. Such

noise levels will not be continuous throughout the day and generally will be restricted to daytime hours.

Noise-sensitive receptors that could be subjected to construction noise include recreational users at Crissy Field and residences at the U.S. Coast Guard station and south of U.S. 101. These residences are clustered in three locations: near Lincoln Boulevard and the San Francisco National Cemetery, near the Army Museum and Lincoln Boulevard, and near the Army Museum and Girard Road. Residences are also located in the area just outside the gate on Marina Boulevard. Temporary noise increases from construction are not usually considered significant impacts on the type of recreational uses that occur at Crissy Field because the recreational users can simply move away from the noise source. The closest residential uses are at least 500 feet from the areas that will undergo construction. These residential areas currently experience relatively high noise levels from traffic on U.S. 101, which would tend to mask construction noise. Construction operations would have to comply with the City of San Francisco's noise ordinance, which limits daytime and nighttime construction noise levels.

Because construction noise would be regulated by the noise ordinance and there is substantial distance between construction areas and residential uses, this impact is considered less than significant.

#### 4.2.9.2 Potential Noise Effects from Ongoing Operations at Crissy Field

Operation of Crissy Field would result in minimal or no increase in noise levels compared with current conditions. The Proposed Action contains no elements that would contribute to increased noise levels. The project would require a similar amount of maintenance activity, including lawn mowing, vegetation trimming, and trash and litter removal as under existing conditions.

Under the Proposal, there would also be greater separation between parking areas and visitors than currently exists, providing a better shield of park users from adjacent noise sources. Shifting the east end of the Promenade out of the storm wave zone would eliminate the need for clearing sand with heavy equipment several times per year (Scheumann pers. comm.). Because

operation of Crissy Field would not result in substantially increased noise levels at any noise-sensitive areas, this impact is considered less than significant.

### ***4.2.10 Impacts on Human Health, Safety, and the Environment***

The ongoing remedial actions for hazardous waste sites at Crissy Field are being conducted by the Army with oversight by the State of California and EPA. This program involves extensive investigation, analysis, reporting, and remedial design activities. Therefore, the characterization of contaminated sites, exposure pathways, and potential health risks associated with the Crissy Field site improvements are addressed under regulatory controls separate from the NEPA process of impact disclosure in this EA. With these considerations, this analysis of hazardous waste cleanup activities only provides a context for discussion of issues of concern related to exposure to hazardous waste at Crissy Field associated with use resulting from site improvements made under the proposed site plan. Detailed information about hazardous waste contamination at Crissy Field and the Army's overall Presidio cleanup activities can be obtained by contacting the following:

BRAC Environmental Office  
604 East Murray Circle  
East Fort Baker  
Sausalito, CA 94965

The Army has completed the majority of investigations required to characterize wastes at Crissy Field. A secondary revised draft final RI was completed in November 1995 (Dames & Moore 1995b). Results of the RI were used to support a feasibility study (FS) (Dames & Moore 1996) that describes potential remediation measures available to clean up contaminated areas. A remedial action plan (RAP) and record of decision (ROD) for the preferred alternative will be developed and approved. Remedial actions (RAs) of sites will then proceed. In some instances, interim remedial actions (IRAs) have been implemented to accelerate the cleanup. Implementation of the Crissy Field site plan would follow necessary remedial action.

#### **4.2.10.1 Coordination of Timing of Crissy Field Site Plan Construction Activities with Army Remediation Activities**

The timing of implementation of improvements under the Proposed Action will be coordinated such that it does not take place prior to remediation in areas where contamination exists. The Army's cleanup plans are being developed to be consistent with implementation of the GMPA for the Presidio, including areas at Crissy Field. The Army is required to implement mitigation measures and BMPs to ensure that exposure does not occur during the course of the cleanup activities. The risk assessment performed by the Army addressed the potential recreational and worker exposures that could result from plan implementation. The cleanup is being performed to ensure that risks to these receptors as well as ecological receptors are addressed. Institutional controls that need to be in place to protect future park visitors or workers from contamination will be implemented (e.g., fencing, signs, notification to NPS maintenance and construction workers). The risk of human exposure following the remediation is low and precautionary measures will be implemented. The coordination of construction activities for projects at Crissy Field with the timing of Army remediation activities is considered beneficial.

See Section 4.2.5.3 for a discussion of potential exposure of aquatic resources to hazardous substances.

#### **4.2.10.2 Potential for Mosquito Generation**

Mosquitos are not expected to pose a nuisance or health problem at Crissy Field. The design of the tidal marsh would minimize mosquito breeding habitat to avoid mosquitos becoming a nuisance. Mosquito production can be minimized by maintaining adequate flushing of the marsh and maintaining a healthy fish population. Implementation of the design will create conditions with efficient flushing and turnover of water and avoid creating stagnant ponds. The continuous tidal flushing and wind that would characterize the marsh would inhibit mosquitos because their larvae cannot thrive under such conditions.

Two mosquito species that have potential to occur in the vicinity, *Aedes dorsalis* and *Aedes squamiger*, only occupy relatively still water pools. Only

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under periods of heavy rain could mosquito habitat be created in isolated pools outside the tidal marsh. Mosquitos, however, are very rare on open coastal systems (Blair pers. comm.). Improved drainage on other portions of the site will eliminate existing areas where water ponds during the rainy season.

### *4.2.11 Scenic Resource Impacts*

Potential effects on scenic resources are considered important because of the important visual resources in the area, such as the Golden Gate Bridge and San Francisco Bay, and because of the number and sensitivity of viewers that use or pass through the site.

#### **4.2.11.1 Enhancement of Existing Views and Provision of New High-Quality Views of the Project Site from within the Site Plan Area**

The Proposal includes the removal of deteriorated surfaces, fencing, and asphalt paving. These site changes, as well as the creation of the tidal marsh and dune areas and the restoration of the historic airfield with its grass surface, would substantially enhance existing views by improving the natural parklike character and revealing the historic nature of the project site while, at the same time, opening up new views within the site. Improving the Promenade, and providing new facilities, such as picnic areas, boardwalks, and other interpretive areas within the tidal marsh and airfield areas, will substantially enhance the visual character of and viewing opportunities within the site for visitors. This impact is considered beneficial because new high-quality views within the project site would be provided.

#### **4.2.11.2 Enhancement of Existing Views of the Project Site from Surrounding Areas**

The Proposal would also substantially enhance views of the project site from surrounding offsite viewing locations, including the Golden Gate Bridge; Doyle Drive; and, most importantly, the overlook on Lincoln Boulevard. It would substantially enhance existing views by removing visually distractive elements, such as fencing and extensive amounts of asphalt, and improving

the natural parklike character of the project site from surrounding offsite viewing locations and revealing its historic nature. Removing structures from the site would help to visually link the Presidio and the bay by creating a smooth and more natural transition of open space. Dunes along Mason Street and vegetation along the Promenade would screen East Beach parking from views. West Bluff parking would be screened from view by the adjacent landform. This impact is therefore also considered beneficial.

#### **4.2.11.3 Enhancement of Existing Views and Provision of New High-Quality Views of the Surrounding Area from the Project Site**

The Proposal would also substantially enhance the expansive quality of views from the project site of the surrounding areas, including such regional landmarks as the Golden Gate Bridge, the Presidio, the bay, and much of the city skyline. Views toward the shoreline from locations in the interior of the site, such as Mason Street, would be enhanced and opened up through removal of fencing that currently obstructs views. Improvements to the Promenade and other recreation facilities along the shoreline and provision of elevated viewing from landforms at the West Bluff and south of the marsh would increase visitor opportunities to view the bay and its scenic resources from Crissy Field. This impact is considered beneficial.

### *4.2.12 Cumulative Impacts*

A cumulative impact is an impact on the environment that results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time. The analysis of cumulative impacts for this Proposed Action is tiered from the cumulative impact analysis conducted for the GMPA EIS. The Proposal would contribute in a minor way to the following cumulative impacts, which were disclosed in the GMPA EIS.

Because of the potential for increased attractiveness of the site to visitors, The Proposal could make a minor contribution to beneficial cumulative effects on the local and regional economy.

