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ALCATRAZ
DEVELOPMENT CONCEPT PLAN
AND ENVIRONMENTAL
ASSESSMENT

July 9, 1993

Prepared for:

Golden Gate National Recreation Area
National Park Service
Building 201
Fort Mason
San Francisco, CA 94123

Prepared with assistance of:

LSA Associates, Inc.
157 Park Place
Pt. Richmond, CA 94801
(510) 236-6810

FINDING OF NO SIGNIFICANT IMPACT
Alcatraz Development Concept Plan

6740

SUMMARY OF CHANGES IN PLAN IN RESPONSE TO PUBLIC COMMENT

1. Night use and night lighting under existing conditions is described.
2. Numbers of nesting black-crowned night-herons in Tables 2 and 3 of Appendix will be changed as appropriate to reflect numbers submitted by USFWS.
3. NPS staff will consult with CNPS and Golden Gate Audubon Society regarding the use of appropriate plant material (consistent with cultural landscape) for habitat improvements.
4. NPS staff will report back to the Commission in 1 year on night use and lighting, and continue to report back annually on this subject.
5. NPS staff will consider inclusion of bird blinds where appropriate.
6. Corrective actions in response to monitoring will include modifications to visitor access.
7. Performance standards will be incorporated into any food service contract to address use of non-recyclables, plastic, and cleanliness related to public health concerns.
8. Construction will only be allowed in year-round open areas, and when it will not disturb adjacent breeding birds. All construction plans, including staging operations will be reviewed by the park wildlife specialist to confirm that there will be no adverse impacts to wildlife. Contract specifications will address management practices and limits to reduce temporary construction impacts such as noise, dust and traffic.
9. Vegetation removal/pruning in areas of existing or potential black-crowned night-heron nesting will be reviewed by a wildlife specialist prior to approval by Superintendent.
10. The decision to re-open closed trails in mid August will consider the presence of pre-fledged herons that would be adversely affected if forced to fly in an intensively used gull area. (This is in addition to determining if there are occupied nests, as stated in the plan).
11. If soil is used to encapsulate hazardous materials in the rubble piles in quantities which would bury salamander or deer mouse habitat, they would be trapped and removed prior to this activity and returned afterwards.
12. Editorial comments/corrections noted in comments from USFWS will be incorporated into the plan, as appropriate.

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I. INTRODUCTION

Alcatraz is a 22-acre island in San Francisco Bay that is owned and managed by the Golden Gate National Recreation Area (Golden Gate), a unit of the National Park System (Figure 1). This plan identifies specific management goals and practices to be employed to provide resource protection, visitor use and interpretation for the entire island, and includes an environmental assessment that analyzes alternatives for resource management and visitor use on Alcatraz.

This environmental assessment (EA) has been prepared to evaluate potential environmental impacts resulting from implementation of the proposed Alcatraz Development Concept Plan (ADCP). National Environmental Policy Act (NEPA) procedures ensure that environmental effects of the proposed federal action have been considered as part of the project. The EA provides evidence and analysis for determining whether to prepare an environmental impact statement or a finding of no significant impact. Further, preparation of the document insures that environmental information is available to public officials and the public before decisions regarding the proposed project are made and actions are taken.

The EA focuses upon environmental issues that have been identified from previous planning documents, resource studies, public participation programs, and from the physical characteristics of the island. The primary concerns include visitor use and safety, existing operations, biological resources, and cultural resources.

Alcatraz was declared a National Historic Landmark in 1986. As a result, proposals to change the physical fabric of Alcatraz must also comply with the provisions of the National Historic Preservation Act (NHPA), and the compliance required under section 106 of that act. Although many of the actions in the ADCP have an effect on cultural resources on Alcatraz, none have an adverse effect as defined under the Advisory Council on Historic Preservation's regulations for section 106 compliance (36 CFR part 800). The majority of the actions in this plan fall within the treatments stipulated in the 1992 Golden Gate Operations and Maintenance Programmatic Agreement (PA) signed between Golden Gate, the Western Regional Office of the NPS (WRO), the California State Historic Preservation Office (SHPO), and the Advisory Council on Historic Preservation (ACHP), and follow the Secretary of the Interior's Standards for Preservation Projects. Any undertaking which falls outside the purview of the actions contained within this PA will undergo full consultation under 106 compliance.

A. PURPOSE AND NEED FOR THE PROPOSED ACTION

Alcatraz was included in Golden Gate primarily because of its historic significance. It was designated a National Historic Landmark in 1986, in recognition of its importance as a historic resource. In the two decades of NPS management of Alcatraz, changes in resource values have occurred that affect the way in which

- **Habitat Preservation and Enhancement**
To preserve and enhance the existing natural resources.
- **Environmental Education**
To promote resource preservation and stewardship through interpretation and direct experience of the island. The unique blend of history and natural resources in a small island setting so close to urban populations will be utilized for education. By utilizing an already heavily visited site for environmental education about the San Francisco Bay region, a constituency for other, more pristine Bay resources in need of preservation and protection can be developed.
- **Access**
To provide access for visitors of all ages, ethnicities, and abilities to interpretation and diversity of experience while on the island.

B. HISTORY OF THIS PLAN & RELATIONSHIP TO GMP

The *Alcatraz Development Concept Plan* (ADCP) is an outgrowth of the comprehensive planning process initiated to determine the future of Alcatraz and other lands within Golden Gate. It takes into account numerous citizen comments and studies undertaken since Alcatraz became part of Golden Gate in October 1972. The GMP and more specifically, the Development Concept Plan (DCP) that was included in the GMP (See Figure 1), established a framework for more detailed planning for the future of Alcatraz and proposed the following:

- Preservation of all historic structures. Removal of rubble, debris and crumbling non-historic structures.
- Enhancement of the island's parklike qualities and a recognition of its key location in the bay as a spectacular viewpoint.
- Creation of open space and parklike settings through plantings, walkways, overlooks and picnic areas. Opening the island to public access.
- Preservation of cliff and shoreline habitat for birds and marine life.

The ADCP is generally consistent with the GMP, but updated to take into account changing visitor patterns and needs, wildlife values, funding constraints, and information from recent resource studies. The approach taken in the ADCP is considerably more focused on preservation, protection and environmental education, and public access is more limited than the GMP. These modifications constitute an amendment to the 1980 GMP.

The Alcatraz Development Concept Plan addresses these changed circumstances and incorporates information gathered in subsequent research. Other studies that have been considered in the development of the ADCP include:

- **Alcatraz Historic Resources Study (1979)**
An NPS planning document identifying important historic resources.
- **Interpretive Prospectus — Alcatraz (1987)**
An NPS planning document to guide educational programs on Alcatraz.
- **Alcatraz the Future — Concept Plan and Guidelines (1988)**
A Golden Gate National Park Association (GGNPA) sponsored planning and design effort taking the concepts of the General Management Plan and Interpretive Prospectus and visualizing their implementation.
- **Agave Walk Project — Environmental Assessment and FONSI**
In 1990, the NPS initiated the first phase of the GMP on Alcatraz. This involved opening of the southern end of Alcatraz, known as the Agave Walk and parade ground. In light of wildlife concerns expressed by two local Audubon Society chapters, the NPS withdrew the project for additional research and development.
- **Ongoing Wildlife Studies**
Various wildlife studies have been conducted (see Appendix B). This work has evaluated nesting and roosting habitat for shore birds, and identified and studied other birds, mammals, marine invertebrates, and amphibians.
- **Historic Gardens of Alcatraz (June 1992)**
A botanical study was conducted to assess what remains of the historic gardens and identify both native and horticultural plant species found on the island.
- **Alcatraz Cultural Landscape Report (1992)**
A draft cultural landscape report was prepared to determine what landscape features merit preservation and interpretation.

These documents are available for review at the Golden Gate headquarters.

II. EXISTING CONDITIONS

A. REGIONAL AND SITE CONTEXT

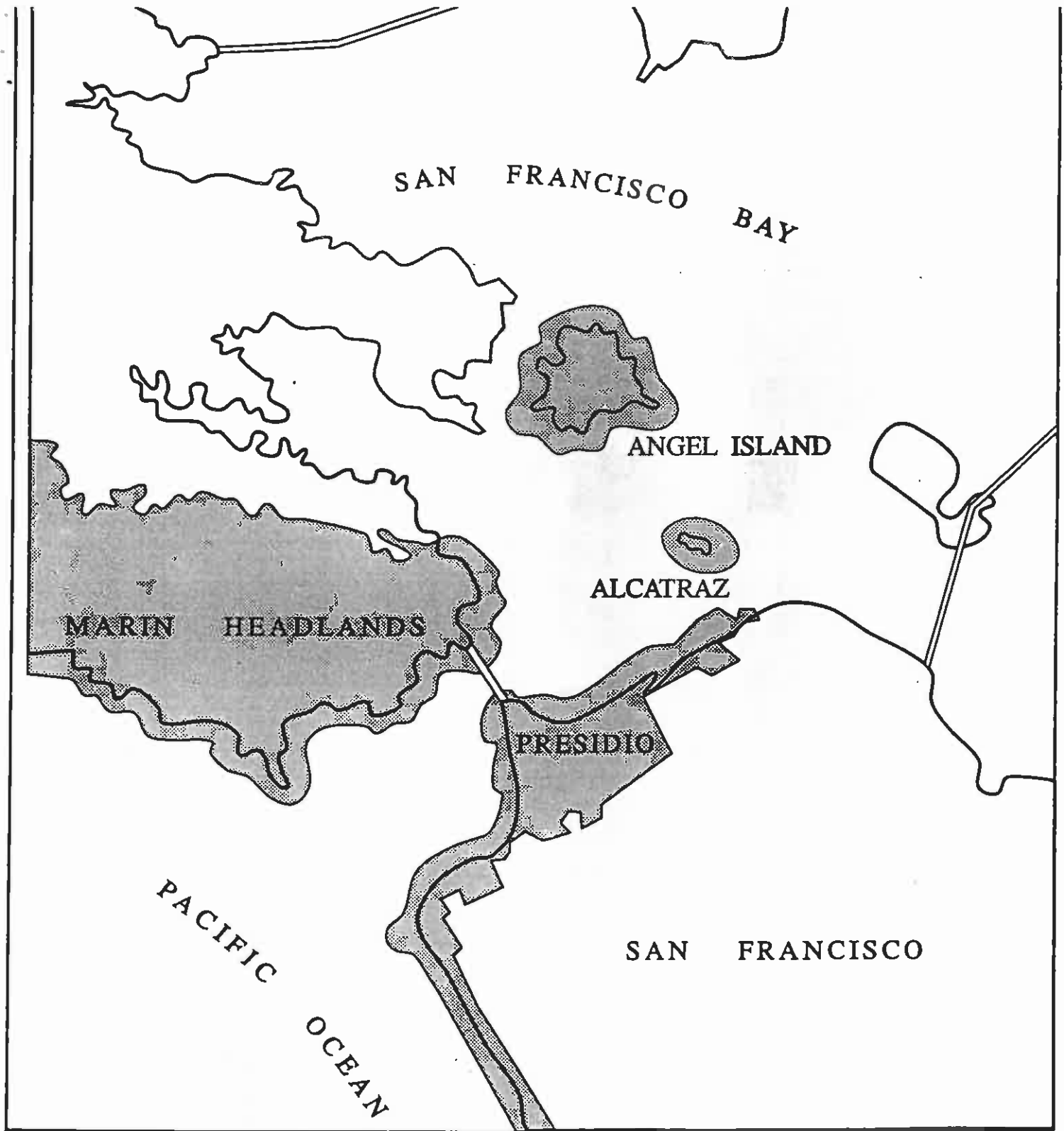
Alcatraz occupies an area of approximately 22 acres, and lies at latitude 37 degrees, 49 minutes, 26.6 seconds north, and longitude 122 degrees, 24 minutes, 18.8 seconds west. San Francisco lies a mile and a quarter to the south of the island; one and one-half miles to the north lies Angel Island, and beyond it, separated by one-half-mile wide Raccoon Straits, is the Marin mainland (See Figure 2). Alcatraz is within the boundaries of the City and County of San Francisco. It is under the jurisdiction of the United States Department of the Interior. The island was transferred to the Department of the Interior under authority of the act establishing the Golden Gate National Recreation on October 27, 1972. Alcatraz is one unit in the 75,000-acre park and part of Golden Gate's Bay District.

B. EXISTING CONDITIONS - VISITOR ACCESS

Visitor access has expanded incrementally since the opening of Alcatraz to the public in 1973. Alcatraz is unique within Golden Gate because levels and timing of visitor access are completely controlled. The island is accessible only by commercial ferry. Private craft are not permitted to land at the island. Currently, boat access is provided by the Red and White Fleet from Pier 41 in San Francisco. Pier 41 is well connected to San Francisco's public transit network. Alcatraz is a popular destination, convenient to tourist attractions such as Fisherman's Wharf and Pier 39. Visitation in 1992 reflects typical visitation in recent years:

- Total visitation during 1992 was approximately one million.
- The month with the highest level of visitation was August, with 124,875. The month with the lowest level of visitation was February, with 56,338.
- The maximum number of visitors on a single day is controlled by transportation to 4,005. In 1992 there were 81 days with maximum attendance.

Visitors to Alcatraz are currently allowed unguided, year-round access to roughly 3,800 linear feet of path. Currently-open paths are shown on Figure 2. An additional 7,900 linear feet of path is accessible to visitors on ranger-guided programs utilizing existing pathways and roads during the non-breeding season, from mid-August until mid-February. Access is also provided to the lowest level of Building 64 (see Figure 3). Currently there are as many as 900 - 1,200 visitors on the island at one time, without significant crowding except in the cellhouse. This is higher than the 1980 GMP estimate of 600 visitors, a number based on staffing constraints and safety issues, which have been subsequently addressed. The current level of visitation is considered the island's carrying capacity, and is based on cellhouse crowding and its impact on visitor experience.



03-30-93(GGN201)Alcatraz Island Plan

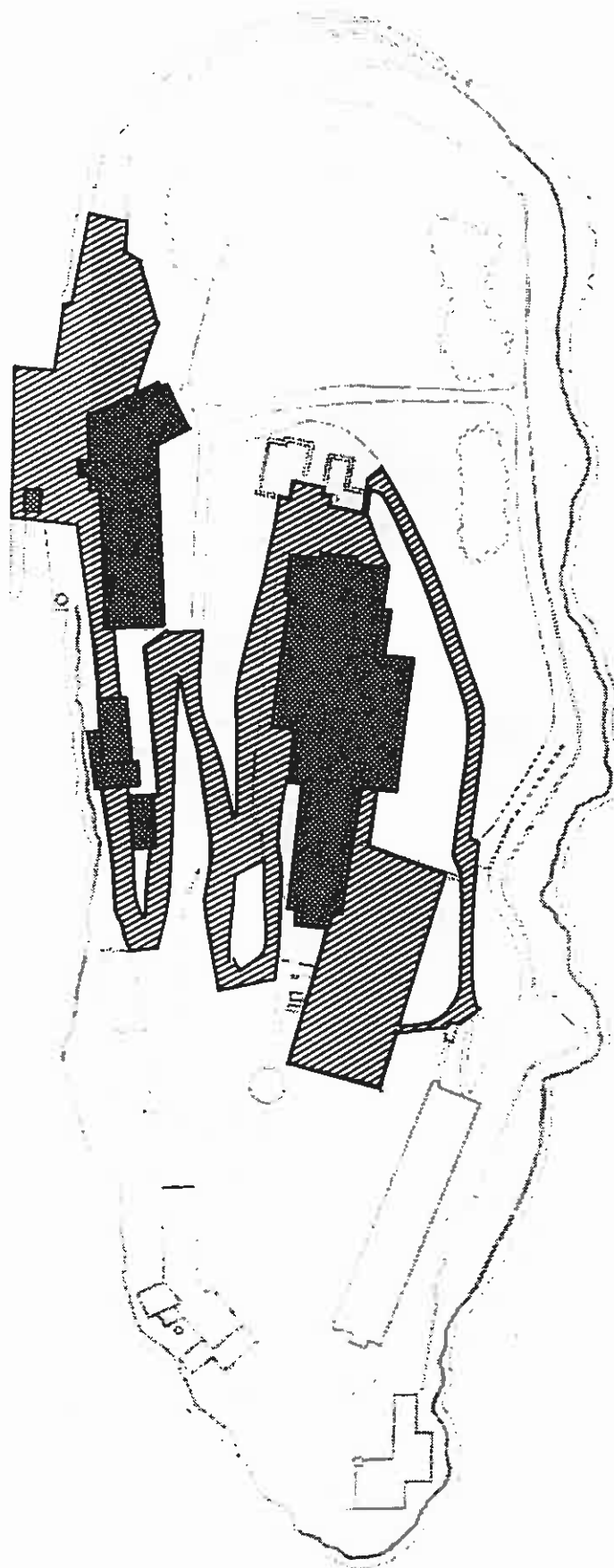
Figure 2



Lands within the legislated boundary of
Golden Gate National Recreation Area.

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Regional Context



Note: The remainder of the island is presently open for limited access, such as ranger-led programs, during the non-breeding season.

05-06-93(GON201) Alcatraz Island Plan

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Scale in feet

2000

Trails and Outdoor Areas Open to Public
Structures Open to Public

Figur

Existing Visitor Acc

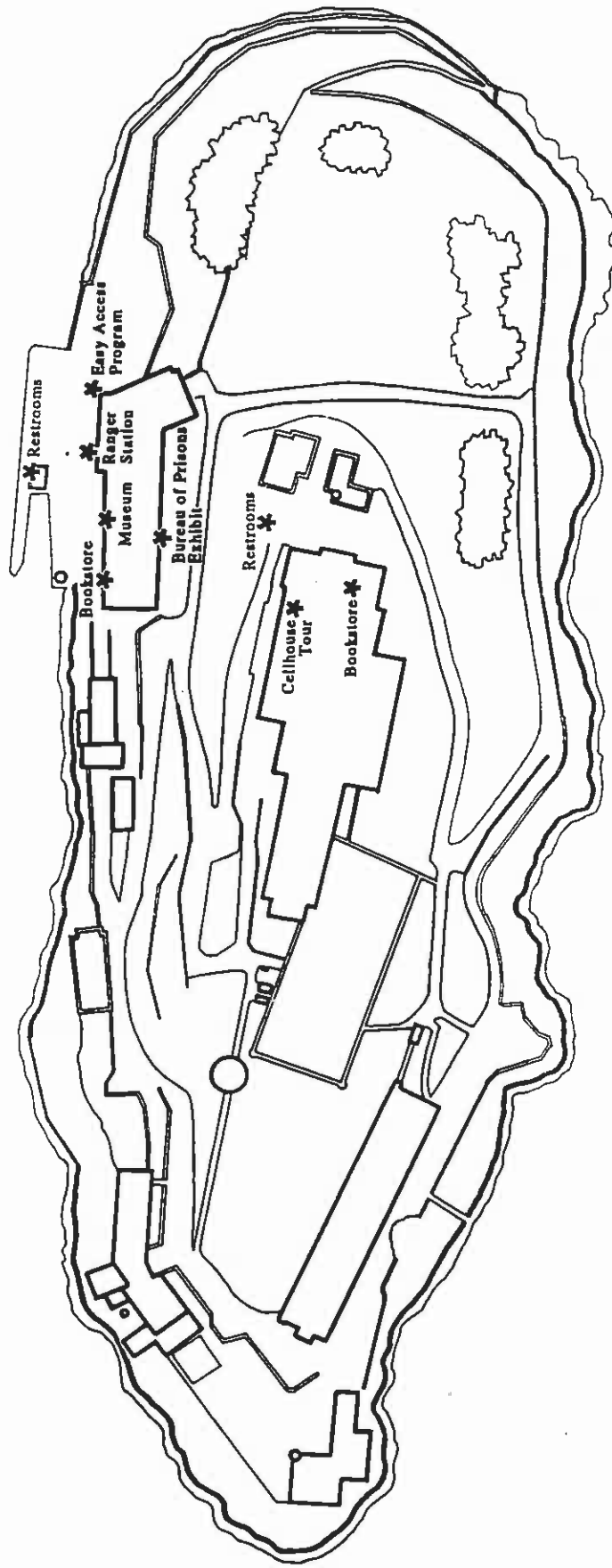
C. EXISTING CONDITIONS - INTERPRETATION AND VISITOR AMENITIES

From 1973 until 1984, the National Park Service allowed only guided visitation to Alcatraz. All visitors were accompanied by ranger tours and self-exploration was limited to a small museum. The completion of a new Interpretive Prospectus in 1987 brought about a shift in thinking about visitor experience on Alcatraz. This interpretive prospectus advocated managing Alcatraz as an "open" island, evolving a new visitor use philosophy based on increasing the ability for park visitors to pursue interpretive and scenic opportunities on the island. The ultimate goal of this approach is to offer a more diverse visitor experience on Alcatraz, covering not only the cellhouse, but other aspects of cultural and natural history. The interpretive prospectus also advocated the development of a visitor services facility to provide food service, shelter and restrooms. The five primary interpretive themes on Alcatraz include:

- Military History
- American Justice and Penology
- Native American History
- Natural History of San Francisco Bay Islands
- The National Park Service and Alcatraz

Since the publication of the Interpretive Prospectus, little change has been made in the areas open to visitors, but some of the proposed interpretive programs have been developed (See Figure 4). These programs include:

- **Ranger-led Interpretive Programs**
NPS Rangers provide all personal interpretation on Alcatraz. Programs include ranger-led hikes (30 - 60 minutes), "mini programs" (10 - 20 minutes), audio visual programs, special guest presentations, and special annual interpretive events. All visitors are greeted by an NPS ranger at the wharf, where they learn of island restrictions and opportunities. An average of 15 interpretive programs are offered by rangers each day, serving 15 percent of visitors to Alcatraz.
- **Cellhouse Audio Tour**
A self-guided tour reproducing first person narratives of life on Alcatraz, the *Cellhouse Audio Tour* provides in-depth interpretation of the cellhouse and life on "The Rock" during the Federal Penitentiary Era. It is provided in 6 languages: English, Spanish, French, German, Italian, and Japanese. Roughly 80% of all visitors to the island, or 850,000 people, take the Cellhouse Audio Tour each year.
- **Self-guided Tour Folder**
A self-guided tour folder provides an introduction to island history and natural resources, and is keyed to stops in the open portions of the island.



05-06-93(GGN201) Alcatraz Island Plan

LSA

Scale in feet



Fig

Existing Interpretation and Visitor Amenities

- **Museum and Slide Show**
A small museum in the basement of Building 64 provides an introduction to Alcatraz history, including 15-minute slide show.
- **Bureau of Prisons Exhibit**
A Bureau of Prisons sponsored exhibit in China Alley, adjacent to Building 64, describes the evolution of the federal penal system.
- **Easy Access Program**
The Easy Access Program is an interactive video tour designed for visitors with limited mobility located on the Alcatraz wharf.
- **Publications**
The Golden Gate National Park Association, the Golden Gate's cooperating association, has produced a number of publications on Alcatraz, including 3 books, the video "Secrets of Alcatraz," a cassette version of the Audio Tour, and informational brochures. Two bookstores, located in Building 64 and the cellhouse, offer these and other Alcatraz-related educational items.

Existing Visitor Amenities

Existing visitor amenities are concentrated in two areas on Alcatraz:

- **Wharf**
Visitor amenities at the Wharf include a ranger and first aid station, museum, theater, bookstore, public telephones, restrooms, picnic tables and benches.
- **Cellhouse**
Cellhouse amenities include a bookstore, public telephones, and restrooms.

D. EXISTING CONDITIONS - NATURAL RESOURCES

Alcatraz is a roughly 22-acre sandstone and shale mass, rising abruptly from the San Francisco Bay three miles east of the Golden Gate to an elevation of 135' above sea level. The Franciscan sandstone, formed during the Upper Jurassic is friable and easily cut. The shoreline of Alcatraz is a combination of human-made and natural rock cliffs, shale beaches, tide pools, and filled land, composed of spoil excavated from the upper slopes and footed by seawalls. The existing natural resources of the island are described below, with more details provided in Appendix B.

Vegetation

The vegetation that exists on Alcatraz is the direct result of the massive topographic manipulations and planting spanning Alcatraz's development. Prior to

development, Alcatraz was mostly ringed with bare rocky cliffs and topped with smooth-topped hillocks covered with species native to the central Californian coastal prairie and coastal scrub plant communities. By the end of the 19th century, major topographic manipulation and extensive planting of trees and shrubs totally transformed the island. Planting continued until the closure of the Federal Penitentiary in 1963, much of which remains.

Today, roughly 58% of Alcatraz is either paved or covered with structures (see Figure 5). In addition, the following areas of the whole island are unpaved:

- 4% is covered with groves of introduced trees.
- 20% covered with shrubs, primarily vestiges of historic gardens.
- 3% is grassland, much of it recolonized in disturbed areas.
- 15% is bare cliffs and bluffs.

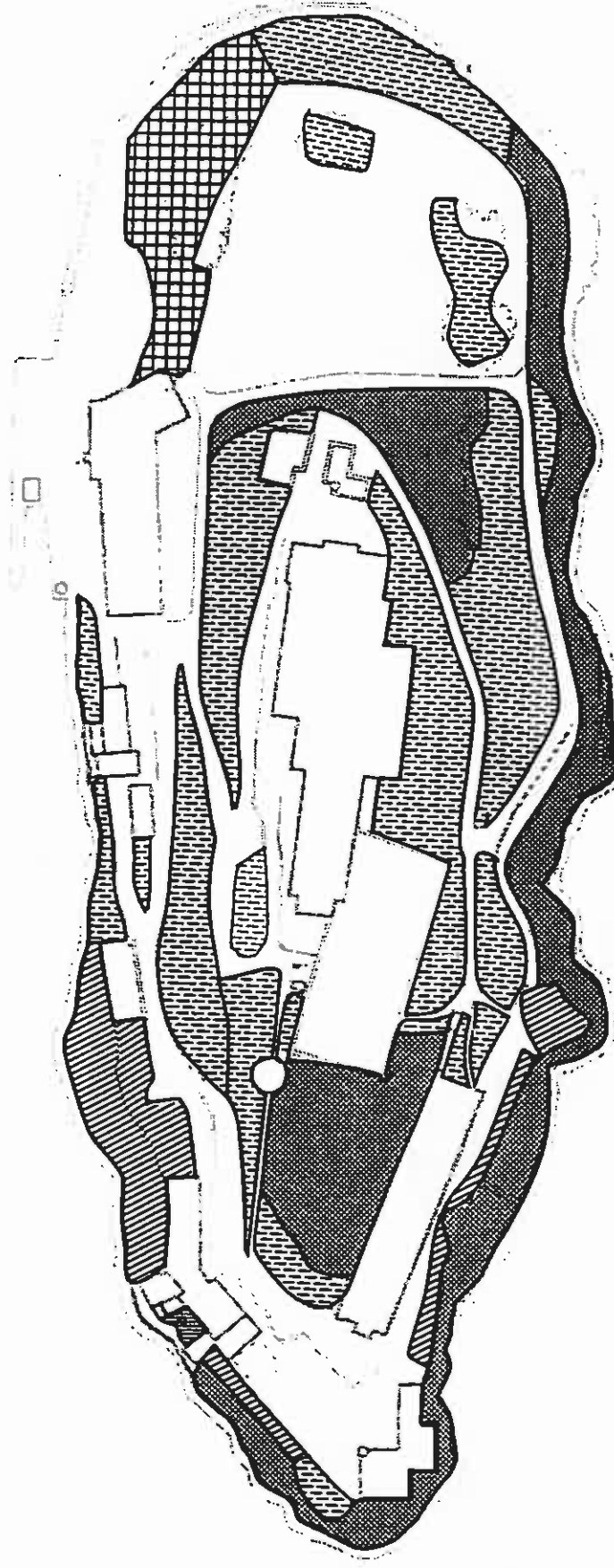
The bulk of the landscape on Alcatraz was planted with non-native exotics, and is an important cultural resource. Overall, perhaps 5% of the island resembles in a general way the native coastal prairie or coastal scrub one would expect to find on a pristine Alcatraz, although certain pioneer species such as coyote brush are making inroads into formerly cultivated areas. Two special status plants species could potentially occur on Alcatraz, the San Francisco gumplant (CNPS rare) and San Francisco campion (CNPS rare), although neither was recorded during the horticultural analysis conducted on Alcatraz in 1992. A list of plant species identified on the island may be found in Appendix C.

