

Conceptual Plan for Interpretation at Fitzgerald Marine Reserve

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in association with
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**San Mateo County Parks and Recreation Foundation
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*The sea
moves us*

We are drawn to it, carried along, perhaps, on currents of ancestral memory stirred by primordial, tidal rhythms deep within.

Here in the windblown, salt-scented tumult we partake, each time anew, of a compelling mystery. It is here, small and alone in the presence of forces older than humanity, that we reconnect with the meaning and power of nature.

Here our perceptions are washed clean, and we see that we move in rhythm with the dance of life on the planet.

Executive Summary

The Need for an Interpretive Plan

The Fitzgerald Marine Reserve is a popular destination for people seeking tidepool experiences, hiking, scenic views, and rare opportunities for solitude in the crowded Bay Area. Increasingly, however, visitor impacts are taking their toll on this unique and irreplaceable site.

Visitation has a direct influence on the Reserve's marine life forms in the form of inadvertent trampling, illegal collecting, inappropriate handling, and disturbance of marine mammals. Visitors and watershed residents also inadvertently contribute to erosion processes that affect upland and tidepool ecology.

The 2002 Fitzgerald Marine Reserve Master Plan identified visitor education as a priority in a wider plan for overall protection of sensitive resources found at the Reserve. As part of that vision, this plan defines the need for an Education Center, interpretive exhibits, and outdoor interpretive amenities. It also explores options for enhanced education programming. The San Mateo County Parks and Recreation Foundation spearheaded the effort to address this priority and funded development of this conceptual interpretive plan.

The Planning Process

In 2004, over the course of nine months, The Acorn Group, Inc. and Ron Yeo, FAIA Architect, Inc. worked together to develop a plan for interpretive facilities and programming at the Reserve. The consultants were aided by a project design committee consisting of County of San Mateo Parks and Recreation staff, Reserve docents and members of Friends of Fitzgerald Marine Life Refuge, staff of the San Mateo County Parks and Recreation Foundation, and representatives from marine institutions and state and federal agencies within the area.

The 2002 Master Plan served as the base document to guide this report. Additional background resources used in the preparation of this plan included documents on the natural history, archeology, and cultural history of the site, technical reports, and the knowledge and experience of Reserve staff, subject experts, and volunteers.

Visitors and educators were interviewed regarding their needs and interests, and comparable facilities within a 25-mile radius were inventoried.

A thematic foundation was established to guide verbal and non-verbal communication with visitors. The core messages convey the importance of stewardship for Fitzgerald's "tough yet tender" tidepool resources.

The new site plan accommodates the functions of the Education Center building while minimizing impacts to the environment and surrounding neighborhood and maximizing safety and aesthetic considerations in the surrounding neighborhood.



Improvements to be Implemented Under this Plan

Moss Beach

The entry experience to the Reserve at Moss Beach will begin with welcoming signage at the new entrance at California and North Lake streets. Vehicles and pedestrians will make use of the newly-reconfigured parking area, picnic grove, and restroom facilities.

Education Center

A conceptual building design accommodates an exhibit gallery, two changing exhibits outside the gallery, a classroom, reception area and lobby, storage space, a gift shop, office space for park staff, a mini-kitchen, and an organizing area for docents. Proposed exhibits for the gallery are colorful, highly engaging, and thought-provoking.

Seven exhibits convey messages of natural history of the Reserve in the context of its importance to people over time, illustrating the decline, protection, and ongoing ecological recovery of the Reserve's natural wonders.

Features outside the building will include a shaded arbor and assembly area, orientation panels, and a context-setting panel describing Fitzgerald's place within the larger cooperative partnership that manages marine resources in the San Francisco area.

Adjacent to but separate from the building itself will be a colorful, larger-than-life sculpture of tidepool animals that invites touch and exploration. Children can move through openings in the sculpture to discover hidden reef treasures. Colorful porcelain enamel panels interpret the wonders of the reef's zones and compel visitors to tread lightly.



Outdoor Amenities in and around Moss Beach

Beyond this sculpture garden, the trail leads down to the beach and reef. Along this path, further panels will prepare the visitor for a positive encounter by conveying "reef etiquette" via imagery and brief text. Additionally, rules and regulations, couched in terms of benefits to the reef and the visitor, will be conveyed.

A new pedestrian bridge, leading from the parking lot over San Vicente Creek to the bluffs overlooking the Reserve, will include a pullout area with an interpretive panel discussing the relationship between watershed processes, Reserve marine life forms, and human activities upstream from the Reserve.

Beyond the bridge, the existing trail leading uphill will beckon the visitor to a new reef overlook featuring a marine mammal observation station complete with magnificent views, view scopes, and interpretive panels.

Also on the bluff and situated inland, an outdoor classroom or amphitheater will provide an informal forum for school group activities and presentations.

Partnerships in Interpretation

There are many entry points along the Reserve's three-mile boundary. Many of its access corridors are owned or managed by other jurisdictions or organizations—most notably the San Mateo County Harbor District, US Air Force, and the Peninsula Open Space Trust.

Despite these multiple jurisdictions, interpretation of coastal resources should begin at the point the visitor experience begins. Rather than siting interpretive features strictly inside Reserve boundaries, this plan envisions the San Mateo County Parks and Recreation Division working cooperatively with neighboring jurisdictions on signage as well as interpretive programming. Working in partnership with adjacent land managers will help to create a seamless visitor experience and convey consistent stewardship messages.

Major Reserve Entry Points

Seal Cove's rich human history calls for a panel about human use over time, couched in terms of evolving values leading to the protected status of the Reserve. Trail orientation and reef etiquette panels will greet visitors using this entry point to reach tidepools on the reef.

At Pillar Point, welcome and orientation panels similar to those outside the Education Center building will greet arriving visitors near the parking lot. Along the San Mateo County Harbor District's path leading to Pillar Point beach, panels on zonation, adaptation, and reef etiquette panels will greet those who make Pillar Point their primary destination for reef exploration activities. To improve management of this popular dog exercise area, a map will show those areas open to dogs, accompanied by an etiquette panel discussing dog owner responsibilities, framed in terms of benefits to wildlife, dogs, and their owners.

Adjacent to the marsh, and in response to a recent discovery of nearby archeological resources, is an excellent opportunity to interpret aspects of the Ohlone and their relationship to this site. Here a reconstructed Ohlone tule

house, with interpretive panels, will describe the Ohlone material culture and challenge visitors to discover two-dimensional photographic cutouts of marsh wildlife half-hidden in the nearby marsh vegetation.

On the bluff above Ross Cove, due west of the current Harbor District parking lot, outdoor panels will discuss cooperative protection of Pillar Point as well as ocean and geologic processes—tides, currents, erosion and sedimentation—that create and sustain the Reserve.

Future Steps

These concepts, designed to offer enjoyable and memorable visitor experiences via seamless, consistent interpretive opportunities throughout the Reserve, are presented at a conceptual level. Further refinements to these ideas will be necessary as the project moves through design and construction stages.

Part I
Project Background

Introduction

Project Purpose

The purpose of this project is to develop a plan for the design and construction of an Education Center and other interpretive amenities at Fitzgerald Marine Reserve, which is headquartered in Moss Beach, California.

This Conceptual Plan was funded by the San Mateo County Parks and Recreation Foundation and is presented as a gift to the San Mateo County Parks Commission and the citizens of San Mateo County.



Design Team

The Design Team for this project consisted of The Acorn Group, Inc. of Tustin, California in association with Ron Yeo, FAIA Architect, Inc of Corona del Mar, California. Team members included Ron Yeo, architect; Jennifer Rigby, director of The Acorn Group; and Rici Peterson, interpretive planner for The Acorn Group. Lori Mann, education consultant, assisted The Acorn Group with educational planning.

Fitzgerald Marine Reserve Master Plan

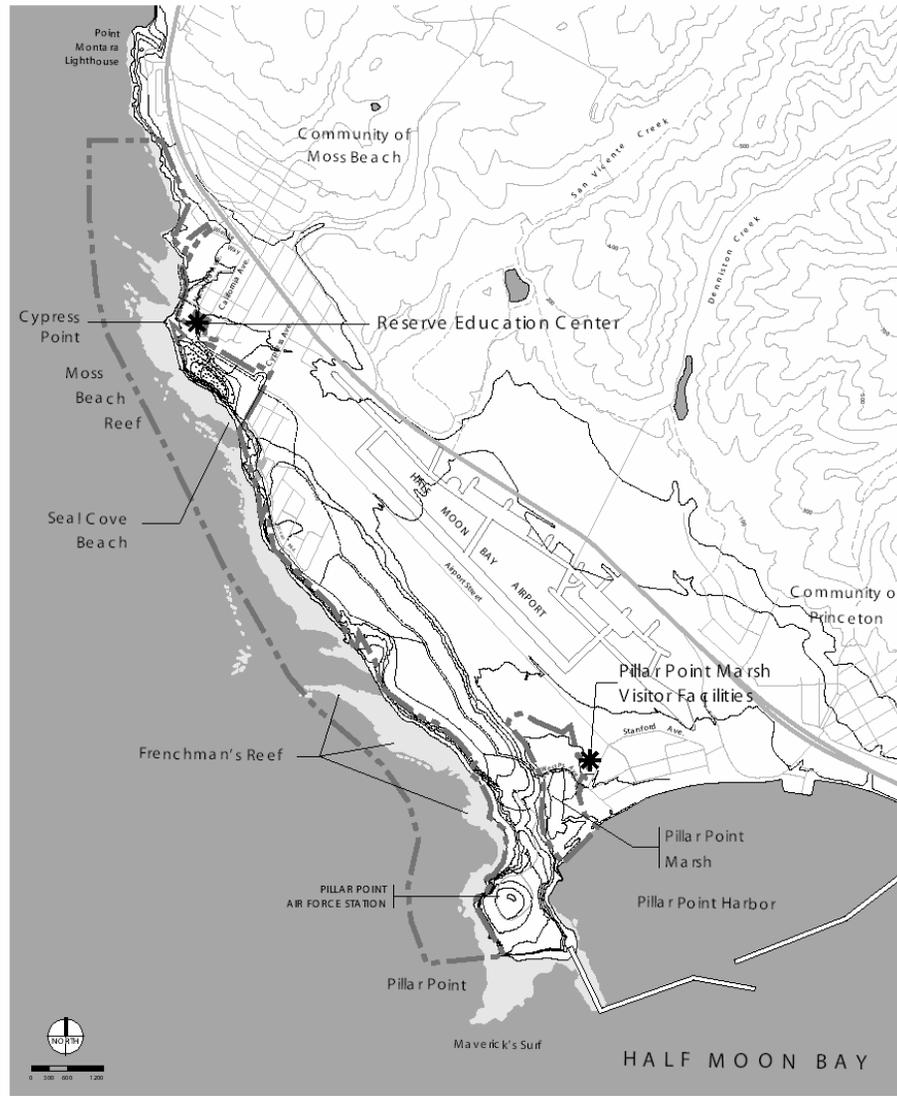
The need for a conceptual plan for interpretation and education was first outlined in the *Fitzgerald Marine Reserve Master Plan* (Brady/LSA, 2002) and the *Fitzgerald Marine Reserve Resource Assessment Plan* (Tenera Environmental, 2004). The Master Plan establishes long-range goals and objectives consistent with the primary mission of the Reserve, to preserve and enhance natural resources, and to provide educational opportunities.

Two policies are identified in the Master Plan that define particular uses and facilities at Fitzgerald:

- *Uses within the Reserve will include activities related to education and interpretation of natural resources... compatible with protection of nature resources.*
- *Facilities developed to accommodate these uses will include an Education Center at the site of the existing Moss Beach visitor's center, and parking, picnic and restroom facilities near the Pillar Point Marsh.*

This Conceptual Plan for Interpretation offers detailed information to implement the two interpretive components from the Master Plan, with particular attention given to education, the primary focus of visitor use at the Reserve. It presents additional information about the site; summarizes the input gathered from the public, the design committee, and the educational community; and defines site development with conceptual drawings of exhibits, trail amenities, a new education center building, and other architectural features for the Reserve.

The San Mateo County Parks and Recreation Division and the San Mateo County Parks and Recreation Foundation must engage in numerous additional steps to implement this plan, including additional design work, additional environmental review, securing permits, and fundraising. These and other steps are outlined in Appendix G.



- Existing Boundary, Fitzgerald Marine Reserve
- Existing Trails
- Proposed Trails, approximate location
- Proposed California Coastal Trail, approximate location
- Cypress Grove
- Intertidal Zone

Source: Brady LSA, June 2002

Scope, Constraints and Limitations of this Plan

This plan is intended to set the overall course for interpretation throughout Fitzgerald Marine Reserve. It identifies target audiences for interpretation and education, key messages to be communicated, specific goals and objectives for interpretation and environment-based education, and a multi-faceted approach to accomplishing those objectives through a variety of interpretive media, facilities, and education programs.

Planning Challenges

The site offered the following challenges to planning:

- The reef itself is extremely fragile and is exposed to impacts of over 100,000 visitors annually. There are three major entry points to the Reserve—Moss Beach, Pillar Point, and Seal Cove/Cypress Avenue—and several minor entry points, each favored by somewhat different subsets of visitors. No entry sites are controlled. While a newly-inaugurated group reservation system assures that organized groups are limited in size and number, there is no viable mechanism to limit the numbers of individuals who arrive on their own.
- Results of a visitor study undertaken as part of this plan indicate a range of backgrounds, interests, motivations, activities, and knowledge levels among visitors.
- Zoning, geotechnical, access, and parking issues limit the size and location of structures at the Moss Beach entrance to the Reserve.



Conceptual in Scope

This document has been developed at a conceptual level. From panel siting suggestions to exhibit renderings and building treatment, the intent is to provide broad-brush plans for later refinement into schematic plans and construction documents. By the same token, the plan's Education Prospectus serves as a road map for the consideration of staff, board members, and docents. Any program development evolving from the recommendations put forth in the Education Prospectus will also require further background research, identification of appropriate educational approaches, materials, and techniques, and ample pilot-testing before implementation. All recommendations are time sensitive, based as they are on information that can be expected to change over time. Any portion of the plan not implemented within five years should be re-examined and updated as necessary.

Project Structure and Process

Design Committee

A Design Committee, drawn from community, government, aquarium, volunteer, and environmental interests, was assembled to guide the planning process. Over the course of the nine-month planning effort, the Design Committee met three times with the Design Team to provide input, review findings, and offer comments. Additional input from committee members was provided via email questionnaires. Please refer to Appendix A for a listing of Design Committee members.

Background Research

Background research for this project was extensive. The Fitzgerald Marine Reserve Master Plan of 2002 formed the basis of planning efforts. Management concerns, resource protection issues, visitor interests, educator needs, safety, access, impacts to neighbors, and geotechnical and other CEQA requirements were examined in depth.

Having previously worked on other interpretive projects in the region, the Design Team was familiar with other Bay Area interpretive sites, bringing to this project an informed perspective regarding activities and programs offered to the visiting population. In addition, the team conducted a full survey of interpretive and environmental programs offered within a 25-mile radius of Fitzgerald to gain a comparative understanding of neighboring facilities and programs and avoid duplication of effort. Recognizing that interpretive opportunities can and should extend well beyond exhibits in a building, the Design Team considered the interpretive needs of Fitzgerald Marine Reserve as a whole, and all its visitors.

Planners considered the issues and recommendations raised in the Master Plan and in Tenera Environmental's Resource Assessment Report. Input from teams of area educators and program providers was also sought, through a survey of existing marine-focused facilities in the surrounding region; an educator needs assessment distributed throughout the public education systems of San Mateo and Santa Clara Counties; an educator focus group; and discussions with Fitzgerald docents and other stakeholders.

Consistent with the recommendations of the Tenera report, this plan envisions using the Education Center as an integral component of school field trips to the Reserve. Likewise, it is agreed that organizing school groups into sub-groups and rotating them between intertidal and surrounding ecological communities, such as sandy beach and coastal bluff, would help protect fragile marine organisms by reducing impacts to any one particular site.

This Conceptual Plan does make one departure from the recommendations put forth in the Tenera report. Based on the results of the educator and program provider research described above, this plan does not recommend the installation of seawater "touch tanks" at Fitzgerald. Touch tanks can be powerful interpretive and teaching tools, but they require labor-intensive, ongoing maintenance—not a realistic option for a facility almost completely reliant on volunteer staffing. Additionally, unless carefully controlled, touch tank environments can inadvertently send messages that conflict with stewardship themes by implying that organisms can tolerate extensive handling and that visitors are encouraged to handle tidepool species in the wild. As noted on pages 79 and 82 in the Education Prospectus, the Reef in the Classroom and Reef Loan Kit programs are better choices to prepare students for their field trip experience. For some groups, programs may even serve as an effective alternative to an actual trip to Fitzgerald. Such endeavors would also serve to reduce impacts at Fitzgerald.

Public Involvement

The planning process was inclusive and open. In addition to working with a design committee representing diverse backgrounds and points of view, the planners conducted a public workshop prior to final development, to introduce the planning project, share results of the process to date, and solicit public input. Although attendance was low, response to the plan was very positive and generated enthusiasm for the project's upcoming development phase. In January 2005, the concept plan was provided to the San Mateo County and Recreation Foundation for distribution to the Parks and Recreation Commission and interested parties.

Planning Process

In April 2004, the Design Team visited the Reserve to tour the site, meet with staff and key volunteers to discuss project scope and key issues, and visit recycled building materials outlets in the area. Development of the educator needs assessment tool also began in April.

In mid-May, planners conducted face-to-face visitor interviews at two entry points to the Reserve. Additionally, the Design Team facilitated a workshop for Design Committee members to identify target audiences, visitor agendas, interpretive goals for the Reserve, and interpretive and educational topics. The group also ranked building functions in order of priority and identified issues and concerns for consideration in the planning process.

After this meeting, the Design Team developed and distributed a questionnaire to the Design Committee regarding the facility's development program.

In June, draft interpretive themes and goals were submitted via email to committee members for their comment. In August, the Design Team shared the results of its background research electronically, including results of the visitor survey and educator needs assessment; an analysis of building site constraints and opportunities; a draft building program proposing size, functions, and exact location; final interpretive theme and subthemes; and a draft plan for interior and exterior exhibits. The Committee approved the draft plans and the Design Team returned to work to begin the final stages of the planning process.

Later in the same month, the Design Team presented the Design Committee with initial results of a site analysis, a preliminary building program, and conceptual sketches for an education center. They also presented a preliminary plan for interpretive exhibits both inside and outside the building, and a series of interpretive panels and outdoor exhibits at other points throughout the Reserve. Comments and suggestions were incorporated into the preliminary plan.

In October, as a supplement to the spring educator needs assessment, The Acorn Group conducted a focus group with seven educators from neighboring school districts. On this same trip, the Design Team met with the Design Committee and presented elements of the Conceptual Plan for Interpretation for comments and approval. These included conceptual building drawings, parking and circulation plans, a conceptual exhibit plan, and an exterior elements plan. The Design Team also led a public meeting to present the plan and solicit public comment.

In December, the draft Conceptual Plan for Interpretation, including the education prospectus, was delivered for internal review. The final version was published in January 2005. The plan was presented for Parks Commission review in February, and it is anticipated that they will take action on it in March 2005.

Planning Timeline at a Glance

2004

April	Kick-off meeting with staff; project scoping; site tour; staff/volunteer interviews; development of educator needs assessment and visitor survey tools
May	Visitor survey conducted; Design Committee building program questionnaire and workshop
June	Draft interpretive themes and goals submitted for comment
August	Results of visitor and educator surveys and site constraints/ opportunities analysis submitted; preliminary parking/circulation, building program and exhibit plans submitted; Design Committee meeting
October	Educator focus group conducted; final Design Committee meeting; public involvement meeting
December	Complete draft plan submitted for internal review

2005

January	Final Conceptual Interpretive Plan published
February	Conceptual Interpretive Plan submitted to Parks Commission for review
March	Parks Commission action

Visitor Survey: Summary of Findings

Understanding visitors is essential to the success of any interpretive programming. To enhance understanding of what visitors want, their attitudes, interests, and prior knowledge levels, and what, if any, barriers to visitation and enjoyment may exist, a visitor survey was conducted at two entries to the Reserve.

Between May 15 and 18, 56 visitors to the Fitzgerald Marine Reserve were interviewed by The Acorn Group, with the assistance of Friends of Fitzgerald volunteer Mary DeLong. Two populations were surveyed: visitors to the northern end of the Reserve at the Moss Beach area (characterized by reef, tidepools, boulders, and small pockets of beach), and visitors to the southern end of the Reserve at Pillar Point (sandy beach at the time of sampling—although reef resources are found at Pillar Point, no tidepools were exposed during this period).

At both sites, visitors were approached as they were making their way toward the coast after parking their vehicles. Visitors were either interviewed at that point in time, or asked to stop by on their way back. Forty-four responses were gathered at Moss Beach and twelve from Pillar Point. Only private visitors were approached (as opposed to individuals from school groups or other organized outings).

During the sampling period, weather was favorable at Moss Beach (low to mid 60s, sunny to partly cloudy, moderate breeze). Weather was less comfortable at Pillar Point (mid 50s, cloudy, and very windy), accounting for the smaller number of responses gathered from this site. Traffic was light enough at both sites to preclude use of random selection methodology; all visitors willing to make eye contact with surveyors were queried. Refusal rate was not tracked formally, but it is estimated that three quarters of contacted visitors agreed to be interviewed.

Visitors were asked thirteen questions in face-to-face interviews. A sample copy of the questionnaire can be found in Appendix B. A map of the Reserve and sample photos of interpretive amenities were used as visual aids to facilitate responses to questions 4 and 9, respectively.

This study targeted existing visitors in an attempt to gain insight into approaches to minimizing impacts on fragile resources. It is a limited study; only two entry points were sampled. Additionally, it is of insufficient size to serve as a

fair sampling of the interests, attitudes or knowledge of the entire population of Reserve visitors. However, it can help to identify trends within the sampled population and may also form a reasonable basis for future inquiry.

Reasons for Visiting

Not surprisingly, 80% of Moss Beach respondents (35) named “exploring the tidepools” as a primary reason for their visit. Seventy-five percent of Pillar Point visitors (8) named walking as their motive (walking dogs 50% or 6; walking along the sand 25% or 2) while only 22% (10) of Moss Beach visitors report exercise as their aim. Being with friends or family is the second-most popular reason for visiting Moss Beach (56% or 25) and the third most popular reason at Pillar Point (17% or 2).¹

Only 22% (10) of Moss Beach respondents and 5% (2) of Pillar Point respondents reported picnicking at the beach as a reason for their visit.²

Valued Aspects of the Reserve

When invited via an open-ended question to share what they value about the Reserve, Moss Beach visitors mentioned the tidepools and tidepool accessibility (43% or 19), wildlife diversity (34% or 15), the Reserve’s undeveloped or natural character (26% or 11), its protected condition, and its beauty or views (both at 23% or 10 each). The Reserve’s serene or uncrowded conditions were listed by 21% of respondents (9).

At Pillar Point, respondents most often cited the Reserve’s uncrowded or serene aspects (25% or 3) while tidepools, undeveloped nature, protection/preservation, and free access were each mentioned 17% of the time (2 each).

¹ Although some visitors at the southern site were there to visit Ross Cove or the bluff above it, others clearly were headed for the Harbor District-managed beach, where dogs are permitted, to exercise their pets. This accounts for the high number of dog-related recreation responses to this question.

² This question did not attempt to separate picnicking in the approved picnic area from unauthorized picnicking on the beach itself.

Desired Interpretive Experiences

Visitors were asked to select, from a prepared list, up to two interpretive amenities or improvements they would like to see at the Reserve. Top-ranked at Moss Beach were a waterproof brochure for tidepool use (55% or 24), tidepool naturalists (35% or 15), visitor center exhibits (32%) and a guarantee of uncrowded conditions (27% or 12). Walking on the slippery reef is an issue: 25% (11) selected better footing or “a way to interact with species without having to walk on the reef” as a desired improvement³.

At Pillar Point, uncrowded conditions and tidepool naturalists ranked highest at 50% each (6). Both a waterproof brochure and better footing on the reef/not having to walk on the reef were selected by 33% of respondents (4)⁴. Exhibits and guided activities such as tours and programs also gained equal rankings (17% or 2 each).

Clearly, queried visitors tend to prefer recreational or hands-on learning experiences; only two of the 56 respondents (4%) requested a resource library; no one selected a web site.

Combined results from both sites show that the waterproof brochure is the clear front-runner for improvement of the Reserve experience (50% or 28), with naturalists (38%, 21) uncrowded conditions (32%, 18), protection from a slippery reef (27%, 15), and visitor center exhibits (29%, 16) close behind.

³ Judging from the side remarks visitors made while answering this question, this number would have been even higher if many visitors hadn't felt constrained by a belief that there is no practical way to improve footing on the reef. These two “footing” choices were offered to allow us to gauge the level of psychological discomfort people experience while on the reef. High levels may be an indicator of future willingness to choose alternative experiences such as interior exhibits.

⁴ Although the sample size is too small to bear speculation, it is conceivable that self-selection may play a role in the slightly different results collected at these two very different sites. Visitors who are uncomfortable walking on slippery reef surfaces may tend to prefer the more secure footing offered by Pillar Point's flat, extensive beaches.