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The provision of additional open space and the interpretive and educational aspects of the airfield restoration and tidal marsh would contribute to the rest of the Presidio and GGNRA programming efforts to enhance the scenic quality and expand interpretive, educational, and recreational opportunities for Bay Area residents and visitors.

Because there is a continuing loss of buildings and other historic features of the cultural landscape in the region, including those related to military history, the preservation and enhancement of historic resources that would occur at Crissy Field would have a positive cumulative effect on regional efforts to preserve such resources and their settings.

Implementation of the Proposal could potentially contribute to the cumulative long-term degradation of water quality. Potential impacts from urban runoff could increase incrementally over the long term at Crissy Field as a result of increased recreational use by the public at Crissy Field and the Presidio former main installation areas and expansion of dog use on the site. Urban runoff that develops from the normal use of public places and vehicular traffic on streets and parking lots can contain many substances that degrade water quality, including oils and other petroleum products, pet wastes, detergents, and garbage. Degradation of surface and groundwater could also potentially occur as a result of the discharge of toxic materials to the shallow groundwater and nearshore waters of San Francisco Bay.

This potential cumulative impact of degradation of water quality from urban runoff is considered less than significant because NPS is implementing a stormwater management plan to minimize pollution sources and routes of transport to water, and provide structural and management BMPs for pollution control. NPS would incorporate BMPs that reduce pollution from urban runoff, including oil/water separators and sediment traps in stormwater drainage system. If water quality associated with stormwater discharges is found to exceed applicable criteria, contaminated discharges would be treated further or routed to the City and County of San Francisco (CCSF) combined storm and sewer treatment system. NPS has initiated discussions with the SPCA and dog walker representatives to improve awareness of concerns related to pet waste and has provided and will maintain pet waste removal supplies at the site. With implementation of these measures, the impacts would be considered less than significant because the incremental increase in pollutants would be small relative to existing conditions.

In addition to reducing the potential effects of long-term water quality degradation from runoff by implementing the stormwater management plan and providing structural management BMPs, some of the very basic design elements of the site plan would directly result in beneficial effects on water quality. Specifically, the reduction in the amount of impervious surfaces on the site would result in less runoff into waterways and improve the ability of the area to absorb more runoff. The pretreatment of stormwater discharged into the tidal marsh would also have indirect beneficial effects on water quality. In addition, parking areas would be shifted farther away from the bay, and the use of significant portions of the waterfront as event parking would be eliminated. Future restoration of the Tennessee Hollow riparian corridor and drainage system, as well as other stormwater improvements proposed in the watershed, would also reduce pollutant discharges.

Actions under the Proposal would contribute positively to the efforts of similar projects in the GGNRA region to restore and expand native biological communities. The restoration of northern coastal salt marsh and native dune communities at Crissy Field would contribute to the extent of these important and relatively limited habitats locally, regionally, and statewide. Other local dune restoration projects are being implemented at the Presidio and Fort Funston. Regional and statewide dune restoration projects include those being conducted at the Antioch dunes and along the coast in Humboldt and Monterey Counties. Regional wetland restoration projects include Sonoma Baylands, Montezuma Wetlands, and the Napa River and Coyote Creek restoration projects. This impact is considered beneficial because of the opportunities created for dependent plant and wildlife species in a period when competition for habitat from human-related activities and the existence of invasive exotic species is extremely high and these types of natural communities are declining.

The Proposal may contribute a small amount of traffic to the overall increases expected to be generated by the Presidio. As noted in the GMPA EIS, the traffic increases generated by the Presidio would have an overall adverse cumulative effect on local and regional traffic congestion. However, mitigation measures adopted as part of the GMPA EIS, including the planned parking improvements and development or expansion of alternative modes of transportation, would reduce the impact to a less-than-significant level. The cumulative effects of Doyle Drive reconstruction will be addressed by Caltrans and other affected agencies in future environmental analyses; the

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cumulative effects of ongoing or planned projects other than Doyle Drive reconstruction are not known at this time, but these projects are expected to improve traffic operations overall.

The Proposal would also contribute to short-term impacts on noise levels during project construction, but noise levels would not violate the City of San Francisco noise ordinance.

Implementation of the Proposal would follow completion of Army remediation activities in any given area of the site. If the implementation of this Proposal is phased, construction could occur in some areas concurrent with the Army's remediation work. Cumulative temporary construction effects related to traffic, access, air quality, and noise would be less than significant.

It is also possible that some phases of the Doyle Drive reconstruction or Golden Gate Bridge seismic retrofit projects could undergo construction simultaneously with construction of phases of the Crissy Field site plan project. Cumulative construction impacts could include air quality, noise, and traffic impacts.

## 4.3 Environmental Consequences of the Dune Alternative

The Dune Alternative would have many of the same environmental consequences as described for the Proposed Action. The primary difference between the two site plan alternatives is the treatment of 20 acres of the central portion of the site. Under the Dune Alternative, a gently rolling landscape vegetated with dune scrub, instead of a tidal marsh, would be constructed. Impacts that would be the same as for the Proposed Action are listed below for each resource topic, along with a discussion of impacts that would be different (specific to the Dune Alternative).

### 4.3.1 Land Use Impacts

#### 4.3.1.1 Impacts That Are the Same as under the Proposed Action

The following land use impact for the Dune Alternative would be the same as under the Proposal. Refer to Section 4.2.1 for a discussion of this impact.

- Change in Availability of the Helipad

The following discussions disclose land use impacts specific to the Dune Alternative.

#### 4.3.1.2 Consistency with National Park Service Management Policies

The Dune Alternative includes establishment of a stabilized dune area on the central portion of the site, restoration of the historic grass landing strip, restoration of native dune and coastal habitats, and provision of recreation and interpretive facilities for visitors. This alternative adheres to the NPS Management Policies by enhancing and perpetuating native plant life as part

of natural ecosystems. It also preserves and fosters appreciation of cultural resources through treatment and interpretation and provides trails and facilities to assist park visitors in enjoying the park and understanding its significance. This alternative does not include creating and maintaining wetlands; however, the field of stabilized dunes would be graded to create topography that would not preclude construction of a tidal marsh in a future project. This impact is considered beneficial because, compared with existing conditions, this alternative is more consistent with the NPS Management Policies.

#### 4.3.1.3 Consistency with Relevant Land Use Plans and Policies

The Dune Alternative is consistent with relevant land use plans and policies. The GMPA specifies that the design for Crissy Field will incorporate a grass landing strip restored to its historic appearance and stipulates that, based on results of a feasibility study, tidal wetlands should be reestablished toward the east end of Crissy Field (National Park Service 1994). This alternative incorporates all elements and objectives envisioned in the GMPA for Crissy Field, except for creating tidal wetlands on the site. This alternative, however, does not preclude the future construction of a tidal wetland, as described above. However, it is acknowledged that by delaying construction of a tidal marsh to a future phase, resource values and uses could become established in the interim that could result in greater conflict and resource impact than under current conditions.

This alternative is also consistent with policies of the San Francisco Master Plan and the San Francisco Bay Plan. It furthers the objectives stated in the San Francisco Master Plan related to improving shoreline areas, promoting public recreation and open space along the shoreline, and providing habitat for many species. It achieves objectives in the Bay Plan related to protecting the coast as a natural resource; managing the use of the shoreline to best meet the needs of the public; and striving to increase public access to the Bay, while restricting development that would have adverse impacts on the Bay.

This impact is considered beneficial because, compared with existing conditions, the Dune Alternative is generally consistent with the GMPA and furthers the objectives of the San Francisco Master Plan and the San Francisco Bay Plan.

### ***4.3.2 Recreation Impacts***

Table 4-1 in Section 4.2.2 presents a comparison of recreational opportunities for each site plan alternative.

#### **4.3.2.1 Impacts That Are the Same as under the Proposed Action**

The following recreation impacts for the Dune Alternative would be the same as for the Proposal. Refer to Section 4.2.2 for a discussion of these impacts.

- Construction/Improvement of Visitor Facilities
- Improvements to the Golden Gate Promenade
- Improved Safety and Amenities for Recreationists along Mason Street
- Temporary Loss of Recreation Use/Access during Construction
- Change in Parking Location at the West End

The following discussion discloses the recreation impact specific to the Dune Alternative.