Wildlife

The closure of certain parts of Alcatraz since the departure of the Federal Penitentiary in 1963 has allowed an array of wildlife species to establish themselves on the island. Eleven animal species have been recorded as breeding on Alcatraz: one mammal, one amphibian, and nine birds. These species utilize both vegetated and bare areas on the island. At least 108 species of birds have been identified on Alcatraz. Detailed information on the most important of these species is included in the Natural Resources Element, Appendix B.

Habitat Areas

Wildlife on Alcatraz is concentrated in a number of habitat areas. Although components of a cultural landscape and not pristine habitat in the sense of being untouched by human intervention, in these areas human modifications to the landscape, such as ornamental plantings, provide valuable habitat for certain wildlife species (see Figure 6). These habitat areas are described below:



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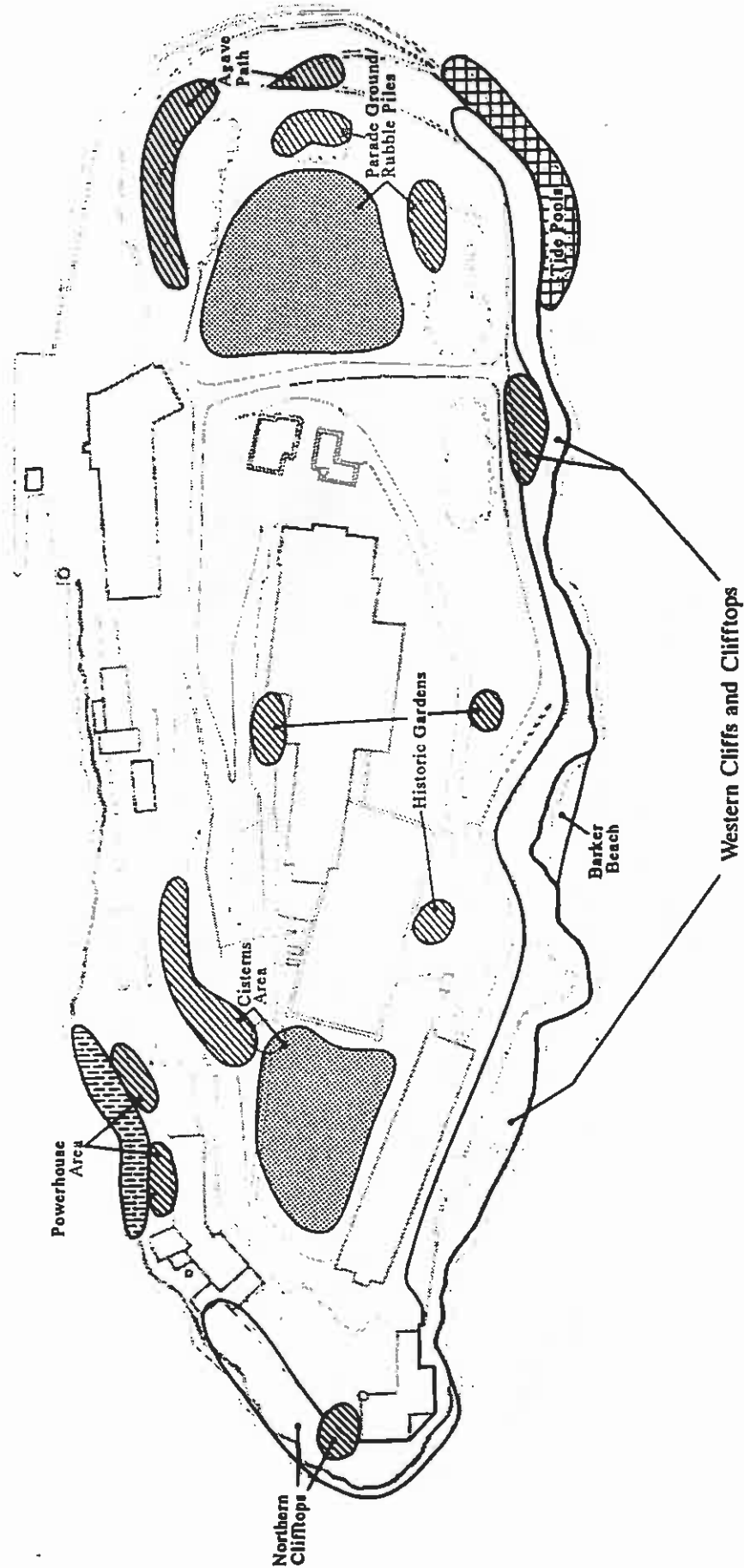
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Scale in feet
0 200

-  Grassland/Prairie—5%
-  Shrubs/Historic Gardens—20%
-  Trees—4%
-  Bare/Cliffs—15%
-  Buildings/Paved Areas—56%

Figure

Existing Vegetation/Habitat



05-06-93(GGN201) Alcatraz Island Plan

Black-crowned Night Heron

Western Gull

Grassland Species

Tidepool Species

Sea Birds (including gulls)

0 200

Scale in feet

LSA

Figure

Existing Habitat

- **Tidepools**

A small tidepool at the south end of Alcatraz, extends roughly 350 feet westward from the end of the Agave Path. These tidepools were created by quarrying activities on Alcatraz. They are one of the few tidepool complexes within San Francisco Bay, and provide habitat for invertebrate species and marine algae typically found in open rocky intertidal habitats.

- **Parade Ground/Rubble Piles**

The Parade Ground was carved from the hillside during the late 19th century. During the 1930s it was surrounded by housing for federal penitentiary staff. These structures were demolished in 1971 by the GSA, and the rubble left in place. Since that time the rubble piles have become overgrown with ornamental vegetation, primarily ivy (*Hedera helix*) and mirror bush (*Coprosma baueri*). The Parade Ground and rubble piles (including the Lover's Bench area) support several breeding colonies of black-crowned night-herons (23% of island total observed in 1992), and western gulls (24% of island total in 1992), and also provide habitat for slender salamanders and deer mice.

- **Agave Path**

The Agave Path runs atop a bulkhead, along the water's edge on the south side of the island. Its name derives from the dense plantings of agave (*Agave americana*) that cover the steep banks above. These banks also support dense plantings of mirror bush and eucalyptus (*Eucalyptus* sp.) that provide nesting habitat for the large Dock Colony of black-crowned night-herons (26% of island total in 1992). The slopes are also habitat for slender salamanders and deer mice.

- **Western Cliffs and Clifftops**

The entire western side of Alcatraz is ringed with cliffs rising abruptly from the bay and attaining heights of nearly 100 feet. This area includes a small beach, known as Barker Beach, that is inaccessible to visitors. The western cliffs provide nesting and roosting sites for pelagic birds, including pigeon guillemots, Brandt's cormorants, pelagic cormorants, Heermann's gulls, and western gulls (25% of island total in 1992). The beach is an occasional haul-out site for pinnipeds.

- **Historic Gardens**

Overgrown historic gardens and ornamental plantings provide nesting habitat for black-crowned night-herons, western gulls (5% of island total in 1992) as well as other small birds, slender salamanders, and deer mice.

- **Northern Clifftops**

Mirror bush at the north end of the island supports a colony of black-crowned night-herons (11% of island total in 1992). Paved areas near the Model Industries Building support a nesting colony of western gulls (11% of island total in 1992).

- **Cisterns Areas**

This bluff is an important habitat for western gulls (16% of island total in 1992), and the nearby "wall colony" of night-herons (7% of island total in 1992).

- **Powerhouse Area**

A steep bank northeast of the Powerhouse supports a stand of native grassland, composed of creeping wild rye (*Elymus triticoides*), and providing habitat for deer mice. Shrubs near the Powerhouse support two small colonies of black-crowned night-herons (6% of island total in 1992).

E. EXISTING CONDITIONS - CULTURAL RESOURCES

Alcatraz was included as a unit of the Golden Gate National Recreation Area in 1972 because of its historical significance (See Appendix D). Alcatraz was listed in the National Register of Historic Places at a National level of significance in 1978 under criteria A and C with commerce, engineering, military, and social/humanitarian themes designated as the areas of significance. In 1986, the island was designated a National Historic Landmark. The island is listed as being associated with three NHL themes and subthemes, Theme XIVB: Transportation: Ships, Boats, Lighthouses and Other Structures, XVIII: Technology (Engineering and Invention), Military (Fortifications, Weapons, War Vehicles), and XXIX: Social and Humanitarian Movements, Prison Reform. A list of all structures that contribute to the NHL is included in this plan in Appendix E showing treatments for each alternative.

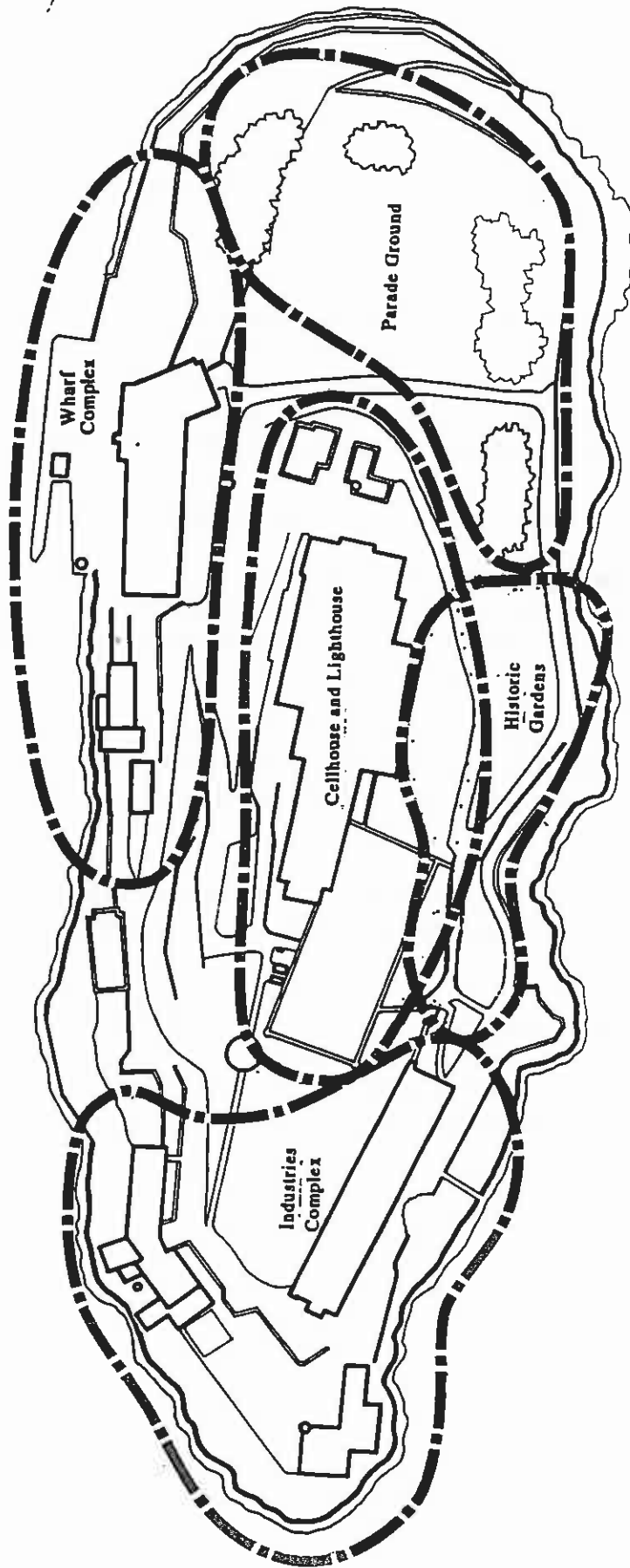
The cultural resources of Alcatraz are outlined in detail in the *Alcatraz National Historic Landmark Nomination*, *Historic Structures Report*, *Historic Resources Study*, and the draft *Alcatraz Cultural Landscape Report*. In general, Alcatraz's cultural resources can be broken down into sub-areas that are internally consistent in period of significance and function. Major sub-areas include (see Figure 7):

- **Wharf Complex**

The wharf complex includes Building 64, the guardhouse complex, remains of the Officer's Club, and a number of associated outbuildings. This complex constitutes the best remaining ensemble dating from the military defense and military prison eras. The buildings retain a high degree of integrity.

- **Cellhouse and Lighthouse**

The 1912 cellhouse and the remains of the lighthouse complex dominate the summit of Alcatraz. With the shell of the warden's house, the recreation yard, prisoner's morgue, and associated minor structures, they constitute a complete picture of the military-era prison, modified by the Bureau of Prisons to be a Federal Penitentiary in 1933. This sub-area has perhaps the highest level of integrity on Alcatraz. Associated with this area are the historic Penitentiary-era gardens located on the west side of the cellhouse, and the citadel basement.



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LSA

Scale in feet



Figure

Major Clusters of Cultural Resource

- **Industries Complex**

The powerhouse Complex and Model Industries Building were built during the military prison era, and the Laundry Building was built by the Bureau of Prisons during the Federal Penitentiary era. Although these structures are missing windows and interior finishes, they constitute a fairly complete picture of an important aspect of prison life on Alcatraz. This area also contains significant remains of military defense-era fortifications.

- **Parade Ground**

When the Federal Penitentiary closed in 1963, the Parade Ground was surrounded by WPA-era housing that created a community for prison staff and their dependents. Although all of the structures located on the Parade Ground were demolished in 1971, the rubble piles do confer a sense of the spatial relationship of the structures and record a tumultuous period of island history.

Other remaining significant cultural resources on Alcatraz include:

- **Island-Wide Circulation System (Roads and Pathways)**

The island-wide circulation system reflects the changing functions of the island over time and tells the story of access on the island and how it was curtailed.

- **Military Defense Structures**

Many military defense era structures and landforms remain on Alcatraz, both buried under and integrated into later development. These structures represent the first significant use of Alcatraz as a military defense installation.

- **Small-Scale Features**

Small-scale features from all eras of development on Alcatraz, such as retaining walls, planters, benches, light fixtures, and stairways remain in the landscape.

- **Fencing**

Fencing was one of the primary landscape features used by the Bureau of Prisons (BOP) to convert Alcatraz from a military prison into a federal penitentiary. In many locations the fencing fabric itself is gone, but fence standards remain in place, providing a sense of the extent and purpose of BOP fencing.

III. DESCRIPTION OF ALTERNATIVES

A. PROPOSED PROJECT

The proposed project description is broken down into seven sections:

- Interpretation and Visitor Amenities
- Visitor Access
- Natural Resource Management
- Natural Resource Monitoring
- Cultural Resource Management
- Hazardous Materials
- Proposed Improvements

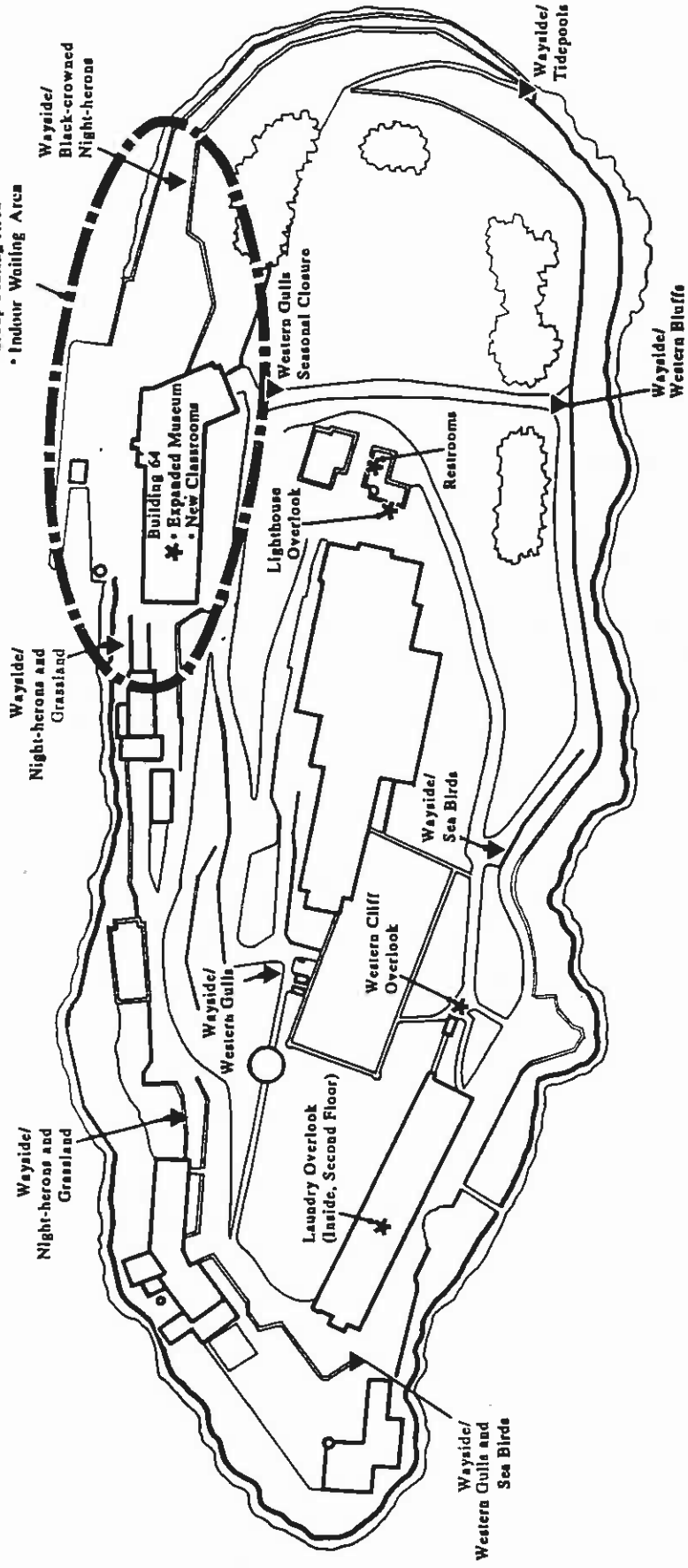
1. INTERPRETATION AND VISITOR AMENITIES

Alcatraz provides an unparalleled opportunity for interpretation and environmental education. Precisely that thing which makes the management of Alcatraz a complex challenge — the existence of cultural and natural resources in an island setting — also makes it a unique interpretive opportunity. On Alcatraz, many of the most significant park stories are available to the public in a discrete, easily accessible area.

Access for the mobility-impaired varies on Alcatraz, limited primarily by the extreme topographic relief on the island. This plan advocates developing new interpretive programs in areas to be opened to the public. Accessibility was a major consideration in the siting of new features on Alcatraz. In addition, media and technology will allow visitors with physical limitations to experience certain areas of the island that would not otherwise be accessible to them. To accomplish these goals on Alcatraz, the following additions to the existing interpretive programs are proposed (see Figure 8):

- **Visitor Information Center and Seating Area**
The existing wharf ranger station will be rehabilitated to improve access to information and upgrade the first aid station. Seating will be constructed on the wharf, one of the few wind-protected spots, for ranger talks and ferry waiting.
- **Expanded Alcatraz Museum**
Staff offices will be relocated to the upper levels of Building 64. The Alcatraz Museum can then expand on the first floor, to better explain the island's resources and history. The upper levels of Building 64 will be made accessible.

- Wayside Improvements
- Expanded Visitor Information
 - Food Service
 - Picnic Area
 - Group Seating Area
 - Indoor Waiting Area



Note: The only waysides mapped in Figure 14 are those proposed to minimize disturbance to natural resources and to explain trail closures.

05-06-93(GGN201) Alcatraz Island Plan

LSA

Scale in feet



Figure

Proposed Interpretation and Visitor Amenities

- **Building 64 Classrooms**
A portion of the upper floors of Building 64 will be rehabilitated as environmental education classrooms. They will be accessible to all visitors.
- **Expanded Educational Programs**
Opening additional parts of Alcatraz provides opportunities to expand interpretive programs. Where accessibility is not possible, alternative means for mobility-impaired visitors to experience these areas will be developed.
- **Waysides**
Educational wayside exhibits will be used for two purposes on Alcatraz. First, they will tell the story of the island, its history and its resources. An update of the *Alcatraz Interpretive Prospectus* will be required before a complete plan for this type of wayside can be developed. Second, they will focus on the importance of island resources and explain seasonal trail closures to minimize human disturbance. Figure 8 maps only this second type of wayside.
- **Scenic Overlooks**
Several points on Alcatraz provide unmatched opportunities for interpretation because of their non-intrusive access to resources and will be developed as scenic overlooks, incorporating interpretive materials and spotting scopes. Overlooks are proposed for lighthouse plaza, the west side of the cellhouse in the historic gardens, and the Laundry Building.

Visitor Amenities

Consistent with the 1980 General Management Plan and the 1987 Interpretive Prospectus, visitor amenities will continue to be improved on Alcatraz. Because Alcatraz is an island, accessible only by boat and subject to a harsh climate, visitor amenities are important. Proposed improvements include:

- **Seating**
Additional seating will be provided along the sometimes steep paths on Alcatraz, to increase accessibility for visitors with mobility problems. A group seating area will be built at the south end of the wharf for ranger programs and ferry waiting.
- **Indoor Waiting Areas**
The waiting area incorporated into the existing ranger office will be expanded as part of a general rehabilitation of that facility.
- **Cellhouse Restrooms**
New, accessible permanent restrooms will be installed within the cellhouse/lighthouse complex. Existing temporary restrooms will be removed.

- **Food Service**

Currently there is no food or beverage service on Alcatraz. Food is available only on the ferry to and from San Francisco. Minimal food and beverage service, providing drinks and light snacks will be provided either in Building 64 or the wharf area. Monitoring of Western gull and deer mouse behavior will evaluate food service impacts. Before food service begins an Integrated Pest Management Plan will address prevention of pest introduction, control of exotic pests, and methods to keep deer mice from becoming pests.

- **Picnic Areas**

Currently, picnicking on Alcatraz is limited to the wharf. To minimize conflict with western gulls, outdoor eating will continue to be limited to designated areas at the wharf. Trash cans will be designed to prevent gull scavenging. The "Dock colony buffer" will separate picnicking from habitat during the breeding season.

2 VISITOR ACCESS

The proposal seeks to minimize disturbance to natural and cultural resources by carefully controlled visitor access, especially to sensitive sites. To accomplish this, three kinds of access are proposed (Figure 9) for different parts of the island: year-round access, non-breeding season access and permanent closure. The maximum number of visitors per day, limited to 4,005 per day, will not increase.

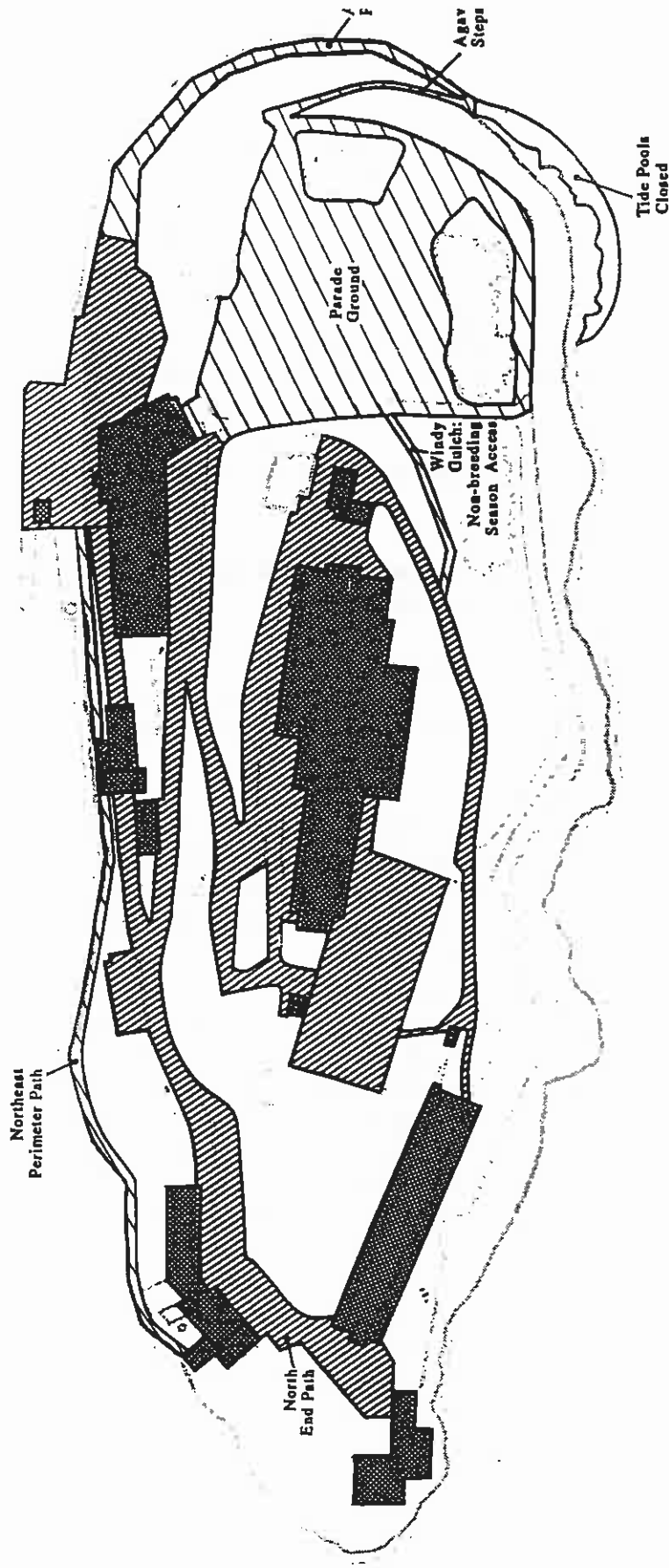
Year-round Access

Year-round, unguided visitor access will be provided to areas on Alcatraz that provide opportunities for interpretation without significant impacts on resources. All access will be limited to existing designated paths, paved areas and buildings, and will be prohibited in the numerous vegetated areas and rubble piles. These year-round access areas are:

- The currently open path leading from the wharf up to the cellhouse and down the west side of the island to the recreation yard.
- The area between Building 64 and the cliff below the Warden's House.
- A North End Path passing the Powerhouse Complex, the Model Industries Building and through the Laundry Building to a currently open path.

Seasonal Access

To protect nesting gulls, night-herons, and other birds, the following areas will only be open to visitors during the non-breeding season, typically August 15 through February 1. During the breeding season, portions of the island will be closed both to visitors and NPS personnel. Exceptions will be made only for appropriate resource management and research activities, subject to the approval of the Superintendent,



05-06-93(GGN201) Alcatraz Island Plan



Scale in feet



- Permanently Closed Areas
- Non-breeding Season Access
- Year-round Access
- Structures (year-round access)

Figur

Proposed Visitor Ac

and for legitimate emergency activities. All closed areas will be clearly marked with barriers and signs during seasonal closure. Seasonally closed areas include:

- The Agave Path, Agave Steps, Parade Ground, and Windy Gulch Path.
- The Northeast Perimeter Path.

Closed Areas:

Areas where wildlife are sensitive to human disturbance year-round will be closed to both visitors and NPS personnel. Exceptions will be made only for appropriate resource management and research activities, subject to the approval of the Superintendent, and for legitimate emergency activities. All closed areas will be clearly marked with fences and signs. Closed areas include:

- The western and northwestern cliffs, including the incinerator area.
- The tide pools.
- The Cistern area.
- The plaza northeast of the Model Industries Building.
- Vegetated areas that are sensitive to visitor use.