Topics of Interest

Combined site data reveal visitors are interested in information about tidepool life (59%, 33), efforts to protect and restore the reef's ecosystem (45%, 25), how to visit the reef without causing damage (39%, 22), and marine mammals (29%, 16). Nine percent (5) of visitors are specifically interested in larger ocean processes while 7% (4) are interested in human history at the site. Only one person (2%) mentioned geology. No significant differences were noted between the topical interests of Moss Beach and Pillar Point visitors.

Awareness of the Impacts of Visitation

Planners were interested in gauging the public's awareness level about visitor impacts to the reef ecosystem. Respondents were asked to name any activities that visitors could engage in that help protect reef life forms from harm. No prompts were offered.

The single most common response was "not littering" (or "picking up trash"; 43% or 24). Visitors were aware that collecting is harmful (41% or 23) as is stepping on sensitive life forms (38%, 21). Not disturbing/not touching/avoiding turning rocks was reported by 28% of respondents (16); respecting closed areas was mentioned by 18% of visitors (10). Only 4% (2) mentioned avoiding marine mammals.

Rules and Regulations

Thirty-eight percent of respondents (21) feel they are inadequately informed about rules and regulations at the Reserve. Eighteen percent (10) said they did not have adequate access to such information; 20% (11) said they were unsure whether their access was adequate.

Perceived Significance of the Reserve

Visitors were asked what they felt is the single most important idea that the public should understand about Fitzgerald Marine Reserve. Fully 75% of visitor comments (42) focused on the fragility of the site and/or the importance of protecting it, while 21% (12) of comments focused on the relatively high quality of the visitor experience at the Reserve.

Additional Comments

Preserving the current values of the Reserve (including largely uncrowded conditions) is a priority with visitors, followed by increased learning opportunities, better facilities, and ongoing public access.

Thirty-two percent of comments (23) were requests for caution regarding developing new facilities or attracting new visitors. In contrast to this “keep it low-key” group, another 15% (11) expressed enthusiasm for new facilities and/or increased or continuing public access. Eighteen percent of comments (13) revealed visitor interest in learning more about the Reserve. Other comments focused on appreciation for the site or its preservation (14%, 10).

Fourteen comments (19%) were specific suggestions regarding management or maintenance issues (e.g., restroom or trail upkeep, water fountains, rule enforcement). Two Pillar Point visitors asked for facilities for dog owners.

Demographics

80% of Moss Beach respondents and 100% of Pillar Point respondents live in the Bay Area and within 40 miles of the Reserve.

Of Moss Beach respondents, 36% (16) live in San Mateo County, as do 67% of Pillar Point respondents (8).

Overall, most visitors first learned about the Reserve through a friend or family member or simply by virtue of living in the area (55% or 31). Twenty percent (11) first learned about the site through publications, tourism websites, or area hospitality staff.

Patterns of Visitation

Combined data reveal the largest category of respondents were first-time visitors (34%, 19). Twenty-nine percent of visitors (16) have visited one to three times over the past year. More than one in five visitors (22% or 12) are “regulars”, having visited between 21 and 100 times.

Visits are not all-day events. Reserve-wide, 68% of visits (38) were under two hours. The modal stay at Moss Beach is under an hour (34% or 15) in contrast to the modal stay at Pillar point of 1 to 1.9 hours (58% or 7). The longer average visit time at Pillar Point is not unexpected. A visit to Moss Beach reef, located only a few dozen yards from the parking lot, can be quick and easy. Reaching the beach at Pillar Point requires a half-mile hike.

Most visitors to the Reserve (52% or 29) say they tend to choose the reef at Moss Beach as their primary destination. The next most popular site is Pillar Point, where 14% of respondents (8) typically head south to the Harbor District beach from the parking lot while 7% (4) said they usually go north along the high bluffs over Ross Cove and Frenchman's Reef. Overall, only 11% (6) of respondents report the Reserve bluff areas as a regular destination, while 4% of respondents (2) say they often visit Seal Cove, near the center of the Reserve⁵.

Eighty-four percent of queried visitors (47) say they also tend to visit other coastal areas in the region; sites ranged northward to Point Reyes and southward to Pismo Beach.

Program Attendance

Only seven of the 47 local resident visitors interviewed (15%) report that a family member has attended a program at the Reserve; all were organized through schools.

What the Survey Reveals about Interpretive Opportunities

Although the sample size was small, survey results were congruent with ongoing impressions held by staff, volunteers and planners regarding visitor attitudes, knowledge, and interests. Results support the widely-held belief that Fitzgerald occupies a special place in the hearts and minds of Bay Area visitors.

Not surprisingly, Fitzgerald visitors regard the site highly, and the spectacular tidepools are the main attraction. Selection of this site over a visit to other tidepool areas in the region appears to be influenced by easy access, free

⁵ These data must be interpreted carefully. No interviews were conducted at Seal Cove or along the bluff trail. Future study may reveal that neighbors close to Seal Cove and/or other bluff trail entry points consider these features their primary destination.

parking, and its undeveloped, scenic, natural setting. Most visitors expressed a strong sense of place when talking about the Reserve as well as their fear of the loss of its unique character.

Visitors are interested in enhanced interpretive experiences at the Reserve and would like more information about its biological wonders. As might be expected, they strongly prefer real experiences at real tidepools – whether aided by non-personal media or by personal assistance from a naturalist – over “virtual” experiences obtainable through exhibits, artificial touch pools, books or web sites. At the same time, people experience a certain level of psychological discomfort while on the reef, where they put themselves and/or reef life forms at risk by walking on the slippery, algae-covered substrate.

Awareness of the reef’s fragility runs very high, and interest is remarkably strong regarding restoration and protection efforts underway at the Reserve. People seem keenly aware of the conflicts Reserve managers face in providing public access to the site while trying to protect its fragile resources. In particular, many visitors are eager to preserve the quality of their experience and to understand how they can continue to enjoy the reef without causing damage.

Almost everyone was able to name at least one appropriate on-site visitor behavior. Additional comments reveal that the majority of visitors are aware that visitor behavior has a direct effect on the health of the reef ecosystem. Yet more than a third of visitors expressed feeling less than adequately informed about site rules and regulations.

It is notable that even the best-informed visitors failed to mention disturbance of resting marine mammals, given that such disturbance is a major management issue at the Reserve. Interpretation should raise awareness of the needs of these creatures and link their survival to appropriate human behaviors.⁶

⁶ The authors observed (and, once, inadvertently participated in) disturbance of marine mammals every time they visited the Reserve. Part of the problem may be due to the fascinating scenery underfoot on the reef; in addition, while wandering from pool to pool, visitors must look down to avoid stepping on either slippery surfaces or living creatures. One is unaware of nearby seals or sea lions until the animals are disturbed enough to move away and slip into the water. From atop the bluffs, however, these animals (and human-animal interactions) are quite apparent. From this high perch, watching animals is rewarding. At the same time, watching other visitors “stumble on” and disturb resting mammals is a frustrating – and highly memorable – experience.

This suggests that a bluff-top marine mammal observation area, enhanced with interpretive amenities such as panels and sighting scopes, would raise awareness of the problem and help visitors become more observant once they descend to the reef.

Clearly, people come to Fitzgerald for a personal experience of “the real thing” in a wild and natural setting. Most notable were the repeated pleas from a majority of visitors to limit development and take low-key approaches to interpretation. Nor can it be ignored that only 29% of visitors requested visitor center exhibits. At the same time, most visitors sent strong signals that they will welcome enhanced information about tidepool life forms and how to care for the Reserve’s resources.

This study concludes that interpretive media at the Reserve will be well received if it is not obtrusive or heavy-handed. In particular, visitors are likely to welcome new information if it will put them at ease regarding permissible behavior, thereby giving assurance that they will be allowed to continue to enjoy the reef in the future.

Increased access to trained roving interpreters and quality self-guiding waterproof brochures would be welcome enhancements to the Fitzgerald experience. Facilities, if any, should present a low profile and blend in with the natural environment; exhibits and other non-personal media should take a low-tech approach wherever possible. At the same time, visitor interest in avoiding difficult reef surfaces suggests that exhibits, if highly engaging and creative, may offer a rewarding alternative and possibly reduce time on the reef for a significant percentage of visitors.

Whether or not interior exhibits are developed, Fitzgerald visitors’ strong preferences for outdoor experiences signifies that a considerable portion of the site’s interpretive opportunities should be located outdoors, for example as a series of panels and activity stations placed along pedestrian corridors. To meet the seemingly contradictory requirements of the site and its visitors, any outdoor interpretive media must be eye-catching to ensure key messages will not be overlooked, yet blend harmoniously with the site to avoid marring its natural beauty. Interpretive programming of any sort must offer enjoyable yet safe, manageable opportunities to interact with site resources. Finally, to be effective, interpretation at Fitzgerald must inform and inspire while respecting the recreational, not scholarly, intentions of the site’s non-student visitors.

Please refer to Appendix B for the complete visitor survey report, including visitor comments.

The Visitor Experience

Current Conditions

Fitzgerald Marine Reserve is a site of value to the plants and animals that make their homes there, to the people who visit the site, and to the community in which it is located. Unparalleled views, rich diversity of tidepool and upland life forms, miles of trails, fascinating history, and three linear miles of undeveloped open space make Fitzgerald a treasured part of our natural heritage.

Yet the features that make the Reserve popular also put it at risk. Daily, the Reserve experiences impacts in the form of inadvertent trampling of tidepool resources, illegal collecting, inappropriate handling, and disturbance of resting marine mammals. Visitors also contribute to erosion processes in upland Reserve areas such as trails, beach access points, and bluffs, indirectly increasing sediment loads that affect intertidal life forms. Additionally, off-site activities of residents and other landowners within the watershed of San Vicente Creek, which flows through the Reserve, have an indirect impact on upland and marine resources by contributing to nonpoint source pollution through land development, agricultural or horticultural practices, and equestrian facilities.



The visitor experience at Fitzgerald offers a great deal, but it also presents several opportunities for improvement. A tiny, one-room building near the parking lot currently acts as visitor center, ranger's office, docent supply storage area, gift shop, and display area.

Despite an impressive number of dedicated docent volunteers who reach thousands of people per year, demand far exceeds supply. Little time is left for other programming or helping independent or non-group visitors to enhance their enjoyment of the mysteries of the sea.

Information panels of embedded fiberglass are arrayed along the path to Moss Beach as well as along the trail leading to Pillar Point. They offer accurate information about species at the Reserve. However, being older, most are now faded and cracked and in need of replacement. Further, they do not convey a unified message, either visually or in their content.

Despite every docent and staff effort to keep visitors aware of Fitzgerald's fragility and protected status, it's not uncommon to see uninformed people using collecting buckets or handling creatures roughly. Clearly not everyone has been reached with messages that promote stewardship. Additionally, witnessing such impacts can lead to cognitive dissonance for rule-following visitors, undermining their beliefs that Fitzgerald is a truly protected place.

Enforcement is not enough to guarantee protection. Even if rangers and wardens were doubled or tripled, staff would still be unable to keep a constant eye on the Reserve's three-mile coastline. The docent corps, too, has its hands full managing school visitors and other large groups.

A Vision for the Visitor Experience

The ideal visitor experience at Fitzgerald should enhance enjoyment of the site, deepen each individual's personal connection to this extraordinary place, and create opportunities for growth as a responsible citizen. All visitors, despite prior experience or existing knowledge levels, should have the opportunity to develop or deepen an awareness of Fitzgerald's sensitive natural values and enhance their understanding of its life forms and natural processes. In so doing, each should have the opportunity to adopt a caring attitude toward the site, to understand and embrace appropriate behaviors, and, ultimately, be encouraged to become an active steward of this remarkable place.

Interpretive opportunities should, therefore, create and reinforce a visitor's sense of place at Fitzgerald Marine Reserve, provide opportunities to better understand and appreciate its life forms and its larger processes, inform visitors of ways to help prevent damage to its resources, and inspire ongoing stewardship in those who visit.

The ideal visitor experience at Fitzgerald starts with learning about the Reserve's existence—whether through a friend, a newspaper article, or a tourism publication. Positive cues that harmonize with site themes of stewardship should be

conveyed from the first contact. For example, even as they make a decision to visit, people should already understand that the site is fragile and that behavioral standards will apply. Consistent verbal and non-verbal cues should be offered. As they travel to the site and enter the parking area, visitors will see well-maintained directional signage that conveys that the site is well-cared for and that visitor's needs are considered. Interpretive media will be easy to enjoy, relying on imagery and text to convey key thematic concepts to all visitors regardless of background or reading level. Reserve staff and volunteers will be trained in customer service as well as interpretive skills to convey a welcoming attitude and encourage enjoyment of the site in appropriate ways. Common questions regarding natural resources and allowable behaviors will be addressed, putting visitors at ease while offering the tools they may need to become more responsible citizens.

As visitors become better informed, experience more enjoyment, and discover that caretaking behaviors are easy and rewarding, they may also find themselves open to joining others who invest time and/or resources in supporting Fitzgerald's well-being. These evolving interests will be supported by opportunities to attend special programs, join volunteer groups, donate to the Friends of Fitzgerald, and share their growing knowledge and enthusiasm with others.

This Conceptual Plan is meant to build a much-needed bridge between the requirements of the site, the efforts of staff and volunteers, and the interests, needs, and perceptions of visitors. It is the intent of this Conceptual Plan that the ideal Visitor Experience becomes an everyday reality at Fitzgerald Marine Reserve.

Part II
Fitzgerald Education Center

NEVADA AVE.

CALIFORNIA AVE.

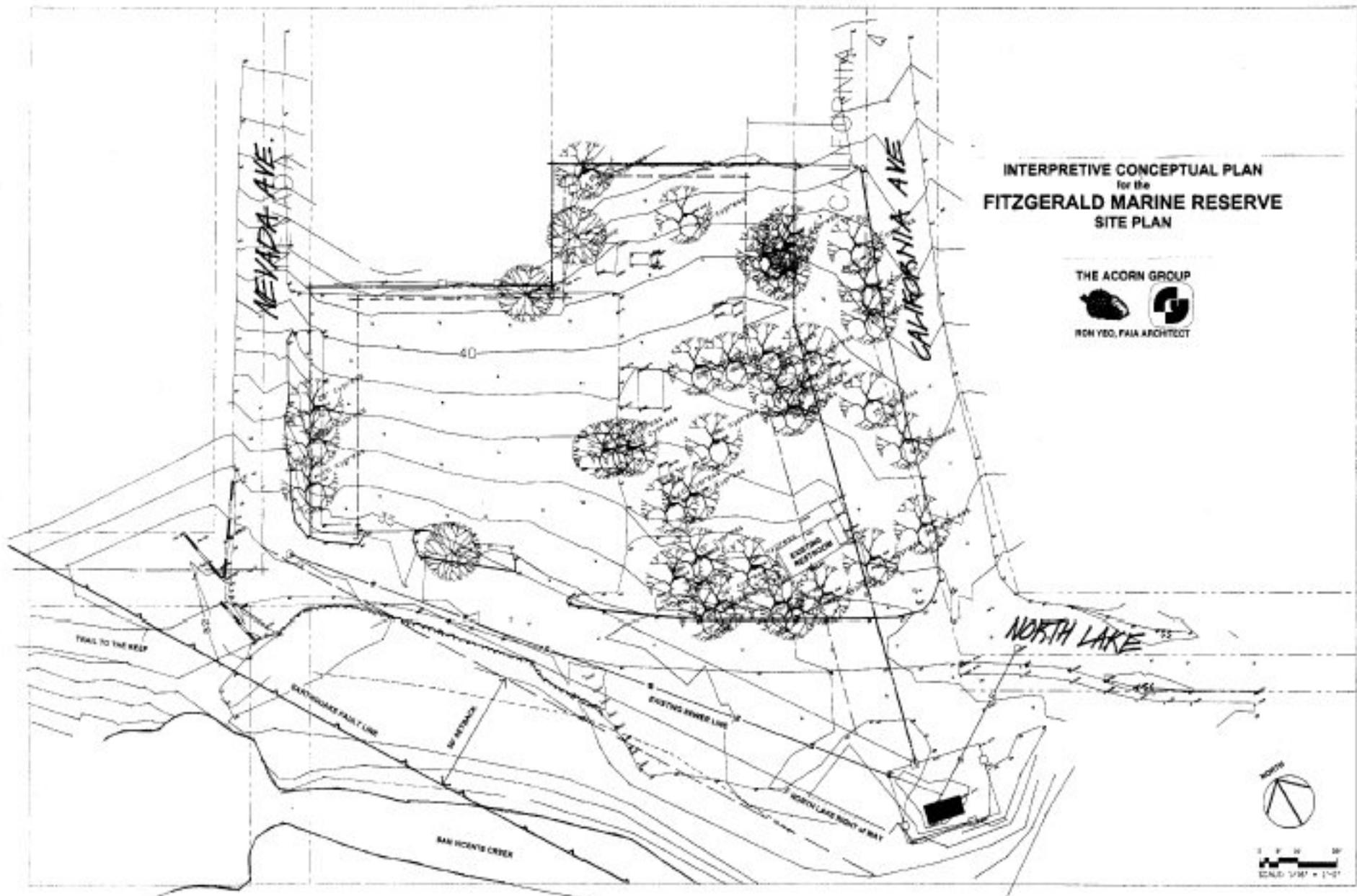
CALIFORNIA AVE.

INTERPRETIVE CONCEPTUAL PLAN
for the
FITZGERALD MARINE RESERVE
SITE PLAN

THE ACORN GROUP



RON YEO, FAIA ARCHITECT



NORTH LAKE

TRAIL TO THE BEEP

SEISMOLOGICAL FAULT LINE

SAN VICENTE CREEK

EXISTING POWER LINE

NORTH LAKE BOUNDARY



SCALE 1/8" = 1'-0"

Refining the Master Plan

This Conceptual Plan further develops two key components first identified in the Master Plan developed by Brady/LSA for the Education Center at Moss Beach, and in the Resource Assessment report developed by Tenera Environmental for the interpretive and educational media.

While the Master Plan establishes long-range goals and objectives for the preservation and development of the Reserve, this Conceptual Plan for Interpretation offers more detailed information. Using the direction set forth in the Master Plan, the Conceptual Plan presents additional information about the site, summarizes the input gathered from the public and the design committee, and provides a site development plan and interpretive media plan, along with conceptual drawings of exhibits, the Education Center, and other architectural features placed in the Reserve.

Site Topographic Survey

Sigma Prime Geosciences conducted a new topographic survey of the site, which proved to be critical to the site development plan. Key elements of this survey included the exact locations of the property lines, road right of way location, utility lines, the earthquake fault line, the creek boundary, and placement of existing trees.

The following site constraints required addressing and assessment in order to establish the refined site design:

1. Zoning setbacks
2. Creek and earthquake fault setbacks
3. Existing trees
4. Property line and road right of ways
5. Existing sewer and water lines
6. Optimum number of parking for vehicles
7. Existing riparian willow grove
8. Pedestrian safety

Opposite page: Building Site Topographic Map

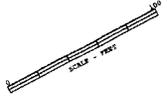
Opposite Page: Creek Area Topographic Map



INTERPRETIVE CONCEPTUAL PLAN
for the
FITZGERALD MARINE RESERVE
SITE PLAN

THE ACORN GROUP

RON YEO, FAIA ARCHITECT



Site Development

The Site Development Plan for Moss Beach, as proposed in this report, encompasses the key layout elements first identified in the Master Plan for building location and driveway auto circulation. It also offers a new approach that maximizes safety, aesthetics, and efficient use of space. The two plans can be compared by reviewing the matrix below.

Site Elements: Comparison of the Conceptual Plan with the original Master Plan		
	<u>MASTER PLAN</u>	<u>CONCEPTUAL PLAN</u>
AUTOMOBILE PARKING	56 Stalls	51 Stalls
BUS PARKING	5 Spaces	3 Spaces
RESTROOM FACILITIES	8 WC fixtures in the building	6 WC fixtures in existing restroom plus 1 new in the new structure = 7
PICNIC STRUCTURE	Roofed structure	Informal open log benches & tables
EDUCATION CENTER STRUCTURE	1,950 square feet	3,050 square feet
OUTDOOR CLASSROOM in the BLUFF AREA	1,000 to 1,500 square feet under a canopy	Open terraced seating for 60 in two locations with raised platforms

Parking Analysis

There are approximately 42 existing auto parking stalls on the site along with two to three bus parking stalls. The Master Plan calls for 56 parking stalls.

However, the County zoning code makes no specific reference to interpretive or educational centers as a recognized use. Relying, therefore, on the “all uses not enumerated” language in Section 6119, the formula of one parking space per 160 square feet of building yields a count of 13 stalls for a 2,000 square foot structure as indicated in the Master Plan. A 3,050 square foot structure, as recommended in this conceptual plan, would require 19 stalls.

Applying the “one in 160” formula to the 56 stall recommendation in the Master Plan would indicate 8,960 allowable square feet of building, which clearly is not recommended, being neither in the best interest of the resource nor the neighborhood. From a practical standpoint, 50 stalls is a reasonable number for this use. As fifty stalls would correspond to 8,000 allowable square feet of building, it is clear that there are no zoning code constraints preventing the adjustment of required parking to 50 stalls for the 3,050 square foot Center recommended in this plan. Reconfiguring the traffic flow and adding eight additional spaces to the existing 42 for a total of 50 auto stalls and 3 bus stalls appears to be a realistic solution.

For overflow parking, it may be desirable to pursue a cooperative agreement with the church located at the corner of Nevada Street & Highway One, owned by the Church of Jesus Christ of Latter-Day Saints.

INTERPRETIVE CONCEPTUAL PLAN
for the
FITZGERALD MARINE RESERVE
SITE PLAN

THE ACORN GROUP

 RON YEO, FAIA ARCHITECT



0 9' 36' 38'
SCALE: 1/16" = 1'-0"

Important refinements of the Master Plan seen in the Site Development Plan include:

1. Adjusting parking layout to prevent the loss of several valuable trees.
2. Adjusting the bus parking so that it is beyond the 50' San Vicente Creek setback and avoids disrupting the existing willow grove along creek.
3. Adding required ADA parking stalls.
4. Shifting the education center building east to conform to the 20' yard setback.
5. Maintaining the existing restroom structure in its current location but screening it with trelliswork in order to soften its appearance.
6. Maintaining a 12' sewer access easement.
7. Relocating the footbridge to the Eastern portion of the creek.
8. Developing a long-term lease from the County Road Department to the County Parks and Recreation Division for the North Lake Avenue right of way for use for pedestrian circulation and a staging area.
9. Adding a gate on Nevada Avenue to eliminate the vehicular traffic in the southwest corner of the property. This will redirect auto circulation more safely by eliminating pedestrian conflicts for visitors traveling from the education to the reef.
10. Providing a bus drop-off area.
11. Incorporating a crosswalk from the picnic area to the education center
12. Replacing the large covered Picnic Shelter with a more manageable and aesthetically pleasing casual assortment of picnic tables and log seating.
13. Eliminating the canopy from the outdoor classroom to be located in the forested bluff area. Refer to the amphitheater concept sketch opposite page 33 for the recommended design.
14. Investigating opportunities to provide overflow parking using the church parking lot located at the corner of Nevada Street and Highway One.

Opposite Page: Conceptual Site Plan

Education Building Program

After reviewing the Master Plan document and gathering information from the Design Committee, docents, County staff, and the public, architect Ron Yeo and planners from The Acorn Group concluded that the Education Center should be expanded from the previously-determined 1,950 square feet to 3,050 square feet. The proposed new size adds space for a circulation corridor, exhibit gallery, and docent all-purpose room to accommodate the needs voiced by volunteers, the public, and members of the education community. A room comparison matrix is provided below.

Building Program: Comparison of the Conceptual Interpretive Plan with the original Master Plan		
	<u>MASTER PLAN</u>	<u>CONCEPTUAL PLAN</u>
CLASSROOM (now REEF LAB)	900 square feet	830 square feet
RESTROOMS	400 square feet	56 square feet
OFFICE SPACE	300 square feet	276 square feet
STORAGE/MECHANICAL	250 square feet	148 square feet
ENTRY/RECEPTION/SALES	100 square feet	360 square feet
EXHIBIT GALLERY	0 square feet	830 square feet
DOCENT ALL PURPOSE ROOM and MINI KITCHEN	0 square feet	310 square feet
CIRCULATION	<u>0 square feet</u>	<u>240 square feet</u>
TOTAL BUILDING AREA	1,950 square feet	3,050 square feet

Building Floor Plan

The entry/reception/sales area has been enlarged in order to handle the capacity of school groups. The reception area offers space for a docent workstation (with visual control of the lobby), classroom (Reef Lab), and a sales area, as well as the exterior staging area.

The exhibit hall (Gallery) and entry alcove are described in detail on pages 43-46.