#### **4.3.2.2 Increase in Total Open Space Area Accessible for Recreation**

Under the Dune Alternative, the amount of open space available for multiple recreational activities, (e.g., beach use, bird watching) would increase compared with present conditions. The overall amount of space accessible for these activities under the Dune Alternative (95 acres) would be more than currently exists (66 acres) (Table 4-2). Dog walking would not be allowed in the central area under this alternative. Large areas in the West Bluff improvements area, in the central dune field, on the grass airfield, and along the shoreline and beach area would be opened up and improved to accommodate a variety of recreational activities. This impact is considered beneficial.

### ***4.3.3 Cultural Resources***

The following cultural resource impacts would be the same under the Dune Alternative as under the Proposed Action. Refer to Section 4.2.3 for a discussion of these impacts. No additional cultural resource impacts are specific to the Dune Alternative.

- Restoration of Crissy Field Airfield
- Restoration of Old Mason Street
- Construction Activities in the Vicinity of the Old Mason Street Railroad Tracks
- Potential to Disturb Archeological Resources

### ***4.3.4 Geomorphology and Soil Impacts***

The following impact related to geomorphology and soils would be the same under the Dune Alternative as under the Proposed Action. Refer to Section 4.2.4 for a discussion of this impact. There are no additional impacts related to geomorphology and soils that are specific to the Dune Alternative.

- Potential Changes in Deposition of Beach Sand Resulting from Removal and Reconfiguration of Bayshore Rubble

### ***4.3.5 Water Resource Impacts***

The following discussions disclose impacts related to water resources that are specific to the Dune Alternative.

#### **4.3.5.1 Potential Short-Term Water Quality Impacts Associated with Construction Activities**

Construction activities that would be required for Crissy Field site improvements have the potential to cause short-term water quality impacts on

nearshore areas of San Francisco Bay, natural drainageways, or the stormwater system as a result of increased soil erosion and discharges of construction-related materials (e.g., fuels, lubricants, solvents, and cleaners) to surface waters. Construction activities for the Dune Alternative that could disturb and expose soil to forces of erosion include earthmoving and grading operations and road construction. Erosion and related construction impacts could result from various cut, fill, and grading activities for creation of the central dune field; asphalt removal from the existing airfield; and beach restoration and rubble removal along the bay shoreline.

The total amount of soil disturbance for this alternative is estimated to be 92,500 cubic yards. Because the site is relatively flat, the potential for erosion is considered low. Furthermore, the site was not identified as having high or moderate erosion potential in the Presidio of San Francisco Storm Water Management Plan (Dames & Moore 1994). Although the potential for soil erosion during construction is low, NPS will comply with conditions of NPDES general construction activity stormwater permits, including implementing erosion control plans and SWPPPs. Measures used will include BMPs to minimize soil erosion, including structural, management, and vegetation measures. NPS will minimize the discharge of soil and pollutants during excavation by requiring contractors to use measures to contain disturbances within localized areas, including use of turbidity barriers, silt curtains, or equivalent measures. Routine monitoring and reporting of BMP performance will be conducted by the permit holders and NPS pursuant to the NPDES permits. Compliance with the BMPs included in the plans would result in a minimal amount of soil erosion, and discharges of construction-related pollutants would be minimized. This impact is considered less than significant.

#### **4.3.5.2 Potential Contribution to Cumulative Long-Term Water Quality Improvement/Degradation from Urban Runoff**

As described in Section 4.2.5 for the Proposed Action, incremental increases in potential impacts from urban runoff could occur over the long term at Crissy Field as a result of increased recreational use by the public at Crissy Field and adjacent Presidio areas. This potential impact is considered less than significant for this alternative because NPS would implement a

stormwater management plan to minimize pollution sources and provide structural and management BMPs for pollution control.

In addition, the reduction in the amount of impervious surfaces on the site would result in less runoff into waterways and improve the ability of the area to handle more runoff. This alternative would not, however, have the additional water quality benefit to nearshore areas of the bay from stormwater contaminant removal in the tidal marsh as "pretreatment", as the Proposed Action would. Under the Dune Alternative, all seven outfalls would be retained and would continue to discharge directly into the bay along the beach.

### **4.3.6 Biological Resource Impacts**

Because no special-status plants are known to exist at Crissy Field and no special-status wildlife species breed there or use the site regularly, the Dune Alternative would not result in any adverse effects on threatened or endangered species. The Dune Alternative would increase the amount of area occupied by natural habitats on the site compared with present conditions. Refer to Table 4-3 for a comparison of habitat acreages under each of the alternatives. Figure 4-2 shows the habitat types that would exist under the Dune Alternative.

#### **4.3.6.1 Impacts That Are the Same as under the Proposed Action**

The following biological resource impacts of the Dune Alternative would be the same as for the Proposed Action. Refer to Section 4.2.6 for a discussion of these impacts.

- Conversion of 10.1 Acres of Developed and Landscaped Area and 16.9 Acres of Beach Areas to Native Dune Communities
- Conversion of 0.4 Acre of Annual Grassland and 2.4 Acres of Developed and Landscaped Areas to Dune Scrub in the East Beach Area
- Conversion of 33.9 Acres of Developed and Landscaped Areas and 11.3 Acres of Annual Grassland Areas to Landscaped Grassland

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- Temporary Disturbance to and Long-Term Enhancement of Beach Habitat Areas
- Removal of Non-Native Trees and Shrubs

The related to biological resources described below is specific to the Dune Alternative.

### **4.3.6.2 Conversion of 12.2 Acres of Developed and Landscaped Areas and 7.8 Acres of Annual Grassland to Dune Scrub in the Central Dune Field**

Restoring native dune communities would result in conversion of developed and landscaped areas and annual grassland to habitat. This action is considered beneficial because it would replace non-native habitat with native habitat and would promote the occurrence of native plant and wildlife species.

### **4.3.7 Transportation Impacts**

Under the Dune Alternative, the operating conditions of the roadways and intersections within and around Crissy Field are not expected to significantly change from existing conditions.

The following transportation impacts would be the same under the Dune Alternative as under the Proposal. Refer to Section 4.2.7 for a discussion of these impacts. No additional transportation impacts are specific to the Dune Alternative.

- Potential Addition of Traffic to the Roadway System as a Result of Visitor Trips and Construction-Related Trips
- Changes in Traffic Speeds and Patterns along Mason Street
- Improvements to the Pedestrian and Bicycle Facilities
- Improvements to the East Beach Parking Facility

- Reduction of Total Available Parking for Day-to-Day Use at Crissy Field North of Mason Street
- Reduction of Total Available Parking Space at Crissy Field for Large-Scale Special Events

### **4.3.8 Air Quality Impacts**

The main types of air pollution that would be generated by construction of the Dune Alternative are tailpipe emissions from construction machinery, dust emissions generated by heavy machinery operation on unpaved surfaces, dust emissions from earthmoving and grading, and dust emissions from wind erosion of unpaved surfaces and stockpiles.

#### **4.3.8.1 Conformity with State Implementation Plans**

The discussion on federal Clean Air Act conformity for the Proposed Action also applies to the Dune Alternative.

#### **4.3.8.2 Impacts That Are the Same as under the Proposed Action**

The following air quality impacts would be the same under the Dune Alternative as under the Proposal. Refer to Section 4.2.8 for a discussion of these impacts. No additional air quality impacts are specific to the Dune Alternative.

- Increased Air Pollutant Emissions from Construction Activities
- Air Pollutant Emissions from Ongoing Operations at Crissy Field

### **4.3.9 Noise Impacts**

The main noise impacts of the Dune Alternative would result from activities occurring on a temporary basis, such as project construction activities.