Other Measures to Minimize Human Disturbance

In addition to area closures, the following measures will serve to minimize disturbance of nesting night-herons, gulls and other birds, as well as cliff-roosting birds during the non-breeding season.

- Interpretive signs will explain path closures, the sensitivity of nesting and roosting bird species, deer mouse and slender salamander populations, and the importance of not disturbing these and other natural and cultural resources on the island (see "Interpretation and Visitor Amenities" section).
- To restore the historic scene, and to ensure visitor and staff safety, historic lighting will be restored along existing paths that lead to structures that are to be rehabilitated (Building 64, Guardhouse Complex, Cellhouse, powerhouse complex, Laundry Building and Model Industries Building). This lighting will be shielded or not used during the breeding season to prevent direct glare onto nesting sites. In areas closed to the public to protect nesting wildlife, lighting will not be used during the breeding season. Lighting will only be used when visitors are on the island. Lighting on the wharf will be designed so that it does not shine into nearby nesting areas.
- Night visitation will continue to occur only with ranger supervision. During the breeding season, night visitation will be limited to Building 64, Guardhouse, Cellhouse, and Wharf with no access to the Wharf Colony buffer area (see Figure 10) to reduce disturbance to nesting colonies.

3. NATURAL RESOURCE MANAGEMENT

Natural resource management proposals include actions aimed both at improving habitat value for particular species and at improving overall natural resource values on Alcatraz. These actions are designed to maximize habitat potential on Alcatraz, while preserving the integrity of the historic district, the cultural landscape and opportunities for interpretation and environmental education. Specific proposed actions are described below (see Figure 10).

Black-crowned Night-heron

- **Overall Vegetation Management**

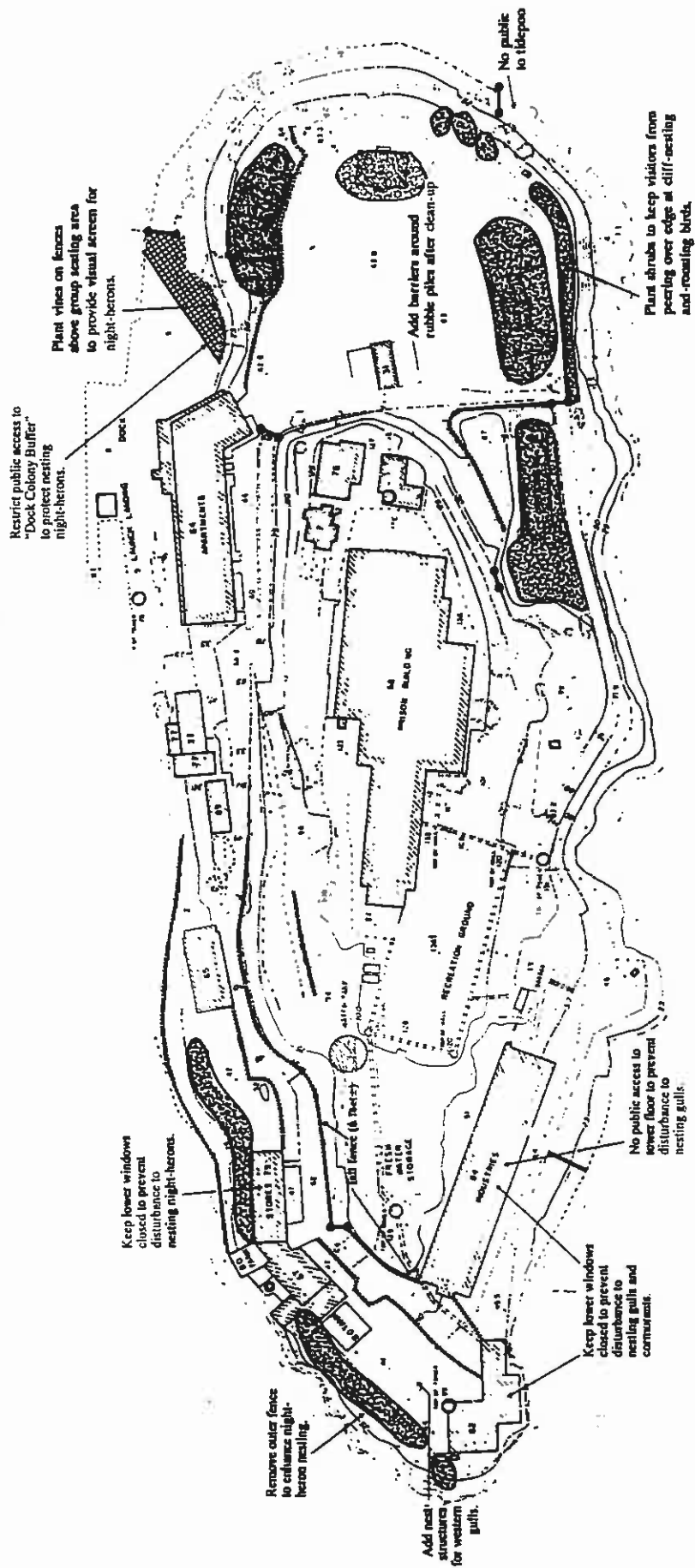
In general, trees and shrubs that are used or may potentially be used as nest-sites by night-herons will not be cleared or trimmed. Exceptions may be made for trees and shrubs adjoining pathways and other areas that are open to the public, in maintained historic gardens and in other instances, such as where a historic structure is affected, subject to a case-by-case finding by the Superintendent that heron nesting would not be degraded.

- **Habitat Enhancement**

Shrubs will be planted to expand nesting habitat for night-herons in the following areas: (1) around the perimeters of the three rubble piles on the Parade Ground and the Apartment A rubble pile; (2) the area between the North Foghorn colony and the Powerhouse Complex; and (3) at the base of the Powerhouse Complex on the northeast side of the island. These sites were selected due to suitable site conditions for shrub growth, proximity to existing night-heron colonies and lack of impact on other wildlife species, historic structures, and the cultural landscape. Shrub plantings will consist predominantly of species currently favored by herons, such as mirror bush (*Coprosma baueri*), acacia (*Acacia longifolia*), and Australian tea tree (*Leptospermum laevigatum*), as well as other shrubs and vines currently found to provide habitat on Alcatraz. In the North Foghorn area, the non-historic outer fence along the cliff between the Foghorn and Tank Building will be removed to provide additional area for shrub planting. The inner fence adjacent to the plaza will remain in place to reduce gull predation on night-herons.

- **Wharf**

Although the wharf is currently open, steps will be taken to protect the dock colony of herons. Non-invasive vines will be planted and trained up the rehabilitated historic chain-link fence to create a visual screen between nesting herons (above the wharf near the Parade Ground) and activity on the wharf. A protective "Dock Colony buffer" area will be established at the southern end of the wharf (see Figure 9), from which visitors will be excluded during the breeding season, by means of temporary barriers, until the vines have formed an



Wildlife Management Measures

 Shrub Planting for Black-Crowned Night-heron (where soil is adequate)

 New or Improved Barriers

 Gates

05-06-93(GON201) Alcatraz Island Plan

LSA Scale in Feet 0 200

Figure

Wildlife Management Measures

effective visual screen for the colony, and in which picnicking will be prohibited during the breeding season.

- **Agave Path, Parade Ground and Northeast Perimeter Path**

NPS will survey the seasonally closed areas on or shortly after August 15 each year to determine if night-heron nests are still occupied. These areas will be opened each year during the non-breeding season, between August 15 and February 1. However, path openings in these areas would be delayed if nesting night-herons remain susceptible to disturbance.

- **North End Loop Path**

The lower windows on the east-facing side of one building (No. 79) in the Powerhouse Complex will be permanently closed to prevent disturbance to nesting night-herons. Barriers near the Model Industries Building will keep visitors from disturbing nearby nesting black-crowned night-herons.

- **Parade Ground**

Friable asbestos, rusting rebar, and other NPS-era debris present hazards both to visitors and to wildlife species that utilize the rubble piles and will be removed or encapsulated to enhance habitat. Treatments will be identified based on additional evaluation and in consultation with the California Department of Toxic Substances Control (DTSC). Organic material and vegetation on the rubble piles provides night-heron nesting habitat and will be protected. Nesting material will be left in place for the night-herons. Vines and shrubs (see above) will be planted around the perimeters of the rubble piles and the growth of additional volunteer vegetation will be encouraged.

Western Gull

- **Wharf**

Trash cans will be designed to prevent scavenging by gulls. Interpretive signs and information provided by rangers during each introductory talk will inform visitors of the importance of not feeding the gulls.

- **North End Loop Path**

To protect nesting and roosting western gulls, barriers (see Figure 9) will be installed as needed along the existing road leading to the Model Industries Building to discourage visitors from wandering into the Model Industries Plaza, and along the bank below the cistern to prevent visitors from gaining access to the Cistern subcolony. No public access will be allowed on the first floor of the Laundry Building, to avoid disturbance to nesting gulls on the adjacent clifftops. Existing fences west of the Laundry Building will remain in their present condition to encourage the gulls to continue nesting there. Habitat enhancements will be made in the closed area between the Model Industries Building and the Powerhouse Complex to encourage gull nesting.

- **Rooftops**
The NPS will continue to discourage gulls from nesting on rooftops and balconies, as it damages the historic structures.

Other Sea Birds

- **Western Cliffs**
Permanent closure of the Western Cliffs will prevent disturbance of nesting and roosting pigeon guillemots, Brandt's cormorants, and pelagic cormorants on the cliffs between the Agave Steps and the Model Industries and Laundry Building. Visitors will be able to view nesting and roosting birds without disturbance from interpretive overlooks inside the Laundry Building, and the historic gardens. Visitors inside the Model Industries and Laundry Buildings will not disturb birds, because the windows are fixed closed.
- **Parade Ground**
The existing stone planter and planting beds running along the southwest side of the Parade Ground will be repaired and planted to prevent people from approaching the cliff edge and disturbing cliff-dwelling birds. Until plantings have formed an effective barrier, temporary fencing and signs will be utilized to keep visitors out of the planting beds.

Deer Mouse

- **Northeast Perimeter Path**
Safety improvements to the Northeast Perimeter Path will not intrude into the native grassland and other important deer mouse habitat areas along this path. The boundaries of the native grassland and important deer mouse habitat will be clearly marked by a biologist before and during any construction to ensure protection. In areas where the trail is narrow, and the soil is easily eroded, barriers will prevent loss of soil, habitat, and native plants.
- **Parade Ground**
Vegetation will be planted and encouraged to cover the rubble piles, improving habitat values for deer mice.

California Slender Salamander

In areas where construction will occur, any habitat potentially suitable for slender salamanders will be checked by a biologist before construction begins. Salamanders found will be captured and temporarily housed so they can be released upon completion of work. In areas with high salamander density, construction will occur only during late summer or early fall, when salamanders are most likely in

burrows. Areas of high salamander density include the area above the Wharf; Agave Path, within the eucalyptus grove; and Parade Ground rubble piles. Protection of the native grassland located south of the Powerhouse Complex and adjacent to the North Perimeter Path will also preserve salamander habitat.

Bats

Existing buildings, tunnels, and rubble will be retained largely intact to maintain potential roosting habitat for bats. Additional bat surveys will be conducted before altering existing structures that might eliminate bat roosting sites. If active roost-sites are found, every effort will be made to design building alterations to accommodate existing bat colonies rather than having to resort to relocation, so long as bats are not significantly contributing to deterioration of cultural features.

Tide Pools

The tide pools will be closed year-round, both to visitors and NPS personnel. Exceptions will be made only for appropriate resource management and research activities, subject to the approval of the Superintendent, and for legitimate emergency activities.

4. NATURAL RESOURCE MONITORING

Monitoring protocols will be developed by the NPS to assess impacts to natural resources as a result of the changes proposed in the ADCP. Studies of many of the species that use Alcatraz have been underway for some time, and provide important information about existing natural resources (see Appendix A).

The goal of monitoring on Alcatraz is to document changes in wildlife use and habitat characteristics and assess whether any adverse changes have resulted, at least in part, due to implementation of the ADCP. If so, and if these impacts are considered unacceptable, corrective measures will then be taken to restore wildlife use and habitat characteristics to a condition at or near the baseline level. The sections below describe plans for short-term monitoring, during the first five years, and long-term monitoring thereafter.

Short-term monitoring for impacts due to changes in use

The potential impacts of any change in visitor use on the island will be monitored starting the year construction begins or the year an area is opened to the public, whichever comes first. This "short-term" monitoring effort will continue until five years after construction is completed (unless otherwise noted).

A Monitoring Plan (MP) will be developed by the NPS to assess potential impacts to wildlife use and wildlife habitat during the short-term monitoring period. The initial MP will be prepared for the 1993 season and used, along with previous studies, to establish the baseline levels of key wildlife populations on the island. The MP will be revised and updated each year, based on the results from the previous year. The monitoring approach will vary by species, to ensure that the most appropriate methods are used, given the prevailing conditions on the island at that time. Appropriate methods would be those that provide accurate data, using repeatable survey techniques to allow comparison with baseline data, while strictly minimizing impacts on wildlife due to the monitoring efforts themselves.

If substantial declines are noted in breeding populations (or roosting populations, as applicable), the data will be examined to determine appropriate corrective actions. Criteria for assessing the significance of specific impacts will be developed on a species-by-species basis, to take into account both island-wide and regional population trends, as well as natural patterns of population variation. Monitoring reports, including recommendations for corrective measures (if needed), will be prepared annually through the short-term monitoring period, and will be made available to the public.

The following changes to the management of the island will be monitored to assess impacts on natural resources during the short-term monitoring period:

- **Opening of new paths to visitor access and night visitation**
Rangers will continue to patrol the island regularly to ensure that visitors stay out of off-limits areas and to record all observed violations. Weekly surveys of visitor behavior will be conducted for two years after a new path is opened, in order to assess the frequency and impacts of violations. The ranger patrols and weekly surveys will be designed to avoid disturbance of wildlife by the rangers themselves; for example, surveys of many areas can be conducted at a distance, from viewpoints. Rangers supervising night visitation will be asked to record observations of possible wildlife disturbance due to visitors and lighting.
- **Year-round opening of the North Loop Path**
Monitoring will assess potential impacts on nesting black-crowned night-herons (especially the Wall and Foghorn colonies), nesting western gulls (especially in the Cisterns area and the western and northern cliffs), and nesting and roosting sea birds on western and northern cliffs. Monitoring will document visitor intrusions into closed areas such as the Cisterns, closed portions of the Model Industries Building plaza, the western cliffs and the Powerhouse grassland.
- **Non-breeding season opening of Agave Walk, Steps, and Parade Ground.**
Monitoring will assess potential impacts to roosting sea birds on western cliffs, slope stability, and vegetation, as well as visitor intrusions into closed areas such as barricaded rubble-piles, planted slopes, and tide pools.

- **Non-breeding season opening of North East Perimeter Walk**
Monitoring will assess potential impacts to slope stability and vegetation in closed areas along the North East Perimeter Walk, as well as visitor intrusions into the Powerhouse grassland.
- **Increased activity at wharf**
Monitoring will assess potential impacts of increased visitor activity in currently opened areas of wharf to Dock colony of nesting black-crowned night-herons, gull behavior (impacts of outdoor eating), and visitor non-compliance with the ban on feeding western gulls and other animals. Monitoring will also assess whether visitor restrictions in the Dock colony buffer zone have succeeded in minimizing impacts on the Dock colony.
- **Food service on lower level of island**
Monitoring will assess potential impacts of a beverage and light-snack facility on lower level of island on the behavior of western gulls and deer mice, and the introduction of exotic pest species to the island.
- **Shrub planting for black-crowned night-heron**
Monitoring will assess the viability of shrub plantings, their progress toward providing nesting habitat for black-crowned night-herons, and any actual use by night-herons.

Corrective Measures

Should unacceptable impacts be identified, corrective measures may include improved barriers; increased ranger patrols; additional signage; visual barriers between nesting colonies and visitors; improvements to nesting habitat, such as nest structures for gulls or additional plantings for night-herons; and measures to reduce predation on bird eggs or young. Additional corrective measures at the Wharf may include an expanded Dock colony buffer zone, seasonal closure or relocation of outdoor eating areas, modification of food service facility, or relocation or closure of that facility. Corrective measures for the shrub plantings may include replacement of dead or dying plants, use of different shrub species at particular sites, or selection of alternative planting sites.

Ongoing long-term monitoring

The NPS will prepare a long-term MP to be implemented in each area of the island after the short-term monitoring period is completed. The MP will be made available to the public. The MP will provide for periodic breeding-season counts of black-crowned night-herons, western gulls, and other sea birds, with the goal of maintaining the long-term viability of these nesting populations. Counts and studies of other species will be conducted as deemed necessary by the NPS. Counts will be conducted more frequently for species that appear to require active management, based on declining populations or other evidence of impacts.

Monitoring reports will be prepared at least every two years and made available to the public. The reports will include recommendations for corrective measures and revisions to the NRMP, if needed.

Additional scientific studies of wildlife species that occur on Alcatraz will be encouraged, by both NPS staff and other qualified biologists, as a means of monitoring long-term population trends and determining appropriate management actions. The NPS will not authorize such studies unless designed to minimize disturbance of breeding night-herons, western gulls, and other wildlife.

Formal long-term monitoring of visitor compliance is not considered necessary. Rangers will continue to patrol the island regularly, however, to ensure that visitors stay out of off-limits areas. Patrols will be more frequent during the breeding season.

5. CULTURAL RESOURCE MANAGEMENT

Cultural resources include both the physical record and visible patterns of human use of a landscape. On Alcatraz, the cultural landscape within the National Historic Landmark district is the physical record of the history of the island. All planning in an historically significant site such as Alcatraz must take into account the evolution of the site and aim to preserve and protect all significant historic resources.

In 1992, a cultural landscape report was drafted for Alcatraz Island. This report identified significant historic resources in the Alcatraz landmark district and made recommendations for preserving and protecting them. The recommendations of this draft cultural landscape report are incorporated into this proposal. All of Alcatraz is a cultural landscape. Planning to preserve the cultural landscape means not only preserving major structures, but also entire ensembles of structures and small-scale elements, including vegetation, as well as patterns of use and ephemera. By law, the National Park Service is required to preserve these cultural resources.

All periods of the development of Alcatraz are important. The NPS will seek to maintain the interrelationship of the clusters, structures and elements of each era, and through preservation and interpretation highlight key concepts from each period. Cultural resource management on Alcatraz will involve three treatments:

- **Preservation**

Preservation calls for retaining and maintaining the materials, features, and spaces which characterize the property. The purpose of this treatment is the retention of the property's integrity and to avoid further deterioration of the existing form and materials.

- **Rehabilitation**

Rehabilitation calls for the retention of the historic character of a property, but this treatment allows for alterations that are necessary for contemporary use. Rehabilitation allows for improvements to a historic property that make possible

an efficient contemporary use while preserving those portions or features of the property that are significant to its historic or cultural value.

- **Restoration**

Restoration differs from preservation and rehabilitation since it may involve the removal of later historic features or the addition of missing historic features to depict the appearance of a cultural resource at a specific earlier period. This treatment will only be considered when a resource's earlier history is so significant that it justifies removal or alteration of features that ordinarily would be retained.

Many factors influence what type of treatment work is undertaken. These include the physical condition and historical significance of the cultural resource, as well as educational or programmatic objectives, maintenance considerations, contemporary or future needs, and funding. The implementation of physical work will not begin before a detailed evaluation of the condition of the resource. A complete list of all structures that contribute to the NHL and proposed treatments for the protection of these structures is included in this plan, in Appendix E. To ensure that cultural resources on Alcatraz are protected, additional plans will be required before treatment may begin. These include:

- Historic structures reports for all structures that are being worked on
- An historic furnishings report for the Main Cellhouse
- An exhibit plan for the museum
- HABS-level recordation of any structure slated for restoration.
- Collection condition survey

Specific cultural resource management actions include:

Buildings and Structures

- **All historic structures will be preserved.**

All structures will be preserved. These include Building 64, the cellhouse, powerhouse complex, Model Industries Building, Laundry Building, and remaining military fortifications. Structures in ruins will be stabilized to prevent deterioration and for public safety. These include the warden's residence, lighthouse keeper's quarters, and post exchange. Accessibility issues will be addressed in all structures.

- **Some structures will be rehabilitated.**

To adapt Alcatraz for park use, portions of some structures will be rehabilitated. These structures include Building 64, the cellhouse, Guardhouse Complex, Model Industries Building, Laundry Building, and the powerhouse complex. These structures will be rehabilitated to house interpretive facilities and other NPS functions.

- **Significant historic features that have been modified will be restored.**
These include the Guardhouse and traverse tunnels under the recreation yard.
- **The residential cluster at the Parade Ground will not be reconstructed.**
No effort will be made to reconstruct the demolished residential area cluster on the parade ground.
- **New construction of structures will be limited.**
The construction of new structures on the island will be limited to those deemed essential to adapt the island for public use or to protect public safety.
- **All preservation, rehabilitation, and restoration of buildings and other structures will conform with applicable and existing building codes to the extent practicable in consideration of maintaining current cultural resources.**
- **Structures and buildings that cannot be preserved, rehabilitated, or stabilized to a geologically safe condition will be identified and restricted from access.**

Circulation Patterns and Systems

- **All pedestrian circulation will use existing paths and roadways.**
Alcatraz has a series of roads and paths that connect all portions of the island. These roads survive and will remain the primary means of access around the island. No additional roads will be established on the island. Historic patterns of circulation on the island are an important interpretive story.
- **During safety repairs to roads and paths, historic features will be retained.**
Conduits for electrical and water systems; concrete marked with initials or dates; bollards, fire hydrants, and manholes will be preserved.
- **Primary pedestrian access and orientation will remain at the wharf.**
Historically the wharf was the primary point of access to Alcatraz, and will remain so as more of the island is opened for visitation.

Site Details and Materials

- **Remaining small-scale site details will be preserved and/or restored.**
These elements include, but are not limited to, foundations of historic buildings, footprints of now vanished structures, historic drainage and sewer systems, retaining walls, ornamental cast concrete railings, historic cast concrete light fixtures, Bureau of Prisons-era pole mounted lights, and historic signage.

- **Historic fencing and railings will be preserved.**
Remaining historic fencing will be maintained in the following areas: around the north end of the cellhouse and recreation yard, the double gated guardhouse near the powerhouse, the parade ground, the incinerator site, and northern tip of the island. Where the maintenance of cyclone fencing is impractical, alternative means may be employed to interpret how fencing circumscribed life on Alcatraz. Concrete railings will be restored. New railings will be installed around the island when required for visitor safety.
- **All new site furnishings will be compatible with the cultural landscape.**
All new site furnishings--benches, garbage cans, and interpretive displays--will be compatible with the historic scene in scale, materials, and site context.

Collections / Archaeology

- **Buried fortifications will be preserved.**
Although in general buried fortifications will be preserved without excavation, where it is possible to excavate and interpret fortifications without adverse impact to other resources, it will be done.
- **Archaeological resources will be protected during rehabilitation.**
Archaeological resources exist within the walls, attics, and beneath the floors of various structures. Care will be taken to ensure that such resources are preserved and curated for study during all preservation work. Prior to any activity which involves ground disturbance, an archeological clearance will be completed.
- **Collections Management.**
Work on Alcatraz will be monitored to ensure that objects of curatorial interest will be catalogued and accessioned into Golden Gate's park collection.

Vegetation

- **No new plant types will be introduced to Alcatraz.**
Most vegetation on Alcatraz is non-native. The varieties and species themselves are an important cultural resource, and will be preserved.
- **Important historic gardens will be rehabilitated.**
The terraced ornamental gardens and the Bureau of Prisons era-established community gardens will be maintained as trim, manicured spaces utilizing historic plant materials. A greenhouse will be constructed on the site of the historic greenhouse on the west side of the island, to propagate plant materials for the restoration of the historic gardens.

6. HAZARDOUS MATERIALS

As part of the proposed plan, a site investigation (Phase II) will be conducted to clarify the level and extent of hazardous materials still on the island. The investigation will include sampling analysis and determination of disposal or remediation methods to mitigate remaining wastes. Recommendations from the HLA "Alcatraz Island Preliminary Assessment of Hazardous Materials Phase I" will serve as the basis for resolving hazardous waste issues in areas to be opened to the public or utilized as wildlife habitat.

The management of hazardous waste will include cleanup and removal of materials from affected areas of the island as deemed appropriate within the context of preserving and maintaining structures of historical significance and protecting public health and wildlife. In areas that are already open or would be open to public access as part of the proposed plan, cleanup will be implemented as part of the proposal. No new areas will be made accessible to the public until appropriate remedial measures are completed. The specific access sites affected and preliminary recommended treatments are described below:

- **Morgue Tanks**

Located in the access area to the Morgue, the two 2,000-gallon tanks will be cleaned and, if appropriate, removed from the island.

- **Boat Wharf Tanks**

Gasoline or diesel, which is still present in the tanks, will be removed and the tanks closed. Borings and sampling analysis will be conducted to determine if contamination to the soil or to possible waters adjacent to the tanks may have occurred from petroleum products. Upon receipt of sample results, appropriate disposal procedures will be determined and implemented.

- **Powerhouse Smokestack**

The Powerhouse Smokestack is adjacent to the terminus of the Northeast Perimeter Trail. Samples of the ash will be collected and analyzed for PNAs, metals and asbestos. When test results are received, appropriate disposal procedures will be assessed and implemented.

- **Parade Ground Rubble Piles**

Additional sampling will be conducted to further characterize the level and extent of possible asbestos, PCB, and lead-paint contamination within the rubble piles. Upon receipt of the sampling analysis, measures deemed appropriate to protect wildlife utilizing the rubble piles as habitat and public safety in adjacent open areas, including encapsulation of the rubble piles and constructing barriers around them, will be assessed and implemented. Measures will be implemented during the non-breeding season to minimize impacts upon bird populations in this area. Encapsulation would involve covering the hazardous materials with soils, crushed rubble, or other suitable material, primarily to prevent windborne

dispersal of the contaminants. Encapsulation would be restricted to the minimum area necessary, to minimize disturbance to deer mice and slender salamanders. Shrubs and trees used as nest sites by night-herons will be protected from disturbance during encapsulation.

- **U.S. Coast Guard Lighthouse Tank**

Golden Gate will request additional information from the U.S. Coast Guard regarding the volume of diesel leaked. Appropriate remedial measures will be performed to remove petroleum-based products from inside the lighthouse prior to public access into this area.

- **Bureau of Prisons Rifle Range**

Cleanup measures will include the removal of accumulated lead slugs beneath the metal trap behind the targets of the rifle range for recycling. Analysis of the floor will be conducted to assure that residual lead concentrations do not pose a risk to the public.

- **Bureau of Prisons Dry Cleaning and Laundry Area**

The NPS will clean up the concrete floor in which the waste oil spill occurred and place the material in drums. The waste oil will be manifested off the island for recycling or disposal.

Other Measures

- **Access Restrictions**

In potentially hazardous areas that will continue to be closed to the public, including the bunker oil tanks in the northeast part of the island, fencing and signage will be installed to prevent access by members of the public. In addition, as cleanup is required on this portion of Alcatraz, a tank closure plan will be developed for removal of petroleum byproducts from this part of the island.

- **Asbestos-Containing Materials and Lead-Based Paint**

Because of the presence of asbestos-containing material and lead-based paint in many structures on the island, further assessment for these materials will be conducted prior to any building remodeling or demolition. A site mitigation plan will be developed to prevent worker and public exposure to ACM and lead-paint dust once the presence of these materials is assessed in the areas proposed for remodeling or demolition. The study will also evaluate the potential for lead contamination of nesting sites and mitigation measures to reduce the exposure of wildlife.

7. PROPOSED IMPROVEMENTS

To accommodate improvements in interpretation, changes in visitor use, and resource preservation, the following changes are proposed.