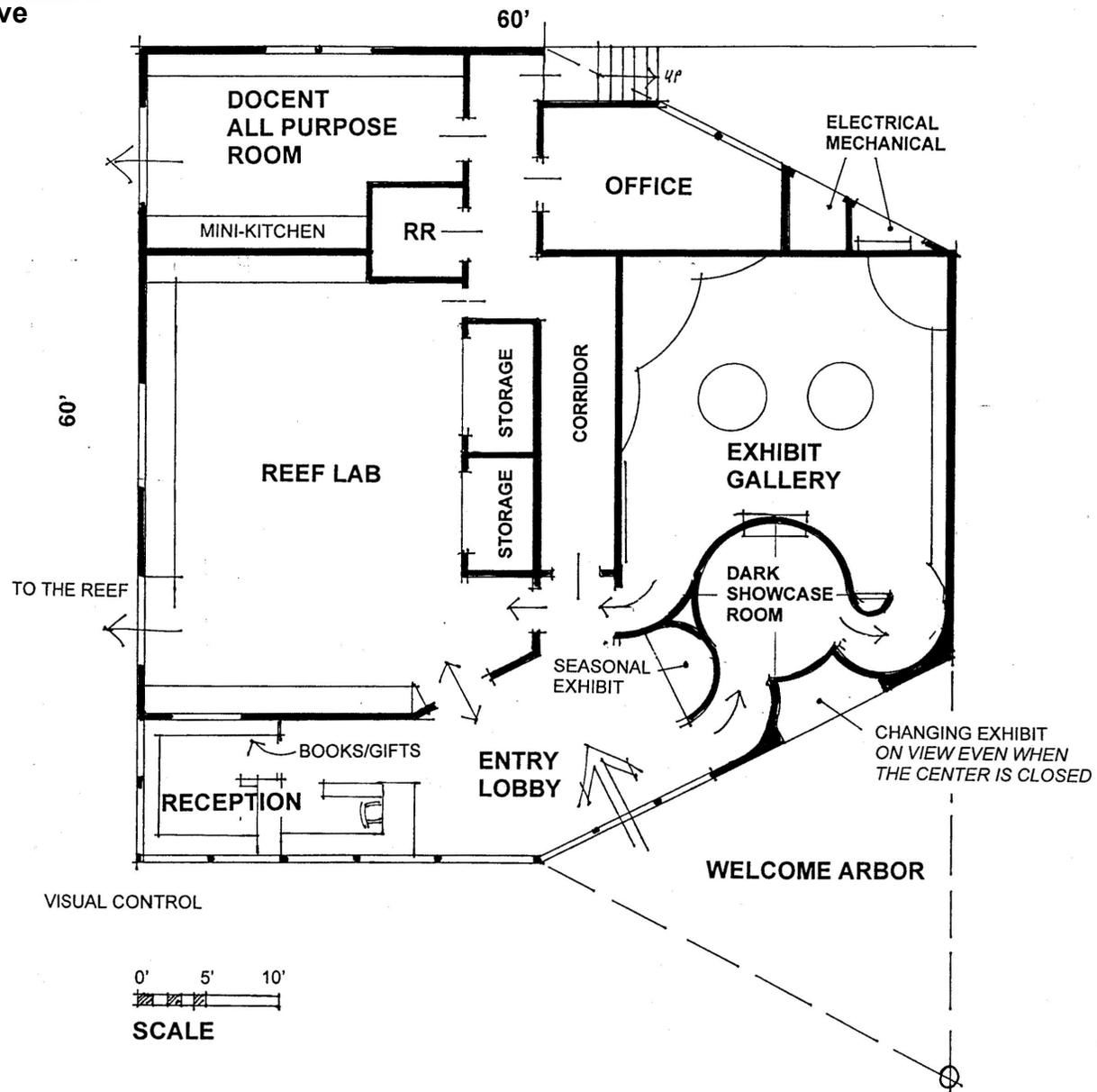
The office area is devoted to park ranger staff and equipment.

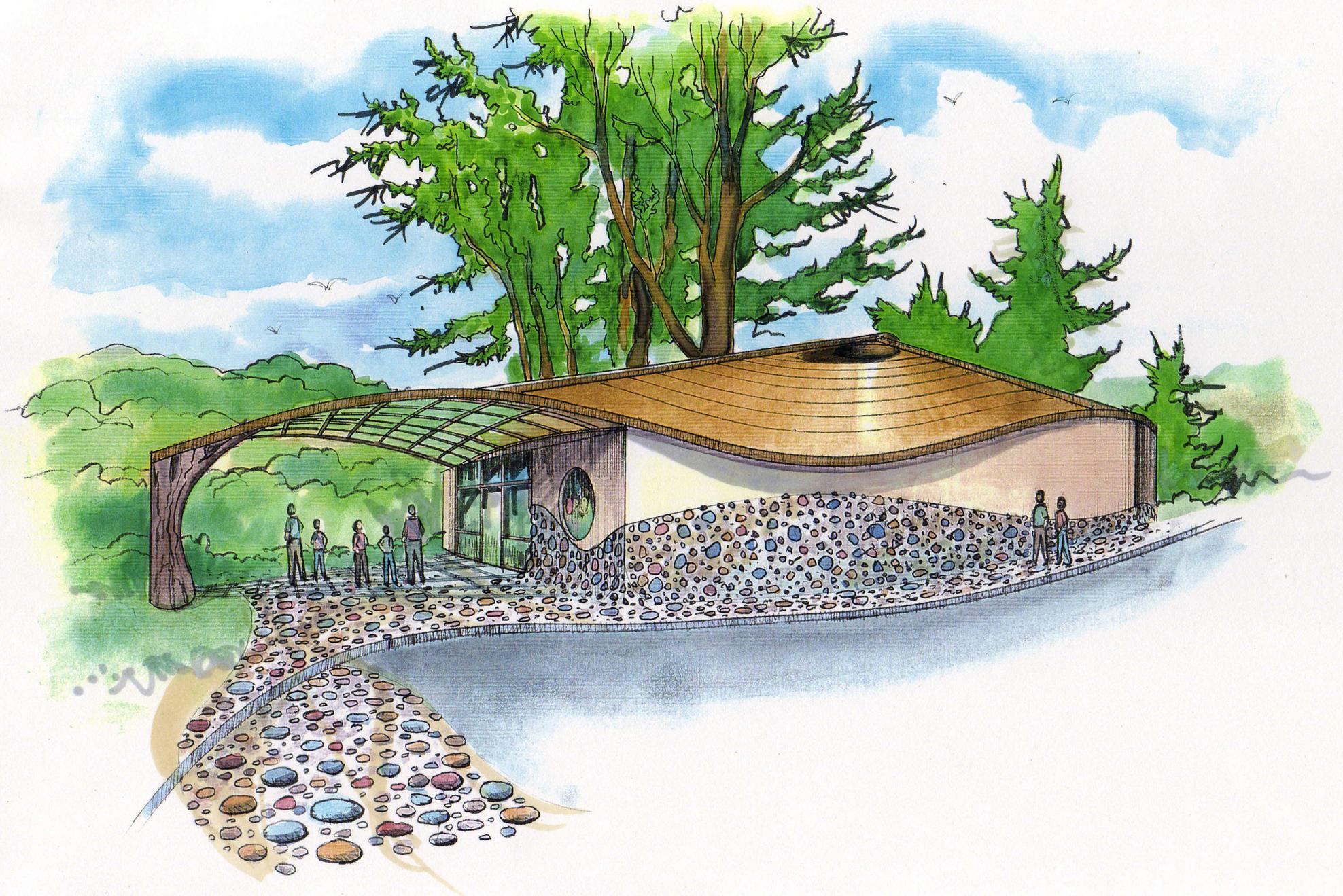
The docent all-purpose room provides space for docents to gather, prepare for programs, and retreat from the cold winds. The room contains a “mini-kitchen” with the capacity to handle informal meal events held in either the classroom or the outdoor staging area.

A “single occupancy” ADA restroom is provided for staff and docents, as well as for visitors on an emergency basis. The existing restroom building across the parking lot will continue to serve the public.

The classroom or “Reef Lab” is envisioned as a flexible room that can accommodate small groups of students watching an introductory video or working at various lab stations. Countertop space and cupboards provide display and storage space for lab equipment such as microscopes, charts and scientific models. The room can be set up in a variety of ways to function as lecture hall, docent training room, classroom laboratory, and small dining hall for docent functions. Adjacent storage rooms are available for tables, chairs, and larger equipment. Counters will have lockable storage below as well as above. Multiple exits add flexibility, enabling groups to move to, from, or between the outdoors, the classroom, the lobby and/or the gallery without disturbing others.

**Fitzgerald Marine Reserve
Education Building
Floor Plan**





Building Character

The Education Center has been designed to be integral to this remarkable ocean site. The building appears to grow out of the ground in a handcrafted, organic design that is sensitive to interpretive themes, the site, and the neighborhood. A low-profile roof, resembling a keyhole limpet and extending into a wave-like curvilinear entry arbor, reflects an ocean motif. The arbor itself, supported by a sculpted column in the shape of a cypress tree, echoes the forested bluffs, while carefully placed landscaping echoes the Reserve's upland areas. Sea-worn stones and a roof of copper or recycled rubber shingles lend texture and subtle color. The design intent is to honor the non-developed, natural aesthetic so valued by Fitzgerald visitors.

Opposite page: Education Center Building

Best Management Practices

The project should employ best management practices (BMPs) to contain and manage all storm water runoff at its source. The conceptual plan calls for adding approximately 10,000 square feet of additional driving, parking and walking surface to the site. It is a goal that some of this surface be pervious to encourage surface water to percolate into the ground. However, it will be necessary to conduct a percolation test at the site to determine that such a system will be feasible.



If the final plan adds more than 10,000 square feet of impervious surface, it will be necessary to apply for a National Pollutant Discharge Elimination System permit from the Regional Water Quality Control Board. If project construction will disturb more than an acre of land, a State General Construction Activity Permit will be required as well as the submission of a Notice of Intent and preparation of a Storm Water Pollution Prevention Plan.

In addition to permeable paving, it is suggested that additional practices such as vegetated bio-strips and bioretention areas be incorporated to assure water quality.

Sustainable “Green” Design Considerations

San Mateo County has established the following fifteen priorities to help create more sustainable environments:

1. Respect the site
2. Save water and reduce local water impacts
3. Reduce, reuse & recycle
4. Make concrete with sustainable materials
5. Design to save wood and labor
6. Support sustainable forests
7. Make a sustainable roof
8. Support healthy environments and sustainable forests
9. Save energy through passive design
10. Save water and energy in plumbing systems
11. Reduce environmental impacts from materials production
12. Save energy in lighting
13. Save energy in equipment use
14. Save energy through passive design
15. Replace fossil fuel use with alternatives

In accordance with these guidelines and in the spirit of the stewardship ethic interpretive programming is meant to foster, the design premise for the Center is to create an environmentally sustainable structure. Architectural features will use or accommodate sun, wind, rain, shade, and natural day lighting in ways that conserve natural resources and lend comfort to visitors, staff, and docents.

Materials and equipment should be selected for their appropriate benefits and may include:

- | | |
|-----------------------------------|---|
| Use of locally produced materials | Ease of maintenance and vandal resistance |
| High-performance windows | Use of recycled materials |
| Reduced energy demand | Under-grounding of utilities |
| Solar heating | |

Additional information and guidelines can be found in the booklet *San Mateo Countywide Sustainable Buildings Guide*. Please see Appendix H, References Cited, for more information.

Exterior Improvements

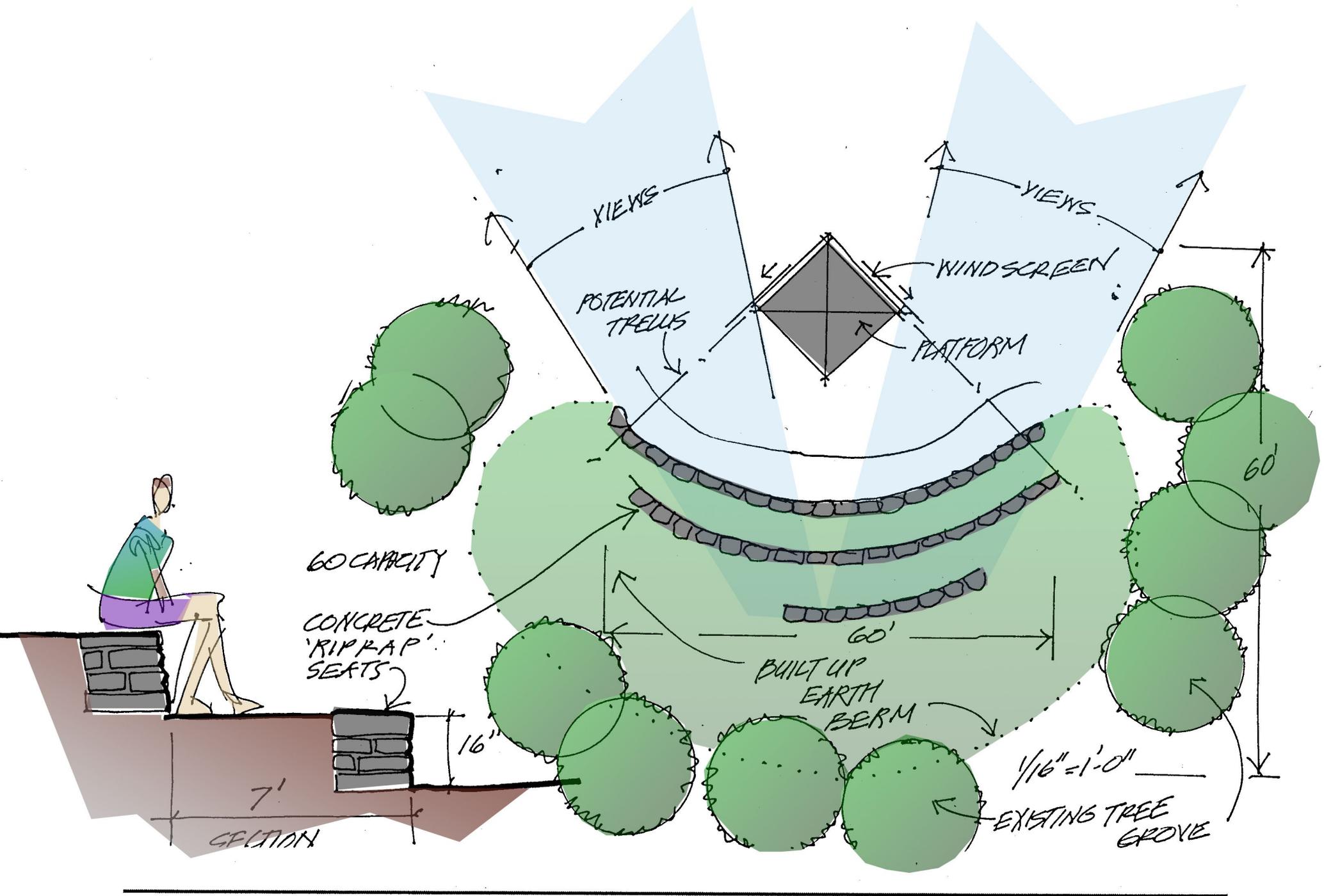
Existing restroom building

The restroom building near the parking area is sound and functional. However, a facelift utilizing trelliswork and ocean cobble walls is recommended. With the addition of a long slat bench, an appropriate water supply and drains, the exterior of the building can also serve as a foot-washing area, a need strongly voiced by members of the education community.



Picnic area

When interviewed, neighbors and docents expressed concern that a structure within the cypress-shaded picnic area would detract from the relaxed, casual feeling of the site. Most visitors, including school groups, prefer to sit in small group gatherings, not in large spaces with formal seating. A casual assortment of picnic tables and log seating would be manageable and aesthetically pleasing.



Outdoor Classroom

As illustrated by the drawing on the facing page, this is conceived as a small informal amphitheater, with a raised stage and slide out windscreens. Seating will be constructed out of dry-stacked recycled concrete pavement or rip rap, which gives an attractive, natural look.



The photo at left shows an example of recycled concrete rip rap (in this case used with mortar to create a garden wall).

Opposite page: Outdoor Classroom/Amphitheater

Footbridges and Ramps

Permanent Footbridge

The old footbridge which once crossed San Vicente Creek has been washed away in a storm. To reach upland areas of the Reserve, including the forested bluff south of the creek, visitors must cross on a fallen log far upstream of the eroded arroyo at California and Lake streets.

Access will be restored by a new footbridge located at the existing informal creek crossing near the end of California Street. The bridge will create a convenient link between the parking/picnic/Education Center area and the “upland portions” of the Reserve, including Reserve trail systems and a new marine mammal overlook station (see page 52).

The bridge will incorporate a widened “pullout” area at the midpoint of the span and an interpretive panel. This is an ideal place to help visitors understand the connection between upstream processes, erosion, water quality, and the health of the reef downstream.

Portable Ramp and Beach Wheelchair

Currently, the reef at Moss Beach is reachable by a dirt path ending in a steep descent that requires picking one’s way across the mouth of San Vicente Creek. This is the Reserve’s most popular access point. But for visitors with balance or mobility problems, the steep terrain, wet creek crossing, and uncertain footing create insurmountable barriers to visitation. Unfortunately, hydrologic and topographic conditions here preclude permanent improvements. However, use of a small portable ramp, removable when storm conditions threaten, should be investigated as an alternative. Additionally, it is recommended that the County make a specially-designed beach wheelchair available to visitors by reservation. Easily disassembled to fit into a car trunk and outfitted with balloon tires that roll on sandy surfaces, such chairs are used successfully at other coastal sites such as the Guadalupe-Nipomo Dunes near San Luis Obispo.



Landscaping

In order to preserve the beauty and health of the cypress tree grove at the picnic area, existing trees should be thinned out to provide light and room so that remaining trees can branch out more vigorously. A certified arborist should be engaged for this work.

Appropriate landscaping that is native to the coastal region should be selected for landscaping the building and grounds. Plants from *The Natural History of the Fitzgerald Marine Reserve*, published by the Friends of Fitzgerald Marine Refuge, would make an appropriate palette. Some of the species are:



Achillea millefolium – Asteraceae (Yarrow)
Angelica hendersonii – Apiaceae (Angelica)
Baccharis pilularis – Asteraceae (Coyote brush)
Camissonia ovata – Onagraceae (Sun cups)
Carex sp. – Cyperaceae (sedges)
Dudleya farinosa – Crassulaceae (Dudleya)
Equisetum telmateia braunii – Equisetaceae (Horsetail, Scouring rush)
Eriogonum latifolium – Polygonaceae (Coastal buckwheat)
Eschscholzia californica – Papaveraceae (California poppy)
Erigeron glaucus – Asteraceae (Seaside daisy)
Eriophyllum staechadifolium – Asteraaceae (Lizard tail)
Fragaria chiloensis – Rosaceae (Strawberry)
Grindelia stricta platyphylla – Asteraceae (Grindelia, Gum plant)
Iris douglasiana – Iridaceae (Douglas iris)

Juncus sp. – Juncaceae (Native rushes)
Lasthenia californica – Asteraceae (Goldfields)
Layia platyglossa – Asteraceae (Tidy tips)
Lupinus variicolor – Fabaceae (Varicolor lupine)
Lupinus arboreus – Fabaceae (Yellow bush lupine)
Mimulus aurantiacus – Scrophulariaceae (Sticky monkey flower)
Polystichum munitum – Dryopteridaceae (Sword fern)
Potentilla glandulosa – Rosaceae (Cinquefoil)
Ranunculus californicus – Ranunculaceae (Buttercups)
Rhamnus californica – Rhamnaceae (Coffeeberry)
Salix sp. – Salicaceae (Willow)
Scrophularia californica – Scrophulariaceae (Bee plant)
Sidalcea malvaeflora – Malvaceae (Checker bloom)
Sisyrinchium bellum – Iridaceae (Blue-eyed grass)
Vicia Americana – Fabaceae (American vetch)
Vicia gigantea – Fabaceae (Giant vetch)

Paving

There is an excellent opportunity to repeat the handcrafted character in enriched “hardscape” paving by reinforcing the ocean theme with ocean-worn flat stones. The photograph below, taken at a private home, illustrates the concept. To ensure full access, stone-paved surfaces must comply with the Americans with Disabilities Act.



Part III
Interpretive Plan

Rationale for Interpretation

Fitzgerald Marine Reserve is celebrated for its rich biological diversity, its intriguing human history, and its opportunities for education and inspiration. It is place where land meets sea—where the rhythm of tides and moon pulls the ocean, creating an eternal ebb and flow of water upon the reef.

Here, where the forces of nature can be brutal, marine life forms have, over millions of years, adapted to the pounding of waves and the endless fluctuations of temperature and salinity. They have endured other forces as well, including those of human predation. For nearly 6,000 years, the Ohlone frequented this region to harvest abalone and other shellfish. Later, Bay Area visitors traveled by railroad to Fitzgerald to fish, harvest food, and collect mementoes, while students from the University of California, Berkeley used the reef as a field station.

By the early 1960s, concerns were being raised that tidepool ecology was being affected by harvesting and other inappropriate visitor behaviors. Further, the site had become known as a destination for recreation and education. Despite state designation as a Marine Life Refuge, visitors continue to have a negative impact on this area. Whether oblivious to the regulations or simply defiant, some visitors harass marine mammals in an attempt to get a close look, or damage tidepools and destroy microhabitats in an attempt to collect a souvenir. Even those who try to select what they believe are empty shells often discover, once home, that they are in fact occupied—by a dying creature.

The process of influencing visitor behavior is complicated. Social science research indicates an assertive approach is not necessarily the most effective means of intervention. It also suggests that any lasting change in visitor behavior is not necessarily attributable to any one influence. At Fitzgerald, therefore, multiple interpretive opportunities must be offered, all aiming to inspire a change in self-perception. If successful, such an approach may, with time, help visitors see themselves as stewards of the reef, and the reef a rare and finite ecological gem.

In this conceptual interpretive plan, specific media are identified to guide this process. New interpretive stations along the California Coastal Trail, outdoor interactive exhibits at Moss Beach and Pillar Point, marine mammal viewing stations, and a new Education Center with classroom and gallery will serve to help visitors understand how marine organisms can be so tough yet so fragile, and how their own behavior can have an impact on Fitzgerald's landscape and reef.

Interpretive Themes and Subthemes for Fitzgerald Marine Reserve

Interpretive themes, goals, and objectives as identified in this plan provide the foundation for all interpretation at Fitzgerald. These in turn are guided by the goals of the Reserve's Master Plan: to preserve and enhance natural resources, and to provide educational opportunities. In this light, the following interpretive framework is offered.

Central Theme

While Fitzgerald's marine life responds well to the forces of nature, it responds less well to the forces of human behavior. Individual and collective stewardship of the Reserve is essential to ensure its long-term health and integrity.

Subthemes

Fitzgerald's reef and its rich array of species are well adapted to the continual changes created by the forces of nature.

Tidepool life is less resilient to changes caused by humans, including handling, collecting, trampling, stream pollution and erosion.

The decline in abundance and diversity of its tidepool species is a rallying call for the Reserve's protection, preservation, and restoration.

People have been connected to this extraordinary place for thousands of years.

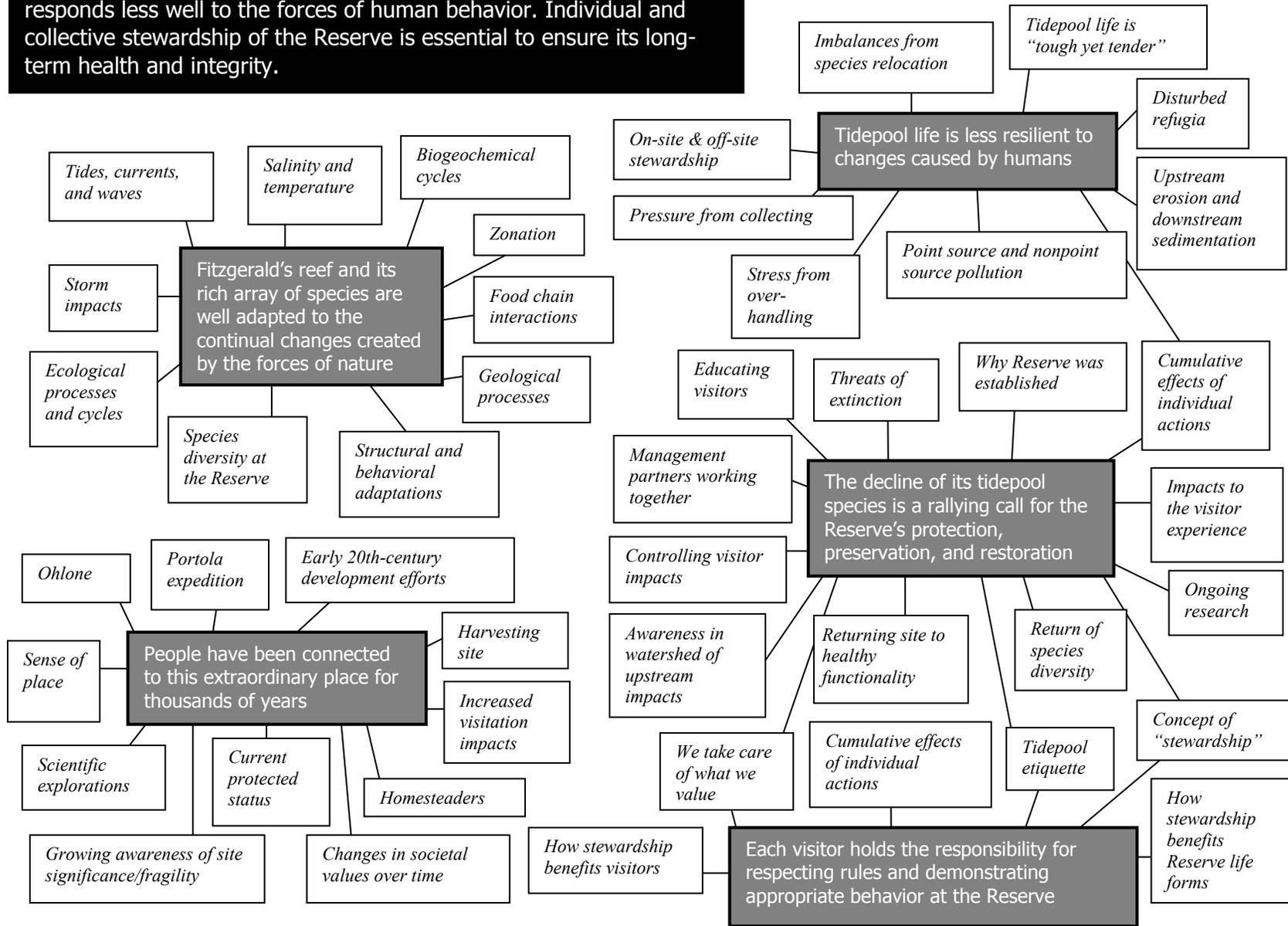
Each visitor holds the responsibility for respecting rules and demonstrating appropriate behavior at the Reserve.