San Francisco Bay

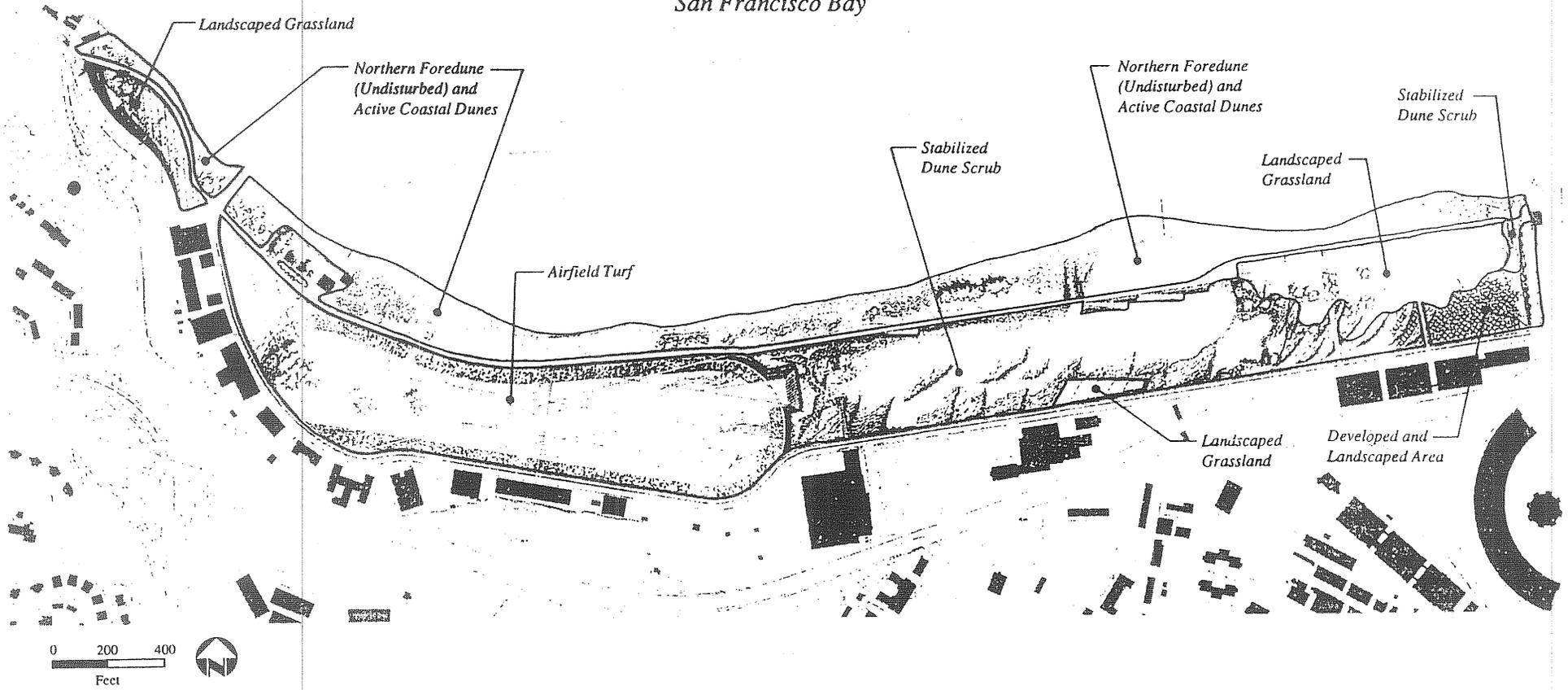


Figure 4-2  
Habitat Types under the Dune Alternative

The following noise impacts would be the same under the Dune Alternative as under the Proposed Action. Refer to Section 4.2.9 for a discussion of these impacts. No additional noise impacts are specific to the Dune Alternative.

- Increased Noise Levels during Construction
- Potential Noise Effects from Ongoing Operations at Crissy Field

### ***4.3.10 Impacts on Human Health, Safety, and the Environment***

Characterization of contaminated sites, exposure pathways, and potential health risks associated with the Crissy Field site improvements are addressed under regulatory controls separate from the NEPA process of impact disclosure in this EA. As noted for the Proposed Action, the analysis of the Dune Alternative for hazardous waste cleanup activities only provides the context for issues of concern related to exposure to hazardous waste at Crissy Field associated with use resulting from site improvements made under the proposed site plan. Detailed information about hazardous waste contamination at Crissy Field and the Army's cleanup activities can be obtained at the address of the BRAC Environmental Office noted in Section 4.2.10.

The following human health and safety issue would be the same under the Dune Alternative as under the Proposal. Refer to Section 4.2.10 for a discussion of this issue. No additional human health and safety concerns are specific to the Dune Alternative.

- Coordination of Timing of Crissy Field Site Plan Construction Activities with Army Remediation Activities

### ***4.3.11 Scenic Resource Impacts***

The following impacts related to scenic quality under the Dune Alternative would be the same as under the Proposed Action. Refer to Section 4.2.11

for a discussion of these impacts. No additional impacts on scenic resources are specific to the Dune Alternative.

- Enhancement of Existing Views and Provision of New High-Quality Views of the Project Site from within the Site Plan Area
- Enhancement of Existing Views of the Project Site from Surrounding Areas
- Enhancement of Existing Views and Provision of New High-Quality Views of the Surrounding Area from the Project Site

### ***4.3.12 Cumulative Environmental Effects***

Cumulative effects of the Dune Alternative would be the same as those for the Proposed Action, except that the Dune Alternative's cumulative contribution to regional efforts to enhance and restore native biological communities would be focused on native dune restoration. It would not include the cumulative benefit of restoring wetlands.

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## 4.4 No-Action Alternative

### 4.1 No-Action Alternative

The No-Action Alternative is a continuation of the existing conditions described in Section 3.0, "Affected Environment" and current management actions for ongoing park operations and to address safety issues. NPS would not implement site improvements and restoration of the natural and cultural resources of Crissy Field and would not implement any new projects other than those that have already been separately programmed or initiated by the Army or NPS (e.g., hazardous waste site remediation and building demolition). The current land uses at Crissy Field would continue most likely at the current levels of intensity. Recreationists would continue to use portions of Crissy Field with limited accessibility, primarily the shoreline areas. Open space areas could be expanded as a result of the building demolition program in progress. These new open space areas would be stabilized with vegetation and provide open space values but would not be improved.

The conceptual planning goals established in the GMPA for the Crissy Field planning area would not be achieved. Furthermore, the No-Action Alternative is not consistent with the NPS Management Policies for recreating, rehabilitating, and maintaining wetlands or fostering the appreciation of cultural resources through treatment and interpretation. The tidal marsh would not be created and the historic airfield would not be restored. The No-Action Alternative is consistent with NPS policies related to perpetuating existing native plant life as part of natural ecosystems and providing trails and facilities for park visitors through existing programs and facilities at Crissy Field that would continue to be maintained.

Under this alternative, none of the adverse or beneficial environmental effects described for the Proposed Action or the Dune Alternative would occur. The following facilities and resources would not be improved:

- Rubble would remain along 4,500 feet of shoreline.
- The Promenade surfaces and alignment would remain as existing.

- Mason Street width and alignment and existing parking would not change.
- Blowing sand would not be controlled by restored and expanded dunes.
- There would be no separated bicycle path and very limited accessibility.
- Maintenance requirements would increase because of building demolition, requiring basic mowing, litter removal, and care.

# Section 5.0 Consultation and Coordination

## *Consultation and Coordination*

Many agencies, groups, and individuals were consulted in developing the site plan alternatives and preparing this EA. Section 1.2.4, "Public Involvement and Scoping"; Section 2.5, "Permits and Approvals Required to Implement the Proposal"; and "Personal Communications" in Section 6.0, "Bibliography", provide information on the context of the communications with these agencies, groups, and individuals. This section summarizes coordination with public agencies and the status of compliance of the Proposed Action with their requirements. Letters documenting communication with the San Francisco Bay Conservation and Development Commission (BCDC), the National Marine Fisheries Service (NMFS), and the U.S. Fish and Wildlife Service (USFWS) follow this section.

**U.S. Army Corps of Engineers.** As noted in Section 2.5, "Permits and Approvals Required to Implement the Proposal", some aspects of the project would require permits from the U.S. Army Corps of Engineers (Corps) to address modification of the shoreline to comply with Section 404 of the Clean Water Act and Section 10 of the Rivers and Harbors Act. NPS has coordinated informally with the Corps through the Corps-sponsored interagency group meetings. The Crissy Field site plan was presented to this group in 1995 and 1996. After approval of the project proposal, NPS will consult with the Corps to determine the type of Section 404 permit that would apply to the action and prepare appropriate documentation.