Phase I: Agave Path/Dock/Parade Ground Improvements

The first area proposed for rehabilitation includes the wharf, Agave Path, Agave Steps, and Parade Ground. The scope of work in this area includes:

- Repair and strengthening of existing walls, paths and other masonry features.
- Installation of barricade fencing along the seawall for visitor safety.
- Replacement of the NPS-era Agave Steps with a safe concrete and stone stairway.
- Improvements to the Parade Ground, including barriers around rubble. Due to funding constraints and potential impacts of full rubble removal as proposed in the GMP, rubble piles will be left in place, and as an interim measure, the following treatments will be applied. Rubble piles will be capped with soil or other materials to the extent necessary for public safety. Safety hazards will be removed. Vegetation will be planted and encouraged to cover the piles. NPS-era debris dumped around the rubble, including scrap metal, will be removed. Much of the woody debris and vegetation trimmings will be left in place or chipped. Seating will be incorporated along paths. At a future date, the long-term disposition of the rubble will be evaluated. If a decision is made to reconsider full removal of the rubble, a separate environmental document will be prepared.
- Improve existing picnic and seating facilities at the wharf. Vines will be planted on the restored historic fence along west and south sides of the wharf to screen the Dock Colony from view. A temporary buffer will be installed at the south end of the wharf during the breeding season until vines create effective screen.
- Installation of barrier fencing and waysides to explain island closures, minimize impacts to resources, and keep visitors out of closed areas.
- Planting to improve habitat values above Agave Path, in rubble piles, and along the perimeter of Parade Ground. Plantings in the rubble piles will be located around the perimeter of the piles, where soil is present in former garden sites. Species currently providing habitat will be used, including but not limited to coyote brush, mirror plant, Australian tea tree, and English ivy.

Later Phases

General Interpretive Improvements

- Revision of Alcatraz Interpretive Prospectus and installation of waysides interpreting cultural and natural resources (see also Phase I, for installation of waysides to minimize disturbance to wildlife and to explain island closures).
- Installation of barrier fencing, interpretive signage and spotting scopes.

Wharf Improvements

- Rehabilitation of existing ranger office, first aid station and waiting area.
- Rehabilitation of Building 64 for visitor and staff use.
- Installation of railing around wharf.
- Replacement of finger pier.
- Strengthening of pier substructure.
- Addition of benches and picnic tables on wharf.
- Overall patch-up of existing masonry and structures.
- Relocation of diesel pumping station from the public wharf to the finger pier.
- Opening and monitoring food service facility.
- Replacement of all "fender piles" on wharf.
- Installation of a floating dock and ramp as part of finger pier area, for NPS use.

Cellhouse Improvements

- Stabilization of warden's house ruins and bluff.
- Construction of new restrooms in lighthouse basement or cellhouse area.
- Development of overlook on top of lighthouse basement.
- Installation of new benches at cellhouse plaza.
- Stabilization of west wall of cellhouse.

North End Path

The following will take place prior to opening the North End Path:

- Overall patch-up of existing paths and structures.
- Elimination of safety hazards, such as metal, tripping hazards, and drops.
- Toxics testing and abatement throughout north end of island.
- Installation of waysides and barrier fencing to protect resources.
- Planting to improve habitat values.
- Installation of benches along existing paths.
- Structural and other safety improvements to powerhouse complex, Model Industries and Laundry Building. Stabilization of Post Exchange ruins.

Northeast Perimeter Path

The following will take place prior to opening the Northeast Perimeter Path:

- Rehabilitation of existing path and retaining walls.
- Installation of waysides, barrier fencing, and gates to control visitor access.

Other Improvements

- Overall patch-up of existing paths and structures.
- Installation of waysides, barrier fencing, and gates to control visitor access.
- Stabilization of lighthouse cliff to ensure visitor safety.
- Removal of slide rock and debris material at cliff base.

Construction Restrictions

- In most areas, construction activities will be limited to the non-breeding season. Some preparations for construction may be permitted during the breeding season in areas that are open year-round.
- In permanently closed areas, no construction will take place, except for habitat restoration measures noted above or where clearly essential for safety or to prevent structural failure. Essential activities in these areas will be designed to minimize biological impacts by careful timing and appropriate construction techniques, in consultation with NPS biologists.
- Construction activities will avoid disturbance of existing areas with vegetation or bare soil. Exceptions will be restoration of historic gardens, enhancement of night-heron nesting habitat, and resurfacing of the Northeast Perimeter Path, part of which is bare soil at present. An NPS biologist will monitor construction activities to prevent inadvertent damage to night-heron and gull habitat.
- All work on Alcatraz will be monitored to ensure that objects of potential curatorial or archeological interest will be preserved, and where applicable, catalogued and accessioned into Golden Gate's park collection.

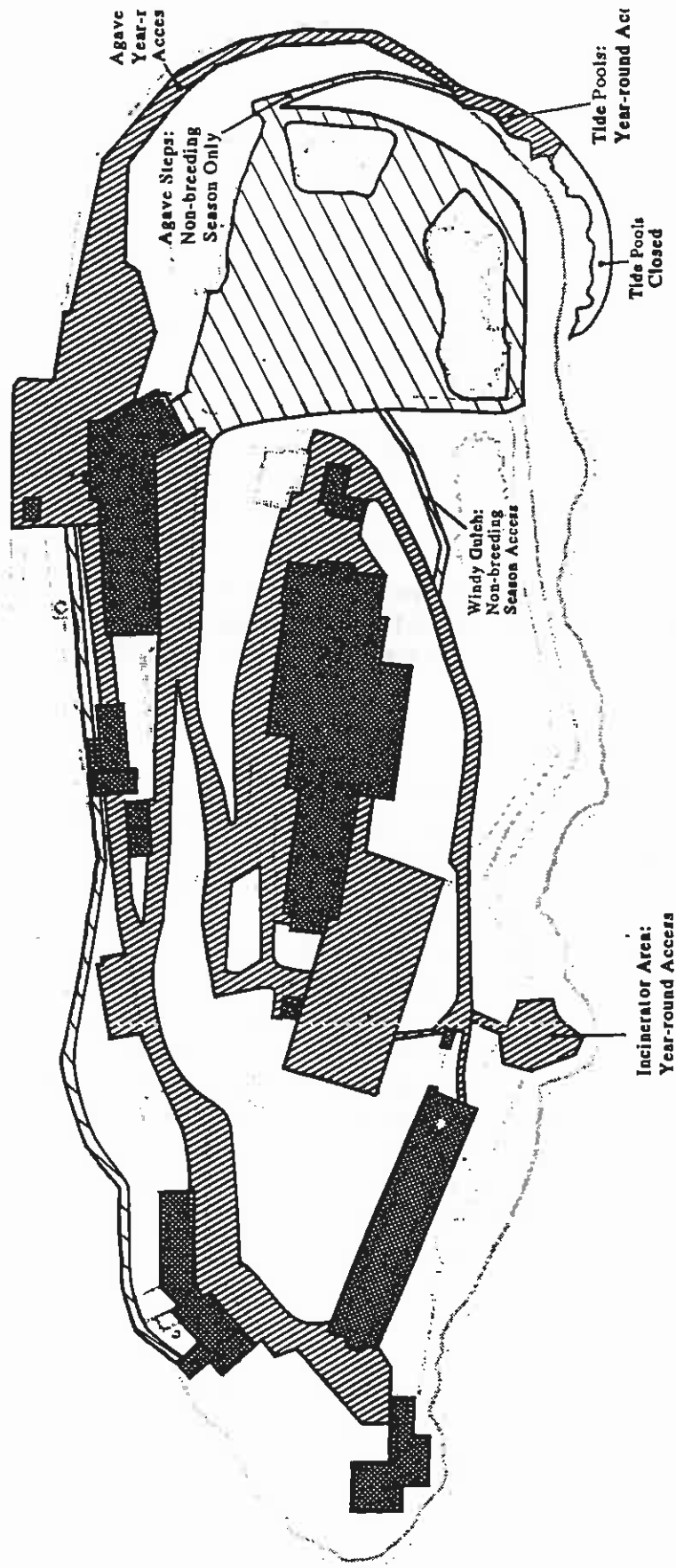
Estimated Cost of Improvements

The 1980 GMP for Golden Gate described estimated costs for improvements to Alcatraz in three categories - historic structure preservation (\$4,000,000); building demolition, rubble disposal, and hazard abatement (\$2,500,000); and landscaping and site improvements (\$3,000,000) - totalling \$9,500,000. The scope of improvements proposed in the ADCP varies from the GMP primarily by reducing the scope of building demolition and increasing the scope of building stabilization, potentially resulting in minor savings. Similarly, reducing the scope of rubble removal at this time also would result in some savings. However, additional wildlife habitat enhancements, monitoring and increased cultural resource preservation work required due to deferred maintenance would offset these potential savings. The cost estimated in the 1980 GMP provides a good rough guide to costs for the ADCP. Assuming that between 1980 (when the GMP figures were calculated) and 1993 construction costs in the Bay Area have risen between 80% and 100%, the estimated total cost of improvements in the ADCP is \$17.1-19 million. Phase I, for which an estimate was developed in 1991, will cost approximately \$1.5 - 2 million of that total.

B. GREATER ACCESS ALTERNATIVE

The Greater Access Alternative would include all elements described under the proposal, but would increase access to three additional areas (see Figure 11):

- The Agave Path (but not the Agave Steps) would be open year-round.
- Half of the tide pools would be open to year-round ranger-led visitation.
- The Incinerator Site located on the western bluff.



-  Permanently Closed Areas
-  Non-breeding Season Access
-  Year-round Access
-  Structures (year-round access)

05-06-93(GDN201) Alcatraz Island Plan



Scale in feet
0 200

Figure

Greater Access Alternatives

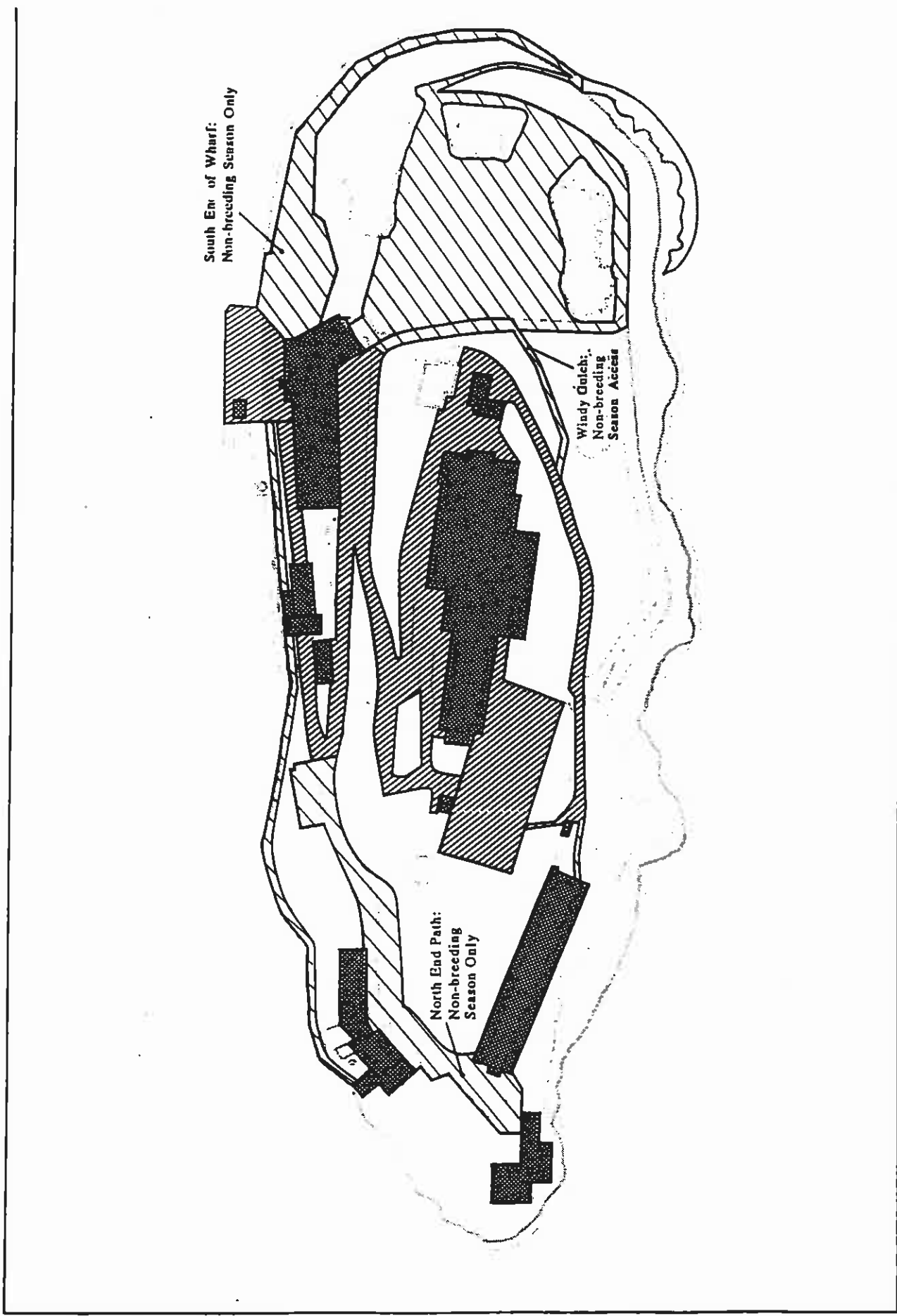
The total annual visitation on the island would remain at the same level as the Proposed Project. Tidepools not proposed for access would be fenced and signed to restrict entry to adjacent areas to the west which are used by birds during the breeding season. The tidepools would be reached from the Agave Path and the Agave Steps while the Incinerator Site would be accessed from the Perimeter Trail along the western cliffs. Year-round opening of the lower Agave Path and access to part of the tide pool area would permit a potentially greater number of visitors to experience these portions of the island compared to the Proposed Project and increase the diversity of their experience. The Incinerator Site would provide views of San Francisco and the Golden Gate, as well as the western bluffs of the island and bird colonies located in this area. Like the Proposed Project, the Greater Access Alternative would focus upon preservation, protection, enhancement and restoration of existing natural and cultural resources along with public access to parts of the island currently closed to the public and improvement of interpretative and educational programs.

Mitigations

- **Public Use and Visitor Access**
No mitigation measures are proposed.
- **Biological Resources**
Impacts to cormorants and guillemots that nest and roost on cliffs near the Incinerator would be partially mitigated by fencing and/or vegetative screening designed to limit views of the cliffs. Similar measures would be used to reduce impacts to night-herons nesting near the Agave Path.
- **Cultural Resources**
No mitigation measures are proposed.
- **Geologic Stability and Soils**
The condition of trails potentially susceptible to heavy public use and soil erosion would be identified and appropriate measures taken to upgrade them.
- **Health and Safety**
For the Incinerator site, sampling and analysis of the ash would be conducted for PNAs, metals, and asbestos to assess appropriate disposal options for the ash. The appropriate disposal method would be implemented.

C. LESS ACCESS ALTERNATIVE

The Less Access Alternative would provide less public access than the Proposed project, in order to ensure a higher level of protection for the natural resources of the island.



05-06-93(GGN201) Alcatraz Island Plan



- ☐ Permanently Closed Areas
- ☒ Non-breeding Season Access
- ☒ Year-round Access
- ☒ Structures (year-round access if adjacent to year-round trail)

Figure

Less Access Altern

- The North End Trail and the south end of the wharf would be closed during the breeding season (see Figure 12).

In other respects, the Less Access Alternative would be the same as the Proposed Project. The annual number of visitors to the island will remain at current levels. As in the Proposed Project, the plan for the island would balance the need to maximize protection, preservation, enhancement and restoration of existing natural and cultural resources while providing for greater access to portions of the island now closed.

Mitigations

- **Public Use and Visitor Access**
No mitigation measures are proposed.
- **Biological Resources**
Impacts of this alternative would be less than the proposed Plan. Therefore, the impacts would be less than significant, and no mitigation is required.
- **Cultural Resources**
No mitigation measures are proposed.
- **Geologic Stability and Soils**
No mitigation measures are proposed.
- **Health and Safety**
No mitigation measures are proposed.

D. NO-ACTION ALTERNATIVE

In the No-Action Alternative, neither the *Alcatraz Development Concept Plan* nor the Greater Access Alternative or Less Access Alternative would be implemented. The No-Action Alternative would maintain the existing conditions described in Part Two of the *Alcatraz Development Concept Plan*, in which very little change in the management of the island would occur. Public access would be limited to those areas currently open to the public. There would be no entry to the northern parts of the island. Improvement and opening of the Agave Path would not be implemented. Additional public facilities and maintenance would not be provided beyond those that currently exist, which include routine maintenance of grounds and previously restored buildings. Interpretative, environmental, and educational programs would not be substantially altered.

Programs to maximize protection, preservation, enhancement and restoration of existing natural and cultural resources would not occur. Habitat enhancements and

increased monitoring of breeding birds would not proceed. Current management of cultural and natural resources would not change.

Mitigations

- **Public Use and Visitor Access**
No mitigation measures are proposed.
- **Biological Resources**
No mitigation measures are proposed.
- **Cultural Resources**
Mitigation measures similar to those incorporated into the Proposed Project for preservation of current cultural resources may be appropriate, to protect existing historical features, even though not all of these facilities would not be opened to visitation.
- **Geologic Stability and Soils**
Since public access would not be expanded, no mitigation measures are required.
- **Health and Safety**
No additional mitigation is proposed beyond measures which Golden Gate would implement as part of the current management of hazardous wastes.

E. ALTERNATIVES CONSIDERED BUT REJECTED

Other alternatives to the Plan were considered but rejected earlier in the planning process, because it was clear that they could not achieve the objectives of the Plan. One type of alternative would reduce visitor access to less than the existing level, or even prohibit visitor access altogether. Such alternatives could provide greater enhancement of wildlife habitat values, but would not be compatible with the objectives of the ADCP. With reduced visitor access, there will be a loss of revenue, reducing Golden Gate's ability to preserve and protect Alcatraz and its resources.

Other alternatives would have provided even more visitor access than the Greater Access Alternative, both by opening more trails and by changing some seasonally closed trails to year-round trails. Such alternatives could provide more visitor amenities and cultural resource interpretation, but would not satisfy the objective of wildlife habitat preservation and enhancement. In addition, by degrading wildlife values, these alternatives would also undermine the objective of promoting environmental education.

IV. ENVIRONMENTAL CONSEQUENCES

A. PUBLIC USE AND VISITOR ACCESS

Currently, roughly 3,800 linear feet of path open for year-round unguided public use, and 7,900 linear feet of path is open to visitor use on a limited basis, through ranger-led walks (See figure below). Under each alternative, the number of annual visitors would remain at the current level. However, visitor use on parts of the island would change. Areas previously closed to the public would be opened on either a year-round or seasonal basis. Several structures would be rehabilitated to enhance interpretation and visitor amenities. Facilities such as wayside exhibits and scenic overlooks would be constructed.

1. EXISTING ACCESS

Year-round	3,800 l.f.
Ranger-led access	7,900 l.f.

2. PROPOSED ACCESS BY ALTERNATIVE*

Proposed Access	Preferred Alt. (l.f.)	Greater Access Alt. (l.f.)	Less Access Alt. (l.f.)	No-Action Alt. (l.f.)
Year-round	5,050 l.f.	6,450 l.f.	3,800 l.f.	3,800 l.f.
Seasonal	4,400 l.f.	3,150 l.f.	5,650 l.f.	n/a
Permanent Closure	2,250 l.f.	2,100 l.f.	2,250 l.f.	n/a

* Public access is measured by linear foot of path or roadway.

Proposed Project

The Proposed Project would have a beneficial impact upon public use by allowing the public to gain year-round or non-breeding season entry to previously restricted portions of the island, which allows for visitors to spread out, avoid crowding, find quieter areas with a diversity of experience not found on the island, as well as educational resources to enhance understanding of the island's resources.

Greater Access Alternative

The Greater Access Alternative would have a beneficial impact upon public access by allowing even greater year-round access than the Proposed Project.

Less Access Alternative

The Less Access Alternative would have a less-beneficial impact on public access than the Proposed Project by allowing a smaller increase in access.

B. BIOLOGICAL RESOURCES

Proposed Project

The proposed *Alcatraz Development Concept Plan* was designed to allow increased visitor access to more of the island, while minimizing impacts to sensitive biological resources and offsetting any impacts by improving habitat values in the less disturbed areas. Key management measures include permanent closure of sensitive habitat areas, seasonal closure of important nesting areas for gulls and night-herons, planting shrubs as nest-sites for night-herons, minimizing disturbance to existing vegetation, limiting most construction activities to the non-breeding season, monitoring to assess the success of these measures, and providing for corrective actions if needed. These management measures are considered adequate to avoid significant impacts to biological resources. Potential impacts to sensitive species and habitats on the island are discussed further below.

- **Black-crowned Night-Heron**

The key concern with this species is whether the increased proximity of visitors to some of the nesting colonies would reduce the numbers and breeding success of night-herons breeding on the island. The studies reviewed in Appendix B demonstrate that nesting night-herons are highly variable in their response to human disturbance. Thus, the level of disturbance cannot be predicted based solely on measures such as distance from paths to nests. Rather, the approach taken in the ADCP was to maintain a horizontal and/or vertical distance between visitors and night-heron nests that has permitted successful nesting on Alcatraz.

The breeding-season closures of the Parade Ground, Agave Path, Agave Steps, and Northeast Perimeter Path would minimize visitor disturbance of colonies in these areas (see Figure 6 for location of colonies). The Proposed Plan would not increase visitor proximity to some of the other colonies (e.g., the Greenhouse and Recreation Yard colonies) and would not allow close approach to the Foghorn colony.

Visitor access would be opened up to the area below the Wall colony, but this potential disturbance is not expected to be significant, night-herons are presently breeding in the Wall colony despite the close approach of visitors from above, which is generally more disturbing than approach from below (see Appendix B). The newly opened path below the colony is approximately the same distance from the colony as the existing path above it, but the new path is well below the colony at the base of a steep slope, and the nests are screened from view by dense vegetation. It is possible that the Wall colony may be reduced in size due to

increased proximity of visitors below it. Even so, this impact is not considered significant, as it would represent a small percentage of the night-herons on the island and would be offset by habitat improvements elsewhere on Alcatraz.

The Proposed Plan would not allow visitors to approach the Wharf colony more closely than at present. Concerns have been raised, however, that the proposed group seating area on the wharf and the picnic area on the Wharf Complex might disturb night-herons by concentrating more people near the Dock colony. To reduce the potential for disturbance, the plan provides for a vegetative screen, prohibits outdoor eating within a "Dock colony buffer", and requires that the seating area be designed so as not to enhance views of the colony from within the buffer area. With these protective measures, no significant disturbance is expected.

- **Western Gull**

The Plan provides seasonal closures of important gull nesting areas in the Parade Ground and Agave Path and permanent closures of other important nesting areas along the western cliffs and cliff tops, the Cistern, and the Model Industries Plaza. Other protective measures include barring public access to the first floor of the Laundry Building, to minimize visitor disturbance to nesting gulls nearby. Impacts from discouraging gull nesting on rooftops and within 25 feet of the Parade Ground loop path are considered minor, as there appear to be adequate available nest-sites on other parts of the island. These and other measures incorporated in the plan to minimize human impacts are considered adequate to avoid significant reduction in the nesting population of western gulls.

- **Other Sea Birds**

Protective measures such as permanent closure of the western cliffs and northern bluffs, and vegetative screening along the western (cliff) edge of the Parade Ground (which will be closed seasonally), would be adequate to avoid significant disturbance to cormorants and guillemots that nest and roost on the cliffs. Eliminating visitor access to the tide pool area will minimize disturbance to sea birds utilizing the adjacent cliff habitat.

- **California Slender Salamander and Deer Mouse**

Some impacts will occur to slender salamanders and deer mice due to treatment of the rubble piles on the Parade Ground and cleanup of "NPS-era" debris. The Plan would minimize such impacts by limiting capping of the rubble to the minimum necessary and by leaving organic debris (e.g., tree trimmings) and old, pre-NPS woody debris in place. In addition, a biologist will capture salamanders before construction activities begin and release them after construction, and construction will in most cases be confined to late summer and early fall, when salamanders are most likely in burrows. Slender salamanders and deer mice occur in many locations throughout the island and can readily recolonize the rubble piles after construction. Revegetation of the rubble piles may enhance habitat values for these species in the long run.

- **Bats**

Potential impacts to bats that may occur on the island could result from the remodeling and stabilization of buildings. These impacts are not considered significant because of the small number of bats that have been detected on the island. In addition, the Plan calls for bat surveys before altering structures that provide potential bat roost-sites, and preservation or replacement of any large roosts and those of sensitive bat species.

- **Other Wildlife Species**

Implementation of the Proposed Plan would not likely result in significant impacts to other wildlife species that breed on the island, including the white-crowned sparrow, song sparrow, mallard, and common raven. These are common species, and ample nesting habitat will remain in areas where human disturbance will not be excessive. Similarly, the Proposed Plan would not likely result in significant impacts to wildlife species that roost on or periodically visit the island, including pinnipeds, monarch butterfly, brown pelican, and peregrine falcon.

- **Tide Pools and Native Grassland**

Eliminating access to the tide pool area during the breeding season will eliminate potential significant impacts to marine invertebrates and birds in this area. The proposal to limit disturbance to the native grassland along the North Perimeter Trail during the trail construction period, and to exclude the public from the actual grassland area, would avoid significant impacts on this grassland and associated wildlife.

Greater Access Alternative

The Greater Access Alternative would allow year-round access to three additional areas: the Incinerator Area; the Agave Path (but not Agave Steps); and the eastern portion of the tide pool area, with ranger-led walks only. Potential impacts to biological resources in these areas resulting from year-round visitor access are discussed below.

- **Incinerator Area**

Year-round access to the Incinerator Area may result in significant disturbance to western gulls, cormorants, and guillemots that nest and roost on cliffs visible from the Incinerator Area and within 150 feet (see Appendix B). Up to 15 western gull nests have been recorded in the Incinerator colony and 3 in the Below Incinerator colony. This represents approximately 5% of the island's nesting western gull population. Brandt's cormorants, pelagic cormorants, and pigeon guillemots nest on the cliffs in the vicinity of the Incinerator, and these birds could abandon the area for nesting if disturbed during the breeding season. Gulls, cormorants and other birds that roost on the cliffs during the fall and winter would likely be disturbed by visitor access to the cliff edge and could abandon this

roosting area. Access to this area could also have some impact on deer mice and slender salamanders, which are potentially present in the grassy area around the Incinerator.

A potential variation, allowing only non-breeding season access to the Incinerator area, would result in less disturbance to breeding birds, but could still result in disturbance of western gulls, which may start establishing territories in December and to gulls and cormorants roosting on the cliffs during the fall and winter season.

- **Agave Path**

Year-round access to the Agave Path may result in significant disturbance to western gull and black-crowned night-heron nesting colonies located nearby. Western gulls nesting in this area include the Agave Trail colony, with 29 nests recorded in 1990 and 16 in 1992 (6% and 4% of the nest totals recorded for those years, respectively). Black-crowned night-herons in the vicinity of the Agave Path are located primarily in the Dock colony, with 34 nests recorded in 1989 and 19 in 1992 (23% and 26% of nest totals recorded for those years). The Lover's Bench colony is located high enough above the path that no impacts are expected.

- **Tide Pools**

Access to the eastern half of the tide pool area to year-round ranger-led walks would increase the impacts on tide pool organisms. It also would likely result in disturbance to cormorants and guillemots nesting on the cliffs in the vicinity of the tide pools.

Less Access Alternative

The Less Access Alternative would include breeding season closure for two areas that would be open under the proposal, the North End Path and the wharf. Impacts to biological resources in these areas would be reduced by the breeding season and permanent closures. Potential benefits to biological resources resulting from the seasonal and permanent closures to these areas are discussed below.