The theme is the overarching or key concept that visitors should understand and retain after participating in interpretive opportunities at Fitzgerald. The five subthemes act as subordinate concepts that reinforce and expand on the theme. As such, they form the specific basis for the development of storylines as expressed in exhibits, programs, and other interpretive experiences. Thematic material represents key concepts, not specific language for exhibits. The theme and subthemes will not necessarily appear verbatim in interpretive exhibits or other media. Rather, they serve as a road map to guide the development and subsequent evaluation of media and programs.

The schematic on the next page illustrates how Fitzgerald's theme (black box) and subthemes (gray boxes) relate to subject matter identified by the project's Design Committee as key topics for interpretation (white boxes). By aligning all exhibits, wayside panels, and programs to one or more interpretive subthemes, each visitor is assured of their opportunity to discover the meaning of this special place. As may be seen, some topics encompass more than others and will support several storylines. By the same token, topics can serve to illustrate more than one subtheme.



While Fitzgerald's marine life responds well to the forces of nature, it responds less well to the forces of human behavior. Individual and collective stewardship of the Reserve is essential to ensure its long-term health and integrity.



About Interpretive Goals and Objectives

Goals are statements of desired outcomes that guide programs and management or operations functions. Interpretive goals articulate what interpretation is meant to do for a site, its visitors, and its management. They guide the formation of interpretive media and services during the planning process and permit accurate and meaningful evaluation of interpretive programming before, during, and after development.

Objectives support goals in specific, quantifiable terms. Objectives first serve to guide the design and implementation of all interpretive media and messages. They also allow managers and planners to test messages, programs, and media before investing resources in their full-scale development. Finally, after development and implementation, interpretive objectives provide the framework for ongoing evaluation of media and program effectiveness.

Interpretation is meant to increase awareness and understanding, build personal connections, and foster stewardship behaviors that help manage and protect resources. To do this, interpretation must address both the cognitive and affective realms – the logical as well as the feeling aspects of the mind. People will not make behavioral changes if they only understand an issue; they must also feel that the topic has some relevance to their lives and that a behavioral change will bring one or more valued benefits.

Every interpretive experience should be designed, therefore, to have an emotional or affective component as well as an intellectual or cognitive component, leading ultimately to a desired behavioral change.

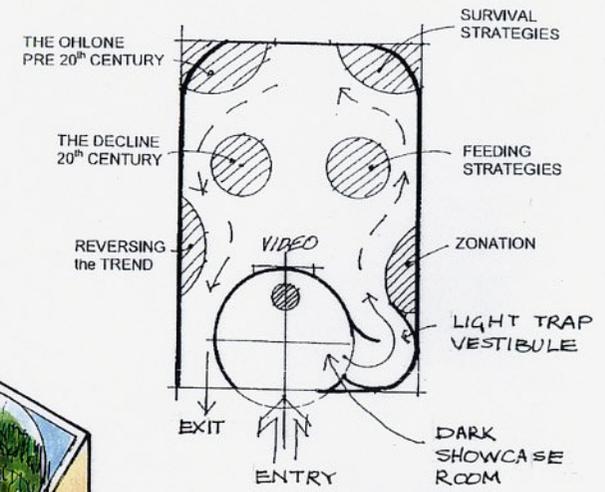
Please refer to Appendix C for details of specific interpretive goals and objectives.

Organization of Interpretive Resources

Interpretation at Fitzgerald Marine Life Reserve falls into four categories: interior media associated with the Education Center; exterior components around the Center; wayside interpretive panels along trails and at Reserve entry points; and school programs, and programs for the general public. This plan addresses all four categories. Exhibits, panels, and other media are discussed in this chapter; education programs and other personal programs are examined in Part IV, Personal Programs.

Functions of the Fitzgerald Education Center

Proposed exhibits are designed for the casual visitor as well as the student charged with a specific task. The Center is a place for reflection, enlightenment about the region's marine environment and Fitzgerald Marine Reserve in particular, and a source of enjoyment within a quiet recreational context.



Exhibits at the Education Center

Interior Space

Molluscan metaphors

To enter the Gallery, the visitor first moves through a darkened alcove where tidepool sounds are piped in. Here, dramatic spotlighting showcases a model of a living red abalone attached to a rock substrate. An interpretive panel with a poetic or inspirational quote sets the mood and introduces the storyline.

The abalone is an icon for Fitzgerald that serves as a symbolic link tying the Center’s interior exhibits together. This rugged animal sustained the Ohlone as food; its iridescent shell enhanced their culture. It is readily recognized by the visitor, serves as an indicator of ecosystem health, displays fascinating adaptations, and is commercially valuable.

Yet the very attributes that give the abalone its significance have placed it in a precarious position. Though a powerful animal with an iron grip, it is a species hovering at the edge of survival. Like Fitzgerald, it is a beautiful piece of nature that is tenacious yet vulnerable. Both are recovering from crisis; both, with intervention, are moving toward restored health and a thriving future.

Leaving the alcove to the right, visitors enter the larger exhibit room where exhibits are on display, as follows:

Opposite page: Artist’s Rendering of Exhibit Gallery



1. Alcove

dramatic spotlighting showcases a model of a living red abalone attached to a rock substrate. The alcove is otherwise dark with the exception of an interpretive panel that, through the use of a poetic or inspirational quote, sets the mood and presents the storyline. Tidepool sounds are piped in. Visitors enter the larger exhibit room through the right entrance.

2. DVD station

A screen offers on-demand or loop video programming (DVD) about the Reserve.

3. Zonation: life in the splash lane

Replicated splash zone rockwork depicts organisms and introduces the concepts of zonation using an *I Spy* approach.

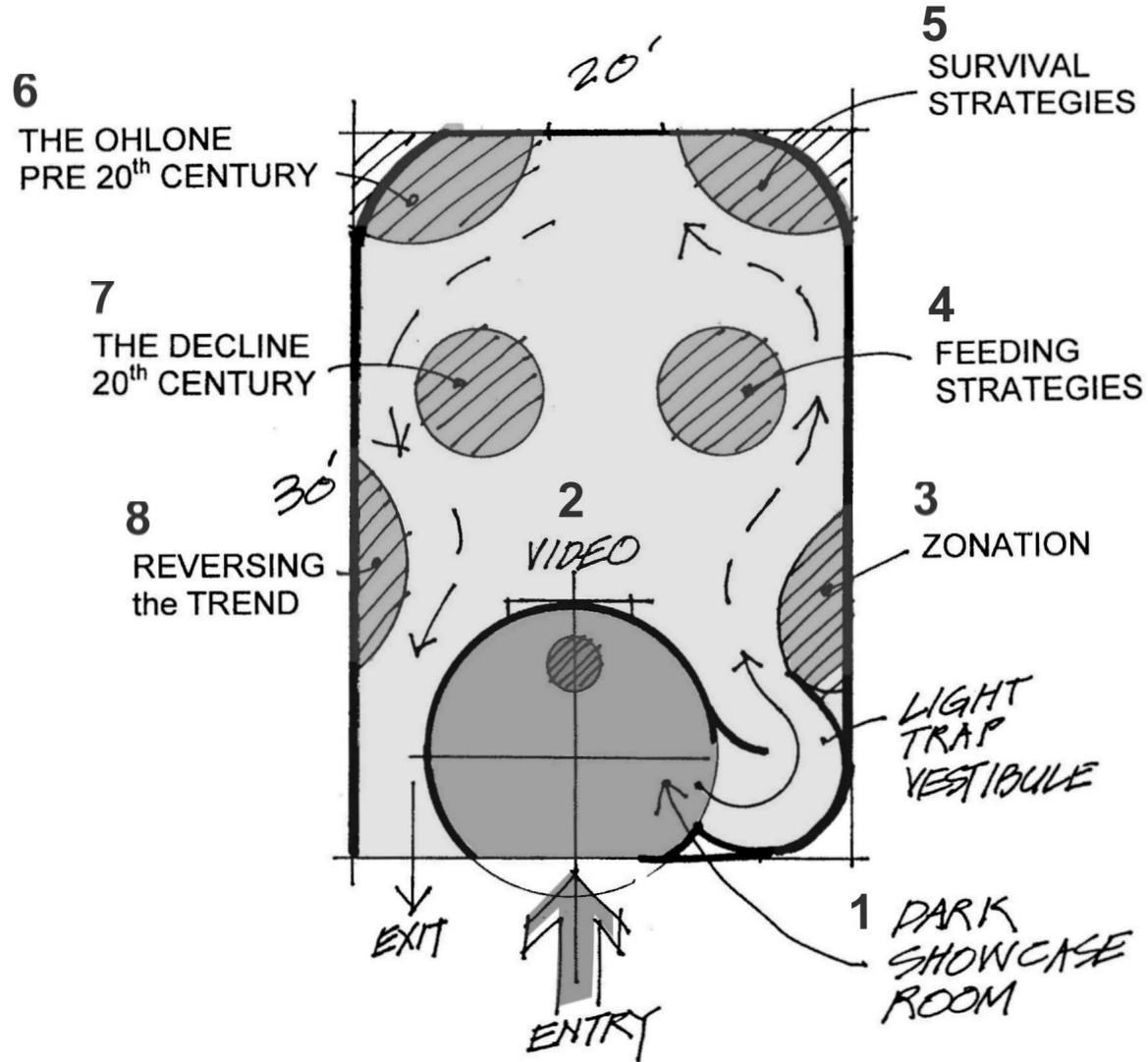
4. Feeding strategies: grabbers and grazers

The feeding strategies of a larger-than-life crab, sea star, sea urchin, anemone, barnacle, and abalone are highlighted in this interactive display.

5. Survival strategies: feet and fins

The foot of a mollusk, tube feet of echinoderms, fins of fish, and other forms of locomotion are explored in this interactive display.

Schematic Exhibit Plan



6. The Ohlone: pre-20th century human dependence

Abalone shells, abalone fish hooks, abalone bead-decorated baskets, and hanging dried fish and shellfish meat are among the many replicated artifacts seen next to a quarter-section tule Ohlone dwelling. The visitor is challenged to locate them and identify their use, using flip lids and bas relief material as their clues. Interpretation focuses on historic subsistence harvesting of tidepool animals for food and material culture, and current traditions.

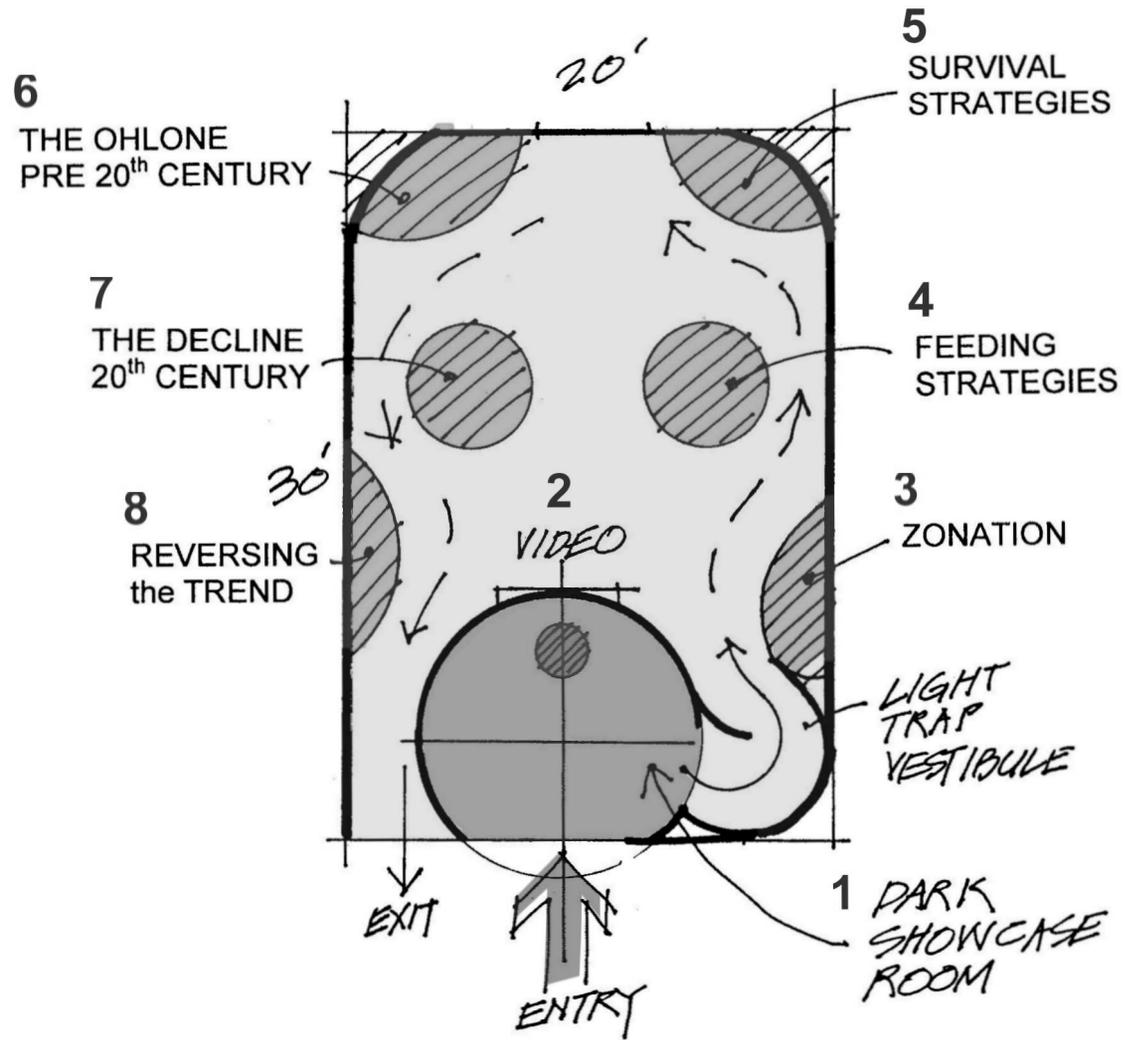
7. The decline: 20th century exploration, development, and misuse

European settlement, commercial and recreational development, and the increase of human-caused stressors are introduced through sepia-toned photographs, audio recordings, three-dimensional material (such as a Styrofoam ice chest of discarded items such as fishing line) and interpretive panels.

8. Reversing the trend: research and stewardship at Fitzgerald

Fitzgerald is showcased as a hotspot of biological diversity. Past and current research studies and measures to protect fragile marine resources are interpreted through text and sepia-toned and full-color photographs. The visitor is challenged to identify and embrace low impact visits to the reef.

Schematic Exhibit Plan



Graphic Panels on Building Exterior

It is unlikely that the Education Center will be open daily. To accommodate the needs of visitors when the Center is closed, the following media will be mounted on the exterior of the building itself:

Current schedule of activities, contact information, and Reserve-wide orientation information including a trail map marked with approved access points.

Donor acknowledgments

Panel on ownership, management, and context within the National Marine Sanctuary system

Grounds Adjacent to the Center

Outdoor Sculpture Garden

To further serve visitors outside the Center, an interactive outdoor sculpture garden is envisioned near the building. Part interpretive tool and part playground, the Sculpture Garden beckons young visitors to explore and discover. Larger than life sculpted and stained concrete tidepool animals, including colorful monkey-faced eels, ochre stars, and giant green anemones are positioned in their correct intertidal zone--low tide, middle tide, and high tide – and identified and described on brief interpretive panels.

In addition to serving as a kinesthetic experience for younger children, the sculpture will be an effective teaching tool for docents. Orientation to the reef can take place here on the bluff, where the structural adaptations of fragile life forms can be pointed out and explored prior to reaching the delicate ecosystem below.

To ensure safety and full access, playground matting encircles the entire structure.

Opposite page: Artist's Rendering of Outdoor Reef Sculpture



Exterior Media

Reaching Visitors through Layers of Information

The rich array of enjoyable learning experiences available in and around the Education Center at Moss Beach will not be sufficient to accomplish the interpretive goals for this project. Other ways of reaching visitors will be needed.

Some visitors to Fitzgerald MLR may not partake of Education Center exhibits or a docent-guided experience. The Center may be closed during their visit, for example, or in use by school groups; additionally, some people tend to prefer to experience a site on their own terms.

People also vary in attention span, learning preferences, and learning styles. Visitor studies and experience demonstrate that a multi-layered communication effort is the most effective tool to raise awareness of issues, guide behavior, preserve a quality experience, and foster a sense of stewardship toward site resources. The plan envisions outdoor interpretive signage at key points to provide additional avenues of communication.

Moss Beach

As the most-visited feature of the Reserve, Moss Beach Reef is the highest priority for a multi-pronged approach to interpretation.

Tidepool Interpretation

Interpretive Panels

Moss Beach visitors, after having an opportunity to view and interact with the outdoor sculpture adjacent to the building, will move toward the reef. Along the path they will encounter a series of attractive and visually compelling

outdoor panels made of porcelain enamel. The panels discuss reef ecosystems, fragility, and restoration efforts—linked, where appropriate, to wildlife observation tips and visitor etiquette.

Regulatory messages should be incorporated within this series, phrased to simultaneously acknowledge the cooperation of the majority of visitors, who abide by Reserve rule, and clearly warn potential violators of the consequences of their actions. An important subliminal by-product of this approach will be to create in visitors with less-than-honorable intentions a sense that their actions are being observed by their peers.

Visual communication will be key to the success of these panels. Graphic imagery illustrating permitted vs. banned behaviors (including the use of buckets and nets) will guarantee intelligibility for visitors regardless of language preference.



Existing signs (above) will be replaced by new, graphically- and thematically-unified panels of durable porcelain materials.

Interpretive Brochures

Of all interpretive amenities offered during the on-site visitor survey, the highest-ranked was a waterproof brochure for use at the tidepools. An image-filled, laminated tri-fold brochure developed specifically for use at Fitzgerald should offer a species identification guide on one side and brief messages on ecology, protection, and tidepool etiquette on the other. A high quality product that can withstand climatic conditions and rough handling by visitors is recommended. The brochures should be purchasable at a nominal cost, and also be made available on a short-term loan basis, perhaps using a cash deposit as collateral. If attractive and durable, the brochure will make a valued memento for purchase in the gift shop. This option would allow the Reserve to recoup development and printing costs over time.

To ensure their availability when the Center is closed, and for the convenience of visitors who prefer to use other entries to the Reserve, the brochures should also be available for purchase elsewhere in the mid-Peninsula region.

Footbridge over San Vicente Creek

The new footbridge over San Vicente Creek will offer a prime opportunity to interpret upstream processes and their relationship to reef ecology and health.

A pullout area will be created mid-bridge with space for a low-profile panel at the railing. The panel will link water quality, erosion, flooding, and sedimentation processes to the reef below, helping the visitor to understand that stewardship of reef resources begins at home.



Marine Mammal/Reef Overlook Stations

Two excellent opportunities exist for the interpretation of marine mammals. Currently, on busy weekends, docents set up a spotting scope on a terrace near the end of the Moss Beach entry path. Visitors on their way to the reef are invited to spot seals and sea lions while docents offer tips on observation skills, and share information about marine mammals, and convey reef etiquette messages. This personal interaction provides a quality interpretive experience that should be continued.

However, because the program relies on volunteer staffing, which is not always available, this plan envisions a second, non-staffed approach that provides opportunities for visitors to observe marine mammals and learn about non-intrusive ways to enjoy them.



Just south of San Vicente Creek, a grassy bluff rises above Moss Beach. Here one can observe the ocean, enjoy the view, and watch others at the tidepools and beach below. If marine mammals are in the area – pinnipeds basking on rocks, otters plying the waters, or whales in migration – they are easily seen from this vantage point, providing a satisfying experience without contributing to the disturbance of their habits. This is an ideal site for a permanent marine mammal watching station. One or two mounted viewscopes can aid visitors and attract them to the site, which is visible from the Education Center as well as Moss Beach. Nearby, one or two panels should discuss marine mammals, provide useful spotting tips, teach marine mammal/human encounter etiquette, and invite the reader to observe and interpret the behavior of any basking or floating animals below.

The station will provide an alternate attraction to the reef, helping to reduce visitor impacts to this sensitive resource. It will also provide excellent wildlife watching opportunities, create awareness and understanding of the importance of avoiding resting animals, and introduce visitors to upland areas of the Reserve. In order to be effective, this station must be attractive and inviting and provide an enjoyable, quality experience considered worth the walk up the hill.

Other Reserve Entries and Trailside Features

Fitzgerald Marine Reserve's narrow, three-mile-long shape and highly permeable boundary present challenges for its managers. The eastern border of the Reserve abuts a multitude of properties with widely varying land uses, including residential, commercial, aeronautical, military, and marine. In addition to the two "main" entry points to the Reserve – Moss Beach in the northern section and Pillar Point Marsh at the southern end – there is a well-used informal entry to Seal Cove at the end of Cypress Avenue in the central portion of the Reserve, an overlook area at the Distillery Restaurant parking lot at the south end of Seal Cove, and, just north of the Pillar Point Marsh parking lot, an access point to the bluff trail above Ross Cove.

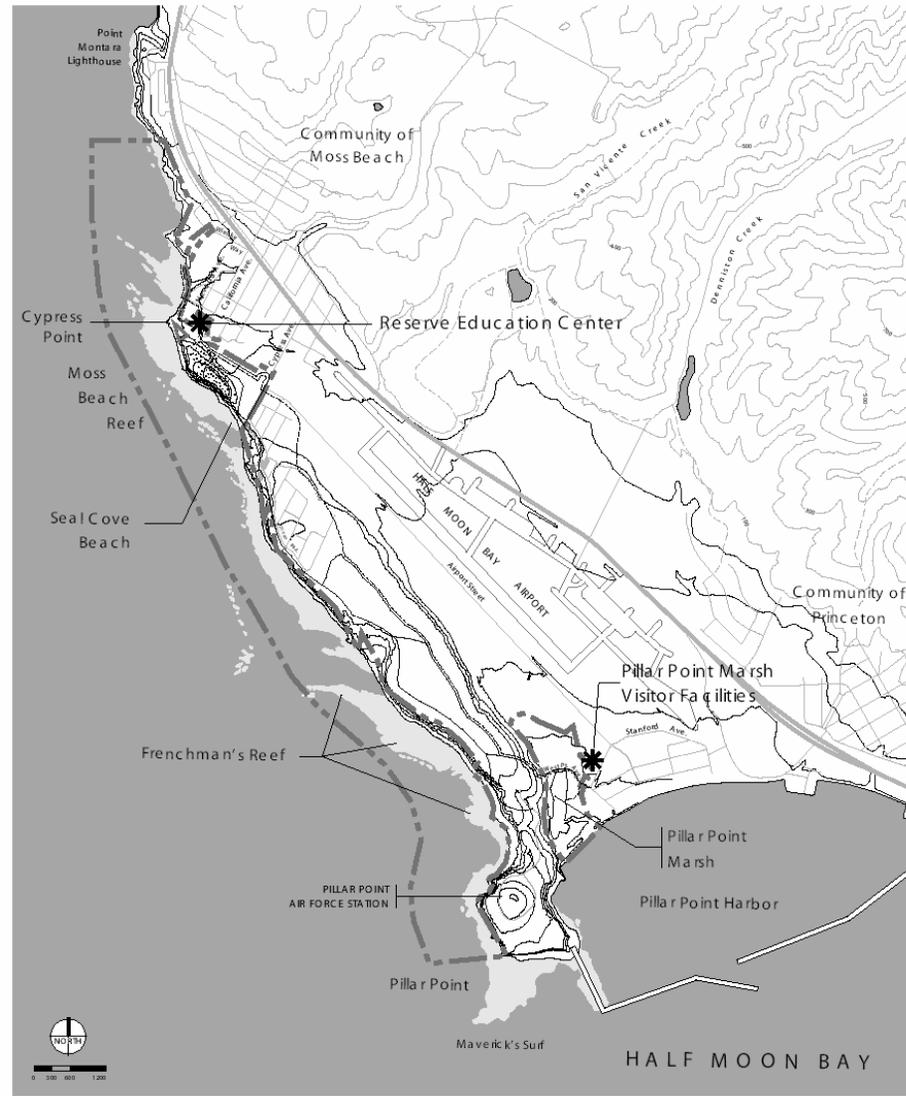
This last site is a high vantage point for those who wish to observe the rare but popular "Maverick's Surf" event taking place offshore. An unofficial and very steep trail near this point leads down to the beach at Ross Cove and provides access to Frenchman's Reef to the north.