**U.S. Fish and Wildlife Service and National Marine Fisheries Service.** USFWS participated in the interagency meeting held in 1996. Because no threatened or endangered species occur at Crissy Field or would be affected by implementation of the site plan, no formal consultation with USFWS is required. USFWS and NMFS also submitted letters to NPS that included names of special-status plant, wildlife, and fish species that have the potential to occur in the San Francisco area.

**U.S. Environmental Protection Agency, Region 9.** EPA participated in the interagency meetings held in 1995 and 1996, and the Army's remedial project managers' meetings in which NPS plan alternatives for Crissy Field were discussed.

**California Department of Health Services.** The California Department of Health Services also participated in the interagency meeting held in 1996.

**Bay Conservation and Development Commission.** The BCDC submitted an informal letter after the June 13, 1995 public workshop to inform NPS that the site plan alternatives being considered are consistent with local coastal plan designations. The BCDC also participated in the 1995 and 1996 interagency meetings. After approval of the project proposal, NPS will prepare a formal consistency determination for submittal to the BCDC to comply with the federal Coastal Zone Management Act and the McAteer-Petris Act.

**Advisory Council on Historic Preservation and California Office of Historic Preservation.** NPS signed a programmatic agreement (PA) in October 1994 with the ACHP and the SHPO. The PA covers all actions described in the GMPA, including the Crissy Field site plan, as well as operation and maintenance activities.

**San Francisco Regional Water Quality Control Board.** NPS has informally coordinated with the San Francisco RWQCB in meetings of the Army's remedial project managers, as well as at an onsite briefing in 1996 and in ongoing discussions regarding the Army's environmental remediation program and its relationship to the NPS plans for Crissy Field.

**Native American Groups.** Native American tribe representatives were identified through consultations for the GMPA EIS and subsequently through contact with the Native American Heritage Commission. Because no known prehistoric sites or resources would be affected by this project, formal consultations have not been initiated. A summary of the plan and notice of availability of the EA has been sent to identified tribal representatives. In the event of discovery of prehistoric sites or burials, consultation would be initiated as noted in Section 4.2.3.6.

**Preservation Groups.** Several interest groups supporting historic preservation were included in the scoping process and have been sent notices of availability of this EA. Groups include the San Francisco Landmarks Preservation Board, the Fort Point and Presidio Historical Association, the American Aviation Historical Society, the National Trust for Historic Preservation, and the American Institute of Architects.

**SAN FRANCISCO BAY CONSERVATION AND DEVELOPMENT COMMISSION**

THIRTY VAN NESS AVENUE, SUITE 2011  
 SAN FRANCISCO, CALIFORNIA 94102-6080  
 PHONE: (415) 557-3686



UNITED STATES DEPARTMENT OF COMMERCE  
 National Oceanic and Atmospheric Administration  
 NATIONAL MARINE FISHERIES SERVICE  
 Southwest Region  
 777 Sonoma Ave. Rm 325  
 Santa Rosa, CA 95404

July 7, 1995

Golden Gate National Recreation Area  
 Fort Mason, Building 201  
 San Francisco, California 94123

ATTENTION: Nancy Hornor

SUBJECT: Design Alternatives for Crissy Field

Ladies and Gentlemen:

We have reviewed the four alternatives for reconstruction of Crissy Field that were presented at a Golden Gate National Recreation Area workshop on June 13, 1995. We are writing informally at this time to inform you that, based on the information presented, the Commission could find any of the four proposed alternatives to be generally consistent with the federally-approved coastal management program for the San Francisco Bay segment of the California coastal zone, and specifically with the McAteer-Petris Act, the San Francisco Bay Plan and its designation of Crissy Field as a waterfront park priority use area.

We would appreciate, however, the opportunity to review and comment on the Environmental Assessment for this project when it is issued. Please send a copy of the EA to my attention.

Very sincerely yours,

STEVE A. McADAM  
 Acting Executive Director

SAM/CR/gg

Dedicated to making San Francisco Bay better.

December 11, 1995 F/SW031:GRS

Mr. Edward Whisler  
 Wildlife Biologist  
 Jones and Stokes Associates, Inc.  
 2600 V Street, Suite 100  
 Sacramento, California 95818-1914

Dear Mr. Whisler:

This letter is in response to your request of November 15, 1995 to Mr. Jim Lecky regarding the presence of Federally listed threatened or endangered species or critical habitat that may occur on or near Crissy Field at the Presidio of San Francisco, California.

Available information indicates that the endangered Sacramento River winter-run chinook salmon may occur at the proposed project site. The site is also located within the designated critical habitat for winter-run chinook salmon (58 FR 33212). Coho salmon have been proposed for Federal listing as threatened (60 FR 38011) and may occur in the project area. In addition, chinook salmon and steelhead may occur in the project area and NMFS is currently conducting a status review pursuant to the Endangered Species Act for these species throughout their range in California, Oregon, Idaho, and Washington.

The U.S. Fish and Wildlife Service (USFWS) may also have listed species or critical habitat under its jurisdiction in the project area. Please contact Mr. Joel Medlin, Field Supervisor, USFWS, at 2800 Cottage Way, Room E-1803, Sacramento, California 95925, or (916) 978-4613, regarding the presence of listed species or critical habitat under USFWS jurisdiction that may be affected by your project.

If you have questions concerning these comments, please contact Ms. Penny Ruvelas of my staff at (707) 575-6062.

Sincerely,

Gary Stern  
 Supervisory Fishery Biologist

cc: R. Craig Wingert, NMFS





IN REPLY REFER TO

# United States Department of the Interior

FISH AND WILDLIFE SERVICE

Ecological Services  
Sacramento Field Office  
2800 Cottage Way, Room E-1803  
Sacramento, California 95825

1-1-96-TA-135

November 8, 1995

Ms. Vicki Lake  
Jones & Stokes Associates, Inc.  
2600 V Street, Suite 100  
Sacramento, California 95818

Subject: Species List for Proposed Projects on Crissy Field, Presidio  
of San Francisco, San Francisco, California

Dear Ms. Lake:

The enclosed list replies to your letter of November 1, 1995, requesting information on listed and proposed endangered and threatened species that may be present in or may be affected by projects in the subject project area (see Enclosure A). Information concerning the distribution, life history, and habitat requirements for the listed species is available upon request.

The Fish and Wildlife Service (Service) used your map(s) and/or other information to locate the proposed project on a U.S. Geological Survey (USGS) 7.5 minute quadrangle map. The species on the enclosed list are those species we believe may occur within the USGS San Francisco North quad, where your project is planned. Some of the species may not be affected by the proposed action. A trained biologist or botanist, familiar with the habitat requirements of the listed species, should determine whether these species or habitats suitable for these species may be affected by the proposed action.

Information and maps concerning candidate species in California are available from the California Natural Diversity Data Base, a program of the California Department of Fish and Game. Address your request to: Marketing Manager, California Department of Fish and Game, Natural Diversity Data Base, 1416 Ninth Street, Sacramento, California 95814 [(916) 324-0562]. You also should request information from the Chief, California Department of Fish and Game, Non-Game Heritage Program (916) 324-8348.

All listed species identified in Enclosure A are fully protected under the mandates of the Endangered Species Act of 1973, as amended (Act). Section 9 of the Act and its implementing regulations prohibit the "take" of a federally listed wildlife species. Take is defined by the Act as "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect" any such wildlife species. Take may include significant habitat modification or degradation where it actually kills or injures wildlife by significantly impairing essential behavioral patterns, including breeding, feeding, or shelter (50 CFR §17.3).

LPCPRV LTR

Ms. Vicki Lake

Take incidental to an otherwise lawful activity may be authorized by one of two procedures. If a Federal agency is involved with the permitting, funding, or carrying out of this project, then initiation of formal consultation between that agency and the Service pursuant to Section 7 of the Act is required if it is determined that the proposed project may affect a federally listed species. Such consultation would result in a biological opinion that addresses anticipated effects of the project to listed and proposed species and may authorize a limited level of incidental take. If a Federal agency is not involved with the project, and federally listed species may be taken as part of the project, then an "incidental take" permit pursuant to section 10(a) of the Act should be obtained. The Service may issue such a permit upon completion by the permit applicant of a satisfactory conservation plan for the listed species that would be affected by the project.