- **North End Trail**

Seasonal closure of the North End Path could reduce potential visitor-related disturbance to two black-crowned night-heron colonies and six western gull colonies. Black-crowned night-heron nesting colonies in the vicinity of the North End Path are the Wall and Store House colonies. These two colonies, combined, have had a maximum of 23 night-heron nests recorded and a minimum of 7 nests (approximately 13% and 9% of the nest totals recorded for those years, respectively). Although the proposed project is not expected to have significant impacts on these two colonies, the Less Access Alternative would provide greater assurance that no impacts would occur.

Western gull nesting colonies in the vicinity of the North End Path are the Tank, Laundry, Below Laundry, Model Industries, North Fence, and Power House colonies. These six colonies, combined, have had a maximum of 77 western gull nests recorded and a minimum of 51 nests (approximately 16% and 11% of the nest totals recorded for those years, respectively).

- **Wharf**

Seasonal closure of the wharf area would reduce the possibility of visitor-related disturbances to one black-crowned night-heron colony, the Dock colony. The Wharf colony is the largest night-heron colony on the island, with 34 nests recorded in 1989 and 19 nests in 1992 (approximately 23% and 26% of the nest totals recorded for those years, respectively). Although protective measures incorporated in the Island Plan are considered adequate to avoid significant impacts on this colony, the Less Access Alternative would provide more assurance that no impacts would occur.

Western gulls have nested in the wharf area only once, with two nests recorded in 1991. Seasonal closure of this area may have little additional benefit to nesting western gulls. However, seasonal closure could benefit western gulls by providing a relatively undisturbed roosting area for breeding and non-breeding gulls. In addition, more nesting may occur, as NPS activities that formerly took place on the wharf would no longer be allowed during the breeding season.

No-Action Alternative

The No-Action Alternative would maintain the areas currently accessible to the public with no additional areas opened to seasonal or year-round visitor access. Impacts to biological resources on the island would likely be similar to those impacts resulting under existing conditions.

Potential impacts to wildlife with the No-Action Alternative could result from continued management practices, which include brush clearing and shrub trimming; retention of the Parade Ground NPS-era debris; and potential disturbance to night-heron and gull colonies and other wildlife populations resulting from on-going research.

C. CULTURAL RESOURCES

Proposed Project

1. The Proposed Project would include implementation of a management program for the island which would lead to preservation, rehabilitation, and restoration of cultural resources. Since all historic structures, buildings, and features on the island would be preserved and maintained, no potentially adverse environmental impacts would occur to cultural resources from the project. The majority of the actions described in this proposed project fall within the treatments stipulated in the 1992

Golden Gate Operations and Maintenance Programmatic Agreement (PA). Any undertaking which falls outside the purview of the actions contained in this PA will undergo full consultation under 106 compliance. Implementation of these actions would include review through the Project Assessment Form (XXXXX) by the Golden Gate staff. The specific action of restoring the Sallyport is described in the 1980 GMP, for which section 106 compliance was provided and a Memorandum of Agreement (MOA) signed among the NPS, SHPO, and ACHP. Under that MOA, the Sallyport restoration project will be certified by NPS Regional Office Preservation professional staff through submission of a Project Assessment Form. Obtaining an archeological clearance prior to any ground disturbance will prevent damage to any undocumented archeological resources. Circulation patterns and systems would be retained along with site details and materials.

2. Rehabilitation of several structures for adaptive use may result in some alteration of existing cultural resource characteristics, but these will follow the Secretary of the Interior's Standards for Rehabilitation and are not considered significant impacts. These areas include portions of the Cellhouse, Model Industries Building, Building 64, Laundry Building, and Powerhouse Complex. In addition, historic gardens would be rehabilitated, and no new species vegetation would be introduced to the island.

3. Restoration of several significant historic features, including the 1850s guardhouse and restoration of gun batteries, where possible, would result in a substantial beneficial impact from the proposed project. No impact to cultural resources would occur during construction activities. Measures have been incorporated into the Proposed Project to minimize such impacts.

4. The excavation and preservation of buried fortifications would result in a beneficial impact upon the interpretation of cultural resources.

5. As part of the Proposed Project, additional physical facilities would be constructed which do not currently exist. These facilities include fencing, waysides, signage, picnic tables and benches, restrooms in the lighthouse basement (with removal of a nearby existing non-historic outside restroom), and scenic overlooks. Although new features, they are not expected to adversely impact the cultural resources of the island. Rather, many of the facilities have been planned to enhance the existing cultural resource interpretation program and to provide relatively minor visitor amenities, compatibly designed and sensitively sited.

Greater Access Alternative

The Greater Access Alternative would have the same impact upon cultural resources as the Proposed Project.

Less Access Alternative

The Less Access Alternative would have virtually the same impact as the Proposed Project upon cultural resources. Public access to cultural resources in the northern part of the island and the wharf would be restricted during the breeding season.

No-Action Alternative

Implementation of the No-Action Alternative would result in continued deterioration of the existing cultural resources of the island resulting in an adverse effect. Except for routine maintenance and activities to assure structural safety of buildings and structures, no management program would be implemented for the preservation, rehabilitation, and restoration of cultural resources.

D. GEOLOGIC STABILITY AND SOILS

Proposed Project

Increased use of previously closed trails, particularly unpaved facilities, by large numbers of visitors could cause erosion and soil instability which could adversely affect existing paths and retaining walls. Steeper trails or trails located along bluffs may be particularly vulnerable. These facilities include the Agave Path, the Agave Steps, and the Northeast Perimeter Path.

Greater Access Alternative

Potentially adverse impacts resulting from geologic instability and soils would slightly increase in the Greater Access Alternative, when compared with the Proposed Project, because access would be provided to an additional area, the Incinerator Site along the western cliffs of the island.

Less Impact Alternative

In the Less Impact Alternative, impacts from geologic instability and soils would be similar to those of the Proposed Project.

No-Action Alternative

The No-Action Alternative would not result in increased impacts from geologic instability and soils, because no additional public access to other parts of the island would be provided.

E. HEALTH AND SAFETY

Proposed Project

1. The Proposed Project would implement a program to quantify the level of remaining hazardous wastes identified in the Phase I survey and remediate sites that are contaminated prior to access by the public. Further, measures would be established to protect worker safety during any excavation, remodeling, or

demolition. No significant adverse impacts would occur to the safety and health of the public, workers, or staff.

2. Access to areas previously closed to the public could result in exposure of visitors to injury from earthquake-induced damage to existing structures, roads and trails. This potential impact could be significant without mitigation.

Greater Access Alternative

In the Greater Access Alternative, the Incinerator site would be open to public access. The possible existence of PCAs, heavy metals, and asbestos materials in the concrete soot chute could pose a significant risk to public health from exposure. We would have to characterize contamination at this site and remediate prior to public use. In other respects, the Greater Access Alternative would have the same impacts as the Proposed Project.

Less Access Alternative

The impacts of the Less Access Alternative are the same as the proposed project.

No-Action Alternative

In the No-Action Alternative, Golden Gate would continue to manage hazardous waste issues under current guidelines, policies, and funding. Since public access would continue to be restricted to current areas, there would be no significant impact upon health and safety.

F. SUMMARY OF INDIRECT IMPACTS

Indirect impacts are effects that could incidentally occur from a project. Indirect impacts may include effects which could result at a later time or are farther removed in distance, such as growth inducement, alterations to patterns of land use, change in population density, or deterioration of air quality.

Proposed Project, Greater Access & Less Access Alternatives

No indirect impacts would result from the Proposed Project, the Greater Access Alternative, and Less Access Alternative. The number of visitors would be maintained at the existing level of approximately one million per year. Current visitor use and planned facilities on the island would not substantially change from current conditions. Biological resources on the island are not expected to be affected in the long-term from the proposed increase in visitor access under any of the alternatives. Restrictions on access to sensitive habitat areas, ongoing monitoring of wildlife populations, and future limitations on areas of access would be implemented to minimize impacts upon biological resources.

No-Action Alternative

The No-Action Alternative could have detrimental indirect impacts on cultural resources on Alcatraz. By not implementing proposed preservation, stabilization

and rehabilitation of structures on Alcatraz, the preservation of historic resources that contribute to the National Historic Landmark might be imperiled.

G. SUMMARY OF CUMULATIVE IMPACTS

Cumulative impacts are generally regarded as two or more individual effects of one project or of other projects in the vicinity which, when taken together, are considerable or which compound to increase other environmental impacts.

All Alternatives

Since the number of visitors would not increase, the level of facilities would not substantially be altered, and environmental impacts can be adequately mitigated, none of the alternatives would contribute to any significant cumulative impacts.

V. CONSULTATION AND COORDINATION

The *Alcatraz Development Concept Plan* represents the culmination of a planning process that stretches back to the very beginnings of Golden Gate in 1980 (See Section I, Part B). After the publication of the GMP in 1980, which included a DCP, the next focused planning for the future of Alcatraz began with the series of workshops conducted during the preparation of the 1988 *Alcatraz: The Future, Concept Plan and Guidelines for Alcatraz Island*. The preparation of this plan included more than 100 participants in four day-long workshops held on Alcatraz. The participants represented many professions, backgrounds and interests including designers, planners, artists, former Alcatraz residents, and park staff.

During preparation of the *Environmental Assessment: Agave Trail Renovation, Alcatraz Island* two workshops were held with heron specialists and avian habitat managers. Participants included San Francisco Bay Bird Observatory, U. S. Fish and Wildlife Service, Audubon Canyon Ranch and the University of California. The San Francisco Bay Conservation and Development Commission and California Coastal Conservancy were also consulted during the preparation of the document.

After concerns were raised by Golden Gate and Marin Audubon Societies about the Agave Trail EA, a series of consultation meetings were held, from which a detailed record of their concerns was assembled. At that time, the NPS withdrew the EA for additional research and development, which has resulted in the *Alcatraz Development Concept Plan*. The development of the ADCP has included consultation with the U. S. Fish and Wildlife Service, and a meeting and subsequent site visit with the Golden Gate and Marin Audubon Societies.

Consultation with the State Historic Preservation Office (SHPO) and the Advisory Commission on Historic Preservation (ACHP) has been initiated.

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II. PREPARERS

Golden Gate National Recreation Area

Ric Borjes, *Historical Architect*

Daphne Hatch, *Wildlife and Fisheries Specialist*

Nancy Hornor, *Environmental Specialist*

Golden Gate National Park Association

Michael Boland, *Landscape Architect*

LSA Associates, Inc.

Stephen Granholm, Project Manager/Biologist

Don Schmoldt, Biologist

Benson Lee, Nonbiological Sections of EA

III. CONTRIBUTORS

Golden Gate National Recreation Area

Chuck Baerlin, Chief, Management and Budget

Gretchen Feiker, Interpretive Specialist

Interpretive Rangers, Bay District

Steve Haller, Park Historian

Judd Howell, Research Ecologist

John Kilpatrick, San Francisco Facility Manager

Howard Levitt, Chief, Communications and Interpretation

Lance Lewis, Safety Officer and Haz. Waste and Mats. Compliance Officer

Martin Mayer, Archeologist

Jane Moore, Cooperative Activities Coordinator

Doug Nadeau, Chief, Resource Management & Planning

Laura Nelson, Botanist

Diane Nicholson, Park Curator

Brian O'Neill, Superintendent

Armando Quintero, District Ranger, Bay District, GGNRA

Gil Soper, Chief of Ranger Activities

Terri Thomas, Natural Resource Management Specialist

Naomi Torres, Supervisory Park Ranger, Bay District

Kevin Turner, Supervisory Park Ranger, Bay District

Nick Weeks, Landscape Architect

Fahy Whitaker, Branch Chief, Division of Interpretation

Brett Woods, Ranger, Bay District

Golden Gate National Park Association

Greg Moore, Executive Director

Charles Money, Dir. of Business, Finance & Admin.

Nancy Ratzesberger, Dir. of Development

Louise Burnham, Assoc. Dir. of Development

Nichollette Phelps, Project Manager

Allen Fish, Dir., Golden Gate Raptor Observatory

**EXISTING NATURAL RESOURCES OF
ALCATRAZ ISLAND**

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Prepared for:

*Golden Gate National Recreation Area
National Park Service
Building 201, Fort Mason
San Francisco, CA 94123*

Prepared by:

*LSA Associates, Inc.
157 Park Place
Pt. Richmond, CA 94801
(510) 236-6810
LSA Project #GGN201*

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INTRODUCTION

Before intervention by man, Alcatraz may have supported one of the major seabird colonies in central California. Persecution and disturbance by humans eliminated all or almost all seabird nesting (Pierotti and Annett 1989) for almost a century. During the 1970s and 1980s, western gulls, and black-crowned night-herons returned to nest at Alcatraz, and three other sea birds have recently begun nesting: Brandt's cormorant, pelagic cormorant, and pigeon guillemot¹. Other wildlife species breeding on the island include California slender salamander, white-crowned sparrow, and deer mouse. Now, Alcatraz Island has become an important resource for San Francisco Bay wildlife.

The National Park Service (NPS) took over Alcatraz in 1964, and human access to most of the island was prohibited. Previously well-pruned ornamental plants were allowed to naturalize and spread. By 1975, both western gulls and black-crowned night-herons were nesting on the island (Roxanne Farwell, pers. comm.). With existing development and under the current management regime, about 75% of Alcatraz Island is available to wildlife (Howell and Pollak 1991).

In recent years the NPS has initiated a planning process for Alcatraz. The objectives are to determine suitable locations for increased visitor access to the cultural resources and spectacular panoramic views of San Francisco Bay available from the island, while minimizing impacts to wildlife and expanding the environmental education program. The proposed plan would open several additional areas to visitor access, including improvements near the Auxiliary Dock; the Agave Path, Agave Steps, and Parade Ground; the waterside trail along the northeast edge of the island; the base of the Lighthouse and Lighthouse Plaza; the Morgue and the east side of the Cellhouse; the North End loop trail to the Model Industries Building and through the Laundry Building; and a new Parade Ground loop trail at the base of the Warden's House cliff. The Agave Path, Agave Steps, Parade Ground, and northeast perimeter trail would be closed during the breeding season to minimize impacts on night-herons and western gulls. Projected visitation is expected to be from 700 to 4,000 people per day, as at present.

¹Common names of birds follow the standard usage in the AOU Checklist, 6th edition (1983) and Supplements (1985, 1987, 1989, 1991), which can be consulted for scientific names. For scientific names of other species mentioned in text, see Tables 1 and 6.

EXISTING BIOLOGICAL RESOURCES

VEGETATION

Prior to occupation by Europeans, Alcatraz Island was sparsely vegetated (Delgado and Associates 1992). By 1853, trees and shrubs were planted and terraced gardens were under cultivation (Pollak and Howell 1991), and this practice presumably continued until 1963 when the federal prison was closed (Lutsko Associates 1992). Soils brought to the island from the mainland and other islands in the Bay probably contained seeds of native plants, including coyote brush (*Baccharis pilularis*), California poppy (*Eschscholzia californica*), and California blackberry (Pollak and Howell 1991). The topography of Alcatraz was highly modified for military purposes in the late 1800s by blasting steeper cliffs and importing tons of topsoil. The steeper cliffs on Alcatraz are generally barren of vegetation, except the northeastern shore which has an extensive grassy area above the cliffs (Pollak and Howell 1991). The more gently sloped cliffs support a variety of introduced plant species.

A small stand of native grassland dominated by creeping wildrye (*Elymus triticoides*) is located along the Northeast Perimeter Trail near the Powerhouse Complex (Figure 1). The Powerhouse grassland is one of the largest grassland stands on the island.

WILDLIFE

The closure of parts of Alcatraz to human use and physical and vegetational changes on the island have created new wildlife habitats which support an array of wildlife (Pollak and Howell 1991). Several species of wildlife have recently colonized the island, and these and other wildlife species present on the island are discussed below. Table 1 provides a list of wildlife species breeding or suspected of breeding on Alcatraz.

Black-crowned Night-Heron

Status of Alcatraz and Bay Area Populations

Black-crowned night-herons are known to nest at only about a dozen colonies in the greater San Francisco Bay Area, which supported at least 976 nests in 1991 (Table 2). Some colonies in the Bay Area seem relatively free from impact while others are suffering from disturbance, most notably the large colony on Bair Island, which was abandoned in 1991 due to the presence of red foxes (*Vulpes vulpes*) (Kopec pers. comm.). The night-heron colony at Brooks Island Regional Preserve in Contra Costa County may eventually be opened to less controlled public access. This could disturb the night-heron colony on the island (K. Berger, pers. comm.). The large colony at West Marin

Island has recently received protection, as the island has been made part of the San Francisco Bay National Wildlife Refuge.

Black-crowned night-herons were first reported nesting on Alcatraz Island in 1975 (Howell pers. comm.). Night-herons nest or have nested in 12 locations, or subcolonies, on the island (see Figure 1 and Table 3). About 17% of the Bay Area nests are located on Alcatraz, based on the 1989 and 1990 nest counts (145 nests and 168 nests, respectively). These counts were considerably more complete than the 1991 and 1992 nest counts, which did not include all of the colonies because of efforts to reduce disturbance to the herons.

Censuses have been conducted by NPS staff, Roger Hothem of the Fish and Wildlife Service and Peg Woodin of the San Francisco Bay Bird Observatory. Data collection thus far has consisted of counting both active nests in spring, and remains of nest structures in fall. Most years this process is incomplete. Due to concerns about disturbance, not all heron nests are tallied. Many nests are located in dense blackberry or ivy patches, and are difficult to find without extensive disturbance. In the fall during some years, staff from the San Francisco Bay Bird Observatory have done an all-island survey to count empty nests. It is possible, based on the observed nest conditions, to estimate which of these were active nests, but this approach does not provide information on hatching or fledgling success.

The reported numbers of night-heron nests decreased from 1989 to 1992 (Woods pers. comm.). This may be due to: (1) the fact that active nests may have been undercounted in 1991 and 1992 to reduce disturbance; (2) normal year-to-year variability; and/or (3) possible effects from El Niño conditions, which reduced food supplies for many piscivorous species. Disturbance by researchers and NPS staff may have had a limited impact. Existing use by visitors on the Cellhouse trail may preclude some nesting of night-herons in this area. Also, a small night-heron colony, referred to as the Shower Room subcolony, was established directly adjacent to the northeast side of the cellhouse but was eventually abandoned, possibly in response to the use of that area for visitor staging (Farwell pers. comm.), and the Greenhouse and Recreation Yard subcolonies may have been abandoned. More data are needed on these two subcolonies to determine if any night-herons still nest there.

On Alcatraz, black-crowned night-herons nest primarily in mirror bushes (*Coprosma repens*), fig trees (*Ficus carica*), blackberry (*Rubus vitifolius*) vines and other trees and shrubs. Eucalyptus (*Eucalyptus* sp.) and Monterey cypress (*Cupressus macrocarpa*) trees were formerly used as nesting sites on Alcatraz, but use has mostly shifted to shrubs. The cause of the shift is not understood. Ravens nesting in the cypresses in the Zig Zag Trail area may have caused the herons to abandon these nests (Hothem pers. comm.). In 1992, however, one night-heron attempted to nest in a eucalyptus tree, but this nesting attempt failed (Woods pers. comm.).

Sensitivity to Disturbance

Effects of human disturbance to black-crowned night-herons and other species of herons have been well documented. Great blue herons were initially disturbed (two or more birds flushing from nest) at distances varying from 175 to 125 meters in March and 70 to 50 meters in July (Vos et al. 1985). Similar work by Erwin (1989) with mixed-species colonies revealed that black-crowned night-herons always flushed before other species of herons and egrets. Night-herons prove most vulnerable when they are setting up their territories in early spring (Tremblay and Ellison 1979, Parsons and Burger 1982, Vos et al. 1985, Dusi and Dusi 1987, Erwin 1989). Tremblay and Ellison (1979) entered a night-heron colony only twice during the pre-laying period and observed almost complete abandonment. Impacts of disturbance during both the egg and chick period may be less adverse. Disturbance mortality occurs directly via complete abandonment or breakage of eggs, and indirectly when unprotected eggs and young are exposed to adverse temperatures, and/or predation. Tremblay and Ellison (1979) observed that post-hatching disturbance sometimes caused abandonment of nests and nestling mortality.

In all of the studies above, human intrusion was conducted on a less than daily basis, and involved relatively few people. Kelly (pers. comm.) states that heron colonies in general are highly variable in terms of their response to humans. The night-heron colonies at Napa and Santa Rosa, for instance, tolerate limited human presence. Other colonies flush easily at the approach of people. Vos et al. (1985) noted that dense vegetation reduced flushing responses in great blue herons. Acclimation of night-herons to humans may minimize some of the disturbance effects. Vos et al. (1985) felt that great blue herons become conditioned to "repeated, non-threatening activities."

On Alcatraz, researchers and NPS staff have noted that disturbance response varies according to subcolony and that this may in part be attributable to density of vegetation. They observed that the Tunnel Bush subcolony was especially sensitive to disturbance. Both researchers and NPS staff have flushed chicks which resulted in either direct mortality by falling, or indirect mortality or stress from injuries sustained from gull attacks (AINHR). Risks of egg predation are potentially high at Alcatraz Island due to high densities of western gulls and the presence of a nesting pair of common ravens. Ravens or crows were major causes of predation to night-herons in several other colonies (Tremblay and Ellison 1979). Gulls attack and sometimes kill large chicks during disturbance episodes or when the young leave their nest site during flight practice sessions. Young herons sometimes regurgitate meals when stressed, and gulls will often steal the regurgitated meal, causing weight loss of heron nestlings (Parsons and Burger 1982).

Farwell (pers. comm.) has noted that both western gulls and black-crowned night-herons are most sensitive to disturbance from humans that approach from above, rather than below nest-sites on Alcatraz's craggy slopes. This has also been demonstrated in night-heron colonies in Santa Rosa and Napa, where human presence beneath nest trees seems to have no effect on nesting

birds. For purposes of this document, we will call this phenomenon this as the Elevational Effect (Kelly and King pers. comm.).

Western Gull

Status of Alcatraz and Regional Populations

The western gull is a common breeding bird in California, with about 25,000 pairs nesting (Sowls et al. 1980). The majority of these nest on the Farallon Islands. The Alcatraz colony may represent 15% of western gulls nesting in the San Francisco Bay area and is the third largest colony in central California (Pollak and Howell 1991).

Western gulls probably nested on Alcatraz before European man occupied the island. Western gulls began re-colonizing the island in approximately 1973 (Pollack and Howell 1991). By 1981, at least 135 pairs were censused (Pollak, no date). In 1991, 417 to 449 pairs of gulls nested on Alcatraz Island (Bell 1991). This is down slightly from 1990 when 482 nests were found. In 1992, 358 nests were counted (Fish 1992). Bell (pers. comm.), however, indicated that the Agave Trail, Rubble Pile, Barker Beach and Gardens area were not completely surveyed in 1992 due to the presence of nesting night-herons. Thus, the 1991 data are considered the most reliable estimates of the current breeding population.

Western gulls nested at 27 locations (subcolonies) throughout the island, including building roofs (Bell 1991) (Figure 2 and Table 4). The largest subcolony in 1991 was at the Cistern (66 nests). Other substantial subcolonies included the Parade Ground (47 nests), Rubble Flat (33 nests), Rubble Pile (29 nests), Agave Trail (25 nests), and Barker Beach (34 nests) (Bell 1991). Bell (pers. comm.) believes that some locations such as the North Perimeter, Parade Grounds and Cistern areas are probably supporting maximum numbers of nests, but states that it is difficult to assess whether or not the entire island is at carrying capacity for nesting gulls.

Western gulls re-occupy nesting territories during winter months (November to March) (Ainley and Boekelheide 1990) and this occurs on Alcatraz Island as well (Farwell pers. comm.), where gulls return in December and January. Sydemann (pers. comm.) noted that older gulls re-occupy territories in January and that younger gulls occupy territories later in the season.

Sensitivity to Disturbance

Western gulls, like night-herons, are most sensitive to disturbance during the pre-egg laying stages, especially in early April (Robert and Ralph 1975). During the latter stages of the breeding season, disturbance can cause mortality to gull eggs and chicks (Gillett et al. 1975). When disturbed, chicks leave their nests and run through the colony in search of shelter (Bell pers.

comm.). Small chicks may be consumed outright by other gulls; larger chicks may suffer severe pecking. Gull nest loss creates escalating mortality during that nesting season, since birds which have lost nests often roost in the nesting area and prey on eggs and chicks in the remaining nests (Hand 1980). In addition, loss of habitat often causes increased crowding with potential for lowered reproductive success in the remaining subcolonies.

Some of the gulls on Alcatraz may become conditioned to visitor use. On the Farallon Islands, nesting western gulls have become accustomed to small numbers of people (3 to 7) that confine activities to established trails. On Alcatraz, Bell (pers. comm.) observed that western gull nesting occurs adjacent to currently open zones such as the Recreation Yard and Dock areas, but nests are generally placed above tourist traffic or in well-screened locations. He suspects that continuous human presence may be less disruptive to the gulls than sporadic bursts of traffic from irregular tours.

Heermann's Gull

Heermann's gulls breed on islands in the Gulf of California, Mexico (Howell et al. 1983) and spend summer and fall on the California coast (McCaskie et al. 1979). From 1979 to 1982, a pair of Heermann's gulls attempted unsuccessfully to nest beneath a coyote brush shrub near the Incinerator. This was the first known nesting locale for the United States (Howell et al. 1979). Several hundred Heermann's gulls roost on the Alcatraz Island cliffs during the summer and fall (Petrilli pers. comm.).

Pigeon Guillemot

Approximately 15,000 pigeon guillemots nest in California, and their population trend is unknown (Jehl 1984). A nest was first discovered on Alcatraz in 1982 (Boarman 1989). Guillemots are seen on the island from March through August, and in November (Pollak and Howell 1991). Boarman (no date; in Pollak and Howell 1991) reported that up to eleven pairs of guillemots may be breeding on the island.

Alcatraz represents the most inland California nesting locale for this species (Steve Bailey pers. comm.). Pigeon guillemots nest on cliffs on the western and southern side of the island. Farwell (pers. comm.) noted that guillemots nested in holes dug in the mortar of the old brickworks on the cliffs. It is unclear at this time how many pigeon guillemots roost or nest on the cliffs below the Parade Ground rubble piles.

Brandt's Cormorant

The Brandt's cormorant is a common breeding bird in California with approximately 64,000 birds nesting. The Brandt's cormorant population may

be increasing in California (Jehl 1984). Two Brandt's cormorant nests with eggs and young were discovered on a cliff just south of Barker Beach in 1991. This was the first nesting record of this species on Alcatraz Island (Farwell pers. comm.). Brandt's cormorants are seen on Alcatraz year-around, peaking from January to April (Pollak and Howell 1991). Mary Petrilli (pers. comm.) noted that during the winter months hundreds of Brandt's and double-crested cormorants roost along the southwest cliffs of Alcatraz.

Pelagic Cormorant

Approximately 16,000 pelagic cormorants nest in California and their population may be stable (Jehl 1984). At least six pelagic cormorant nests were observed in 1991 on Alcatraz Island on the northwest cliffs below the Model Industries building (Petrilli pers. comm.). It is unclear at this time how many pelagic cormorants roost on the cliffs below the Parade Ground rubble piles.

Pollak and Howell (1991) noted that on Alcatraz, both Brandt's and pelagic cormorants are highly sensitive to disturbance.

Asby Storm-Petrel

The ashy storm-petrel nests only on islands off the coast of California and Baja California (Sydemann pers. comm.). The northernmost colony is on the Farallon Islands, with approximately 6,000 to 7,000 individuals (Sydemann pers. comm.). Ashy storm-petrels and other species of storm-petrels have been observed in San Francisco Bay (Grinnell and Miller 1944, Richmond pers. comm., Schmoldt pers. obs.). No ashy storm-petrels have been observed nesting on Alcatraz Island, but they are considered a potential breeding species, based on the availability of suitable cliff-nesting habitat.