In addition to these popular sites, there are several low-use defacto entry points created by local residents all along the Reserve's eastern boundary.

Although the majority of visitors use the Moss Beach or Pillar Point entries, in part due to the parking and sanitation facilities available there, many do not. Survey data, discussion with staff, and casual contact with frequent visitors indicate that local residents tend to favor one access point for repeat visits. These entries are mainly chosen for their proximity to user residences, as they provide easy entrée to trails or beaches. Additionally, non-local and traveling visitors are sometimes directed by friends, innkeepers, etc. to such access points as an alternative to Moss Beach and Pillar Point.

Interpretive signage at alternative access points can help ensure that stewardship messages reach all visitors, not only those who visit the Education Center. This plan envisions the installation of interpretive signs at Seal Cove and in the Pillar Point and Ross Cove areas. A general location map and specific topics for each site follow.

Overview Map Fitzgerald Marine Reserve



- Existing Boundary, Fitzgerald Marine Reserve
- Existing Trails
- - - Proposed Trails, approximate location
- - - - Proposed California Coastal Trail, approximate location
- ▨ Cypress Grove
- Intertidal Zone

Source: Brady LSA, June 2002

**Fitzgerald Marine Reserve
Northern Section
Outdoor interpretive features**

Moss Beach Reef

- Welcome arbor
- Outdoor Reef Sculpture
- Regulatory and reef etiquette panels

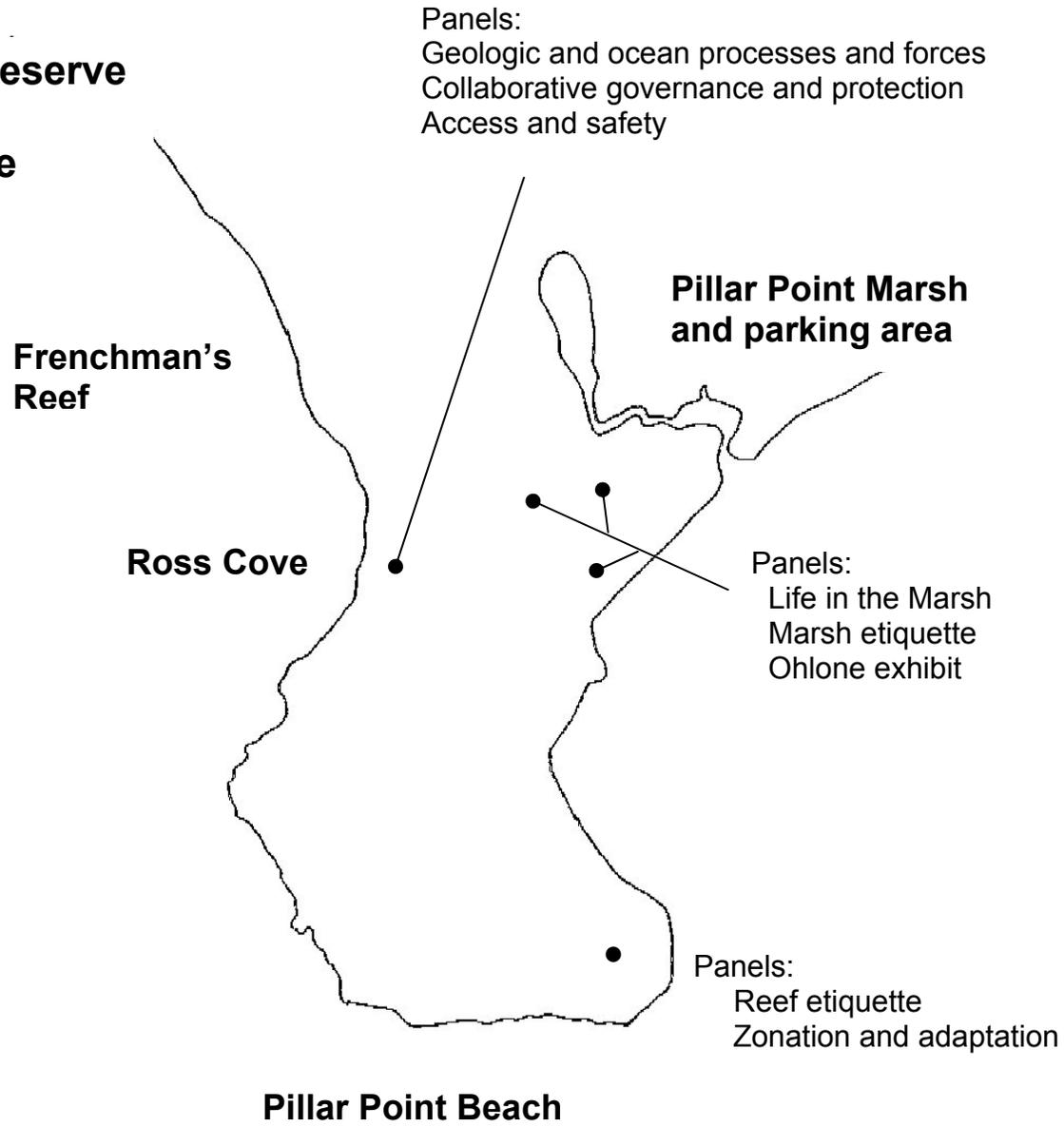
Cypress Point

- Footbridge panels (geology, river processes, water quality)
- Marine mammal overlook station with scope and panels (behavioral adaptations, visitor etiquette)

Seal Cove

- Panels: human ties over time

**Fitzgerald Marine Reserve
Southern Section
Outdoor interpretive
features**



Seal Cove (Cypress Avenue entrance)

This entry, mid-point along the Reserve’s eastern boundary, is popular with local residents. Earthen steps down to the beach and reef are scheduled for replacement in 2005 or 2006, improving the safety of this site.

In addition to beach access, this entry point provides admittance to the bluff trail which leads north through the cypress woodland to Moss Beach. Seal Cove offers an inviting stretch of trail along the forested bluff, sweeping views, a protected beach, and reef access. Many local visitors use Seal Cove as their primary access to the Reserve. The trail from Moss Beach to Seal Cove is a popular amenity.



Thanks to its long and varied history of human use, Seal Cove lends itself particularly well to interpretation of people’s relationship with the reef over time. Here, the remains of the Smith-Dolger homesite can be traced in the feral vegetation surrounding a long-disintegrated foundation. The area was part of a resort development dream that began in the 1880s and is still traceable in planted cypress groves and historic tourism facilities such as the Distillery Restaurant. Seal Cove was used by smugglers, rowing small boats under cover of darkness, to import liquor during Prohibition. From the bluff and beach, visitors have an excellent view of the World War II-era signal marker still standing sentinel on the reef. The Reserve has also served as a living laboratory for biologists for a hundred years.

Interpretive panels at the entry to the Seal Cove area of the Reserve can interpret these stories. In accordance with the Reserve theme and subtheme, they should be framed in the context of people’s changing relationship with this place over time, culminating in today’s recognition of the site’s significance, fragility, and worthiness of protection.

California Coastside Trail

Also known as the California Coast Trail, this portion of the trail will eventually connect Pacifica with Half Moon Bay. Part of the future trail, fenced along its alignment to protect sensitive Reserve elements, will pass through the Reserve. Only pedestrian users will be allowed into the Reserve from the trail, at approved entry points. Coastal Trail users can have a significant impact on Reserve resources. They will need to understand the sensitivity and importance of the Reserve, limits on visitor activities, and how to visit the Reserve properly. Interpretive signage at entry points can educate and inform trail users, reducing impacts and preparing trail users for future visits to the Reserve.



Pillar Point Beach and Reef

Adjacent to the Reserve and often a portal to it, Pillar Point is a site rich in seal haul-out areas. As it is also a popular destination for beachgoers, reef enthusiasts, and pet owners, this site merits panels on zonation, adaptation, and visitor etiquette, with particular emphasis on dog owner responsibilities toward marine mammals resting on the beach. For longevity, the panels should be placed where storms and tides will have minimal effect.

Pillar Point Marsh

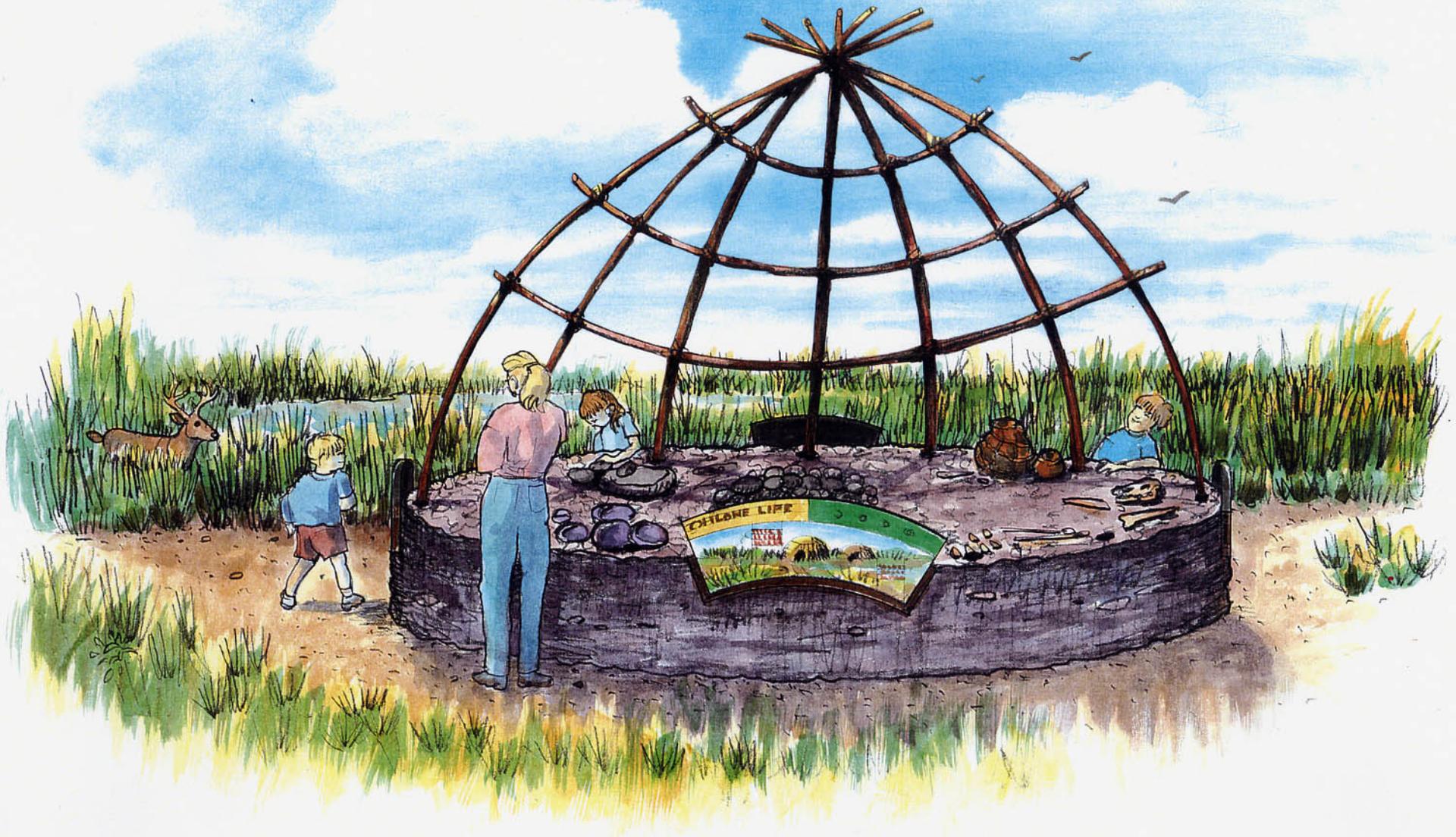
The Marsh at Pillar Point is a small but ecologically significant feature of the landscape. With existing and future parking facilities very close by, the marsh is vulnerable to impacts from uninformed visitors, particularly those who walk their dogs along the county's Harbor District trail to Pillar Point beach and reef. Aging signage along the harbor trail currently discusses marsh bird life. The plan envisions replacement of these signs with new panels that convey Reserve subthemes relating to life in the marsh, marsh etiquette, and restoration and protection activities.



Ohlone Exhibit at the Marsh

A recent discovery of archeological remains of Ohlone settlements near the marsh provides an interpretive opportunity to illustrate the subtheme “People have been connected to this extraordinary place for thousands of years.” Interpretation takes the form of a replicated tule house with concrete bas-relief samples of material culture—basketry, hearth tools, and so forth. Interpretive panels describe daily life of the Ohlone and the significance of the marsh’s resources to their culture and subsistence. Life-size two-dimensional photographic cut-outs of the wildlife that historically supported the Ohlone appear in the reeds; the visitor is challenged to spot them. As with other exterior media, the Ohlone exhibit will be fabricated to withstand weather, ultraviolet radiation, and high use by visitors.

Opposite: Artist’s conception of Ohlone exhibit at Pillar Point Marsh



Ross Cove Overlook

The view along this bluff is astonishing, encompassing nearly everything that relates to Fitzgerald as a protected area in the midst of development—ocean, beach, reef, marshlands, harbor, mountains, and residential and commercially settled areas. The site is a popular spot for spectators during Maverick’s Surf events.

Here, “big picture” oceanic and geologic processes that create and sustain coastal resources can be discussed via a low-profile panel. Collaborative efforts to protect and manage this area can be discussed as well. Safety and reef etiquette issues should be addressed for those who are tempted to use the unauthorized trail down to the beautiful but dangerous coastal area below. Directional signs at this location should recommend better access points to the beach and reef.



Media development costs and a general outline of next steps in the implementation of this Conceptual Plan for Interpretation can be found in Appendix G, Estimated Implementation Costs and Next Steps.

Part IV
Personal Programs

Education Programs at Fitzgerald

Educator Needs Assessment Summary of Findings

In spring 2004, a needs assessment survey of educators was conducted by The Acorn Group as part of the planning process for interpretation at Fitzgerald Marine Reserve. Color-coded surveys were sent to two populations of teachers: kindergarten through college teachers who have visited the Reserve within the past year (identified in this report as Reserve) and third through sixth grade teachers within all school districts in both Santa Clara and San Mateo Counties (identified in this report as general). A combined 4,250 surveys were distributed and 192 surveys were returned, resulting in a response rate of 4.5%.

Eighty-five percent of Reserve respondents (57) and 95 percent of general respondents (119) are classroom teachers. Of the Reserve respondents, 15 percent (10) teach third grade, 12 percent (8) each teach fourth and fifth grade, and 10 percent (7) teach sixth grade. Five Reserve respondents teach at the college level; one teaches kindergarten. Of the general respondents, 30 percent (37) teach third grade, 23 percent (29) teach fourth grade, 13 percent (17) teach fifth grade, and 8 percent (11) teaches sixth grade. The typical Reserve teacher has an average of 16.3 years of teaching experience; the typical general teacher has an average of 12.9 years of teaching experience, indicating both sets of respondents are well-seasoned educators. Respondents identified a combined 138 schools each with representation by one or two teachers. Respondents also identified a combined 56 school districts. While the counts generally remain low for representation, a surprisingly high percentage (13%) of Reserve respondents (compared to less than one percent of general respondents) teach in Pacifica School District and 15 percent of general respondents (compared to one percent of Reserve respondents) teach in Franklin-McKinley Unified School District. Of Reserve respondents, 28 percent (19) report a class size of 20 students, 18 percent (12) report a class size of 30 students, and seven percent (5) report a class size of either 25 or 30 students. Of general respondents, 39 percent (49) report a class size of 20 students, 18 percent (22) report a class size of 32 students, and 14 percent (17) report a class size of 30 students.

Fifty-two percent (35) of Reserve respondents indicate that state standards are the one source of information that most directly influences their teachings, followed by both scope and sequence (18%) and district standards (13%). Sixty

percent (75) of general respondents also indicate that state standards are the source of information, followed by district standards (15%) and adopted textbooks (13%).

In spite of the targeted mailing to past Reserve visitors, six percent of respondents in this group indicated they had not heard of Fitzgerald Marine Reserve. Over half (55%) of the general respondents (69) have heard of the Reserve. Both groups identified friends or family members as their source of information about the Reserve - 53% for Reserve respondents and 26% for general respondents. Among Reserve respondents, 16% cited websites as another source, and among general respondents, six percent cited direct mailings and nearly six and one-half cited district-approved lists.

When asked if they had ever been to the Reserve, 90 percent (60) of Reserve respondents indicated they had, compared to 47% (59) of general respondents. When asked if they taken students on a field trip to the Reserve, 87% (58) of Reserve respondents had, compared to 35% (44) of general respondents. Moss Beach was identified in both populations as the site most frequently visited: 84% (49) for Reserve respondents and 77% (34) for general respondents. Surprisingly, only 42% (28) of Reserve respondents indicated their students had taken a guided tour with Friends of Fitzgerald docents. Eighteen percent (23) of general respondents had participated in this type of tour. Sixty-one percent of these Reserve respondents and 87% of general respondents indicated the Reserve did not seem crowded during their visit.

When asked what two elements would likely improve their students' experiences at the reserve, both populations cited docent stations most frequently, followed by time in the new Center, and descriptive signs. Less than one percent of both populations cited improved access or awareness of rules.

When asked what two elements they would like to see developed at the Center, hands-on learning was cited most frequently: 48% of Reserve respondents (32) and 54% of general respondents (67). Introductory talks, live animals, and exhibit areas were also cited. Other suggestions included the availability of docents, a visual emphasis (as opposed to text), and a bathroom by the beach.

Eighty-eight percent (59) of Reserve respondents are aware of group reservation requirements, compared to 50% (62) of general respondents.

When asked about criteria for selecting field trips, educators gave the following information:

	<u>Reserve respondents</u>	<u>General respondents</u>
Relevance to class curriculum	76%	56%
Quality of program	60%	65%
Cost	31%	25%
Relevance to standards	10%	25%

When asked about factors that limited field trip selection, educators offered the following information:

	<u>Reserve respondents</u>	<u>General respondents</u>
Cost	63%	53%
Distance	40%	36%
Availability of funds	39%	34%

While these results are not surprising, the low percentage for “standards alignment” is. Only four percent of Reserve respondents and 16% of general respondents identified this as a “most significant factor.” Further, this low percentage contradicts the response to a follow-up question in which respondents were asked to select two variables that would enhance or justify a field trip experience. Forty-four percent of general respondents (55) cited “alignment to state or district standards,” second only to “availability of pre-trip materials” (63%). Among Reserve respondents, 21% (14) cited “alignment” which followed “loan of ‘hands-on’ material” (61%) and “availability of pre-trip materials” (58%). In both cases, bilingual material was least frequently cited.

Both populations identified science, followed by history/social science, as the discipline to emphasize in Reserve field trips.

	<u>Reserve respondents</u>	<u>General respondents</u>
Science	95%	91%
History/social science	52%	59%

Further, they prefer a field trip that lasts from two hours to one-half of a day that includes a guided tour of the tidepools and hands-on investigations nearby. Less than eight percent prefer a one-hour program.

	<u>Reserve respondents</u>	<u>Hands-on investigations</u>
Tidepool tour	81%	61%
Hands-on investigations	78%	60%

When asked about the development of classroom resources, Reserve respondents expressed interest in teacher guides (48%), booklets for students (46%), and pre-trip classroom visits by staff or docents (43%). General respondents expressed interest as well in pre-trip classroom visits (61%), followed by booklets for students (35%), a video or CD-ROM (30%), and teacher guides (27%).

On average, Reserve respondents ranked the likelihood of their class visiting the Reserve at 3.8 using a scale 1 - 4 (with one low and four high). General respondents ranked their likelihood at 2.6. Using the same scale, Reserve respondents ranked their likelihood of participating in a visiting classroom program by Reserve staff or staff at 2.9. General respondents ranked such likelihood at 3.0. Both populations cited preference for direct experience, uncertainty of the program content, time and cost as negative factors, and enhancement of on-site learning, student preparation for a field trip, and retention of knowledge as positive factors.

Using the same scale, both populations of respondents ranked their ability to teach students about tidepool ecology at 3.1. Both identified the availability of docents and instructional materials, a more informed public, pre-trip classroom visits, and introductory talks as specific resources that would enhance their experiences at the Reserve.

A complete summary of tabulated data and narrative responses are found in Appendix F.

Educator Focus Group Summary of Findings

Seven classroom teachers participated in an educator focus group for Fitzgerald Marine Reserve on October 26, 2004. Lori Mann and Jennifer Rigby facilitated the discussion. Its purpose was to solicit feedback on the proposed interpretive media placed in the new Education Center and grounds at Moss Beach and Pillar Point, and along the California Coastal Trail. Specifically, planners sought to understand the needs and expectations of teachers and gain additional insight into the trends revealed in the needs assessment conducted last spring.

All seven participants have extensive experience in the classroom. Five teach at the elementary level (3rd – 5th grade) and two teach at the intermediate level (6th and 7th). It should also be noted that one of the elementary teachers, John Walton, is the former director of open space and Baylands Nature Preserve for the City of Palo of Alto, and one of the intermediate teachers, Ellen Witter, is a former marine biologist who conducted pinniped research at Año Nuevo State Reserve.

Only four of the seven teachers use bus transportation provided by the school district to travel to Fitzgerald. Two rely on private transportation by parents and one uses public transportation. Four were aware of the new reservation guidelines and speak highly of the County staff who answer the phone, although one indicated it was difficult to get through.

While cost and distance (driving time) are factors that influence a decision to pursue a field trip, the appropriateness of the site and the opportunity for hands-on study in a natural setting remains the key criterion used. Clearly, highly qualified and dedicated teachers were in this group. Their concerns focus on matching a field trip with their educational goals. State content standards are important in their selection process, but so too are the field trip resources that allow them to expand their classroom teaching to show real-life connections in the field. These teachers feel very comfortable aligning a field trip experience with grade level-specific standards and creating multi-disciplinary learning opportunities. For example, several use their Fitzgerald field trip to introduce literature, mythology, and history/social science concepts.

When asked what would improve their students' experiences at Fitzgerald, most indicate the number of docents is key. Since the new reservation guidelines require each group to be docent-led, teachers are particularly concerned about the docent: student ratios. A docent count of one, however well qualified that docent is, is not sufficient.

Teachers requested having at least four docents per group of 30 students. It should be noted they were extremely complimentary about the Friends of Fitzgerald docents, citing them as outstanding.

In addition, these teachers indicate they do an extensive amount of pre-trip planning to make the most of the field trip. This preparation includes traveling programs by Cal Academy and the Marine Science Institute. It was also suggested that the County and Foundation consider requiring teachers (and parent chaperones) to participate in a training workshop (on a weekend or evening) prior to being allowed to take students to Fitzgerald.

Features to consider at the Center include slat benches at the foot-washing station; soap, toilet paper and locking doors for the restrooms; and continual fencing throughout the bluff area due to safety issues. They expressed concern over stream contamination. They loved the idea of an outdoor, wind-protected amphitheater so that they can gather their students and chaperones for an orientation prior to handing the program to the docents.

Specific Comments regarding the Reef Lab, Gallery, and Outdoor Sculpture Garden

Reef Lab: Consider setting up stations with equipment beyond what they can obtain for their own classroom, including video microscopes, compound and dissecting microscopes, and so forth. Plankton stations, benthos stations, and other activities comparable to what is done at Don Edwards NWR and Pier 39 Aquarium would compel these teachers to want to spend time in a classroom during a field trip. Some teachers expressed a desire to be able to use the Reef Lab for their own labs during the field trip (as opposed to a docent-staffed lab experience). Still others indicated they would prefer to use the classroom after visiting the reef so that students could debrief, reflect on what they had seen, and find the labs more relevant based upon their direct experiences in the tidepools.

Gallery: Consider reference to Latin names, including phyla, on the interpretive panels since this is a focal point of seventh grade life science. Consider development of new curriculum materials that challenge students to use the exhibits for directed learning.

Either in the Gallery or Reef Lab, add a weather station, actual tide clock (mechanical or digital), a wave tank, a fault map, and time-lapse photographic sequence showing a 24-hour (or 12-hour) period at Fitzgerald. Participants are also interested in a permanent measuring stick at Moss Beach to enable younger students to see tidal fluctuations as they occur since this is a relatively abstract concept for students to understand.

Outdoor Sculpture Garden: Add another tunnel to enhance the kinesthetic opportunities; lower the height of the sculpture for safety and viewshed considerations; make sure actual sizes of organisms are portrayed on interpretive panels. Teachers said that this would be great for younger kids. Consider signage in multiple languages and in Braille.¹

When asked to comment about future directions for program development, participants were very enthusiastic about a traveling classroom (comparable to that of Audubon Canyon Ranch). Having docents (ideally the same docents as will lead the trip in the field) visit the classroom, share a visual presentation, and engage students in some pre-trip exploratory stations would be extremely beneficial, though labor-intensive. Participants also expressed interest in loan kits for classroom use. Such kits could include a DVD, anatomically correct models of intertidal organisms, hand-outs, a children's book about Moss Beach, laminated cards depicting marine organisms designed for younger students (big photographs and simple text), and even bags of (clean) trash such as six-pack rings, plastic trash bags, and Styrofoam with information on their impact at Fitzgerald. It would be most effective if the kit included activities students can do. They also appreciate the logistics of managing such a loan kit program, particularly the checkout and check-in procedure. They prefer being able to return such a loan kit during their visit to the Reserve.