If suitable habitat for federally listed species exists in the project area, we recommend that surveys for them be undertaken by qualified biologists during or prior to the environmental review process. We also recommend that surveys be undertaken for the proposed and candidate species included in Enclosure A if suitable habitat exists on site. The results of these surveys should be published in any environmental documents prepared for this project.

Should these surveys determine that federally listed or proposed species occur in the area and are likely to be affected by the proposed project, the Service recommends that the project proponent, in consultation with this office and the California Department of Fish and Game, develop a plan that mitigates for the project's direct and indirect impacts to listed species and compensates for project-related loss of habitat. The mitigation plan also should be included in the environmental document.

We also recommend addressing adverse impacts to candidate species. One of the benefits of considering these species early in the planning process is that exploring alternatives, it may be possible to avoid conflicts that could develop, should a candidate species become listed before the project is complete.

We appreciate your concern for endangered species. If you have further questions, please call Michael Thabault of this office at (916) 979-2725. For questions regarding wetlands, please contact Mark Littlefield of this office at (916) 979-2113. For questions concerning the endangered winter-run chinook salmon or the proposed threatened coho salmon, please contact the National Marine Fisheries Service's Protected Species Management Division, (310) 980-401

Sincerely,

*Patricia Leonard*  
For  
Joel A. Medlin  
Field Supervisor

Enclosure

LPCPRV LTR

LISTED AND PROPOSED ENDANGERED AND THREATENED SPECIES AND CANDIDATE SPECIES THAT MAY OCCUR IN OR BE AFFECTED BY PROJECTS IN THE AREA OF THE FOLLOWING SELECTED QUADS  
Reference File No. 1-1-96-TA-135  
November 6, 1995

QUAD : 466C SAN FRANCISCO NORTH

Listed Species

**Mammals**

salt marsh harvest mouse, *Reithrodontomys raviventris* (E)

**Birds**

American peregrine falcon, *Falco peregrinus anatum* (E)  
California brown pelican, *Pelecanus occidentalis californicus* (E)  
California clapper rail, *Rallus longirostris obsoletus* (E)  
western snowy plover, *Charadrius alexandrinus nivosus* (T)  
bald eagle, *Haliaeetus leucocephalus* (T)

**Fish**

winter-run chinook salmon, *Oncorhynchus tshawytscha* (E)  
winter-run chinook salmon crit. habitat, *Oncorhynchus tshawytscha* (E)  
Delta smelt, *Hypomesus transpacificus* (T)

**Invertebrates**

mission blue butterfly, *Icaricia icariodes missionensis* (E)  
San Bruno elfin butterfly, *Incisalia mossii bayensis* (E)

**Plants**

Presidio manzanita, *Arctostaphylos hookeri* ssp. *ravenii* (E)  
marsh sandwort, *Arenaria paludicola* (E)  
Presidio clarkia, *Clarkia franciscana* (E)  
beach layia, *Layia camosa* (E)  
Marin dwarf-flax, *Hesperolinon congestum* (T)

Proposed Species

**Amphibians**

California red-legged frog, *Rana aurora draytoni* (PE)

**Fish**

Coho salmon, *Oncorhynchus kisutch* (PT)  
Sacramento splittail, *Pogonichthys macrolepidotus* (PT)

**Plants**

San Francisco lessingia, *Lessingia germanorum* (PE)

Candidate Species

**Mammals**

greater western mastiff-bat, *Eumops perotis californicus* (2)  
long-eared myotis bat, *Myotis evotis* (2)  
fringed myotis bat, *Myotis thysanodes* (2)  
long-legged myotis bat, *Myotis volans* (2)  
Yuma myotis bat, *Myotis yumanensis* (2)  
San Francisco dusky-footed woodrat, *Neotoma fuscipes annectens* (2)

LISTED AND PROPOSED ENDANGERED AND THREATENED SPECIES AND CANDIDATE SPECIES THAT MAY OCCUR IN OR BE AFFECTED BY PROJECTS IN THE AREA OF THE FOLLOWING SELECTED QUADS  
Reference File No. 1-1-96-TA-135  
November 6, 1995

QUAD : 466C SAN FRANCISCO NORTH

Candidate Species

**Mammals**

Pacific western big-eared bat, *Plecotus townsendii townsendii* (2)  
Point Reyes jumping mouse, *Zapus trinotatus orarius* (2)

**Birds**

tricolored blackbird, *Agelaius tricolor* (2)  
Bell's sage sparrow, *Amphispiza belli belli* (2)  
ferruginous hawk, *Buteo regalis* (2)  
little willow flycatcher, *Empidonax traillii brewsteri* (2)  
saltmarsh common yellowthroat, *Geothlypis trichas sinuosa* (2)  
black rail, *Laterallus jamaicensis* (2)

**Reptiles**

northwestern pond turtle, *Clemmys marmorata marmorata* (2)  
southwestern pond turtle, *Clemmys marmorata pallida* (2)  
California horned lizard, *Phrynosoma coronatum frontale* (2)

**Amphibians**

California tiger salamander, *Ambystoma californiense* (1)  
foothill yellow-legged frog, *Rana boylei* (2)

**Fish**

longfin smelt, *Spirinchus thaleichthys* (2)

**Invertebrates**

Opler's longhorn moth, *Adella oplerella* (2)  
sandy beach tiger beetle, *Cicindella hirticollis gravida* (2)  
globose dune beetle, *Coelus globus* (2)  
Ricksecker's water scavenger beetle, *Hydrochara rickseckeri* (2)  
bumblebee scarab beetle, *Lichnanthe ursina* (2)

**Plants**

San Francisco manzanita, *Arctostaphylos hookeri* ssp. *franciscana* (2)  
San Francisco Bay spineflower, *Chorizanthe cuspidata* var. *cuspidata* (2)  
San Francisco gumplant, *Grindelia hirsutula* var. *maritima* (2)  
Kellogg's (wedge-leaved) horkelia, *Horkelia cuneata* ssp. *sericea* (2)  
adobe sanicle, *Sanicula maritima* (2)  
Marin checkermallow, *Sidalcea hickmanii* ssp. *viridis* (2)  
Mission Delores campion, *Silene verecunda* ssp. *verecunda* (2)  
San Francisco owl's-clover, *Triphysaria floribunda* (2)  
San Francisco popcornflower, *Plagiobothrys diffusus* (2\*)  
alkali milk-vetch, *Astragalus tener* var. *tener* (2R)

LISTED AND PROPOSED ENDANGERED AND THREATENED SPECIES AND CANDIDATE  
SPECIES THAT MAY OCCUR IN OR BE AFFECTED BY PROJECTS IN THE AREA OF  
THE FOLLOWING SELECTED QUADS  
Reference File No. 1-1-96-TA-135  
November 6, 1995

Notes:

- (E) Endangered      (T) Threatened      (P) Proposed      (CH) Critical Habitat
- (1) Category 1: Taxa for which the Fish and Wildlife Service has sufficient biological information to support a proposal to list as endangered or threatened.
- (2) Category 2: Taxa for which existing information indicated may warrant listing, but for which substantial biological information to support a proposed rule is lacking.
- (1R) Recommended for Category 1 status.
- (2R) Recommended for Category 2 status.
- ( ) Listing petitioned.
- (\*) Possibly extinct.