White-crowned Sparrow

White-crowned sparrows breeding on Alcatraz Island most likely represent a distinct song dialect and are currently being studied, with a report due this winter (Jesse pers. comm.). They nest in small numbers on the island. Up to 14 males were observed singing during 1981-82 (Boarman 1989). Song dialects have no particular genetic significance (Baptista and Morton 1988). Alcatraz white-crowned sparrows currently nest very close to existing open trails (Jesse pers. comm.).

Deer Mouse

Deer mice are common and are distributed across most of North America (Burt and Grossenheider 1976). Deer mice are abundant on Alcatraz Island. Mark-recapture studies indicate that 209 mice may live in the rubble piles alone. Areas of highest concentrations include the rubble piles, shrubbery

west of the cellhouse, and along the eastern shore (Pollak no date). Howell (pers. comm.) has found that they prefer grassland habitat on the island. Some of the Alcatraz Island mice (16.5 percent in 1988 [Thompson 1988] and 19 percent in 1990 [Pollak and Howell 1991]) exhibit a lighter buff color than the rest of the San Francisco Bay population. This color morph also lacks the tail stripe found in other deer mice. Current impacts to deer mice throughout the island consist primarily of predation pressure gulls, kestrels and other predators (Pollack, no date).

California Slender Salamander

Slender salamanders are small, lungless salamanders that do not require water for breeding. They lay their eggs in moist ground, usually under rotting logs (Stebbins 1985). Preliminary surveys on Alcatraz Island have revealed that high populations of slender salamanders are present in the Dock area, the northeast section of the Agave Path near the Dock, and the Parade Grounds (Martin pers. comm.). The Agave Steps and southern Agave Path areas have drier substrate than other parts of the island and thus may not harbor large numbers of salamanders. The northern end of the island tends to be moister and thus may harbor a higher concentration of salamanders (Martin pers. comm.). Neither the salamanders nor their eggs can tolerate salt spray and they are thus confined to moister upland areas of the island (Martin pers. comm.).

Populations on Alcatraz Island are either endemic to the island, or were introduced inadvertently, e.g., in soil brought to the island during construction projects (Martin and Lawson 1991). Dave Martin (pers. comm.) is presently conducting a study to determine whether the Alcatraz population is distinct genetically.

The Alcatraz population of slender salamanders is dormant during dry summer months, spending this time in burrows deep beneath the soil (Martin pers. comm.).

Current impacts to slender salamanders are limited. The salamanders probably have no predators on the island. Populations of this species are kept in check by density-induced gonad atrophy (Anderson 1960). If the population is substantially reduced, a combination of low fecundity and arrested reproduction may mean that it could take decades to recover (Pollak, no date).

Pinnipeds

Both harbor seals (*Phoca vitulina*) and California sea lions (*Zalophus californianus*) have occasionally hauled out on Alcatraz Island in small numbers. The total population of harbor seals in San Francisco Bay is estimated to be approximately 700 animals, which use five primary haul-out sites: Mowry Slough, Greco Island, Castro Rocks near the Richmond-San

Rafael Bridge, and Corte Madera Ecological Reserve (Harvey et al. 1992). The California sea lion population increases to 400-500 animals (mostly immature males) during anchovy and herring runs and occur primarily in the North and Central Bays (Harvey et al. 1992). For the past five years, sea lions have hauled out in the San Francisco waterfront, and have recently begun hauling out during fall and spring at the Pier 39 Marina in San Francisco, where an estimated 600 animals were observed in January and February, 1991 (Harvey et al. 1992).

A harbor seal raised a pup on Alcatraz Island on one occasion in the area of the Powerhouse and she may have given birth on the island (Farwell pers. comm.). At Alcatraz, rarely more than four seals and/or sea lions are observed at any one time (Petrilli pers. comm.).

Bats

Information on bats on Alcatraz was obtained from a preliminary survey conducted by Dr. Elizabeth Pierson on August 16, 1992 (Pierson 1992). Thirteen species of bats are known or expected from the Golden Gate National Recreation Area. Any of these could potentially occur on Alcatraz. The area offering the best potential roosting site was the Sally Port. Temperatures were warmer in this building than elsewhere. Acoustic surveys using bat detectors resulted in hearing a single pulse, possibly of a red bat (*Lasius borealis*) from the trees on the road to the cell house. No bats were captured in the mist nests set. One animal, possibly a bat, was observed near the west tunnel of the Recreation Yard.

Roosting sites do not appear to be limited (Pierson 1992). Pierson (1992) observed that factors that may limit the presence of bats on the island include the microclimate (frequency of winds) and the scarcity of prey (insects).

Monarch Butterfly

The winter roosting sites of the monarch butterfly (*Danaus plexippus*) are of concern to the California Department of Fish and Game. Winter roost sites extend along the coast from northern Mendocino County to Baja California, Mexico. Roosts are usually located in wind-protected tree groves (e.g., eucalyptus, Monterey pine, cypress), with nectar and water sources nearby (CNDDB 1991). Approximately 100 or more monarch butterflies have been reported by NPS staff in the shrubs above the Agave Trail steps west of Lover's Bench (Woods pers. comm.). The eucalyptus and cypress trees present on the island provide additional potential roost-sites for the monarch. The availability of fresh water on the island may be a limiting factor. However, the trees and shrubs on the island may act as a staging ground en route to traditional roosting sites.

Tide Pools

A small tide pool area is present at the southern end of the island, extending approximately 350 feet westward from the base of the Agave Stairs. These tide pools were created by quarrying activities (Pollak and Howell 1991). They are one of the few tide pool complex present within the San Francisco Bay, and provide habitat for a variety of invertebrate species typically found in open coastal areas (Gosliner pers. comm., Inase 1974). As yet no complete survey of marine invertebrates has been conducted in these tide pools.

Special Status Species

Plant Species

Twelve special status plant species were recorded in the CNDDDB (1992) as occurring in the San Francisco North USGS 7-½ minute quadrangle which includes Alcatraz Island (Table 5). Two of these, the San Francisco gumplant and San Francisco campion could potentially occur on Alcatraz, based on the presence of suitable habitat, but have not been observed on the island. The campion occurs on rock outcrops (CNDDDB 1992) and would likely occur on the cliffs on the island. The gumplant occurs in coastal scrub habitats on ocean bluffs and rocky slopes (CNDDDB 1992).

Wildlife Species

Two special status wildlife species have been observed on Alcatraz Island, the peregrine falcon (*Falco peregrinus*) and California brown pelican (*Pelecanus occidentalis californicus*) (Alcatraz Island Natural History Record [AINHR]). Both are State and federally listed endangered species. Peregrine falcons have been observed occasionally on the island during fall and spring migration and during the winter months (Armando Quintero, pers. comm.). Farwell (pers. comm.) noted that up to 12 brown pelicans have been observed in the tide pool and west cliff areas during the late winter months when fish become abundant.

Burrowing owls (*Spetyto cunicularia*) have occasionally been observed on the island (AINHR) but have not been recorded nesting there. The burrowing owl is a State species of special concern. Species of special concern are not afforded the protection provided formally listed threatened or endangered species, but are of concern due to declining breeding populations in California.

Other Wildlife Species

Other wildlife species that breed on the island include small numbers of mallards (*Anas platyrhynchos*), song sparrows (*Melospiza melodia*), and

common ravens (*Corvus corax*). Thus far, 108 bird species have been documented on Alcatraz Island (Howell and Pollak 1991). The only other vertebrates known from the island are deer mice, pinnipeds, and slender salamanders (see above).

Non-breeding wildlife species that occur regularly on the island are listed in Table 6. Table 7 provides a list of wildlife species observed by LSA biologists in 1991 and 1992.

DISTURBANCES TO WILDLIFE UNDER EXISTING CONDITIONS

HAZARDOUS WASTES

Hazardous wastes such as asbestos have been identified in the rubble pile on the southern portion of the island. Some of these materials were removed by hand in fall 1992, with the intent of leaving the bulk of the rubble piles intact.

The area just offshore of the south end of the island has been used for dumping dredge spoils for decades (Farwell pers. comm.). These dredge spoils potentially contain pollutants such as cadmium, copper, mercury, selenium, silver, and other pollutants (Harvey et al. 1992). Preliminary studies have revealed that San Francisco Bay night-heron eggs and chicks have high levels of DDE and PCBs (Hothem research project certification to the NPS, 1989). In initial Alcatraz studies, Hothem (pers. comm.) has observed elevated PCBs, evidence of heavy metals, and chick deformities. Additionally, availability of foraging habitat is not yet well-described for Alcatraz birds. Alcatraz night-heron have been observed flying towards San Francisco and the East Bay at dusk (Farwell pers. comm.). For off-island foragers such as black-crowned night-herons and western gulls, prey item quantity and quality is no doubt impacted by pollution of San Francisco Bay. Potential oil spills could result in death or injury to wildlife on the island.

HUMAN DISTURBANCE

Inter- and intraspecific predation of nests and young black-crowned night-herons by western gulls and corvids potentially occur resulting when NPS patrols, researchers, or visitors disturb nesting herons. This has been observed in black-crowned and western gull nest sites disturbed by the approach of people (AINHR). There are no data on predation to undisturbed nests on Alcatraz. Western gulls probably also prey on the nestlings and/or adults of other species such as white-crowned sparrows and deer mice. Raptors occasionally visit the island but have never been observed feeding on colonially nesting species (Farwell pers. comm.).

Existing human presence in the Dock area, Cellhouse Trail and Lighthouse Plaza to Laundry Building Trail undoubtedly causes some disturbance to wildlife populations both from human presence and from removal of vegetation and debris on paths that would otherwise provide wildlife habitat. Between 700 to 4000 visitors use these trails each day.

Boats and low-flying aircraft may result in disturbances to the cliff nesting birds, and the heron and gull colonies present on the island. Low-flying aircraft caused abandonment of cormorant nests on the Farallon Islands in the 1970s (Ainley and Boekelheide 1990). Hothem (pers. comm.) has witnessed occasional massive disruption to the gull colony from low-flying helicopters, which may in turn impact night-herons and other species, but has not witnessed any adverse impacts from boats. The presence of numerous

buildings and cement walkways probably limit bird distribution and diversity compared to pre-development times.

WILDLIFE USE OF SPECIFIC AREAS

DOCK AREA

The Dock itself consists of a large flat cement area that is currently used to load and unload visitors arriving by ferry. The "Dock Area" includes the Auxiliary Dock, which is a paved platform adjacent to the dock, with a dense grove of eucalyptus trees growing above it and to the southeast.

The Dock area receives little use for nesting by western gulls. Only two nests were recorded in 1991. There were no western gull nests on the Auxiliary Dock area or under the eucalyptus grove.

The eucalyptus grove at the southern edge of the Auxiliary Dock is used extensively by black-crowned night-herons, which nest in tall shrubs in the understory of the eucalyptus. In 1989, 34 night-heron nests were recorded at the Auxiliary Dock. Many of these birds have since shifted to areas of denser vegetation (Farwell pers. comm.). In 1992, 19 active nests were recorded in this area. It is unclear why the shift occurred and whether the population actually declined in this area or was just not counted as thoroughly in 1992 (Woods, pers. comm.). At the Redwood Shores nesting colony in San Mateo County and at the Santa Rosa colony (Kopec and King, pers. comm.), night-herons nest successfully in eucalyptus groves (Kopec pers. comm.). It is possible that night-herons could re-establish nesting in the Alcatraz eucalyptus trees should the colony grow.

AGAVE PATH AND STEPS

For about 560 feet, the Agave Path parallels the Bay from the Auxiliary Dock to the base of the agave Trail stairs, which ascend to the Parade Grounds. Habitat consists of a eucalyptus grove, along the portion of the path near the Dock, and a large path of agave plants, below and adjacent to the Agave steps.

A maximum of 29 western gull nests have been recorded in the Agave Path area and at the Parade Grounds border of the Agave Steps. Two large night-heron subcolonies referred to by NPS personnel as the Lower Agave and Lover's Bench colonies recorded 30 nests in 1989 and 6 nests in 1991.

PARADE GROUNDS

For purposes of discussion, the rubble piles and Parade Grounds are lumped as one unit and include the paths that encompass the outer edges of the rubble piles. The rubble piles consist of three piles of broken concrete and other debris formed by the remains of the apartments leveled in the 1970s. Shrubs have since pioneered on about 25% of the rubble. The piles afford both good bird nesting and California slender salamander habitat. The

probably presence of asbestos and lead-based paint, however, could pose hazards to wildlife.

About 20% of Alcatraz Island western gulls nest on the Parade Grounds area, including three of Bell's (1991) study areas: Parade Ground (47 nests), rubble pile (16 nests) and rubble flat (28 nests). The flat paved area on the Parade Ground is also important in winter to roosting gulls.

Black-crowned night-herons nest at the east Parade Grounds subcolony (11 nests in 1989, 10 in 1992), which is located in the bushes on the southern rubble pile.

PARADE GROUND LOOP TRAIL

The proposed Parade Ground Loop Trail follows the east and south edges of the Lighthouse/Warden's House bluff.

There is no specific mention in any of the literature as to the significance of the dense shrubs below the Officer's Quarters to wildlife. This area is incorporated in the Cellhouse area, described by Bell (1991), which is quite large and encompasses the Cellhouse and much of the area above the Sally Port. Nine western gull nests were recorded in the Cellhouse area in 1991 and 18 in the Lighthouse colony in 1991. Black-crowned night-herons do not nest directly adjacent to the Parade Ground Loop.

WESTERN CLIFFS (INCLUDING THE INCINERATOR AREA)

The western cliffs also provide nesting sites for pigeon guillemots, Brandt's cormorant and pelagic cormorant, and may provide roosting sites for these species during the non-breeding period. Black-crowned night-herons nest in the Tunnel Bush colony the top of the western cliffs, just north of the Parade Ground. Western gulls nest in several locations on the western cliffs and adjacent cliff tops, including the Below Laundry, Seawall, Incinerator, Below Incinerator, and Barker Beach study areas. These areas supported 85 gull nests in 1991 and 73 nests in 1992 (20% of the island's nesting population in both years). Several hundred Heermann's gulls roost on Alcatraz cliffs during summer and fall (Petrilli pers. comm.)

The Incinerator area consists of a small flat area just northwest of Barker Beach, overlooking the Bay. Bell (1991) split this area into the Incinerator (15 western gull nests) and Below Incinerator (3 western gull nests) areas. Collectively, these represent 4.7% of Alcatraz's nesting gull total. This is also the site where a pair of Heermann's gulls attempted to nest during the early 1980s. The cliff area below and surrounding the Incinerator site is an important roost for both Heermann's gulls and cormorants. Coyote brush in this area may provide habitat for nesting white-crowned sparrows and other passerine birds, and potentially for deer mice.

CISTERNS AREAS

The Cisterns area is important to nesting western gulls and, although density surveys have not yet been conducted, probably an important site for California slender salamanders due to a high density of moist crevices (Martin pers. comm.). Sixty-six western gull nests (14.7% of total) were observed here in 1991, and 57 were observed in 1992.

NORTHERN CLIFFTOPS

The North Foghorn Area consists of the Model Industries Building and Plaza, and associated cliffs; the foghorn that formerly occupied this end of the island has been removed. This area is important to nesting and roosting gulls and nesting black-crowned night-herons. Western gull nest totals in this area have been separated into five parts: the Foghorn (3 nests), Model Industries Building (3 nests), North Fence (5 nests), North Perimeter (26 nests) and Tank area (15 nests) (1991 data). This represents approximately 11.6% of the island's total nesting gull population. Like the Parade Grounds, the Plaza area may also be important to roosting gulls during fall and winter months.

The North Foghorn area is important for nesting black-crowned night-herons. Shrubs just above the bay, and below the foghorn, supported 19 night-heron nests in 1989 (15.8% of total); in 1992 there were approximately 8 nests. The night-herons in this colony tend to be especially nervous, like those in the Tunnel Bush colony, in the presence of humans.

NORTHEAST PERIMETER TRAIL

The Northeast Perimeter Trail borders the Bay, running northwestward from the Dock area and through the Powerhouse Complex to the North End Path.

The adjacent Bay waters, located on the leeward side of prevailing winds, may provide shelter for wintering shorebirds and waterfowl.

Black-crowned night-herons nest in the rose bushes between the Officer's Club and Powerhouse (number of nests uncertain) and in the shrubs below the Powerhouse (2 nests in 1992) (Wood pers. comm.). A few western gulls have nested adjacent to the Northeast Perimeter Trail, in the Officers' Club and Below Powerhouse study areas (11 nests in 1991 and 6 in 1992).

The portion of this trail between the Officers Club (Post Exchange) and the Power House supports a dense stand of native grass (*Elymus triticoides*), which is one of the largest grassland stands on the island.

The area along the Northeast Perimeter Trail has an abundance of small rodent holes, suggesting a large population of deer mice.

NORTH END LOOP TRAIL

The North End Loop Trail would run from the Post Exchange to the New Industries Building. It is unclear how many western gulls nest in this area, since it contains a portion of the large Cellhouse site, Tank or Plaza site and Walkway site (12 nests). There is a potential that 3.6% of Alcatraz Island gulls could be impacted by opening the North End Loop Trail.

This trail runs just below the night-heron Wall subcolony. This site held 12 nests in 1989; 23 in 1990; 7 in 1991; and 5 in 1992.

LIGHTHOUSE PLAZA BASE TRAIL

The Lighthouse Base Trail (LBT) segment will open up a trail between the officer's club (Post Exchange) and Lighthouse.

Dense shrubs grow on cliffs below this plaza. The data indicate that black-crowned night-herons do not nest in the vicinity of the Lighthouse Plaza. According to Bell (1991) 18 gull nests were in this general area, which represents 4.0% of the total.

RECREATION YARD

The Recreation Yard is currently open to visitor access. Low grass and weeds on the baseball diamond portion of the yard may provide deer mouse habitat. There is no habitat in the Recreation Yard for black-crowned night-herons and only four gull nests were observed here in 1991. Cool, moist habitat is present in the Recreation Yard tunnels for slender salamanders.

THE MORGUE

The Morgue is located adjacent to the northern wall of the Cellhouse. The trail, currently open, consists of a U-shaped loop.

It is unclear how many western gulls nest here because nest totals have been lumped in the Cellhouse figure of 9 nests, but it is likely that totals are low. The grassy area between the Morgue, Wall and Water Tower may provide deer mouse habitat.

OTHER AREAS

Western gulls have nested in several other parts of Alcatraz in recent years, including the roofs of the Cellhouse, Laundry Building, Model Industries Buildings, and Sallyport Complex; the northern cliffs; the historic gardens west of the Recreation Yard; and the walkway north of the Sallyport Complex.

Black-crowned night-herons have nested in two areas that are now subject to year-round use: the Recreation Yard Stairs (6 nests in 1989, 8 in 1990, 4 in 1991, and none recorded in 1992); the Greenhouse colony below the inner West Perimeter Trail (17 nests in 1989, 37 in 1990, and none recorded in 1991 and 1992); and the Shower Room Plaza (1 nest in 1989, 11 in 1990, and none recorded in 1991 or 1992).

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PERSONAL COMMUNICATIONS

Bailey, Stephen F. Dept. Ornithology and Mammalogy, California Academy of Sciences, San Francisco.

Bell, Doug. Biologist. California Academy of Sciences, San Francisco.

Berger, Ken. East Bay Regional Park District, Oakland, CA.

Farwell, Roxanne. Former Natural Resources Coordinator, Alcatraz Island, Golden Gate National Recreation Area (GGNRA), San Francisco, CA.

Gosliner, Terry. Biologist and nudibranch specialist, California Academy of Sciences, San Francisco, CA.

Hothem, Roger. Wildlife Research Biologist, Pacific Coast Research Station, U.S. Fish and Wildlife Service, Davis, CA.

Howell, Judd. Wildlife Biologist, GGNRA, San Francisco.

Jesse, Andrea. Biologist, California Academy of Sciences, San Francisco.

Kelly, John. Director, Audubon Cypress Ranch, Marin County, CA.

King, Mary Ellen. Volunteer black-crowned night-heron observer, Santa Rosa.

Kopec, Dianne. Director, San Francisco Bay Bird Observatory, Alviso, CA.

Martin, Dave. Herpetologist, California Academy of Sciences, San Francisco.

Petrilli, Mary. Former Natural Resources Coordinator, Alcatraz Island, GGNRA, San Francisco, CA.

Richmond, Bob. Ornithologist, Hayward, Alameda County, CA.

Sydemann, Bill. Biologist, Point Reyes Bird Observatory, Stinson Beach, Marin County, CA.

Woodin, Peg. Biologist, San Francisco Bay Bird Observatory, Alviso, CA.

Woods, Brett. Current Natural Resources Coordinator, Alcatraz Island, GGNRA, San Francisco.

Quintero, Armando. Bay District Ranger, Golden Gate National Recreation Area, San Francisco.

Table 1 - Wildlife Species Known or Suspected to Breed on Alcatraz Island^{ab}

Species	Known (K)/Suspected (S) Breeder
California slender salamander <i>Batrachoseps attenuatus</i>	K
Brandt's cormorant	K
Pelagic cormorant	K
Black-crowned night-heron	K
Mallard	K
Western gull	K
Pigeon guillemot	K
Rock dove	S
Mourning dove	S
Anna's hummingbird	S
Allen's hummingbird	S
Black phoebe	S
Barn swallow	S
Common raven	K
European starling	S
Song sparrow	K
White-crowned sparrow	K
House finch	S
Deer mouse <i>Peromyscus maniculatus</i>	K

^a Pollak and Howell (1991)

^b Common names of bird follow the standard nomenclature established by the American Ornithologists' Union (AOU) Checklist, 6th Edition (1983) and Supplements (1985, 1987, 1989, 1991).

Table 2 - Black-crowned Night-heron Nesting Colonies, San Francisco Bay Area, 1991

Location	Active nests	Source
Brooks Island, CCO	31	Kelly 1991
Red Rock, MAR	60	Kelly 1991
West Marin Island, MAR	294	Kelly 1991
Napa State Hospital, NAP	40	Kelly 1991
Penngrove, SON	30	Kelly 1991
Peterson Lane, SON	55	Kelly 1991
Hole in the Head, SON	1	Kelly 1991
Alcatraz Island, SF	168 ¹	National Park Service
Lake Merritt, ALA	approx. 40	Burgess (pers. comm.)
Bair Island, SMT	0 ²	Kopec (pers. comm.)
Redwood Shores, SMT	240	Kopec (pers. comm.)
Mallard Slough, SCL	17	Kopec (pers. comm.)
Lake Temescal, ALA	?	
Total	976 ³	

County key:

ALA Alameda
 CCO Contra Costa
 MAR Marin
 NAP Napa
 SMT San Mateo
 SON Sonoma
 SCL Santa Clara

¹Estimated number of nests initiated in 1990.

²In 1990, 209 nests were counted on Bair Island. In 1991, black-crowned night-herons attempted to nest but abandoned the island in April due to the presence of red fox. It is believed that these birds re-nested that season at Redwood Shores (240 nests).

³Not including Lake Temescal colony.

Table 3 - Black-Crowned Night-Heron Nesting Colonies On Alcatraz Island^a

Location	1989 (NPS)	1990 (NPS)	1991^b (Hothem)	1992^b (Woods)
Dock (Do)	34	33	24	19
Fog Horn (FH)	19	29	16	8
Green House (GH)	17	37	0	0
Lover's Bench (LB)	30	3	0	6
New Rubble Pile (N)	0	0	0	1
Power Plant (PP)	0	1	1	2
Recreation Yard (RE)	6	8	4	0
Rubble Pile (RU)	11	10	12	10
Store House (SH)	0	0	2	2
Shower Room Plaza (SR)	1	11	0	0
Tunnel Bush (TU)	15	19	15	21
Wall (WL)	12	23	7	5
Total Nests	145	174	81	74

^a Data sources:

NPS - National Park Service staff

Hothem, (pers. comm.)

Woods, Brett, unpublished field notes for one day census, 4/30/92.

^b Incomplete counts

Table 4 - Western Gull Study Areas and Nests on Alcatraz Island

Location	1990 6/1	1991 6/9	1992 6/4
Officers' Club (OC)	1	1	1
Tank Area (T)	13	15	
Power House (PH)	9	5	21 ^c
Below Power House (BP)	9	10	5
North Fence (NF)	5	5	6
North Perimeter (NP)	28	26	9
Model Industries (MI)	6	3	1
Fog Horn (FH)	28	21	
West Perimeter (WP)	3	4	N/A ^c
Cistern (C)	61	66	57
Laundry (L)	19	15	13
Below Laundry (BL)	25	14	18
Sea Wall (SW)	16	19	9
Recreation Yard (RY)	4	4	4
Gardens (G) ^a	22	11	18
Incinerator (I)	12	15	
Below Incinerator (BI)	3	3	16 ^c
Barker Beach (BB) ^a	45	34	30
Cell House (CH)	8	9	9
Light House (LH)	13	18	8
Parade Grounds (PG) ^a	38	47	42
Rubble Pile (RP) ^a	27	16	13
Rubble Flat (RF) ^{a,b}	33	28	32
Agave Trail (AT) ^a	25	29	16
Walkway (WW)	15	17	18
Roofs (R)	14	12	12
Docks (D)	0	2	0
Eucalyptus (E) ^c	-	-	-
Total Nests	482 (451)^d	449 (424)^d	(358)^d

^a Area not completely surveyed to avoid disturbance to nesting black-crowned night herons.

^b Cypress rubble (CR) was included in the Rubble Flat (RF) study area after 1989.

^c Eucalyptus study area not surveyed to avoid disturbance to black-crowned night-herons.

^d Totals in parentheses do not include the Fog Horn or West Perimeter study areas, which were not counted in 1992.

^e Study area surveys lumped.

**Table 5 - Special Status Plant Species Potentially Present
on Alcatraz Island^a**

Species	Status^b	Habitat	Nearest Population	Potential for Occurrence^c
<i>Sanicula maritima</i> Adobe sanicle	C2/CR/1B	Moist clay/ ultramafic soils, often margins of salt marshes	Last seen 1895 Potrero Hills	No
<i>Grindelia maritima</i> ^d San Francisco gumplant	C2/-/3	North coastal scrub, grassland; may be on steep eroded terrain, slopes and bluffs, degraded chert, along roads and trails	Presidio	Possible
<i>Lessingia germanorum</i> var. <i>germanorum</i> ^d San Francisco lessingia	C1/CE/1B	Remnant sand dunes	Presidio	No
<i>Pentachaeta</i> <i>bellidiflora</i> White-rayed pentachaeta	C2/CE/1B	Serpentine/clay grassland	Marin City	No
<i>Plagiobothrys diffusus</i> San Francisco popcorn flower	C2/CE/1A	Clay flats-grassland	Presidio	
<i>Arenaria paludicola</i> Marsh sandwort	PE/CE/1B	Freshwater marshes and swamps	Presidio	No
<i>Silene verecunda</i> ssp. <i>verecunda</i> ^d San Francisco campion	C2/-/1B	Coastal scrub; rock outcrops	Baker Beach	Possible
<i>Arctostaphylos bookeri</i> ssp. <i>ravenii</i> Presidio manzanita	FE/CE/1B	Chaparral, coastal prairie, ultramafic soils	Presidio	No
<i>Arctostaphylos bookeri</i> ssp. <i>franciscana</i> Laurel Hill manzanita	C1/-/1A	Serpentine/ultramafic soils	Laurel Hills cemetery	No
<i>Hesperolinon</i> <i>congestum</i> Marin dwarf flax	C1/CT/1B	Serpentine grassland	Presidio	No
<i>Clarkia franciscana</i> Presidio clarkia	C1/CE/1B	Serpentine	Presidio	No

Species	Status ^b	Habitat	Nearest Population	Potential for Occurrence ^c
<i>Orthocarpus floribundus</i> San Francisco owl's clover	C2/-/1B	Coastal prairie, serpentine grassland	Presidio	No

^a The species in this table are known to occur near Alcatraz, in Marin and/or San Francisco Counties.