When asked about the possibility of a Pillar Point Marsh tour, the following concerns were voiced: lack of public transportation, impact on the resource, and better wetlands connections elsewhere. How would the Pillar Point experience be different than that at Don Edwards or Coyote Point (other than perhaps a study of migratory bird life)?

When asked about living history programs at Pillar Point Marsh, teachers wondered if it would duplicate what is already offered at Año Nuevo and Coyote Hills Regional Park. When asked about developing service-learning opportunities, the teachers saw value in having trained high school students serving as docents at Fitzgerald. They view service-learning as having great potential, although logistically very challenging.

¹ As less than 10% of the visually impaired population in the US actually reads Braille, this plan recommends investigating alternative approaches to ensuring universal access.

Education Prospectus for Fitzgerald Marine Reserve

Introduction

The unique resources of Fitzgerald Marine Reserve make it a vitally important regional resource with tremendous educational potential. Few places can offer a similar experience. The Reserve is rich in species diversity, more so than comparable habitats in central and northern California. For instance, 439 species of marine plants and animals have been found at the Reserve, compared with 186 found at Point Reyes Headlands. The Reserve is a range limit for dozens of species of marine plants and animals, and 25 species new to science at the time of discovery were found at the Reserve.

This wealth of resources has made the Reserve an overwhelmingly popular destination for school field trips. The site attracts thousands of students each year for docent-led and, formerly, self-guided visits. Despite careful controls, these trips have taken their toll on the reef environment. The development of interpretive facilities and educational programs at Fitzgerald Marine Reserve will provide off-reef opportunities to enhance learning about the intertidal community while mitigating the effects of the irreplaceable hands-on visit to the reef itself.

The programs identified in this document are based on input from teachers through an educator needs assessment and an educator focus group. Specific goals and objectives will need to be defined for each program, but the overall goal remains consistent with the primary missions of Fitzgerald Marine Reserve: to preserve and enhance natural resources and to provide educational opportunities.

The edge of the sea is a strange and beautiful place. All through the long history of Earth it has been an area of unrest where waves have broken heavily against the land, where the tides have pressed forward over the continents, receded, and then returned. For no two successive days is the shore line precisely the same. Not only do the tides advance and retreat in their eternal rhythms, but the level of the sea itself is never at rest.

Only the most hardy and adaptable can survive in a region so mutable, yet the area between the tide lines is crowded with plants and animals. In this difficult world of the shore, life displays its enormous toughness and vitality by occupying almost every conceivable niche. Visibly, it carpets the intertidal rocks; or half hidden, it descends into fissures and crevices, or it hides under boulders, or lurks in the wet gloom of sea caves. Invisibly, where the casual observer would say there is no life, it lies deep in the sand, in burrows and tubes and passageways. It tunnels into solid rock and bores into peat and clay. It encrusts weeds or drifting spars or the hard, chitinous shell of a lobster. It exists minutely, as the film of bacteria that spreads over a rock surface or a wharf piling; as spheres of protozoa, small as pinpricks, sparkling at the surface of the seas; and as Lilliputian beings swimming through dark pools that lie between the grains of sand.

The Edge of the Sea
Rachel Carson 1955

Assessment of Educator Needs

As part of the interpretive master planning process for the Marine Reserve, The Acorn Group conducted an educator needs assessment in spring 2004 and a teacher focus group in fall 2004. It is clear from all input that the Education Center exhibits cannot and should not replace active exploration of the tidepools as the key impetus for visiting the Reserve. It is this living, breathing experience that brings students to the Reserve; this direct contact with the tidepools and its many life forms must remain the centerpiece of the field trip experience.

However, this core experience can be augmented effectively through additional educational programming. The needs assessment survey indicated that docent stations, followed by time in the new Center, were the two elements most likely to improve their students' experience at the Reserve. The educators most frequently cited hands-on learning as the element they would like to see developed. Introductory talks, live animals, and exhibit areas were also cited.

Teachers participating in the focus group corroborated the emphasis on docent availability. With the recent requirement that docents must accompany all groups visiting the reef, teachers are concerned about maintaining sufficient docent to student ratios to enable all students to see and hear in the outdoor setting. A minimum of four docents per group of 30 students is recommended.

Knowledge of the oceans is more than a matter of curiosity. Our very survival may hinge upon it.

John Kennedy

Standards-based Programming

In the current standards and testing driven academic climate, it is important that programs reflect California's state standards. California content standards for science, history-social science, mathematics, and English-language arts and the California Science Framework for K-12 Public Schools are essential planning tools for Fitzgerald programs. Further, the standards provide a foundation for the State's three-part Standardized Testing and Reporting (STAR) Program, which in turn forms the mechanism for complying with federal No Child Left Behind provisions. One part of the STAR Program is a series of California Standards Tests, which test fifth grade students' mastery of both fourth and fifth grade science content standards.

Many teachers must demonstrate compliance with state standards in order to justify field trips to their principals and district officials. Therefore, programs should be thematic and consistent with state standards by grade. Fitzgerald Marine Reserve should be seen as a field trip destination where meaningful standards-based learning is conducted in context, where the content standards are illustrated and applied, and where students can see value in their education. Conveying this to those who make field trip decisions at the school site level is an important, albeit challenging, task.

That said, this emphasis on standards need not be limiting. A wide variety of appropriate concepts can be readily addressed at the site, making it relatively easy to connect to the standards. Teachers in the focus group were comfortable with the notion of linking to the standards and did not feel standards correlations strongly restricted their decision to visit the Reserve.

California Science Content Standards

The Science Content Standards for California Public Schools, Kindergarten through Grade Twelve represents the content of science education and includes the essential skills and knowledge students will need to be scientifically literate citizens in the twenty-first century.

The Science Content Standards reflect the desired content of science curriculum in California public schools. This content should be taught so that students have the opportunity to build connections that link science to technology and societal impacts. Science, technology, and societal issues are strongly connected to community health, population, natural resources, environmental quality, natural and human-induced hazards, and other global challenges. The standards should be viewed as the foundation for understanding these issues.

Education and the Environment Initiative (AB 1548)

The first phase of implementation of California's landmark legislation, the Education and the Environment Initiative (formally known as AB 1548) has been successfully completed: California has established a conceptual road map to bring environment-based learning to the forefront of education.

A set of environmental principles and concepts that examine the interactions and interdependence of human societies and natural systems has been developed. First crafted with input from over 100 scientists and technical experts from a range of fields, these environmental principles and concepts now have been reviewed by literally hundreds of educators and community leaders across California.

The principles and concepts are aligned to California content standards in science and history/social science. While the primary purpose of this alignment is to ensure that teaching these principles and concepts will help students achieve mastery of the content standards, a secondary purpose is to provide a meaningful context in which students perceive the significance of the standards to their daily lives.

Alignment of Fitzgerald programs and curricula to the AB 1548 principles and concepts is strongly suggested, as these principles will appear in textbooks and the state's model curriculum.

Education and Environment Initiative – Environmental Principles and Concepts

The environmental principles examine the interactions and interdependence of human societies and natural systems. The nature of these interactions is summarized in the environmental principles presented below. A full list of the principles and supporting concepts is included in Appendix E.

Principle I: The continuation and health of individual human lives and of human communities and societies depend on the health of the natural systems that provide essential goods and ecosystem services.

Principle II: The long-term functioning and health of terrestrial, freshwater, coastal and marine ecosystems are influenced by their relationships with human societies.

Principle III: Natural systems proceed through cycles that humans depend upon, benefit from and can alter.

Principle IV: The exchange of matter between natural systems and human societies affects the long-term functioning of both.

Principle V: Decisions affecting resources and natural systems are based on a wide range of considerations and decision-making processes.

Docent Availability

Fitzgerald Marine Reserve's educational programming is fully dependent on the availability of knowledgeable, well-prepared docents. Many of the programs proposed in this document rely on docents to facilitate activities and exchange of information. The number of volunteer docents is likely to be the most limiting factor affecting educational programming at the Reserve (second to low tide times during school hours). Therefore, offering regular, high quality training that attracts new volunteers is critically important. Such training will need to address both the relevant scientific content and skills for working with students of varying ages. Equally important is sustaining an organizational foundation to support and retain existing volunteers.

Reef Tours

To maximize the educational value of visits to Fitzgerald Marine Reserve and to preserve the reef's fragile resources, it is recommended that school groups continue to be required to take tours led by an adequate number (a minimum student-to-docent ratio of 8:1) of qualified docents. While the central focus of any visit to the Reserve should be the reef itself, the educational impact of any such visit could be augmented by additional programs conducted in the exhibit gallery and reef lab before or after exploring the tidepools. Several program possibilities are outlined below.

The strategically placed Sculpture Garden also offers an opportunity for students to expend pent-up energy after exiting their buses and before going out on the reef. The structure can readily be used to provide short (10 minute) introductions to the concept of adaptation and other related themes. In addition, the outdoor amphitheater could provide a central location for introducing tour themes and acquainting students with rules and safety regulations for behavior on the reef.

Reef Lab – elementary level

A class of 20–30 students can be accommodated at one time in the Reef Lab. Here, rotating laboratory-based stations could provide hands-on experiences that encourage intertidal-based investigations without having an impact on the fragile reef environment. Each station’s investigation would need to be facilitated by a docent. Teachers who participated in the focus group emphasized the point that any class time spent at the new education center needs to be compelling enough to justify precious time spent indoors. Therefore, the Reef Lab stations that are developed need to be provocative and dynamic, relevant to the standards-based curriculum, and based on the use of equipment and resources not likely to be found in the classroom.

Elementary stations could include a plankton lab based on the examination of fresh plankton samples using microscopes, petri dishes, and plankton identification cards—provided docents are able to tow for plankton at the site. If not, laboratory-raised brine shrimp could serve as a substitute. Other stations could include a fish anatomy lab using models of perch, eel, and other species likely to be seen in deep pools; fish printing using the same models, ink, brayers, and rice paper; tidepool mapping—learning how to conduct a tidepool census with a student-friendly field guide or laminated flash guide and tidepool map master printed on water-resistant paper; and a tidepool zonation study using a three-dimensional, tabletop cross-section model of rock divided into zones. Life-size realistic models of tidepool organisms such as gooseneck barnacles, ochre stars, sea urchins, giant green and aggregate anemones, chitons, limpets, hermit crabs, turban snails, and octopus could serve as a basis for discussion on adaptations. Students would then be challenged to position the models correctly in the substrate; a discussion of environmental stressors and adaptation could be led by the docent.

During their exploration of the Reef, students could apply what they learned in the Reef Lab by actually conducting a tidepool census.

Linking oceanography with geography – the study of the oceans with the study of the Earth – is a key step on the path to “ocean literacy.” Indeed, the synergy between the two disciplines invites science and social studies teachers to enrich and cross-promote one another’s core curriculum: as science teachers learn to present ocean processes and life-forms within a geographic context, their counterparts discover why an understanding of the life, physical, and earth sciences can form such a strong thread in the social fabric.

The ultimate goal of this cross-pollination of ideas is a fairly simple one: to help students comprehend how and why all life on Earth arises from – and remains dependent on – our precious oceans.

*Oceans for Life
A Scope and Sequence in Geography Education
National Geographic Society 2002*

Reef Lab – middle and secondary level

For students in grades six through twelve, lab stations could include a water chemistry station in which students measure such environmental parameters as salinity, dissolved oxygen, and turbidity; a wave tank; and a current and convection station, as well as more advanced plankton and fish anatomy labs. However, lab-based instruction for these higher grade levels would require extensive training on the part of docents and the procurement of expensive demonstration tanks and test kits, from either LaMotte Co. or Hach Co. whose contents, such as TestTabs, are safe and expendable.

Geology Lab – middle and secondary level

The unique geological features of the Reserve combined with California's sixth grade emphasis on earth science make a geology lab a natural program. The strong link to sixth grade standards would make this an appealing topic for teachers, especially those who are not entirely comfortable teaching earth science content. A geology lab could include rotating stations on a variety of geological themes, each facilitated by a docent. Again, docents would require more extensive training than they currently receive in order to guide students effectively. Stations might include using maps or scale models of the reef to read landscapes and explain the creation of various landforms found on the Reserve. In another station, docents could use hands-on maneuverables to demonstrate the movements of strike-slip faults and learn how earthquakes occur. In a third station, sample fossils could be used to discuss the variety of species that have lived on the Reserve over time and to explore how the distribution of fossils informs our understanding of the geologic processes involved in plate tectonics. All of these themes can be readily demonstrated on the reef during the students' exploration on the reef.

Gallery Tour

Providing students with worksheets to guide their exploration of the exhibits would enhance the learning experience in the gallery and provide direction to self-guided groups. Worksheets need to engage students in examining the exhibits and avoid the pitfall of reducing the visit to the finding of simple, correct answers. Thus, open-ended questions that require close observations, comparison, and description are recommended. Worksheets could be developed around different themes that correspond to state content standards by grade. For instance, the roles of producers, consumers, and decomposers in the tidepools would be appropriate for fourth grade life science studies,

while structures for respiration, digestion, waste disposal, and transport of materials would be on target for fifth graders. For older students, especially seventh grade life science, the study of phyla would be in keeping with science standards.

*National Science Education Standards
Science as Inquiry*

For students to develop the abilities that characterize science as inquiry, they must actively participate in scientific investigations, and they must actually use the cognitive and manipulative skills associated with the formulation of scientific explanations.

One challenge to teachers of science and to curriculum developers is making science investigations meaningful. Investigations should derive from questions and issues that have meaning for students. Scientific topics that have been highlighted by current events provide one source, whereas actual science- and technology-related problems provide another source of meaningful investigations.

Reef in the Classroom (Traveling Classroom)

Teachers in the education focus group were very enthusiastic about having a traveling classroom program prior to their visit to the Reserve. Such a program would better integrate the field trip with classroom learning and make the learning experience more effective. The traveling program again needs to offer something that teachers are unlikely to have access to in the classroom, such as a slide show or video that focuses specifically on species found at Fitzgerald Marine Reserve, followed by docent-run classroom stations that differ from those found in the Education Center. Such stations might include an adaptation activity where students are challenged to use simple craft supplies to adapt a basic form to withstand different characteristics of life in the tidepools, such as wave action and varying levels of exposure.

This program would best correspond to different themes that link to the state science or history-social science standards by grade. Ideally, the same docents that will be leading the students' field trip would facilitate the classroom session. This would familiarize both the docents and the students with each other, maximizing the ability of the docent to tailor the field experience to the group's particular interests and level of experience. The main drawback, of course, is that offering an in-class program is labor intensive and will require additional time commitments by docents.

California Science Content Standards

Students in kindergarten know how to observe and describe similarities and differences in the appearance, behavior of plants and animals.

Students in the first grade know different plants and animals inhabit different kinds of environments and have external features that help them thrive in different kinds of places.

Students in second grade know the sequential stages of life cycles are different for different animals, such as butterflies, frogs, and mice. They know that soil is made partly from weathered rock and partly from organic materials and that soils differ in their color, texture, capacity to retain water, and ability to support the growth of many kinds of plants.

Students in third grade know plants and animals have structures that serve different functions in growth, survival, and reproduction. Students know examples of diverse life forms in different environments, such as oceans, deserts, tundra, forests, grasslands, and wetlands.

Students in fourth grade know plants are the primary source of matter and energy entering most food chains. Students know producers and consumers are related in food chains and food webs and may compete with each other for resources in an ecosystem.

At the fifth grade, students know most of Earth's water is present as salt water in the oceans, which cover most of Earth's surface. Students know when liquid water evaporates, it turns into water vapor in the air and can reappear as a liquid when cooled or as a solid if cooled below the freezing point of water. Students know that the amount of fresh water located in rivers, lakes, underground sources, and glaciers is limited and that its availability can be extended by recycling and decreasing the use of water. Students know the origin of the water used by their local communities.

At the sixth grade, students know evidence of plate tectonics is derived from the fit of the continents, the location of earthquakes, volcanoes, and midocean ridges; and the distribution of fossils, rock types, and ancient climatic zones. Students know that earthquakes are sudden motions along breaks in the crust called faults and that volcanoes and fissures are locations where magma reaches the surface. Students know how to explain major features of California geology (including mountains, faults, volcanoes) in terms of plate tectonics.

Students know water running downhill is a dominant process in shaping the landscape, including California's landscape. Students know rivers and streams are dynamic systems that erode, transport sediment, change course, and flood their banks in natural and recurring patterns. Students know earthquakes, volcanic eruptions, landslides, and floods change human and wildlife habitats.

Reef Loan Kits for Classroom Use

As an alternative or as a supplement to a traveling classroom program, a loan kit for classroom use could enrich learning and enhance the field trip experience. Loan kits could be available to teachers for use before or after a scheduled visit to the Reserve. The kits might include such items as a DVD specific to Fitzgerald Marine Reserve, anatomically correct models of intertidal organisms, hand-outs, a children’s book about Moss Beach, laminated cards depicting marine organisms designed for younger students (big photographs with simple text), and bags of (clean) trash with information on the impact of marine debris on tidepool organisms. The kits could include ideas for using the materials and for setting up interactive student exploration stations. These ideas could be tied to specific themes, as well as to the state content standards. To be most effective, it is important that loan kits be sturdy and readily available. Multiple copies may be necessary. The loan system logistics must be teacher-friendly; teachers in the focus group preferred that kits be delivered or mailed to their school sites, and that they would be able to be returned during their visit to the Reserve.

*Guiding Principles
Science Framework for California Public Schools, 2003*

Multiple instructional strategies, such as direct instruction, teacher modeling and demonstration, and investigation and experimentation, are useful in teaching science and need to be included in instructional materials. Those strategies help teachers capture student interest, provide bridges across content areas, and contribute to an understanding of the nature of science and the methods of scientific inquiry.

Pillar Point Marsh Tour

The freshwater Pillar Point Marsh offers an additional opportunity for school tours. Migratory bird life, food cycles, and comparing marsh and tidepool habitats are three potential themes that could be developed. The site could also be used for field investigations such as probing for and identifying creatures in the mud and testing water chemistry. However, teachers in the educator focus group suggested that other sites in the region better meet this need and that spending time touring the marsh would not take full advantage of the Reserve's unique resources and would be hard to justify. Concerns about lack of public transportation also exist.

Ohlone Living History Programs

The Ohlone tule house exhibit offers the opportunities to develop living history programs at the Reserve, demonstrating Ohlone lifestyles in the context of a naturalistic setting. Again, however, teachers felt that such a program would duplicate what is already offered on a larger scale at Año Nuevo and Coyote Hills Regional Park among other sites.

Service-Learning Opportunities

Focus group participants responded positively to the idea of involving students in service-learning opportunities at the Reserve. Historically, such programs have worked well here. However, due to recent changes in the law that bar carpooling among adolescent drivers, this program has been suspended. If alternate transportation can be arranged, service-learning programs might include training high school students to serve as docents for younger students, and developing and participating in restoration efforts. Service-learning projects are seen as extremely valuable learning, but they are logistically challenging and can demand a great deal of staff and/or volunteer time.

*California Department of Education
Service-Learning, Linking Classrooms and Communities*

The Superintendent's Service-Learning Task Force envisions an education for all California students where knowledge and participation intersect to engage youth as vital community members. Service-learning is a proven teaching and learning strategy that inspires young people to learn about and serve their communities through experiences directly tied to their school curriculum. Therefore, the task force believes that every school, in partnership with its community, must provide ongoing, integrated service-learning for all students.

Since the world outside the school moves more rapidly than the one inside the classroom, many youth seem uninterested in their education. The Service-Learning Task Force believes that young people learn best when they connect their learning to something meaningful (Caine and Caine, 1997). The strongest attachment that most people have is to their community, which includes their families and friends. When youth and adults are involved in activities that link classrooms and communities, the level of learning is deeper than that used in the classroom alone. Teachers who use service-learning have found that their students become eager participants in the learning process.

Interpretive Training and Other Program Recommendations

The Power of Personal Contact

Personal interpretation—interpretive services delivered by paid or volunteer staff—can consist of live programs, guided walks, slide shows, demonstrations, and even informal, unplanned encounters with visitors.

Personal interpretation is interpretation at its most powerful. Because it occurs in the moment, oral communication with well-trained staff and volunteers can be adapted to fit any situation. Such representatives are the audience’s personal facilitators, connecting the visitor to the resource both emotionally and intellectually. However, personal communication is expensive. Staff and volunteers cannot be everywhere at once, and training volunteers takes time and dedication. Compared to non-personal media such as interpretive exhibits and brochures, the cost per visitor contact is high.

Balancing the urgency of preserving the resource with the financial realities of Fitzgerald Marine Reserve, this plan recommends relying primarily on non-personal media while still using personal interpretation wherever possible. In particular, the plan recommends leveraging volunteer energy to accomplish project goals.

Seamless Thematic Experiences

Current programs offered at Fitzgerald reach hundreds of school children and many adults. These popular programs are only made possible by the energy and focus of dedicated volunteer docents from the Friends of Fitzgerald organization.

In addition to setting the direction for exhibits and non-personal media at the Reserve, the themes and goals identified in this Conceptual Plan should guide all oral communications between Reserve representatives and visitors. The visitor experience should be seamless. Whether reading an indoor exhibit label, exploring a trail, or having an informal chat with a volunteer, the visitor should notice no inconsistencies of message or attitude. To ensure such consistency, the Friends and the County will need to fine-tune existing docent programs to align them with Fitzgerald interpretive goals and themes. This also will require revamping in-house training programs and materials.

Training in Interpretive Principles and Techniques

Historically, training at Fitzgerald has focused on providing the substantial body of information docents need to speak with authority about the resource. Having grasped the material, however, most trainees require guidance to organize and deliver programs effectively.

The Friends of Fitzgerald organization has recognized that such a gap can lead to missed opportunities to connect with visitors. As of 2005, some basic interpretive skills training has been introduced into the Fitzgerald training program. The County should support the Friends in their ongoing efforts to improve programming by providing added support for expert training in communication strategies, interpretive guide and host skills, and creative techniques in interpretation.

Training is a challenging and time-consuming activity. In-house leaders may benefit from “train the trainers” courses to help them work more effectively with new and existing volunteers. Additionally, existing training programs can be enhanced by using outside trainers who specialize in interpretive skills for volunteers and staff to provide supplemental workshops or certification courses. People with the needed expertise can be found in the Bay Area or can be brought in from outside the region if necessary.

The National Association for Interpretation (NAI) offers two exceptional programs that are particularly well suited to Fitzgerald programming. The Certified Interpretive Guide (CIG) course, a four-day program focused on interpretive principles, program preparation, and communication skills, is outstanding basic training for new volunteers and staff. It also makes an excellent refresher course for experienced individuals, who will value the review as well as new insights they gain from an update in state-of-the art interpretive communications. For those who have contact with visitors but who do not have direct interpretive responsibilities—rangers, information desk workers, maintenance staff, etc.—NAI’s Interpretive Host training is ideal. It combines an overview of interpretive principles and skills with customer service training, and is effective in helping non-interpretive personnel understand the power of interpretation, its ability to help accomplish the organizational mission, and their role within the visitor-resource-agency “communication triangle”.

If possible, the County and the Friends should offer basic and advanced interpretive training at no or little cost to key individuals within their staff and volunteer corps. To defray costs, the Friends and the County may wish to extend training opportunities at full cost to any outside individuals who seek professional development.

Regardless of the training program chosen, it is recommended that the Fitzgerald Marine Reserve permanently incorporate core concepts of interpretive principles, techniques, goals and themes into future training for all staff and volunteers.

Interpretive Library

Several excellent publications exist to support volunteers and/or staff in the development of their interpretive skills and techniques. It is recommended that a basic library of interpretive reference works be maintained for use by staff and volunteers. A list of titles may be found in "References Cited", Appendix H.

Other Program Recommendations

To the extent that additional programming is desired in future, Fitzgerald Marine Reserve is well situated for expanded programming opportunities.

The Bay Area's large population includes a wide array of experts, including photographers, artists, writer, gardeners, and teachers, who could be tapped as volunteers to develop and conduct classes, lead hikes, or hold workshops.