# Section 6.0

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Appendix A  
Plant and  
Wildlife Species

Table A-1. Native Plant Species That Occur or May Be Used in Restoring Dune and Other Areas at Crissy Field

Scientific Name	Common Name	Scientific Name	Common Name
<b>Northern Dune Scrub</b>			
<i>Abronia latifolia</i> *	Coastal sand verbena	<i>Cirsium quercetorum</i>	Oak thistle
<i>Abronia umbellata</i> *	Sand verbena	<i>Claytonia perfoliata</i>	Miner's lettuce
<i>Achillea millefolium</i>	White yarrow	<i>Croton californicus</i>	California croton
<i>Ambrosia chamissonis</i> *	Beach bur	<i>Cryptantha leiocarpa</i>	Cryptantha
<i>Amsinckia menziesii</i> var. <i>intermedia</i>	Rancher's fire	<i>Danthonia californica</i>	California oatgrass
<i>Amsinckia spectabilis</i>	Seaside fiddleneck	<i>Daucus pusillus</i>	Wild carrot
<i>Artemisia californica</i>	California sagebrush	<i>Dichelostemma congestum</i>	Ookow
<i>Atriplex leucophylla</i>	Beach saltbrush	<i>Dudleya farinosa</i>	Coast live-forever
<i>Baccharis pilularis</i> *	Coyote brush	<i>Ericameria ericoides</i>	Heather goldenbush, mock heather
<i>Bromus carinatus</i> var. <i>maritimus</i>	Seaside brome	<i>Erigeron glaucus</i>	Seaside daisy, beach fleabane
<i>Camissonia cheiranthifolia</i> ssp. <i>cheiranthifolia</i> *	Beach primrose	<i>Eriogonum latifolium</i>	Coast buckwheat
<i>Camissonia contorta</i>	Broadleaf sun cups	<i>Eriophyllum staechadifolium</i>	Seaside woolly sunflower
<i>Camissonia micrantha</i>	Small primrose	<i>Erysimum franciscanum</i>	San Francisco wallflower
<i>Camissonia ovata</i>	Sun cup	<i>Eschscholzia californica</i> *	California poppy
<i>Cardionema ramosissimum</i>	Sand mat	<i>Festuca rubra</i>	Red molate fescue
<i>Carex brevicaulis</i>	Short-ligule sedge	<i>Gilia capitata</i> var. <i>chamissonis</i>	Dune gilia
<i>Carex obnupta</i>	Slough sedge	<i>Gnaphalium purpureum</i>	Purple everlasting
<i>Castilleja affinis</i>	Coastal paintbrush	<i>Gnaphalium ramosissimum</i>	Cudweed
<i>Castilleja wightii</i>	Wight's paintbrush	<i>Heracleum lanatum</i>	Cow parsnip
<i>Chenopodium californicum</i>	California goosefoot	<i>Hesperevax sparsiflora</i>	Evax
<i>Chlorogalum pomeridianum</i> var. <i>divaricanum</i>	Common soap plant	<i>Hesperolinon californicum</i>	California dwarf flax
<i>Chorizanthe cuspidata</i>	San Francisco Bay spineflower	<i>Iris douglasiana</i>	Douglas' iris
<i>Cirsium occidentale</i>	Cobweb thistle	<i>Lepidium nitidum</i> *	Common peppergrass

Table A-1. Continued

Scientific Name	Common Name	Scientific Name	Common Name
<i>Lessingia germanorum</i>	Lemmon's lessingia	<i>Piperia elegans</i>	Elegant bog orchid
<i>Leymus xvancoverensis*</i>	Leymus	<i>Plantago erecta</i>	California plantain
<i>Linaria canadensis</i>	Blue toadflax	<i>Plantago maritima</i>	Pacific seaside plantain
<i>Lotus scoparius</i>	Deerweed	<i>Poa douglasii</i>	Douglas' bluegrass
<i>Lotus wrangelianus</i>	Lotus	<i>Polygonum paronychia</i>	Knotweed
<i>Lupinus albifrons</i>	Silver bush lupine	<i>Polypodium californicum</i>	California polypody fern
<i>Lupinus arboreus*</i>	Yellow bush lupine	<i>Quercus agrifolia</i>	Coast live oak
<i>Lupinus bicolor</i>	Bicolored lupine	<i>Rubus ursinus</i>	California blackberry
<i>Lupinus chamissonis*</i>	Chamisso bush lupine	<i>Rumex salicifolius*</i>	Willow dock
<i>Lupinus nanus*</i>	Douglas' lupine	<i>Scrophularia californica</i>	California figwort
<i>Lupinus variicolor</i>	Many-colored lupine	<i>Sidalcea malvaeiflora</i>	Checker bloom
<i>Marah fabaceus</i>	Man-root	<i>Silene verecunda</i> var. <i>verecunda</i>	San Francisco campion
<i>Microseris bigelovii</i>	Bigelow's microseris	<i>Solidago spathulata</i>	Coast goldenrod
<i>Mimulus aurantiacus</i>	Salmon monkeyflower	<i>Tanacetum camphoratum</i>	Dune tansy
<i>Oenothera elata</i> var. <i>hookeri</i>	Hooker's evening primrose	<i>Toxicodendron diversilobum</i>	Poison-oak
<i>Phacelia californica</i>	California coast phacelia	<i>Trifolium wormskioldii</i>	Cows clover
<i>Phacelia malvifolia</i>	Stinging phacelia	<i>Vicia gigantea</i>	Giant black vetch
<i>Phacelia ramosissima</i> var. <i>ramosissima</i>	Branching phacelia	<i>Wyethia angustifolia</i>	Narrowleaf mule-ears
<b>Transitional</b>			
<i>Agoseris aparigioides</i> var. <i>aparigioides</i>	North coast seaside dandelion	<i>Castilleja wightii</i>	Wight's paintbrush
<i>Ambrosia chamissonis</i>	Beach bur	<i>Dudleya farinosa</i>	Coast live-forever
<i>Artemisia pycnocephala</i>	Beach sagewort	<i>Erigeron glaucus</i>	Seaside daisy, beach fleabane
<i>Bromus carniatus</i> var. <i>maritimus*</i>	Seaside brome	<i>Eriogonum latifolium</i>	Coast buckwheat
<i>Camissonia cheiranthifolia</i> ssp. <i>cheiranthifolia</i>	Beach primrose	<i>Eschscholzia californica</i>	California poppy

Table A-1. Continued

Scientific Name	Common Name	Scientific Name	Common Name
<i>Leymus triticoides</i>	Creeping wildrye	<i>Poa douglasii</i>	Douglas' bluegrass
<i>Lotus scoparius</i>	Deerweed	<i>Polygonum paronychia</i>	Knotweed
<i>Lupinus chamissonis</i>	Chamisso bush lupine	<i>Tanacetum camphoratum</i>	Dune tansy
<i>Phacelia distans</i>	Wild heliotrope		
Northern Foredunes			
<i>Abronia latifolia</i>	Coastal sand-verbena	<i>Eriophyllum staechadifolium</i> var.	Seaside woolly sunflower
<i>Abronia umbellata</i>	Sand verbena	<i>Erysimum franciscanum</i>	San Francisco wallflower
<i>Achillea millefolium</i>	White yarrow	<i>Eschscholzia californica</i>	California poppy
<i>Ambrosia chamissonis</i>	Beach bur	<i>Festuca rubra</i>	Red fescue
<i>Artemisia pycnocephala</i>	Beach sagewort	<i>Fragaria chiloensis</i>	Beach strawberry
<i>Atriplex leucophylla</i>	Beach saltbrush	<i>Leymus mollis</i>	American dunegrass
<i>Baccharis pilularis</i>	Coyote brush	<i>Leymus xvancoverensis</i> <sup>a</sup>	Leymus
<i>Camissonia cheiranthifolia</i> ssp. <i>cheiranthifolia</i>	Beach primrose	<i>Linaria canadensis</i>	Blue toadflax
<i>Camissonia contorta</i>	Broadleaf sun cups	<i>Lotus scoparius</i>	Deerweed
<i>Camissonia micrantha</i>	Small primrose	<i>Lupinus albifrons</i>	Silver bush lupine
<i>Cardionema ramosissimum</i>	Sand mat	<i>Lupinus chamissonis</i>	Chamisso bush lupine
<i>Carex obnupta</i>	Slough sedge	<i>Lupinus variicolor</i>	Manycolor lupine
<i>Chenopodium californicum</i>	California goosefoot	<i>Marah fabaceus</i>	Man-root
<i>Chorizanthe cuspidata</i>	San Francisco spineflower	<i>Microseris bigelovii</i>	Bigelow's microseris
<i>Claytonia perfoliata</i>	Red miner's lettuce	<i>Oenothera elata</i> var. <i>hookeri</i>	Hooker's evening primrose
<i>Croton californicus</i>	California croton	<i>Plantago maritima</i>	California plantain
<i>Cryptantha leiocarpa</i>	Cryptantha	<i>Poa douglasii</i>	Douglas' bluegrass
<i>Ericameria ericoides</i>	Goldenbush	<i>Polygonum paronychia</i>	Knotweed
<i>Erigeron glaucus</i>	Seaside daisy, beach fleabane	<i>Solidago spathulata</i>	Coast goldenrod
<i>Eriogonum latifolium</i>	Coast buckwheat	<i>Tanacetum camphoratum</i>	Dune tansy