^b

- FE = Federal-listed Endangered species
- CE = California-listed Endangered species
- CR = California-listed Rare species
- CT = California-listed Threatened species
- PE = Proposed Endangered
- C1 = Enough data are on file to support federal listing
- C2 = Threat and/or distribution data are insufficient to support federal listing as threatened or endangered.
- 1A = California Native Plant Society (CNPS) List: Plants presumed extinct in California.
- 1B = CNPS List: Plants considered rare, threatened, or endangered in California and elsewhere.
- 3 = CNPS List: Plants which are on a review list; more information needed to determine their status.

^c Based on availability of suitable habitat

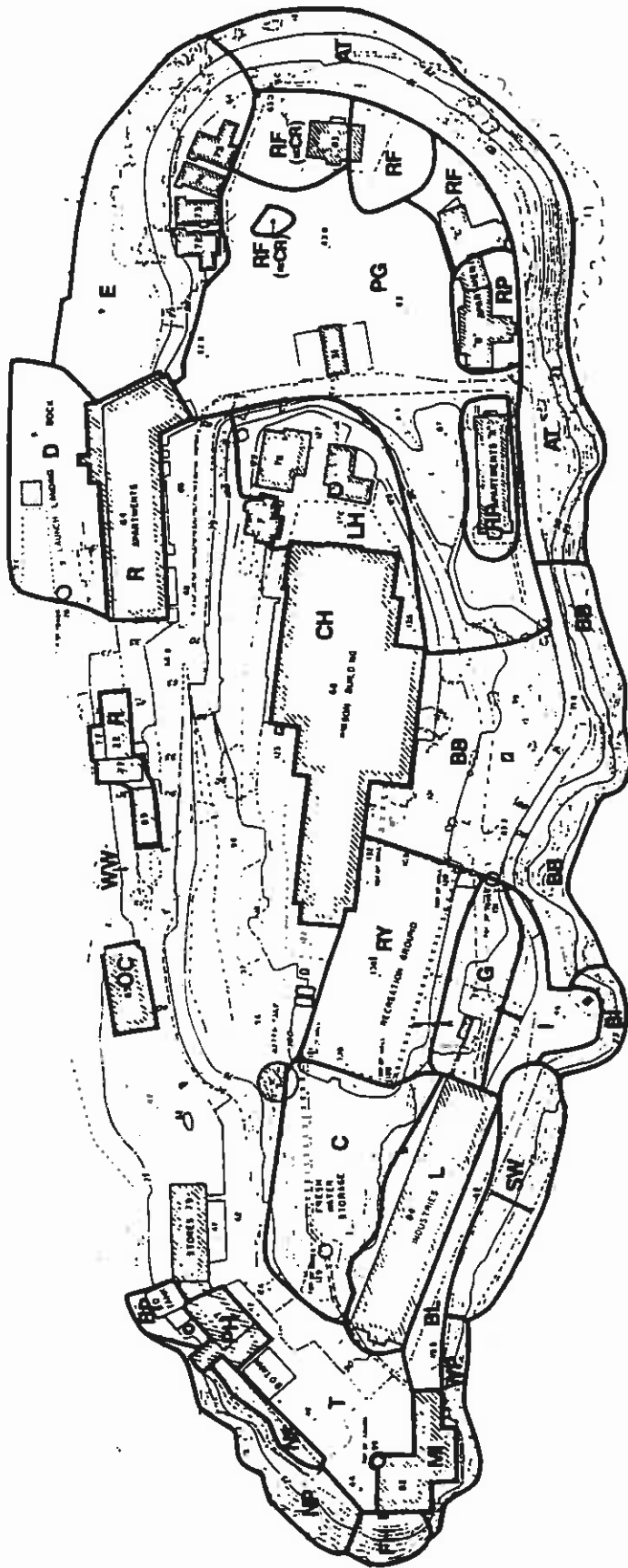
^d Iceplant threatens these species.



Fig. 1

Scale in Feet

Location of Sensitive Biological Resources



Location of Western Gull Study Areas

AT Agave Trail
 BB Barker Beach
 BI Below Incinerator
 BL Below Laundry
 BP Below Powerhouse
 C Cistern
 CH Cell House
 CR Cypress Rubble¹

D Docks
 MI Model Industries
 NF North Fence
 NP North Perimeter
 OC Officer's Club
 PG Parade Grounds
 PH Power House
 R Roofs

E Eucalyptus²
 FH Foghorn
 G Gardens
 I Incinerator
 L Laundry
 LH Light House
 RF Rubble Flats¹
 RP Rubble Piles

RY Recreation Yard
 SW Seawall
 T Tank
 WP West Perimeter
 WW Walkway

¹ Cypress rubble was included in Rubble Flats (RF) study area in 1990-92 surveys.
² Eucalyptus area was not surveyed adequately because black-crowned night herons were present.

05-06-93(GDN201) Alcatraz Island-Natural Resources

Figur

LSA
 Scale in Feet
 0 200

Location of Western Gull Study Areas

Table 6 - Non-Breeding Wildlife Species That Occur Frequently
on Alcatraz Island^{a,b}

BIRDS

Western grebe
Double-crested cormorant
Brown pelican
Surf scoter
Red-tailed hawk
American kestrel
Black oystercatcher
Willet
Wandering tattler
Black turnstone
Surfbird
Sanderling
Heermann's gull
Glaucous-winged gull
Common murre
Belted kingfisher
Northern flicker
Hermit thrush
California towhee
Fox sparrow

MAMMALS

California sea lion
(*Zalophus californianus*)
Harbor seal
(*Phoca vitulina*)

^a Pollak and Howell (1991)

^b Common names of birds follows standardized nomenclature established by the American Ornithologist's Union Committee on Classification and Nomenclature.

Table 7 - Wildlife Species Observed by LSA Associates, 1992^a

Banana slug
(*Ariolimax columbianus*)
California Slender Salamander
(*Batrachoseps attenuatus*)
Western Grebe
Clark's Grebe
Double-Crested Cormorant
Brandt's Cormorant
Black-crowned night-heron
Surf Scoter
American kestrel
Wandering Tattler
Black Turnstone
Surfbird
Heermann's Gull
Mew Gull
Herring Gull
Western Gull
Glaucous-winged gull
Elegant Tern
Anna's Hummingbird
Black Phoebe
Northern Mockingbird
European Starling
Yellow-rumped Warbler
Savannah Sparrow
Fox Sparrow
Song Sparrow
Lincoln's Sparrow
Golden-crowned Sparrow
White-crowned Sparrow
Western Meadowlark
House Finch

^a Common names of birds follows standardized nomenclature established by the American Ornithologist's Union (AOU) Committee on Classification and Nomenclature. For scientific names, see the AOU Checklist.

APPENDIX C -- LIST OF PLANTS IDENTIFIED ON ALCATRAZ
(Lutsko Associates, 1992)

SPECIES LIST/LOCATION TABLE

The Species List and Location Table is keyed to the Area Index Map by number and letter. Plants are listed in alphabetical order. An "X" indicates the general area where they can be found.

Species List/Location Table

	1A	1B	1C	1D	2	3	4	5	6	7	A	B	C	D	E	F	G
<i>Acacia longifolia</i>		X															X
<i>Acanthus mollis</i>				X			X		X		X	X	X			X	
<i>Aeonium arboreum</i>				X													
<i>Aeonium</i> sp. & hybrids	X	X	X	X			X			X	X	X	X	X		X	X
<i>Agapanthus orientalis</i>									X	X	X	X	X			X	X
<i>Agave americana</i>	X	X	X	X				X	X		X	X	X				X
<i>Agave americana</i> - variegated			X														
<i>Agave lecheguilla</i>		X										X					
<i>Agave</i> sp.			X									X	X				
<i>Ageratina adenophora</i>																	X
<i>Albizia distachya</i>			X	X						X	X	X			X		X
<i>Aloe arborescens</i>			X	X								X					
<i>Aloe sladeniana</i> (?)												X	X				
<i>Amaryllis belladonna</i>										X		X					
<i>Ambrosia chamissonis</i>					X	X											
<i>Aptenia cordifolia</i>			X														
<i>Arundo donax</i>									X								
<i>Athanasia parviflora</i>	X																
<i>Baccharis pilularis</i> ssp. <i>pilularis</i>			X	X		X	X	X	X	X	X			X			X

Species Lis/Location Table

[illegible]

Species List/Location Table

	1A	1B	1C	1D	2	3	4	5	6	7	A	B	C	D	E	F	G
<i>Galium aparine</i>										X		X				X	
<i>Gladiolus hybrid</i>									X								
<i>Gnaphalium</i> sp.				X													
<i>Hebe franciscana</i>							X			X							
<i>Hebe salicifolia</i>									X					X			
<i>Hebe</i> sp.							X		X	X	X			X	X	X	X
<i>Hedera helix</i>	X	X	X	X													
<i>Hedera helix</i> - variegated cultivar				X													
<i>Homeria Breyniana</i>										X				X			
<i>Hydrangea macrophylla</i>				X							X						
<i>Iris douglasiana</i>									X	X							
<i>Iris spuria</i>										X		X		X			
<i>Iris</i> sp. - Tall Bearded (several color morphs)	X								X	X				X			X
<i>Kniphofia uvaria</i>																X	
<i>Lathyrus latifolius</i>														X			
<i>Lavatera arborea</i>				X													
<i>Lavatera assurgentiflora</i>					X												
<i>Leptospermum laevigatum</i>	X								X							X	
<i>Leucospermum aestivum</i>																X	
<i>Ligustrum japonica</i>													X	X			

Species List/Location Table

	1A	1B	1C	1D	2	3	4	5	6	7	A	B	C	D	E	F	G
<i>Lobularia maritima</i>			X	X	X	X	X			X	X						X
<i>Lonicera japonica</i>	X						X	X	X				X				
<i>Lupinus arboreus</i> - yellow color morph										X				X	X		
<i>Maleophora crocea</i>			X				X	X				X					
<i>Malus</i> sp.										X			X	X	X		X
<i>Malva parviflora</i>				X		X											X
<i>Marah fabaceus</i>										X							X
<i>Melilotus indica</i>							X										
<i>Mentha piperita</i> (?)	X			X													
<i>Metrosideros excelsus</i>												X					
<i>Muscari armeniacum</i>										X						X	X
<i>Narcissus</i> sp. - several forms, all tazetta section									X			X	X		X	X	
<i>Nothoscordum gracile</i>					X												
<i>Olearia traversii</i>				X							X						
<i>Oxalis pes-caprae</i>	X	X	X	X	X	X	X		X	X	X	X		X	X		X
<i>Prunus persica</i> (peach)				X													
<i>Pelargonium</i> 'California Brilliant'													X				
<i>Pelargonium x domesticum</i> 'Prince Bismark'	X	X		X			X		X		X	X	X			X	
<i>Pelargonium x hortorum</i> 'Alphonse Ricard'		X		X						X	X	X	X			X	
<i>Pelargonium</i> 'Mrs. Langtry'				X										X			

Species List/Location Table

	1A	1B	1C	1D	2	3	4	5	6	7	A	B	C	D	E	F	G
Rosa 'General MacArthur'																	X
Rosa 'Gloire des Rosomanes'																	X
Rosa 'Russeliana'									X			X				X	
Rosa wichuraiana												X					
Rubus sp.				X			X			X	X	X	X	X	X		X
Rumex crispus			X	X	X				X								
Schinus sp. (latifolius, polygamus?)											X						
Scrophularia californica	X																X
Sedum dendroideum subsp. praealtum											X	X					X
Senecio mikanioides		X															
Sidalcea malviflora							X							X			
Solanum americanum	X			X	X					X	X						X
Sonchus oleraceus				X		X		X	X	X							
Stachys bullata (?)									X						X		X
Stellaria media										X							
Tropaeolum majus		X		X		X	X		X		X	X	X	X	X		
Tulipa sp. (likely hybrid, leaves only)										X							
Vicia coronilla									X	X				X	X		
Vinca major	X								X					X		X	X
Watsonia 'Mrs. Bullard's White'													X				

Species List/Location Table

[illegible]

APPENDIX D – HISTORICAL BACKGROUND OF ALCATRAZ

The evolution of Alcatraz mirrors the evolution of the Bay Area, and is of special importance to the history of the military, including the U.S. Coast Guard, the Federal penal system, the Native American rights movement and the evolution of the National Park Service. The physical features of Alcatraz Island as they exist today are significant as a record of these histories, and changes to its landscape must be made in consideration of the preservation and perpetuation of these stories.

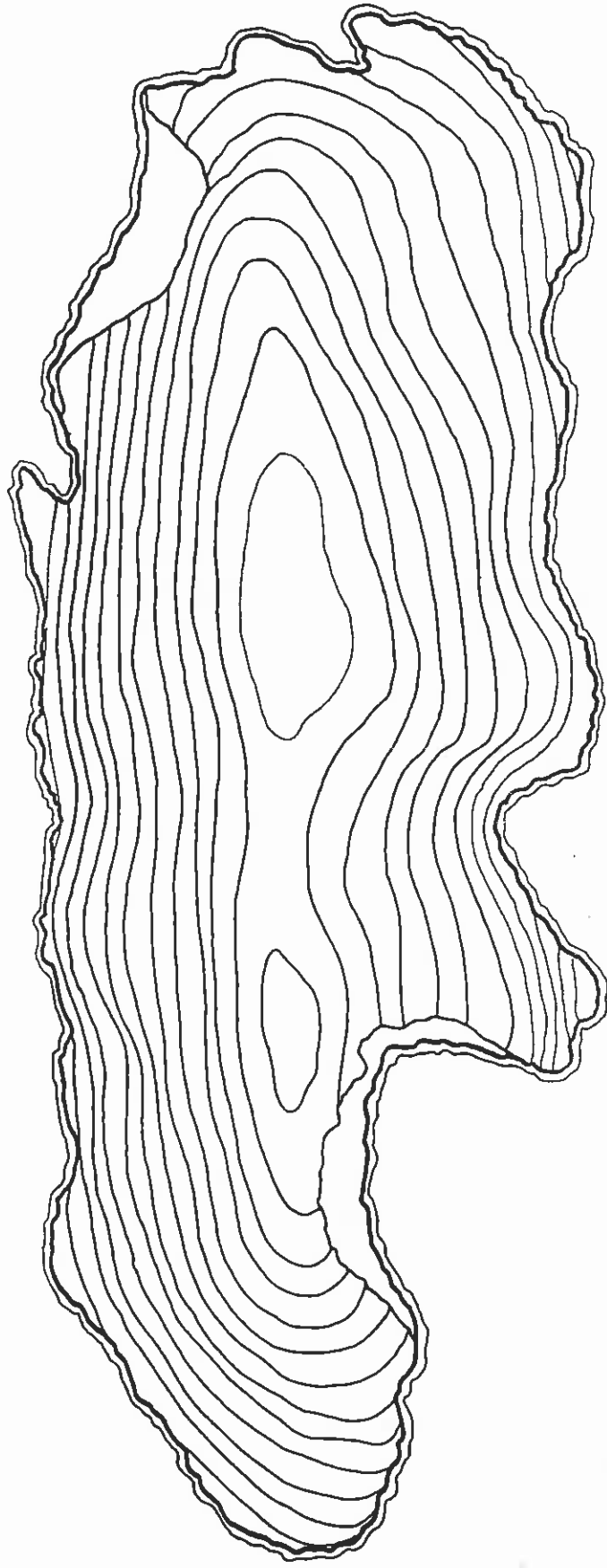
The evolution of Alcatraz may be broken down into five periods, each representing a major change in the pattern of use and development of the island. These periods are Pre-Development (up to 1846), the Military Defense Era (1847 1907), the Military Prison Era (1907 - 1933), the Federal Penitentiary Era (1933 1963), and the Public Lands Era (1963 - present).

Pre-Development (to 1846)

Before human development Alcatraz was a 22-acre hump-backed island, with two low, rounded peaks roughly 135 feet above sea level (Figure 2). The southeast end of the island gradually sloped to the water, while the north, east and west shores were more precipitous, rising straight up from the water between 20 and 50 feet. Early accounts of the island describe these cliffs as covered with guano, home to thousands of nesting pelagic birds. The upper slopes were vegetated with plant communities typical of the central coast of California. The island had little beach and only two or three points where small boats could land. The earliest known photograph of Alcatraz, an 1853 daguerreotype, depicts this predevelopment landscape.

The Native American peoples of San Francisco Bay were not resident on Alcatraz. The island, while accessible to their craft, was sparsely vegetated, without water and afforded no protection from the wind. Native American culture on San Francisco Bay thrived on pelagic and shore harvests, and Alcatraz, with its colony of seabirds and mollusks was probably a rich source of eggs and shellfish. Several prehistoric sites on nearby Angel Island are less than an hour away from Alcatraz by paddled craft.

The first recorded entry by sea of Europeans into San Francisco Bay was on August 5, 1776, when the packet San Carlos, commanded by Juan Manuel de Ayala sailed through the Golden Gate and anchored "opposite" Angel Island. During the next week, these explorers charted the bay and its shores, as well as the islands. A few of the names conferred by these first explorers remain, such as *Isla de los Angeles*, or Angel Island, and *Isla de los Alcatraces*, or Alcatraz Island. The name derives from *alcatrace*, the Spanish term for cormorant. The island continued to serve as a habitat for these birds. Alcatraz remained undeveloped and uninhabited during the periods of Spanish and Mexican ownership. Alcatraz offered little inducement for visitation, except during the Gold Rush period of 1849 - 1850, when a brisk market in gull and other seabird eggs drew people to the sea bird colony on Alcatraz. During



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LSA

Scale in feet



Figure

Pre-development Era (184

this period, Alcatraz was also called "White Island," in reference to the guano deposits that characterized its shores.

Military Defense Era (1847 - 1907)

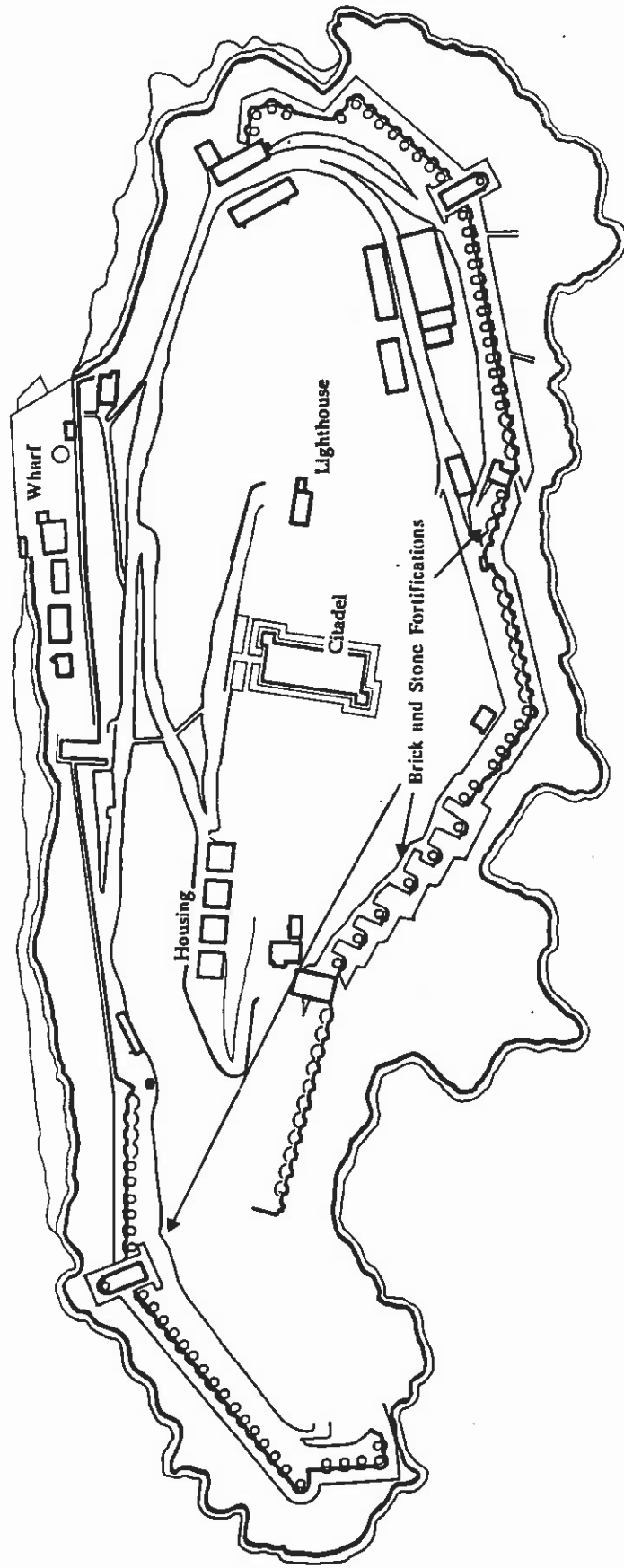
As soon as California was occupied by the United States, the Army began to view Alcatraz as a site for harbor defenses. Alcatraz was surveyed by military engineers in May 1847 as a site for one of the forts designed to guard the entrance to San Francisco Bay. Work to fortify the island began in earnest in 1853. Lower slopes were blasted out to create steep cliffs to prevent enemy landings. Upper slopes were blasted off to create platforms for guns that would ultimately ring the island. By July of 1859, a belt of stone and brick fortifications ringed the island, altogether mounting 75 guns. A 50,000 gallon cistern was blasted into the north end of the island to store water shipped from Sausalito (Figure 3).

During the Civil War, the vulnerability of masonry fortifications to rifled gun fire was demonstrated, rendering the recently-completed stone and brick batteries on Alcatraz obsolete. The decision was made to replace the masonry fortifications with low-profile earthworks. For ten years, beginning in 1869, the topography of Alcatraz underwent major manipulations, lowering the northern peak by 30 feet, cutting a 180-foot tunnel across the northern end of the island, and carving away 70 feet of slope to create a parade ground at the southern end of the island. The rubble was dumped down Alcatraz's slopes, filling in Pirate's Cove and creating the tide pools that exist today. New gun batteries, magazines, and gun pits were built atop the old stone and brick barbettes, and covered with tons of topsoil from Angel Island. These new artificial slopes were planted to control erosion. The first small gardens were built around the defensive barracks at the summit and on the east side of the island (Figure 4).

Work to convert Alcatraz's batteries was suspended in 1876, as part of a nationwide reduction in military spending. The last decades of the 19th century saw Alcatraz's role as a military prison gain in importance, particularly in 1898, as a result of the Spanish American War and the subsequent Phillipine Insurrection. In 1907, the island was officially renamed "the United States Military Prison, Alcatraz Island."

Military Prison Era (1907 - 1933)

Alcatraz had a small number of cells for the confinement of its own garrison prisoners as early as 1859. Its isolation by water made it an ideal place to incarcerate troublesome prisoners. Other western forts began to send soldiers and civilians to Alcatraz, to be incarcerated in the guardhouse complex next to the island's guardhouse, on the road from the wharf. In 1862, the first true prison building for housing prisoners was constructed, adjacent to the guardhouse. This formed the nucleus for the development of the "Lower Prison" complex. In response to the prisoner population explosion during the Spanish-American War, a new "Upper



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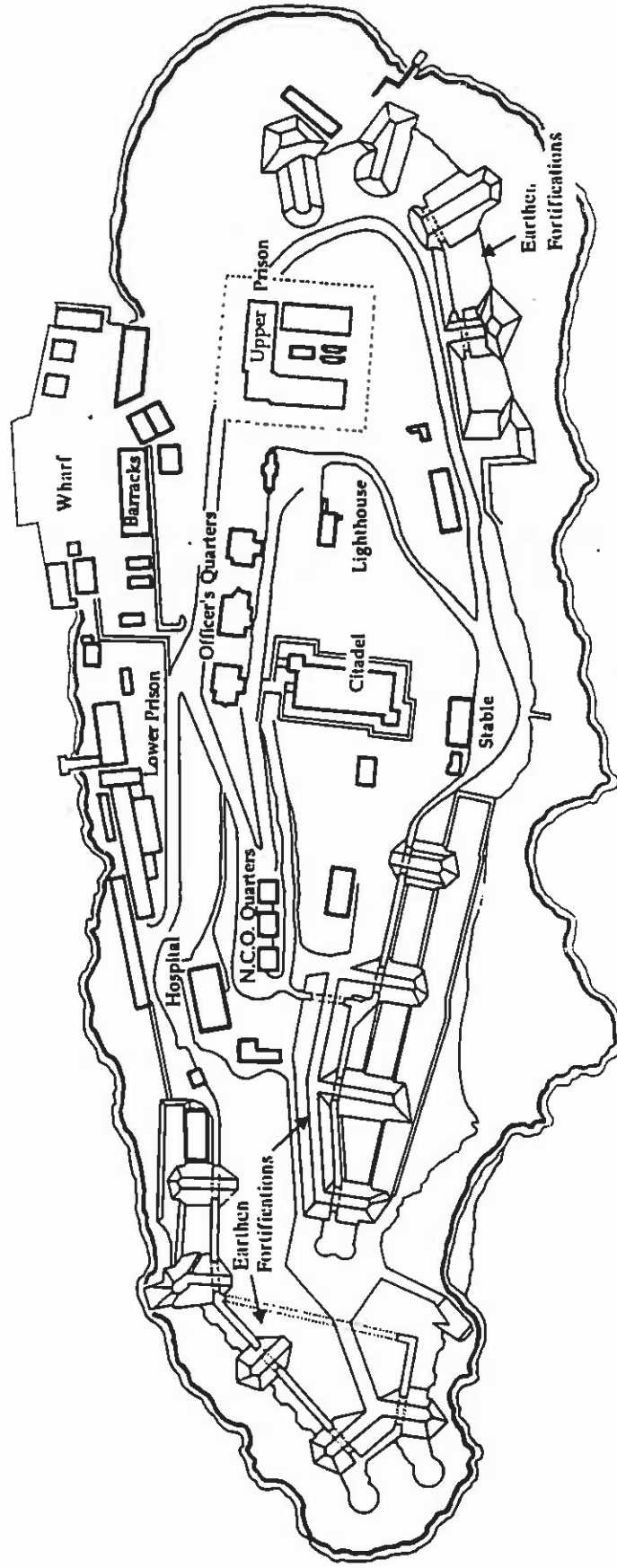


Scale in feet
0 200



Figure

Military Defense Er
Masonry Fortifications (186



05-25-93(GGN201) Alcatraz Island Plan

EN

LSA

Scale in feet
0 200

Figure

Military Defense Era
Earthen Fortifications (1869)

Prison" was built on the plateau of the parade ground. At this time a quarry was built above Pirate's Cove; "Alcatraz Rock" was used to pave the roads at the Presidio. The quarry left a plateau later used by the Bureau of Prisons as the site for the New Industry Building. Other structures built during the military prison era include the stockade, later called the Recreation Yard, the Model Industries Building, the barracks at the wharf, and the power plant.

Although Alcatraz remained designated as a harbor defense post, its role as a prison slowly came to dominate the island. In 1905, the Army decided that the military prison on Alcatraz needed to be rebuilt. Concurrently, the Army decided to abandon the island as a harbor defense post, and designate Alcatraz solely as a military prison. Between 1909 and 1912, the citadel and lighthouse on the summit were demolished, and a huge, reinforced concrete cellhouse and new lighthouse was built. The new prison could hold 600 men; it was said upon its completion to be the world's largest reinforced concrete structure.