Appendix A, Design Committee Members and Workshop Attendees

Design Committee

Mary Burns, Director
San Mateo County Parks

Dave Moore, Superintendent
San Mateo County Parks

Sam Herzberg, Senior Planner
San Mateo County Parks

Steve Durkin, Supervising Park Ranger
Fitzgerald Marine Reserve
San Mateo County Parks

Bern Smith,
San Mateo County Parks and Recreation
Commission

Julia Bott, Executive Director
San Mateo County Parks and Recreation
Foundation

Tom Ciotti, Board Member
San Mateo County Parks & Recreation
Foundation and
Friends of Fitzgerald Marine Life Refuge

Bob Breen,
Friends of Fitzgerald Marine Life Refuge

Mary DeWolf,
Friends of Fitzgerald Marine Life Refuge

Mary DeLong, President,
Friends of Fitzgerald Marine Life Refuge

Linda Ciotti,
Friends of Fitzgerald Marine Refuge

Tina Conway,
Friends of Fitzgerald Marine Life Refuge

James Covell
Interpretive Programs Manager
Monterey Bay Aquarium

Lisa Borok, Visitor Programs Manager
Seymour Marine Discovery Center
Long Marine Laboratory

Susan Danielson,
Northern Program Director,
Save Our Shores

Carol Preston, Gulf of the Farallons NMS

Gael Erickson
Mid Coast Community Council

Katy Rhoades
County Commission on Disabilities

Deborah Hirst
Supervisor Gordon's office

Barbara Kossy,
Neighbor

Public Workshop Attendees

Kathy Korbholz
Bill Korbholz
Gael Erickson
Julie Barrow
Tina Conway
Linda Ciotti
Tom Ciotti
Mallory Nomura Saul
Tom Saul
Carol Rose
Julia Bott
Mary DeLong

Appendix B, Visitor Survey Questions

Visitors were interviewed at Moss Beach and Pillar Point entries to the Reserve. The interviewer estimated the respondent's age and marked the size of the group the individual was traveling with (if any). Tides were not especially low during the survey period. The weather ranged from sunny and warm to uncomfortably windy and cold. Fifty-six responses were gathered over the three-day sampling period.

Each visitor was approached with the following standard greeting and invitation:

Hello. I wonder if I can get your opinion. The Fitzgerald Marine Reserve is planning improvements to its visitor services, including a new exhibit center about the reef. As part of the process, we're talking with visitors to know more about your interests and needs.

Would you be willing to give me your opinion? The survey takes less than 10 minutes, and it will help us develop services that are both enjoyable & useful.

Although refusal rates were not tracked, at least three quarters of visitors who were asked agreed to be interviewed. Below are the questions that were asked.

I'm going to read you a question and then offer you a choice of responses. If your preferred response isn't listed, just let me know and I'll write in what you wish to say.

1. What are your reasons for visiting today? **(up to 2 selections allowed)**

- explore the tidepools
- walk along the sand
- exercise
- be with family or friends
- attend a program
- picnic on the beach
- use free parking for beach access
- go fishing
- other _____

2. How long do you intend to visit today? _____

3. How did you first hear about the reserve?

- park brochure
- friend or family
- newspaper (which) _____
- website (which) _____
- teacher don't recall
- other _____

4. About how many times have you visited any site within the Reserve in the past year?

- 1st time (go to question 7) other: _____

5. When you visit, where do you typically go? **(2 max; show map)**

- Moss Beach reef Seal Cove
- Bluff (which) _____
- PP (south from lot)
- PP (north from lot)
- Other: _____

5a. (If bluff) What do you do on the bluff? walk enjoy view other _____

6. Have you or any family members attended a program at the Reserve?

- no (go to Q7) yes (which) _____

7. Do you also tend to visit other coastal areas in the region?

- no (go to Q8) yes (where) _____

8. What, if anything, do you value about the Reserve?

9. What **two changes** might improve your experiences at the Reserve? **(2 max; show pictures)**

- Exhibits at a visitor center with 3-dimensional touchable features and engaging activities
- Waterproof brochure with color images & descriptions about tidepool life
- Naturalists at the tidepools to answer questions & point things out
- A way to see and interact with tidepool species without having to walk down to the reef
- A way to walk on the reef w/o having to worry about slipping or damaging sensitive areas
- Knowing that the reef won't be crowded during your visit
- (More) activities such as guided tours, programs, etc.
- A resource library about the reef More web resources specific to the Reserve other: _____

10. Which two topics, if any, would you be interested in learning more about here? **(up to 2 responses allowed)**

- tidepool life
- marine mammals
- larger ocean processes (tides, currents, storms, etc.)
- efforts to protect & restore the Reserve's reef and ecosystem
- how to visit the reef without causing damage
- human history of the Reserve
- other _____

11. We'd like to get a sense of the public's awareness about visitor impacts to the reef. Can you name any visitor activities that help protect the reef and its plants and animals from harm? (no limit) _____

12. Do you feel you have adequate access to information about rules & regulations at the Reserve?

- yes no not sure

13. If you could have everyone understand **one** important thing about the Fitzgerald Reserve, what would it be?

14. Is there anything else you'd like the planners to know?

15. What is your zip code?

Thank you VERY MUCH for sharing your time and opinions with us. Enjoy the rest of your day!

Estimated Age: _____ Group size: _____ Time: _____ Location: _____ Date: _____

Visitor Survey Tabulated Data

Data gathered from Moss Beach (“MB”) entry visitors are in the first three columns; data from Pillar Point visitors (“PP”) are in the next three columns. Combined data can be seen in the last two columns.

Questions	MB Data (n=44)	MB %	Moss Beach comments/details	PP data (n=12)	PP %	Pillar Point comments/details	All data (n=56)	All %
1. What are your reasons for visiting today? (2 max)								
explore the tidepools	35	80%		1	8%		36	64%
walk along the sand	9	20%		3	25%		12	21%
exercise	1	2%		5	42%		6	11%
be with family or friends	25	57%		2	17%		27	48%
attend a program	0	0%		0	0%		0	0%
picnic on the beach	2	5%		0	0%		2	4%
use free parking for beach access	2	5%		1	8%		3	5%
go fishing	0	0%		0	0%		0	0%
other	5	11%	To see what’s here; curious to see stranded buoy; hosting a film scout; the view; to unwind	11	92%	Walk dogs (6); birding (2); look for mavericks (2); unwind	16	29%

2. How long do you intend to visit today?	MB Data	MB %	Moss Beach comments/details	PP data	PP %	Pillar Point comments/details	All data	All %
Under 1 hour	15	34%		4	33%		19	34%
1-1.9 hours	12	27%		7	58%		19	34%
2 –2.9 hours	12	27%		1	8%		13	23%
3-4 hours	2	5%			0%		2	4%
More than four hours	2	5%			0%		2	4%

3. How did you first hear about the Reserve?	MB Data	MB %	Moss Beach comments/details	PP data	PP %	Pillar Point comments/details	All data	All %
park brochure	0	0%		0	0%		0	0%
friend or family	16	36%		4	33%		20	36%
newspaper	2	5%		0	0%		2	4%
website (which)	3	7%	Pt. Montara website; Half Moon Bay chamber website	0	0%		3	5%
teacher		0%		0	0%		0	0%
don't recall	2	5%		0	0%		2	4%
grew up here/live here	7	16%		4	33%		11	20%
other	8	18%	Child's teacher (2); AAA book (2); motel/restaurant staff (2); Half Moon Bay book; "101 Best Hikes"	4	33%	Just exploring/ accidental (3); "Birding in N. CA" book (1)	12	21%

4. About how many times have you visited any site within the Reserve in the past year?	MB Data	MB %	Moss Beach comments/details	PP data	PP %	Pillar Point comments/details	All data	All %
First visit	16	36%		3	25%		19	34%
1-3 times	14	32%		2	17%		16	29%
4-9 times	6	14%		1	8%		7	13%
10-20 times	1	2%		0	0%		1	2%
21-49 times	0	0%		2	17%		2	4%
50-100 times or more	6	14%		4	33%		10	18%
Not sure	1	2%		0	0%		1	2%

5. When you visit, where do you typically go?	MB Data	MB %	Moss Beach comments/details	PP data	PP %	Pillar Point comments/details	All data	All %
Moss Beach reef	26	59%		3	25%		29	52%
Seal Cove	2	5%		0	0%		2	4%

	MB Data	MB %	Moss Beach comments/details	PP data	PP %	Pillar Point comments/details	All data	All %
Bluff areas	5	11%		1	8%		6	11%
PP (beach trail leading south from parking lot)	3	7%		5	42%		8	14%
PP (bluff trails leading north from parking lot)	3	7%		1	8%		4	7%
All areas	3	7%		1	8%		4	7%
Other/no response	2			0	0%		2	4%

6. Have you or any family members attended a program at the Reserve? (n=27)	MB Data	MB %	Moss Beach comments/details	PP data	PP %	Pillar Point comments/details	All data	All %
no	22	81%		10	83%		32	57%
yes	5	19%		2	17%	grade school program with their child; college program	7	13%

7. Do you also tend to visit other coastal areas in the region?	MB Data	MB %	Moss Beach comments/details	PP data	PP %	Pillar Point comments/details	All data	All %
no	8	18%		1	8%		9	16%
yes (where)	36	82%	Monterey , Carmel, Santa Cruz, San Francisco beaches/Bay, Pacifica, Pescadero, Half Moon Bay, Montara, Ocean Beach, Mavericks, Don Edwards NWR, Don Pedro, Marin Headlands, Peninsula, Pigeon Point, Redwoods, Grey Whale Cove, Stinson Beach, "north of here", "south of here", "anywhere", San Gregario, Año Nuevo, Point Reyes, Sonoma Coast, Salt Point, Bolinas, Pebble Beach, Coyote Hills, not sure, not specified	11	92%	11 Similar to Moss Beach responses plus Salmon Creek, Bodega Bay, Miramar, Berry Falls Basin; Hyde St. Pier, Moss landing; Bean Hollow	47	84%

8. What, if anything, do you value about the Reserve?	MB Data	MB %	Moss Beach comments/details	PP data	PP %	Pillar Point comments/details	All data	All %
wildlife/biodiversity	15	34%		0	0%		15	27%
tidepools/accessible tidepools	19	43%		2	17%		21	38%
undeveloped/natural/no buildings	11	25%		2	17%		13	23%
protected/preserved	10	23%		2	17%		12	21%
beauty/views/setting	10	23%			0%		10	18%
quiet/serene	7	16%		1	8%		8	14%
beach	2	5%			0%		2	4%
it's free and accessible	2	5%		2	17%		4	7%
place to give kids taste of Pacific wildlife/resource for child education	3	7%		1	8%		4	7%
the variety of habitats (forest, ocean, etc.)	2	5%		0	0%		2	4%
cliffs/bluff trail	2	5%		0	0%		2	4%
close by	2	5%		1	8%		3	5%
Secluded/not crowded	2	5%		2	17%		4	7%
Other (one each)	15	34%	Fun; wonder of the place; the way people respect it; clean; safe for kids; everything; exercise; kids love it; plants; fresh air; time with my kids; true feeling of CA coast; a miniature of CA; restrooms; trash cans; the interpretive panels	7	58%	That it exists; birds; unique; fresh air; place to unwind; exploring new sights; salt marsh	22	39%

9. What two changes might improve your experiences at the Reserve? (2 max)	MB Data	MB %	Moss Beach comments/details	PP data	PP %	Pillar Point comments/details	All data	All %
Exhibits at a visitor center with 3-D touchable features and engaging activities	14	32%		2	17%		16	29%
Waterproof brochure with color images & descriptions about tidepool life	24	55%		4	33%		28	50%
Naturalists at the tidepools to answer questions & point things out	15	34%		6	50%		21	38%
A way to see and interact with tidepool species without having to walk down to the reef	7	16%		1	8%		8	14%
A way to walk on the reef w/o having to worry about slipping or damaging sensitive areas	4	9%		3	25%		7	13%
Knowing that the reef won't be crowded during your visit	12	27%	Moss Beach comments/details	6	50%	Pillar Point comments/details	18	32%
(More) activities such as guided tours, programs, etc.	7	16%		2	17%		9	16%
A resource library about the reef	2	5%		0	0%		2	4%
More web resources specific to the Reserve	0	0%		0	0%		0	0%
other	1	2%	new trails	0	0%		1	2%

10. Which two topics, if any, would you be interested in learning more about here?	MB Data	MB %	Moss Beach comments/details	PP data	PP %	Pillar Point comments/details	All data	All %
tidepool life	25	57%		8	67%		33	59%
marine mammals	12	27%		4	33%		16	29%
larger ocean processes	3	7%		2	17%		5	9%
efforts to protect & restore the Reserve's reef and ecosystem	18	41%		7	58%		25	45%
how to visit the reef without causing damage	19	43%		3	25%		22	39%
human history of the Reserve	4	9%		0	0%		4	7%
other	2	5%	Geology/faults; I find my own info	0	0%		2	4%

11. Can you name any visitor activities that help protect the reef and its plants and animals from harm? (no limit)	MB Data	MB %	Moss Beach comments/details	PP data	PP %	Pillar Point comments/details	All data	All %
No/not sure	3	7%		0	0%		3	5%
not collecting	18	41%		5	42%		23	41%
watching step	18	41%		3	25%		21	38%
avoiding marine mammals	2	5%		0	0%		2	4%
not turning rocks over	1	2%		0	0%		1	2%
not relocating pool species	5	11%		1	8%		6	11%
Not littering/picking up trash	15	34%		9	75%		24	43%
Not disturbing or touching	12	27%		3	25%		15	27%
Respecting closed areas	8	18%		2	17%		10	18%

Smaller crowds	4	9%		0	0%		4	7%
Educate/teach respect	3	7%		0	0%		3	5%
Not using sticks	2	5%		0	0%		2	4%
Obeying signs	2	5%		1	8%		3	5%
Brighter, more visible signs	2	5%		0	0%		2	4%
Picking up after pets	0	0%		2	17%		2	4%
Keeping pets out of sensitive areas	0	0%		2	17%		2	4%
Other (one each)	17	39%	No bonfires; no swimming; no pets; park ranger; docents; taxpayer support; no polluting activities; not running; knowing rules; spreading the word; awareness; no feeding; erring on the side of caution; approaching area carefully; watching your kids; having kids read the signs	6	50%	Avoid erosion; keep it uncrowded; become educated about what to do; not sure what causes damage here; supervise your kids; interaction with the environment	23	41%

12. Do you feel you have adequate access to information about rules & regulations at the Reserve?	MB Data	MB %	Moss Beach comments/details	PP data	PP %	Pillar Point comments/details	All data	All %
yes	29	66%		6	50%		35	63%
no	5	11%		5	42%		10	18%
not sure	10	23%		1	8%		11	20%

13. If you could have everyone understand one important thing about the Fitzgerald Reserve, what would it be?	33	75%	Comments focused on its fragility and the importance of protecting it	9	75%	Comments focused on its fragility and the importance of protection	42	75%
	11	25%	Comments celebrating the quality of the visitor experience	1	8%	Good place to see marine life	12	21%
	1	2%	A sign saying how slippery the reef can be	1	8%	That it's here at all	2	4%
				1	8%	Got me!	1	2%

14. Is there anything else you'd like the planners to know?		Reserve-wide , 72 comments were offered. Thirty-two percent of them (23) were requests for caution regarding developing facilities or attracting more visitors; 19% (14) were specific requests regarding management or maintenance; 18% (13) showed interest in learning more about the Reserve; 15% (11) expressed support for increased facilities or continuing public access; 14% (10) expressed appreciation for the site or its preservation. See next page for full list of comments.
15. What is your zip code?		At Moss Beach , 16 (36%) were from San Mateo County; 11 (25%) from Santa Clara County; 9 visitors (20%) from out of area; 6 from San Francisco County; balance scattered around Bay Area. 80% of respondents live within 40 miles of the Reserve. At Pillar Point , All users were from Bay Area; 8 were from San Mateo County (67%)

Compiled comments from both surveyed sites; those specific only to the Pillar Point area are so marked. 72 comments total.

“Use Caution” comments

1. not an obtrusive center please
2. leave natural, please--no swing sets
3. likes that it's natural, not built up--please preserve that
4. don't make it obtrusive
5. keep it as pristine as possible
6. perfect the way it is
7. exhibits are not the same thing as the real setting
8. happy with what they've done so far – there isn't much open space left and it's important to maintain it for future generations
9. don't change reef--natural state is better
10. stay natural without being overexposed to the public
11. make people want to come here without a massive visitor center!
12. keep it natural as possible
13. don't build, don't bring more people in
14. no VC on bluff--won't visit anymore if it gets too civilized
15. concerns about more crowding with development of a center
16. doesn't usually feel crowded here
17. don't make it more accessible!
18. secluded
19. it's already overloaded

20. don't let seal population get too big or no one will be allowed near here
21. don't overmarket
22. every place I visit is changing so rapidly
23. exhibits belong at places like Monterey Bay Aquarium, not a natural place like Fitzgerald--don't make it into a museum

Supporting the idea of increasing facilities or public use

1. Make it ADA accessible
2. pleased that a center would attract more attention to the region
3. parking is occasionally an issue
4. need more parking!
5. free parking is great (2)
6. an educational center or museum is an exciting idea, would enhance the experience
7. well-chosen merchandise could replace urge to collect
8. keep in mind the economic impact that filming can bring to our parks system--with proper staffing and docents, the filming community and the Reserve can both be respected
9. wants a VC where kids can explore so they will be more aware when they get to the reef
10. keep it open to the public
11. keep it available to the public

Welcoming opportunities for more information

1. sees lots of "don'ts" and would love to see some "do's"
2. likes ALL the [interpretive media and services] ideas in question 9
3. more signs – also wants naturalists as well as exhibits
4. naturalists would be great if they could be offered--also a library
5. brighter, more visible signs
6. would like to know what constitutes "disturbance"
7. more info would enhance the experience
8. would like more information about this place--wants to know what to look for and how to make it a better experience
9. wish to know more about this place
10. kiosk with brochures would be nice
11. please create more education programs focused on parent-child interaction opportunities, not just school programs
12. I'm a teacher (and docent at another site), so I know how important exhibits are to protection
13. wants their kids to come get educated about it and learn to care--hands-on experience

Management requests

1. soap in restroom, please (2)
2. larger bathroom for women, please
3. please use better fencing to protect eroding bluff
4. erosion is bad here
5. footing on descent to beach is slippery
6. please repair trails
7. keep it clean so everyone can enjoy
8. enforce leash law
9. post the closed areas so we can know to stay out
10. please give us an off-leash area for our dogs--there are so few places a dog owner can give their pets full running privileges (Pillar Point)²
11. need bathrooms, water fountain, and a dog water fountain (Pillar Point)
12. need barrier and signs from beach end of marsh (Pillar Point)
13. need to patrol parking and crowding (Pillar Point)
14. please continue to incorporate the public into your planning

Expressing appreciation for site

1. well worth preserving
2. grateful for preservation efforts
3. been visiting here for 30 years
4. wonderful place
5. amazingly pleasant experience
6. it's important--wants their child to be able to enjoy it in the future
7. one of the most beautiful beach and tide pools in the area--view, cliffs--used to walk in Distillery area before it was overtaken by brushy overgrowth
8. showing out of town guests this place; Chamber suggestions for visitation are great
9. great place to learn about ocean life up close and personal
10. it's great
11. we enjoyed our visit

² Approximately 75% of visitors observed at Pillar Point during the survey period brought their dogs.

Appendix C, Interpretive Goals and Objectives at Fitzgerald Marine Reserve

Here at Fitzgerald, goals ensure interpretation is aimed at helping visitors understand and support Reserve rules and regulations and encouraging a stewardship relationship with threatened marine resources. Setting goals is not enough, however. To ensure progress toward those goals, specific, quantifiable objectives must be established. Such objectives first serve to guide the design and implementation of all interpretive media and messages. They also allow managers and planners to test messages, programs, and media before investing resources in their full-scale development. Finally, after development and implementation, interpretive objectives provide the framework for ongoing evaluation of media and program effectiveness.

The objectives set for each goal are meant to be “realistically ambitious”. The percentages (as high as 90% in some cases, as low as 50% in others) reflect the universal reality that no interpretive programming is 100% successful in effecting change in every visitor. At the same time, the figures set a high standard that will require all interpretive communications to stay focused on effecting changes that ultimately protect Reserve resources.

The use of affective goals and objectives needs to be qualified. Feelings are unlike knowledge or behavior. While the cognitive and behavioral objectives presented in this report can be used as direct measures of progress toward their corresponding goals, it is difficult to measure visitor feelings or attitudes with accuracy or certainty that a specified variable is having an effect. Most often, affective changes can only be inferred from measurement of visitor behavior (since behavioral changes are preceded by changes in attitude or affect). Nevertheless, affective goals can guide the tone of interpretation during its planning and implementation phases. With this in mind, the affective goals and objectives offered in this plan are offered only to help future planners, designers, and managers consider this realm as they develop interpretive products and programs.

Affective Goals and Objectives

1. People¹ will appreciate the Fitzgerald Marine Reserve and the role it plays in supporting a complex web of organisms and habitats.
 - a. 70% of visitors will indicate that the life forms and habitats found in the Reserve are inherently important and deserving of protection.
 - b. 70% of visitors will express strong appreciation for the Reserve and the role it plays in supporting diverse populations of marine and terrestrial life.
2. People will recognize that appropriate behaviors are expected from visitors while at the Reserve.
 - a. 80% visitors will indicate awareness that they are in a protected Reserve.
 - b. 80% of visitors will indicate awareness that certain behaviors are permissible and others are not within the Reserve.
 - c. 70% of visitors will indicate awareness that their actions and behavior at the Reserve are likely to have a direct impact on the protection or degradation of the Reserve, its habitats, or the organisms that live in those habitats.
3. People will respect and value efforts directed at protecting the Reserve.
 - a. 70% of visitors will express support for rules protecting the Reserve, for research and restoration efforts, and for staff and volunteer undertaking such efforts.

¹ Here “people” refers to the full array of target audiences for Fitzgerald interpretive communications, which includes on-site visitors but may also include off-site populations such as neighbors, community leaders, organizations and businesses. Some goals are particularly relevant to certain audience segments. Accordingly, actual interpretive messages and methods of delivery should be shaped to fit each target audience.

Cognitive Goals and Objectives

1. People will understand that marine organisms are adapted to constantly changing environmental conditions.
 - a. 70% of visitors will be able to describe in general terms at least two conditions that undergo daily change in a tidepool.
 - b. 70% of visitors will be able to describe in general terms how marine organisms have adapted to those changing conditions.
2. People will gain an understanding of how, despite their resilience to daily and seasonal changing conditions, marine organisms are fragile and subject to injury and death due to the impacts of human activities
 - a. 70% of visitors will be able to describe two on-site behaviors that have a direct negative effect on marine life at the Reserve.
 - b. 70% of visitors will be able to describe two behaviors at home (that contribute to non point source pollution or erosion) that can have a negative effect on coastal and marine life.
3. People will gain an understanding of the various ways human populations have been connected to this site over time, from 7,000 year old Ohlone settlements, to the 18th century Portola expedition, to 20th century use as homestead, resort, and harvest site, to the current status as a Reserve protected for its significant biodiversity
 - a. 50% of visitors will be able to state the correct name, Ohlone, as that given to identify the region's native people.
 - b. 50% of visitors will be able to name at least one historic use of Reserve property.
 - c. 70% of visitors will be able to describe in general terms how the site's protected status was triggered by sharp increases in visitation beginning in the late 20th century.
4. People will recognize and know the rules and regulations that help protect and manage the Reserve and why they are in place.
 - a. 70% of visitors will be able to give two specific reasons why rules and regulations are in place at the Reserve.

- b. 70% of visitors will be able to cite at least two examples of how abiding by rules and regulations has a positive impact on marine life.
- 5. People will gain an understanding of the ongoing need for Reserve preservation and restoration and that such efforts are undertaken by many agencies and organizations, including the County of San Mateo, the California Department of Fish and Game, two National Marine Sanctuaries, and the Friends of Fitzgerald.
 - a. 70% of visitors will be able to describe at least one step that is currently being undertaken to protect and restore Fitzgerald's biological diversity.
 - b. 70% of visitors will be able to name at least two partners involved with the Reserve.

Behavioral Goals and Objectives

- 1. People will demonstrate heightened awareness of, understanding of, and support for Fitzgerald Marine Reserve through their adherence to rules and regulations.
 - a. 80% of visitors will voluntarily abide by posted rules and regulations at all times.
 - b. 90% of all visiting group leaders including educators will voluntarily abide by new field trip policies.
- 2. People will engage in activities that are appropriate for the Reserve.
 - a. 90% of visitors will keep a safe distance between themselves and any marine mammals that have hauled out at the Reserve.
 - b. 90% of visitors will refrain from tidepool exploration behavior that causes injury to marine organisms, including but not limited to prying animals off rocks, not returning animals to their exact location after temporarily looking at them, wading in tidepools, or turning rocks over.

Appendix D, Neighboring Facilities Report

This is a partial list of Fitzgerald Marine Reserve's neighboring facilities and organizations that offer marine-oriented interpretive and environmental education opportunities (within a 25-mile radius). Listings reflect programs and facilities located on or near the coast between Marin Headlands and Monterey and/or that directly involve intertidal or marine features in this region. Programs or facilities addressing inland waters and baylands are not included.

Año Nuevo State Park

Año Nuevo State Park near Pescadero preserves a substantial area on the western slope of the central Coast Range inland from Año Nuevo Point. The property contains a diversity of plant communities, including old growth forest, freshwater marsh, red alder riparian forest and knobcone pine forest. Its four perennial streams support steelhead trout and coho salmon, and its wetlands are habitat to the rare San Francisco garter snake and red-legged frog. Cultural resources include the remnants of a prehistoric Native American village site and a number of structures from the nineteenth century Cascade Ranch. Exhibits and guided tours are available.

Año Nuevo State Reserve

Located within Año Nuevo State Park, the Reserve is a restricted-access site protecting the largest mainland breeding colony in the world for the northern elephant seal. Rangers and docents at Año Nuevo State Reserve offer seasonal field trips to see elephant seals and hear wildlife lectures. A Visitor Center features natural and cultural history exhibits and a bookstore offering educational items such as books, postcards and posters.