Table A-1. Continued

Scientific Name	Common Name	Scientific Name	Common Name
<b>Airfield</b>			
<i>Bromus carinatus</i> var. <i>maritimus</i>	Seaside brome	<i>Hordeum brachyantherum</i>	Meadow barley
<i>Elymus glaucus</i>	Blue wildrye	<i>Poa douglasii</i>	Dune bunchgrass
<i>Festuca californica</i>	California fescue	<i>Poa unilateralis</i>	San Francisco bluegrass
<i>Festuca rubra</i>	Red molate fescue		
<b>Upland Areas (Native Shrubs and Herbaceous Perennials)</b>			
<i>Achillea millefolium</i>	Yarrow	<i>Eriophyllum staechadifolium</i>	Seaside woolly sunflower
<i>Artemisia pycnocephala</i>	Beach sagewort	<i>Mimulus aurantiacus</i>	Sticky monkeyflower
<i>Baccharis pilularis</i>	Coyote brush	<i>Rhamnus californica</i>	Coffeeberry
<i>Eriogonum latifolium</i>	Coast buckwheat		
<b>Central Coast Riparian and Salt Marsh</b>			
<i>Aesculus californica</i>	California buckeye	<i>Salicornia bigelovii</i>	Annual pickleweed
<i>Deschampsia caespitosa</i> ssp. <i>holciformis</i>	Coastal hairgrass	<i>Salicornia virginica</i>	Perennial pickleweed
<i>Heteromeles arbutifolia</i>	Toyon	<i>Salix lasiolepis</i>	Arroyo willow
<i>Hordeum brachyantherum</i>	Meadow barley	<i>Satureja douglasii</i>	Yerba buena
<i>Lonicera involucrata</i> var. <i>ledebouril</i>	Twinberry	<i>Scirpus robustus</i>	Alkali bulrush
<i>Myrica californica</i>	Wax myrtle	<i>Spartina foliosa</i>	Cordgrass
<i>Rubus ursinus</i>	California blackberry	<i>Trifolium wormskoldii</i>	Clover
<p><sup>a</sup> Hybrid between <i>Leymus mollis</i> and <i>L. triticoides</i>.</p> <p>* Observed at Crissy Field.</p>			

**Table A-2. Bird Species That May Use Existing or Created Habitats at Crissy Field**

Common Name	Scientific Name	Common Name	Scientific Name
<b>Northern Dune Scrub</b>			
Herring gull	<i>Larus argentatus</i>	Western gull*	<i>Larus occidentalis</i>
Killdeer*	<i>Charadrius vociferus</i>		
<b>Tidal Marsh</b>			
American coot	<i>Fulica americana</i>	Marbled godwit	<i>Lemosa fedoa</i>
American avocet	<i>Recurvirostra americana</i>	Northern pintail	<i>Anas acuta</i>
Bufflehead	<i>Bucephala albeola</i>	Northern shoveler	<i>Anas clypeata</i>
Dunlin*	<i>Calidris alpina</i>	Ruddy duck	<i>Oxyura jamaicensis</i>
Forster's tern	<i>Sterna forsteri</i>	Sanderling*	<i>Calidris alba</i>
Great blue heron	<i>Ardea herodias</i>	Snowy egret	<i>Egretta thula</i>
Great egret	<i>Casmerodius albus</i>	Song sparrow	<i>Melospiza melodia</i>
Herring gull	<i>Larus argentatus</i>	Western grebe*	<i>Aechmophorus occidentalis</i>
Killdeer*	<i>Charadrius vociferus</i>	Western gull*	<i>Larus occidentalis</i>
Lesser scaup	<i>Aythya affinis</i>	Western sandpiper*	<i>Calidris mauri</i>
Mallard	<i>Anas platyrhynchos</i>	Willet*	<i>Catoptrophorus semipalmatus</i>
<b>Northern Foredunes</b>			
Dunlin*	<i>Calidris alpina</i>	Sanderling*	<i>Calidris alba</i>
Forster's tern	<i>Sterna forsteri</i>	Western gull*	<i>Larus occidentalis</i>
Herring gull	<i>Larus argentatus</i>	Western sandpiper*	<i>Calidris mauri</i>
Killdeer*	<i>Charadrius vociferus</i>	Willet*	<i>Catoptrophorus semipalmatus</i>

**Table A-3. Fish Species That May Use Existing or Created Habitats at Crissy Field**

Common Name	Scientific Name
Arrow goby	<i>Clevelandia ios</i>
Bat ray	<i>Myliobatis californica</i>
Bay pipefish	<i>Syngnathus leptorhynchus</i>
Jack mackerel	<i>Trachurus symmetricus</i>
Jacksnelt	<i>Atherinopsis californiensis</i>
Leopard shark	<i>Triakis semifasciata</i>
Northern anchovy	<i>Engraulis mordax</i>
Pacific herring	<i>Clupea harengus</i>
Pacific sardine	<i>Sardinops sagax</i>
Rubberlip surfperch	<i>Rhacochilus taxotes</i>
Shiner surfperch	<i>Cymatogaster aggregata</i>
Spiny dogfish	<i>Squalus acanthias</i>
Staghorn sculpin	<i>Leptocottus armatus</i>
Surfsmelt	<i>Hypomesus pretiosus</i>
Threespine stickleback	<i>Gasterosteus aculeatus</i>
Topsmelt	<i>Atherinops affinis</i>
Yellowfin goby	<i>Acanthogobius flavimanus</i>

Table A-2. Continued

Common Name	Scientific Name	Common Name	Scientific Name
<b>Upland Areas (Native Shrubs and Herbaceous Perennials)</b>			
Northern harrier	<i>Circus cyaneus</i>	White-crowned sparrow	<i>Zonotrichia leucophrys</i>
Red-winged blackbird	<i>Agelaius phoeniceus</i>		
<b>Central Coast Riparian</b>			
Allen's hummingbird	<i>Selasphorus sasin</i>	Ruby-crowned kinglet	<i>Regulus calendula</i>
Anna's hummingbird	<i>Calyte anna</i>	Song sparrow	<i>Melospiza melodia</i>
Bushtit	<i>Psaltriparias minimus</i>	Yellow-rumped warbler	<i>Dendroica coronata</i>
Red-winged blackbird	<i>Agelaius phoeniceus</i>		
* Observed at Crissy Field.			

**Table A-4. Selected Estuarine Invertebrates That May Use  
Existing or Created Habitats at Crissy Field**

Common Name	Scientific Name
Red tube worm	<i>Capitella capitata</i>
Nephtyid polychaete	<i>Nephtys</i> sp.
Spionid polychaete	<i>Polydora brachycephala</i>
Spionid polychaete	<i>Streblospio benedicti</i>
California horn snail	<i>Cerethidia californica</i>
Gem clam	<i>Gemma gemma</i>
Bent-nosed clam	<i>Macoma nasute</i>
Soft-shelled clam	<i>Mya arenaria</i>
Japanese littleneck	<i>Tapes japonica</i>
Barnacles	<i>Balanus</i> spp.
Skeleton shrimp	<i>Caprella californica</i>
Mud-burrowing amphipod	<i>Corophium</i> spp.
Tube-dwelling amphipod	<i>Ampelisca milleri</i>
Tube-dwelling amphipod	<i>Grandidierella japonica</i>
Bay shrimp	<i>Crangon franciscorum</i>
Dungeness crab	<i>Cancer magister</i>
Mud crab	<i>Hemigraspus oregonensis</i>
Purple shore crab	<i>Hemigraspus nudus</i>
Brine flies	<i>Ephydriidae</i> spp.