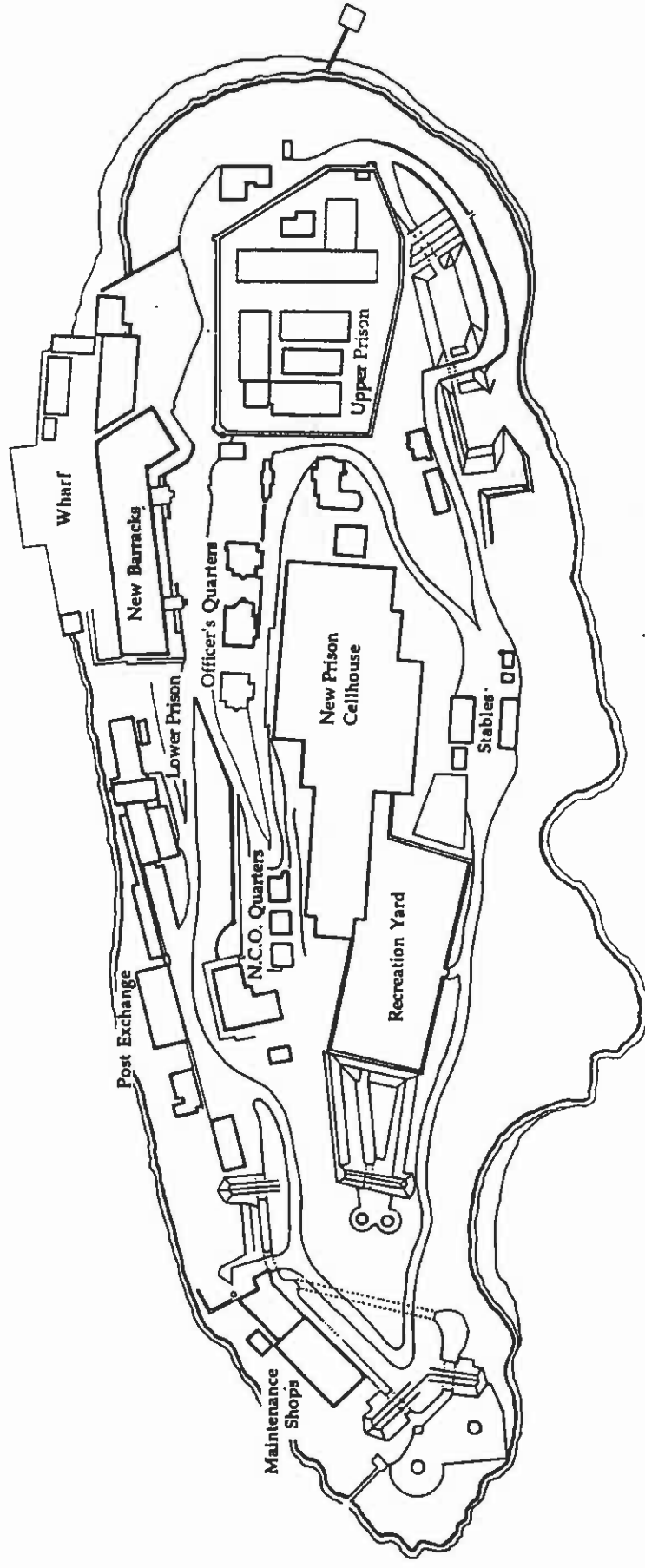
By 1915, Alcatraz was receiving prisoners from the western United States, the Pacific and Panama Canal Zone. San Francisco's role as host for the 1915 Panama Pacific International Exposition, as well as a move by the Army to beautify its posts drove the next series of changes on the island, which included reinforced concrete Mission Revival buildings and extensive plantings to beautify the island (Figure 5). Despite its more beautiful appearance, the military prison faced public disapproval as "Uncle Sam's Devil's Island." In 1932, the Army decided to close the prison.

Federal Penitentiary Era (1933 - 1963)

The Bureau of Prisons spent nearly a year transforming the military prison into a maximum security federal penitentiary, designed to incarcerate notorious felons. Between 1934 and 1940, the island was modified by the Bureau, notably through the introduction of security fences, guard towers, the demolition of several military buildings, and later through the construction of several new buildings and structures, notably multi-storied apartment houses on the parade ground, a water tower, and the New Industries Building. The gardens were extended to include a lawn and two large ornamental gardens beneath the prison's western facade (Figure 6). The island remained basically unchanged after 1940. The penitentiary operated for 29 years before closing in 1963, in the face of highly publicized escapes and rising costs for maintenance of the deteriorating facilities.

Public Lands Era (1963 - present)

Between 1964 and 1969, Alcatraz was vacant except for General Services Administration (GSA) security personnel and occasional visitors. Public opinion over the future of the island and its development varied. In November 1969, the Bureau of Outdoor Recreation prepared a proposal to protect Alcatraz as a keystone in a Golden Gate National Recreation Area, to include existing military lands on



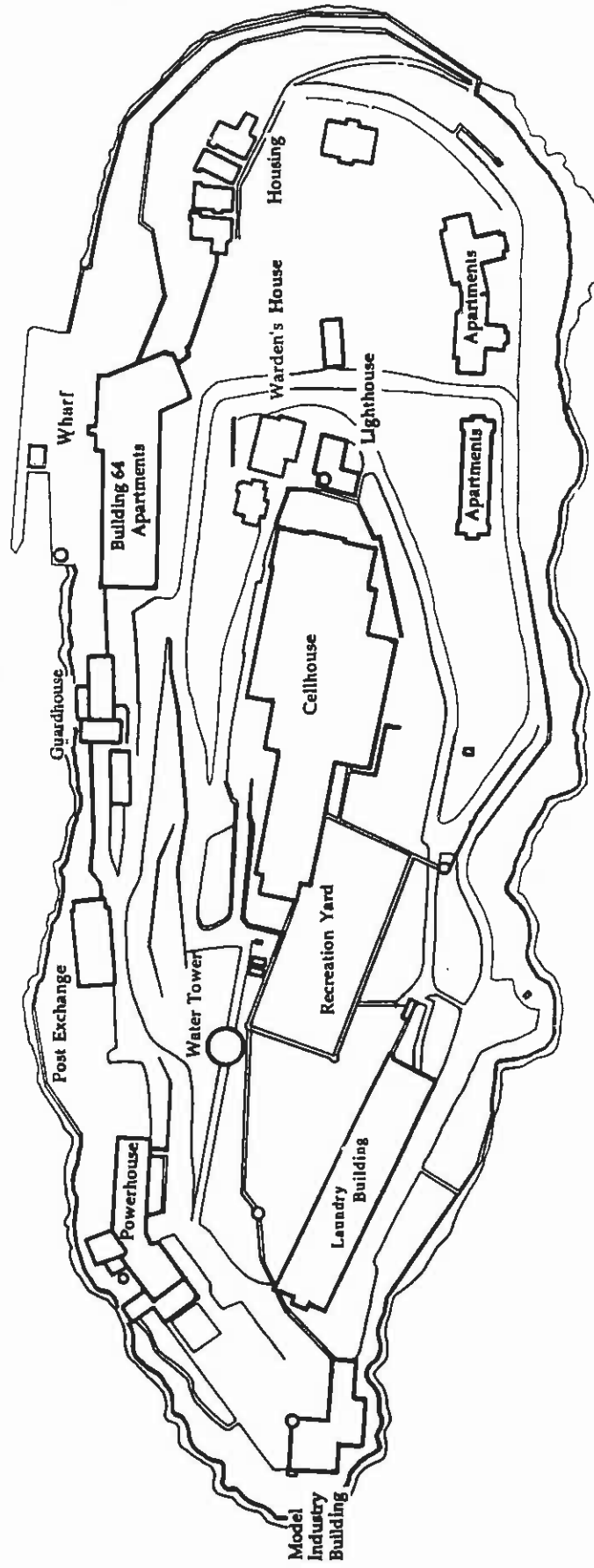
05-06-93(GGN201) Alcatraz Island Plan



Scale in feet
0 200

Figure

Military Prison Era (1910s)



05-06-93(GGN201) Alcatraz Island Plan

LSA

Scale in feet



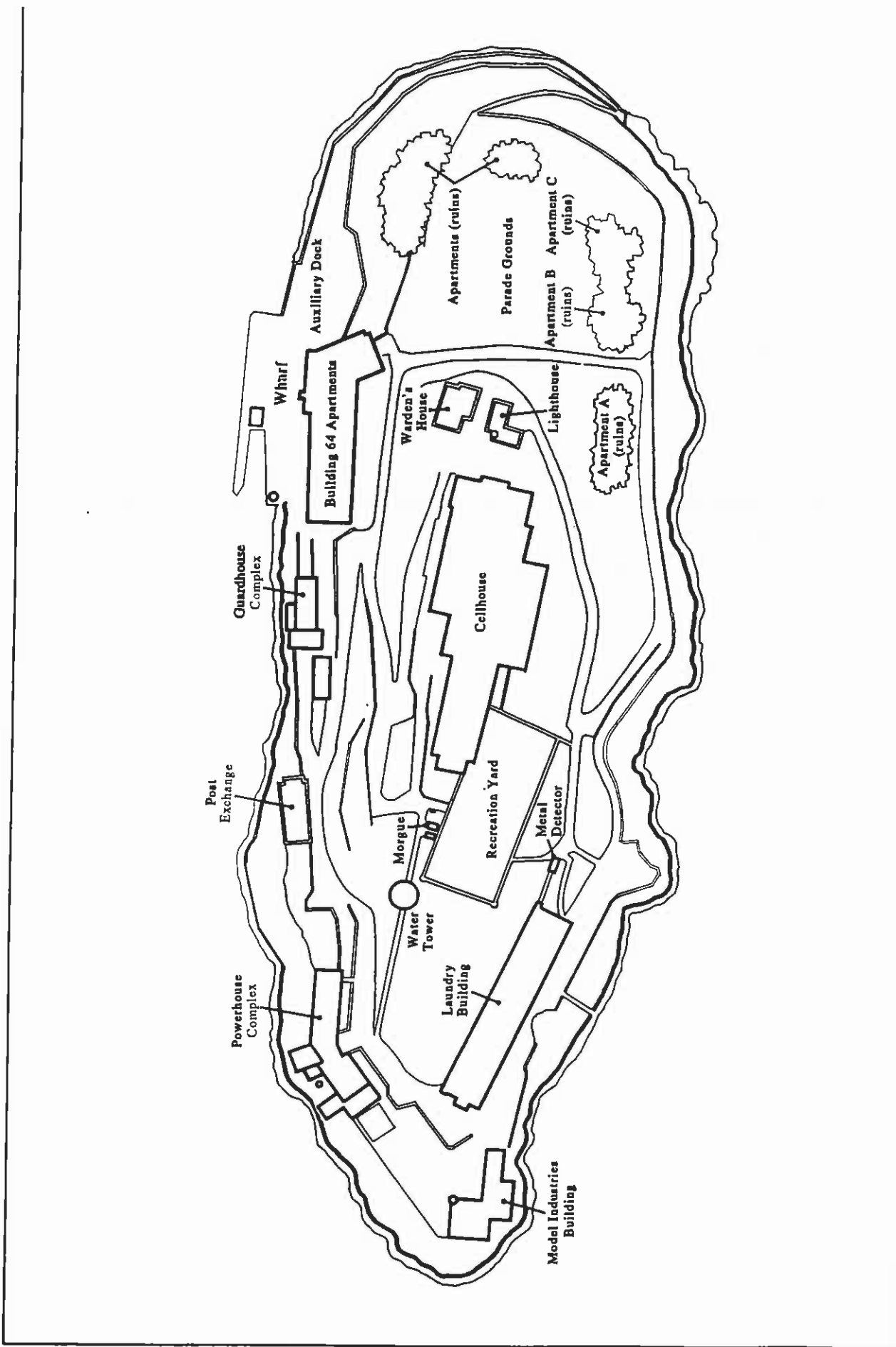
Figure

Federal Penitentiary Era (1960s)

either side of the Golden Gate. Also in November 1969, Native American activists initiated an occupation of the island that lasted 19 months. During this period, in April 1970, fire destroyed the lighthouse keeper's residence, three military period buildings, the old post exchange, the warden's residence and the surgeon's home.

In the aftermath of the occupation, the GSA acted to protect public safety and ensure the operation of the light house by encircling the island with cyclone fencing. The three apartment buildings and five houses on the Parade Ground were demolished, and a cyclone and barbed wire perimeter fence was erected around the southern end of the island. The demolition debris was left on the Parade Ground. Public interest in the demolition and in preserving the island as part of the contemplated Golden Gate National Recreation Area was instrumental in halting further destruction. In late 1972, Golden Gate National Recreation Area was established and the island became one of the first units of the new park. Alcatraz was opened to the public in October 1973.

The island's physical features have remained basically unchanged since 1973 (Figure 7) except for the rehabilitation of a few structures on the island, overall cleanup and routine grounds maintenance, and the general aging of the remaining unrestored structures and gardens. The casemates and barracks at the wharf have been partially rehabilitated for museum, book store, and office use. The cellhouse has been partially stabilized and restored for interpretive use. The original guardhouse has been cleaned and partially restored to its 1861 appearance. A modern restroom facility was built on the wharf, new generators in the powerhouse provide power to the island's utilized structures, and a cellular microwave dish links the island to mainland telephone service. Visitors land at the wharf and follow the original road system of the 1850s to the island's summit and the cellhouse, which is the center of activity and visitor interest as it was between 1910 and 1963.



05-06-93(GGN201) Alcatraz Island Plan



Scale in feet
0 200

LSA

Figure

APPENDIX E -- HISTORIC STRUCTURE TREATMENTS BY ALTERNATIVE

**PROPOSED TREATMENT FOR STRUCTURES
CONTRIBUTING TO THE ALCATRAZ NHL**

Legend

PP = Preserve

RR = Restore

ST = Stabilize

RH = Rehabilitate

Number	Structure Name	Proposed	No Action
		Greater Access Less Access	
AL - 001	Water Tower	ST	ST
AL - 003	Lighthouse	PP	ST
AL - 004	Foghorn (N)	PP	ST
AL - 005	Foghorn (S)	PP	ST
AL - 006	Toolshed	PP	ST
AL - 008	Check Station (metal detector)	PP	ST
AL - 012	Morgue	PP	ST
AL - 013	Firebox	PP	ST
AL - 014	Guard Tower (dock)	PP	ST
AL - 022	Guardhouse, firing range	RR/part. RH	ST
AL - 064	Barracks and casemates	RH	PP
AL - 065	Post exchange, Officers' club (ruins)	ST	ST
AL - 067	Power plant	PP	ST
AL - 068	Prison	PP	PP
AL - 076	Warden's residence (ruin)	ST	ST
AL - 077	Guardhouse, apartments	PP	ST
AL - 079	Quartermaster storehouse	PP/part. RH	ST
AL - 082	Model Industries Building	PP	ST
AL - 084	New Industries Building	PP	ST
AL - 089	Prison, salvage storehouse, electric shop	RH	ST
AL - 201	Stockade, exercise yard	PP	ST
AL - 202	Fortification arch & bombproof	PP	ST
AL - 203	Fortification arch & magazine	PP	ST
AL - 204	Fortification arch & magazines	PP	ST
AL - 205	Fortification wall	PP	ST
AL - 206	Fortification wall	PP	ST
AL - 207	Fortifications & Tunnel	PP	ST/PP
AL - 208	North Caponier & fortifications	PP	PP
AL - 209	Fortifications under industries bldg.	PP	PP
AL - 210	Parade ground	PP	ST

AL - 211	Wharf, dock	PP/part. RH	ST
AL - 212	Ranger office, waiting room	RH	ST
AL - 213	Maintenance garage	RH	ST
AL - 214	Firebox	PP	ST
AL - 215	Firebox	PP	ST
AL - 216	Firebox and equipment storage	PP	ST
AL - 217	Oil tank	PP	ST
AL - 218	Storage vault	PP	ST
AL - 219	Greenhouse	PP	ST
AL - 220	Oil tanks	PP	ST
AL - 221	Officers Quarters #7 (ruins)	ST	ST
AL - 222	Officers Quarters #8 (ruins)	ST	ST
AL - 223	Officers Quarters #9 (ruins)	ST	ST
AL - 224	South Battery	PP	PP
AL - 225	Citadel retaining wall	PP	ST
AL - 227	Road, from wharf to northwest end	PP	ST
AL - 228	Road, from guardhouse to top	PP	ST
AL - 229	Three gun battery	PP	PP

APPENDIX F -- SUMMARY OF HAZARDOUS MATERIALS SURVEYS
(LSA Associates 1993)

Several surveys have been conducted to assess the existence and previous release of hazardous materials and waste on different parts of the island. Following is brief chronology of the surveys based upon the July 17, 1990 "Hazardous Materials Report - Alcatraz" completed by Asbestos Advisory Association and the December 3, 1992 "Alcatraz Island Preliminary Assessment of Hazardous Materials, Phase I" prepared by Harding Lawson Associates (HLA):

- **July 1979.** Royston, Hanamoto, Beck and Abbey Engineers reported that the Powerhouse (Building 67) contained a concrete tank containing No. 6 bunker fuel oil.
- **July 1990.** The Asbestos Advisory Association completed a hazardous materials assessment of the rubble piles at the Parade Grounds. From their observations, sampling, and analysis, the firm concluded that the rubble may contain PCB-affected concrete and soil under the transformer, lead-paint dust, asbestos-containing material (ACM), batteries, and miscellaneous drums of unknown materials.
- **October 1991.** Ace Pacific Company (Ace) completed a hazardous materials and waste survey of the island. Hazardous materials and wastes were identified in various container sizes at the wharf area maintenance shed, a flammable materials locker at the wharf area, the old paint shop area, the Powerhouse, the Sallyport Entrance, and the morgue area. Ace recommended removal of material from the wharf area and Powerhouse and properly manifesting it from the island. Ace also concluded that hazardous materials may be associated with the rubble at the Parade Grounds, the former island incinerator, and the fill material west of the Laundry Building.

In 1992, the GGNRA reportedly consolidated part of the hazardous materials and waste identified by Ace and it is contracting to have these materials removed from the island. Further, the GGNRA used brick and mortar to close entrances to two tunnels (communications tunnel) located immediately south of the Powerhouse that contain friable asbestos.

- **December 1992.** A comprehensive Phase I Preliminary Assessment of Hazardous Materials was performed by Harding Lawson Associates. The assessment was based upon available NPS records at the GGNRA, and interviews with GGNRA personnel about potential generation, storage, or disposal of hazardous materials on the island. HLA then performed a preliminary field investigation to evaluate potential hazardous materials sites identified during records reviews and interviews.

The purpose of the assessment was to initiate a hazardous materials assessment for the island in accordance with the Draft Federal Agency Hazardous Waste Compliance Docket Reference Manual (May 1991). The goal was to identify potential hazardous waste sites within federal agency jurisdiction and assess sites for hazardous materials release. Several regulatory agencies have authority for hazardous wastes including the U.S. Environmental Protection Agency (waste disposal criteria), California Department of Toxic

Substances Control (waste disposal criteria), San Francisco Department of Public Health (underground storage tank closure criteria), and the San Francisco Fire Department (aboveground tank closure criteria).

The sites identified by HLA are further discussed below. All of these sites are relatively small in size, generally limited to discrete areas of actual contamination, and (except for the boat dock) restricted from access by the public. Several sites, including the Industries Area Scrap Metal Yard, the Laundry Building Fill, and Pipe Graveyard, are not hazardous and do not warrant further investigation. The HLA report included recommendations for mitigating each of the other hazardous waste sites. The numbering of the sites corresponds with those mapped in the HLA report and Figure 13.

1. Quartermaster House Tanks

Inside the north end of the warehouse (southern part of powerhouse complex) three aboveground steel tanks of approximately 9,000 gallons are present within an area currently restricted from public access. There are approximately two to three inches of petroleum sludge in two of the tanks and oil in the third tank. Removal or request for a variance from removal has been recommended.

2. Gun Battery Bunker Oil Tank

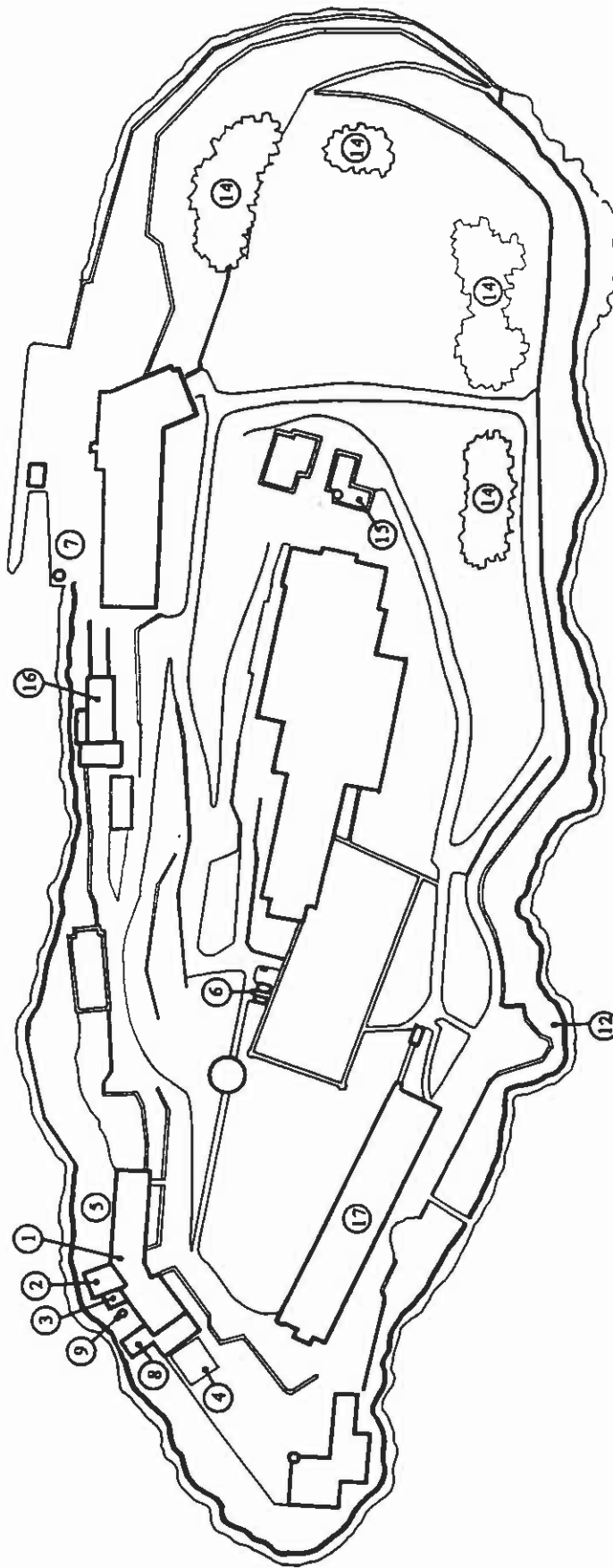
The bunker oil tank is located at the brick gun battery north of the warehouse and is closed to public access. Solidified tar stains were observed on the outside of the gun battery and on rocks below. Filling part of the tank with inert material after the tank has been emptied and sealing tank product lines has been suggested.

3. Hotwell Tanks

Located on the west side of the gun battery tank, these two 25,000-gallon tanks were used to preheat bunker oil prior to burning the oil in the Powerhouse. The area is closed to public access. Solidified tar stains were observed on the exterior of the tank and the amount of oil remaining is unknown. As an aboveground tank which has been unused for over a year, the regulations mandate that it be removed. HLA recommended that a variance from removal be requested due to the difficult tank location and historic structure status and that measures similarly suggested for the gun battery bunker oil tank be implemented.

4. Powerhouse Concrete Tanks

The concrete tank is the larger bunker oil tank at the north end of the island, which is not open to the public. Minor solidified tar seeps were observed on the sides of the tank, but the amount of remaining material in the approximately 100,000-gallon tank is unknown.



- | | |
|-------------------------------|---|
| ① Quartermaster House Tanks | ⑧ Powerhouse Oil Spill |
| ② Gun Battery Bunker Oil Tank | ⑨ Powerhouse Smokestack |
| ③ Hotwell Tanks | ⑫ Former Incinerator Soot Chute |
| ④ Powerhouse Concrete Tanks | ⑬ Parade Ground Rubble Piles |
| ⑤ Oil Product Lines | ⑮ U.S. Coast Guard Light House Tank |
| ⑥ Morgue Tanks | ⑯ Bureau of Prisons Rifle Range |
| ⑦ Boat Dock Tanks | ⑰ Bureau of Prisons Dry Cleaning and Laundry Area |

Source: Harding Lawson Associates, Preliminary Site Assessment, December 3, 1992

05-06-93(GGN201) Alcatraz Island Plan



Scale in feet



LSA

Figure 1

5. Oil Product Lines

The remnants of three oil product lines are present along the north side of the island from the dock to the powerhouse complex. The pipes were used to convey oil and much of the pipe has been severely corroded. HLA recommended closure of the pipes by capping the buried sections of the pipes where the ends are exposed at the surface.

6. Morgue Tanks

Two approximately 12,000-gallon steel tanks are located aboveground north of the former morgue and were used to store diesel fuel. Although empty, the tanks emitted a petroleum odor and HLA recommended that they be cleaned and removed from the island. The area is not currently open to the public.

7. Boat Dock Tanks

The boat dock tanks are located in an area that is generally open to public access. The two 2,000-gallon underground tanks are located inside a concrete vault at the north edge of the boat docks. Gasoline or diesel is still present in the tanks. HLA recommended that closure of the tanks be performed and that borings and sampling analysis be conducted.

8. Powerhouse Oil Spill

Several thousand gallons of bunker oil were spilled into the Powerhouse while filling the gun battery bunker oil tank. The date of the spill is unknown. The area of the Powerhouse is not currently accessible to the public. Since the spill, the floor of the room has collapsed to the ground surface. Although a large spill was not evident, recommendations include collection of soil samples in the area to assess if residual spilled bunker oil exists in the collapsed structure.

9. Powerhouse Smokestack

The smokestack is on the north side of the Powerhouse and was used to exhaust byproducts of combustion from the oil-fire boilers in the Powerhouse. There was approximately two cubic yards of yellow-brown ash at the base of the ash chute. Byproducts of combustion would include polynuclear aromatic hydrocarbons (PNAs) and metals and asbestos from the furnace, which could have accumulated in the ash. HLA recommended that the ash be characterized for PNAs, metals and asbestos.

12. Former Incinerator Soot Chute

The incinerator operated on the bluff just south of the Laundry Building no longer exists and the area is currently closed to the public. However, a concrete soot chute is present on the top of the bluff to sea level. Approximately three cubic yards of ash are present. HLA recommended that samples be collected to characterize it for PNAs, metals, and asbestos to assess disposal options.

14. Parade Grounds Rubble Piles

Four large rubble piles are present along the perimeter of the Parade Grounds and are currently fenced and closed to public access. The piles are likely to contain asbestos-containing material and lead-based paint. Further, a PCB transformer is located at the west side of the Parade Grounds. HLA has advised that the materials be removed or encapsulated on-site if public access is provided in this area. An earlier survey (Asbestos Advisory Association) recommended that the PCB from the transformer site be removed from the island.

15. U.S. Coast Guard Lighthouse Tank

An aboveground diesel tank for a generator is located inside the lighthouse southeast of the prison building. During a previous archaeological excavation, petroleum hydrocarbon odors were detected beneath the prison building. A surface release from the tank occurred into former utility line conduits and the outlet is not known. HLA recommended that further information be collected and appropriate remedial measures be taken. The inside of the lighthouse is not currently open to the public.

16. Bureau of Prisons Rifle Range

The second floor of the Sallyport was used as a rifle range and contains an accumulation of lead slugs. The Sallyport area, but not the building, is currently open to public access. Recommendations include transporting lead off of the island and sampling and analysis for residual lead concentrations in the floor.

17. Bureau of Prisons Dry Cleaning and Laundry Area

An approximately 1,200-square foot oil spill is located on top of the concrete floor in the northwest corner of the Laundry Building in the northern part of the island, which is currently closed to the public. Recommendations include spill cleanup, storage of oil, and off-island transport.

According to GGNRA personnel and based on the age of the structures on the island, asbestos-containing material and/or lead-based paint is likely to occur throughout the existing structures on the island. Further, GGNRA personnel have indicated that lead-sheathed cable is commonly buried at shallow depths throughout the island. Further analysis and a program of assessment and sampling is likely to be required.