Big Basin Redwoods State Park

Big Basin, established in 1902, is California's oldest State Park. Home to the largest continuous stand of Ancient Coast Redwoods south of San Francisco, the park consists of over 18,000 acres of Old Growth and recovering Redwood Forest, with mixed conifer, oaks, chaparral, and riparian habitats. Big Basin has a full schedule of interpretive programs during the summer and on weekends during the fall and spring as staff allows. There is a docent program and school programs are available.

Butano State Park

Located on the San Mateo Coast, this 2,200 acre state park¹ is situated in a redwood canyon. Trails and camping facilities are available. Education programs consist of guided natural walks, weekend campfires, and a Junior Ranger program.

California Academy of Sciences

Including the natural history museum, Steinhart Aquarium, and the Morrison Planetarium, the California Academy of Sciences comprises one of the largest and most complex natural history institutions in the world. Located in San Francisco's Golden Gate Park, the academy is home to one of the foremost natural history collections and a rigorous, global science research program. Steinhart Aquarium houses a wide variety of underwater specimens from different marine habitats and features a live tide pool touch tank. The Academy offers an extensive array of educational programs for school groups and the public.

California Coastal Commission

The California Coastal Commission's public education programs increase public knowledge of coastal and marine resources and engage the public in coastal protection and restoration activities. Offerings include a variety of conservation, education and community involvement programs, such as coastal cleanup day, adopt-a-beach, boater education, and coastal art and poetry contests.

Camp SEA Lab

Camp SEA Lab is a marine science camp adventure for youth ages 8-13, headquartered in Seaside, CA. Science, Education, and Adventure are the focus as SEA Campers explore the wonders of the marine world. Weeklong day

¹ California State Parks offers guided field trips focused on natural history, cultural history, and environmental living at many park sites. In addition, the Park system offers environmental studies programs (heavily emphasized at sites within the counties of Santa Cruz and Monterey where the Beach Garden Project and Snowy Plover Guardians program have been launched) as well as school outreach, Junior Ranger, Junior Lifeguard, and Litter-Getter programs.

camp and residential camp programs are scheduled throughout the months of June, July, and August. The SEA Guides Program is a leadership program for teens age 14-18, through which teens are trained as program leaders for camp. One-day youth and family programs are offered during the school year, and special workshops for teachers and Camp SEA Lab in the Schools programs will be developed and offered year-round.

Coyote Point Museum

Located in Coyote Point Park, the Coyote Point Museum for Environmental Education features an Environmental Hall (four levels descending from the Bay to the Pacific Ocean) with exhibits that integrate dioramas, interactive media and graphics. Fifty live animals are displayed in wildlife habitats; a small walkthrough aviary and series of gardens (Hummingbird, Butterfly Habitat and Nature's Marketplace) are also featured. Programs are extensive, ranging from tours in the museum and in the field (to Fitzgerald Marine Reserve to the marsh at Coyote Point, as well as to five San Mateo county parks) to theme-based programs, four-week programs, teacher workshops, group learning and family activity days, and service-learning projects. School program topics include tide pools, whales, and open oceans.

Elkhorn Slough

Located in the middle of Monterey Bay, Elkhorn Slough harbors the largest tract of tidal salt marsh in California outside of San Francisco Bay. This ecological treasure provides habitat for plants, animals, and more than 340 species of birds. Designated a Globally Important Bird Area, the slough is a key stopover for hundreds of thousands of migrating birds and is a major fish nursery for Monterey Bay. Visitor Center exhibits feature unique views of the more difficult to see and often rather peculiar creatures of the Slough. A teacher training program is designed to help teachers become proficient in leading successful field trips on the Reserve (there are no docent-led or staff-led programs for schools). The public Coastal Training Program provides the best available science, tools, and techniques to those individuals and groups whose actions influence coastal watersheds, estuaries and near shore waters.

Elkus Ranch

Situated five miles south of Half Moon Bay, the 600 acre Richard J. Elkus Ranch is operated by the University of California Cooperative Extension Service. The Ranch features a farmhouse, new 4,400 square foot Ranch center, network of hiking trails, platform sleeping tents, two barns, gardens, greenhouse, lathhouse, and an array of farm

animals. Programs include ranch tours, content-specific programs (i.e. energy flow, cycles, adaptations, food and fiber) and overnight stays where students explore the Ranch and coastal environment and participate in ranch chores.

Environmental Volunteers

Based in Palo Alto and serving San Mateo and Santa Clara Counties, Environmental Volunteers provide hands-on, inquiry-based, volunteer-driven natural science educational opportunities through school services, projects, and summer camp programs. At any one time, a variety of K-8 programs is offered on such topics as marine ecology, baylands ecology, foothills ecology, geology, and early California Indian life.

In partnership with UC Santa Cruz Extension, Environmental Volunteers also offers an Environmental Education Certificate Program for academic credit for K-6 teachers.

Exploring New Horizons

Exploring New Horizons is a private, non-profit environmental education organization that operates from two different locations along the San Mateo coast: Camp Loma Mar and Pigeon Point (as well as the Sempervirens Outdoor School in Santa Cruz). Resident and field trip excursions are offered for primary and secondary students. The Loma Mar program focuses on redwood and oak woodland ecology, sandy beach and intertidal ecology. The Pigeon Point program focuses on marine and redwood ecology, and lighthouse history.

Farallones Marine Sanctuary Association

The Farallones Marine Sanctuary Association (FMSA), incorporated in May 1995, is a non-profit cooperating organization with the Gulf of the Farallones National Marine Sanctuary (GFNMS) that protects the resources managed by the GFNMS through collaborative education, interpretation, outreach, and research. Educational programs include two-hour introductory programs for all ages at the FMSA Visitor Center (the Sanctuary Center), loan slide shows, teacher workshops, and educator packets. FMSA operates sandy beach and rocky intertidal monitoring programs for high school students. In conjunction with the San Francisco Recreation and Park Department, they operate the Sanctuary Explorers Camp for inner city San Francisco youth ages 8-13.

Field Trip Foundation

Field Trip Foundation (FTF) offers environmentally oriented field trips to students from low-income schools meeting specific requirements. Field trips are often preceded by in-class instruction and activities. FTF also offers grants to low-income schools for environmentally oriented field trips that teachers coordinate. Field trip sites include Fitzgerald Marine Reserve, Pillar Point, and Ano Nuevo State Beach. There is a qualifying application process.

Gulf of the Farallones National Marine Sanctuary

The Gulf of the Farallones National Marine Sanctuary protects an area of 948 square nautical miles (1,255 square miles) off the northern and central California coast, located just a few miles from San Francisco. Designated in 1981 because of its rich biological diversity, the GFNMS encompasses over 1,200 square miles of open ocean and coastal waters as well as bays and estuaries from Bodega Head in Sonoma County all the way down along the San Mateo County coast. Educational efforts are conducted by the Farallones Marine Sanctuary Association (see separate listing).

Half Moon Bay State Beach

Managed by California State Parks, Half Moon Bay State Beach has three access points at Francis Beach, Venice Beach, and Dunes Beach. The Coastside Trail runs along the eastern boundary, parallel to a horse trail. A public Visitor Center is open on weekends (and Thursday and Friday during the summer). Park lifeguards, rangers, visitor center docents, and snowy plover volunteers offer interpretive programs for groups and classes, and field trips, environmental living programs, Junior Rangers, and Litter Getters programs are offered through the park system. Half Moon Bay State Reserve also involves local students in a dune, coastal scrub, and riparian restoration program.

Headlands Institute

Located in the Golden Gate National Recreation Area in Sausalito, the Headlands Institute is a private, non-profit educational organization that provides residential field-science programs for students of all ages. Headlands Institute curriculum is based on three core themes: sense of place, interconnections, and stewardship. They offer a yearlong program for high school students (Teen Environmental Action Mentorship Program) and, in cooperation with UC Berkeley Extension and the National Park Service, an environmental education training program for educators.

Hostel Adventure Program/American Youth Hostels

The Hostel Adventure Program is an outdoor environmental and experiential one to three day program that primarily serves economically and educationally disadvantaged Bay Area youth (though all school groups are welcome). School groups and community agencies may choose from one of three youth hostels (Marin Headlands, Montara, and Point Reyes), where a trained naturalist takes the group on a daylong hike followed by a night at the hostel. Scholarships for transportation and hostel stays are available.

Marine Mammal Center

Located in the Marin Headlands, the Marine Mammal Center rescues and rehabilitates stranded and sick marine mammals, while simultaneously gathering scientific data and documenting each patient's case. Educational programs for schools and the general public include guided beach walks, tours of the pinniped hospital, career exploration days (for high school students), a marine science classroom (at the Center), and the traveling Whale Bus outreach programs.

Marine Science Institute

Marine Science Institute offers hands-on, marine science programs to all grade levels and ages. Programs include Discovery Voyages on the Bay, on-shore programs at MSI, outreach programs to schools with a traveling aquarium, tide pool expeditions to Pillar Point, teacher workshops, and summer marine camps.

Memorial Park

Established in 1924, Memorial Park is the oldest park in the San Mateo County Parks and Recreation Division. The 499-acre Park features old-growth redwood forest, wintering habitat for steelhead in Pescadero Creek, ten miles of trails including the self-guided one-mile Mt. Ellen Nature Trail and Tan Oak Nature Trail for those with disabilities, family picnic sites, six youth group areas, group picnic sites, two group camping area, amphitheater, and camp store. The interpretive center has exhibits on natural and cultural history, live animal displays, and other media. Park staff provides campfire and naturalist programs, guided walks, and nature programs during the summer months. Trail construction and patrol, exotic plant removal, and habitat restoration volunteer opportunities are available through the Park Division's Volunteer Program.

Mission Springs Outdoor Education

Mission Springs Outdoor Education, located in Scotts Valley, offers residential outdoor programs for 5th to 8th grade students in public and Christian schools. Topics include redwood forest ecology, water quality, environmental stewardship, observational skills, art, marine biology, and tide pool studies. One guided coastal field trip is included in each five-day program. Special programs include “Ocean Weeks” and “Wilderness Weeks.”

Monterey Bay Aquarium

Monterey Bay Aquarium's nearly 200 exhibits and galleries are devoted to the diverse habitats of Monterey Bay. The more than 250,000 animals and plants on exhibit represent nearly 700 species of fishes, invertebrates, mammals, reptiles, birds and plants found in Monterey Bay. Each year, more than 80,000 California school children benefit from free tours, labs and other programs at the aquarium. Workshops for teachers are offered throughout the year.

Monterey Bay National Marine Sanctuary

The Monterey Bay National Marine Sanctuary (MBNMS) is a federally protected marine area offshore of California's central coast stretching from Marin to Cambria. It encompasses a shoreline length of 276 miles and 5,322 square miles of ocean and includes our nation's largest kelp forest, one of North America's largest underwater canyons and the closest-to-shore deep ocean environment in the continental United States. Through the development of exhibits, publications, programs, events and services, MBNMS educates public and school audiences about the Sanctuary. These include an annual public symposium, the Urban Watch Storm Drain Monitoring Program, the “Land-Sea Connection” curriculum, and a teacher list serve. An interactive interpretive visitor center is in planning stages. MERITO (Multicultural Education for Research Issues Threatening Oceans) was developed in 2001 by MBNMS in partnership with Hispanic communities in Central California to provide expanded bilingual outreach and education about marine and coastal environments and their conservation to youth, teachers, adults and families.

Natural Bridges State Beach

With its famous natural bridge, Natural Bridges State Beach (Monterey County) offers an excellent vantage point for viewing shore birds, migrating whales, and seals and otters playing offshore. Further along the beach, tide pools offer a glimpse of life beneath the sea. The park also includes a large area of coastal scrub meadows, with native

wildflowers in the spring. Moore Creek flows down to the ocean through these meadows, forming a wetlands in the sand. The park's Monarch Grove is a Natural Preserve and provides a temporary home for over 100,000 Monarchs each winter from mid-October through the end of February. Docent-led butterfly, tide pool and nature trail tours are available. A small visitor center features exhibits about the Monarchs and other area wildlife.

Pescadero Creek Park

One of San Mateo County Parks and Recreation parks, Pescadero Creek Park is comprised of three county parks: Sam McDonald, Memorial, and Heritage Grove Parks. Pescadero Creek flows year-round and serves as steelhead habitat. The land also offers nesting habitat for the endangered marbled murrelet. Future plans may include restoration for coho salmon as well. Park features include the Shaw Flat and Tarwater Trail Camps, and hiking and equestrian trails.

Pescadero Marsh Natural Preserve

Located across the road from Pescadero State Beach, Pescadero Marsh comprises 360 acres of wetlands formed where Pescadero Creek and Butano Creek drain into the Pacific. The marsh is north of Pigeon Point Lighthouse, off Highway 1, and is well known among birders for its abundance of migratory waterfowl and shorebirds (as well as largest single populations of the endangered San Francisco garter snake and red-legged frog). Free guided walks are offered through California State Parks.

Pescadero State Beach

Operated by California State Parks and located south of Half Moon Bay, Pescadero State Beach offers one mile of shoreline with sandy coves, tide pools, and cliff formations. Fishing and picnicking are allowed, and ranger-led field trips are offered.

Point Lobos State Reserve

Point Lobos State Reserve, in Monterey County, contains headlands, coves and rolling meadows. The offshore area forms one of the richest underwater habitats in the world popular with divers. Wildlife includes seals, sea lions, sea otters and migrating gray whales (from December to May). Thousands of seabirds also make the reserve their home.

Hiking trails follow the shoreline and lead to hidden coves. The area used to be the home of a turn-of-the-century whaling and abalone industry. A small cabin from that era remains on Whaler's Cove, near Carmel. Working in cooperation with the California Department of Parks and Recreation, the Point Lobos Natural History Association supports the docent program, publishes and distributes interpretive materials, and develops and maintains interpretive displays. Docents lead public and school nature walks, interact with visitors on trails and give visitors a close-up look at animals through spotting scopes.

Sam McDonald Park

One of San Mateo County Parks and Recreation parks, Sam McDonald Park in Loma Mar consists of 850 acres of redwood forest contrasted with open ridges and brush areas which, in spring, offer wildflower displays. Interconnecting trails, accessible to hikers, joggers, and equestrians, link Pescadero Creek, Memorial, and Sam McDonald Parks. Three youth group campgrounds and one horse camp are available for reserved use. The Hikers' Hut is operated by the Sierra Club, and offers rustic group accommodations.

San Mateo Fishing Pier

One of San Mateo County Parks and Recreation facilities, the pier is actually a portion of the old San Mateo Bridge. Additionally, it serves as a trailhead for the Baylands Trail.

San Mateo Outdoor Education – San Mateo County Office of Education

Located in La Honda at the YMCA's Camp Jones Gulch, the San Mateo Outdoor Education program is a weeklong residential program for 5th and 6th grade students. The program focuses on both experiential and environmental education. Course content includes the physical and social sciences, art, and music, in addition to providing the opportunity for students to gain social skills.

San Pedro Valley Park

Located in Pacifica and one of San Mateo County Parks and Recreation parks, San Pedro Valley Park is situated on 1250 acres of grasslands, scrub, oak woodlands, and riparian areas along the middle and south forks of San Pedro

Creek – home to spawning steelhead. The Park offers group picnic areas, family picnic areas, self-guiding nature trail, eight hiking trails, and a Visitor Center. The Center features exhibits on the ecology of the San Pedro Valley, a park library, and bookstore, staffed by volunteers who also perform trail repair and habitat restoration.

Sanchez Adobe

Located in Pacifica and one of San Mateo County Parks and Recreation historical sites, the Sanchez Adobe (1846) provides a venue for historical interpretation. The adobe is furnished with period pieces; archaeological evidence of the 17th century Mission Dolores Outpost is also found here. Docents from the San Mateo County Historical Association offer a living history program depicting life on an early California rancho for fourth grade students in San Mateo County schools. Storytelling and demonstrations such as brick making and corn grinding are also offered. The five-acre adobe site is reached using the lower trails from San Pedro Valley Park.

Seymour Marine Discovery Center

The Seymour Marine Discovery Center is part of the Joseph M. Long Marine Laboratory, a research and education facility of the University of California, Santa Cruz. The laboratory is affiliated with the Institute of Marine Sciences, a university research unit, and serves as a base for field research in Monterey Bay and the ocean beyond. The Seymour Marine Discovery Center offers exhibit halls, aquarium, touch tanks, tours to marine mammal research overlook, Ocean Discovery Shop, and unsurpassed vistas of the Monterey Bay National Marine Sanctuary. A variety of programs is offered for K-12 students, youth, and teachers.

Walden West, Santa Clara County Office of Education

Walden West Center is a residential outdoor program for 5th and 6th grade students, operated by Santa Clara County Office of Education. Students study forest, meadow, and stream ecology using the 35-acre site in the foothills of the Santa Cruz Mountains near Saratoga as their laboratory.

YMCA Point Bonita Outdoor and Conference Center

The YMCA Point Bonita Outdoor and Conference Center is a branch of YMCA San Francisco located in the Marin Headlands just west of the Golden Gate Bridge. The Outdoor Education Program (OEP) hosts residential stays with programs that might include walking tours of local tide pools and beaches, the historic Point Bonita Lighthouse, the Marine Mammal Center, a freshwater lagoon, nearby Nike Missile sites, and remnants of several other coastal defense systems. Night programs include academic programs such as marine mammals, marine biology/oceanography or a town hall event as well as hiking and campfires.

YMCA Point Bonita also offers The Urban School of Environmental Education, a multi-day, environmental outreach program designed to introduce students in grades 5-8 to the natural history of their local communities.

ZunZun

ZunZun is a performing arts group that celebrates the environments and cultures of the Americas through music. They use as many as 25 different instruments during their performances. ZunZun has created school assembly shows about water pollution, recycling, rainforests, watersheds, oceans, endangered animals and water conservation.

Appendix E, Education and Environment Initiative – Environmental Principles and Concepts

The environmental principles examine the interactions and interdependence of human societies and natural systems. The nature of these interactions is summarized in the environmental principles and concepts presented below.

Principle I

The continuation and health of individual human lives and of human communities and societies depend on the health of the natural systems that provide essential goods and ecosystem services. As a basis for understanding this principle:

- Concept a. Students need to know that the goods produced by natural systems are essential to human life and to the functioning of our economies and cultures.
- Concept b. Students need to know that the ecosystem services provided by natural systems are essential to human life and to the functioning of our economies and cultures.
- Concept c. Students need to know that the quality, quantity and reliability of the goods and ecosystem services provided by natural systems are directly affected by the health of those systems.

Principle II

The long-term functioning and health of terrestrial, freshwater, coastal and marine ecosystems are influenced by their relationships with human societies. As a basis for understanding this principle:

- Concept a. Students need to know that direct and indirect changes to natural systems due to the growth of human populations and their consumption rates influence the geographic extent, composition, biological diversity, and viability of natural systems.
- Concept b. Students need to know that methods used to extract, harvest, transport and consume natural resources influence the geographic extent, composition, biological diversity, and viability of natural systems.
- Concept c. Students need to know that the expansion and operation of human communities influences the geographic extent, composition, biological diversity, and viability of natural systems.

- Concept d. Students need to know that the legal, economic and political systems that govern the use and management of natural systems directly influence the geographic extent, composition, biological diversity, and viability of natural systems.

Principle III

Natural systems proceed through cycles that humans depend upon, benefit from and can alter. As a basis for understanding this principle:

- Concept a. Students need to know that natural systems proceed through cycles and processes that are required for their functioning.
- Concept b. Students need to know that human practices depend upon and benefit from the cycles and processes that operate within natural systems.
- Concept c. Students need to know that human practices can alter the cycles and processes that operate within natural systems.

Principle IV

The exchange of matter between natural systems and human societies affects the long-term functioning of both. As a basis for understanding this principle:

- Concept a. Students need to know that the effects of human activities on natural systems are directly related to the quantities of resources consumed and to the quantity and characteristics of the resulting byproducts.
- Concept b. Students need to know that the byproducts of human activity are not readily prevented from entering natural systems and may be beneficial, neutral, or detrimental in their effect.
- Concept c. Students need to know that the capacity of natural systems to adjust to human-caused alterations depends on the nature of the system as well as the scope, scale, and duration of the activity and the nature of its byproducts.

Principle V

Decisions affecting resources and natural systems are based on a wide range of considerations and decision-making processes. As a basis for understanding this principle:

- Concept a. Students need to know the spectrum of what is considered in making decisions about resources and natural systems and how those factors influence decisions.
- Concept b. Students need to know the process of making decisions about resources and natural systems, and how the assessment of social, economic, political, and environmental factors has changed over time.

Appendix F, Educator Needs Assessment Survey

The first column, “Visited”, refers to teachers who have visited the Reserve. “All” refers to the entire population of sampled teachers from Santa Clara and San Mateo Counties. Visited n=67; All n=125

1. What is your current teaching position?

	Visited	All
classroom teacher	57	119
administrator	2	3
special ed teacher	0	2
other:		
school secretary-field trip coordinator	0	1
field teacher	1	0

	Visited	All
teacher of a summer school program	1	0
university professor	1	0
senior girl scout	1	0
independent study teacher	1	0
instructional assistant	1	0
parks and recreation program coordinator	1	0
children’s coordinator	1	0

2. What grade level(s) do you teach?

	Visited	All
K-1	0	1
K-4	1	0
K-5	1	1
K-6	0	2
K-8	1	1
K-12	2	0
1	0	3
2	2	2
2-3	3	6
3	10	37
3-4	5	6
3-6	0	1
3-12	1	0

	Visited	All
4	8	29
4-5	2	6
4-6	1	0
5	8	17
5-8	1	0
6	7	11
6-8	1	0
7	1	0
9-12	2	0
12	1	0
university undergraduates	1	0
college	5	0
preschool to adult	1	0

3. How many years have you taught?

	Visited	All
1		3
1.5		2
2	4	7
3	1	7
4		9
5	3	12
6	3	5
7	5	10
8	2	7
9	1	7
10	6	4
11	4	1
12	1	6
13	1	1
14		1
15	5	3
16	1	3
17	4	3
18	1	4

	Visited	All
19	1	1
20	2	4
22	1	2
23	2	1
24	1	1
25	5	2
26	1	
27	2	4
28	1	
29	1	3
30	3	4
31	2	
32	1	2
34	1	
35		2
37		1
38		1
39		2
41	1	

4. At what school do you teach?

	Visited	All
Adelante		1
All Saints	1	
Allen School		2
Alma Heights Christian Academy	1	
Aptos MS	1	
Arbuckle		1
Argonaut Elementary		1
Arundel		1

	Visited	All
Athenian	1	
Bagley		1
Barron		1
Bayshore		4
Baywood		1
Beach Elementary	1	
Brooktree		2

	Visited	All
Brown		1
Bubb		1
Cabrillo	2	
Canoas		1
Capt. Jason M Dahl		1
CCSF	1	
Cesar Chavez Academy		1
Cherry Chase		1
Cherrywood		1
City of Roseville Parks and Rec	1	
College of San Mateo	1	
Connecting Waters Charter	1	
Country Lane	1	
Covington		2
Cumberland Elementary		1
Curtner Elementary		1
Daniel Webster	2	
Del Roble		2
Dr. William Cobb Elementary	1	
Edenvale		2
El Carmelo	1	1
El Granada		2
El Toro		1
Encinal	2	
Escondido	1	1
Fairview	1	
Flood		1
Fox		1
Garden Village		1
Garfield Charter		1
George Hall		1
George Mayne		1
George Washington		1
Hacienda		1

	Visited	All
Handels		1
Hatch		3
Hawes		1
Heather Elementary		1
Hellyer		3
Herbert Hoover		2
Horrall		5
Hubbard		1
John Gill		1
John F Kennedy		3
John Muir	1	
Junipero Serra	1	2
La Honda	1	
Lakeside		1
Laneview		1
Las Positas College	1	
Laurelwood		2
Lawrence Hall of Science	1	
Linda Mar	2	
Lomita Park		1
Lorenzo Manor	1	
Los Arboles Elementary		4
Los Cerritos		2
Lynhaven	1	
Madera	1	
Marshall Lane		2
McKinley		2
Meadows Elementary		5
Meyer		1
Meyerholz	1	
MH Tobias		1
Millard	1	
Miramonte	1	
Monte Verde		1

	Visited	All
Monte Vista	1	
Nordstrom		2
North Shoreview		1
Notre Dame de Namur University	1	
Notre Dame Elementary	1	
Oak		1
Ocean Shore	1	
Oddstad	2	
Ohlone		2
Orion		1
Pacific	1	
Park		2
Parkmont School	2	
Pescadero	1	
Ponderosa		1
Prince of Peace Lutheran	1	
Roosevelt		1
Rose		1
Rosemary		1
Sacramento Country Day School	1	
Sakamoto		1
San Carlo MS	1	
San Jose State University	1	
San Mateo Park		1
Santa Rita	1	
Santee Elementary		1
Selby Lane	1	
Shetek After School Program	1	
Shirakawa		1

	Visited	All
Sinnott		1
Skyline Elementary	2	
South Peninsula Hebrew Day	1	
Spruce Elementary		1
St Peter's	1	
St Viator	1	
Stonegate	1	1
Sunset Ridge	1	1
Sunshine Gardens		2
Sutter		3
Suzume no Eakko	1	
Taft		1
Theuerkauf		1
Thomas Edison		1
TLC Stockton	1	
Village		1
Vinci Park		2
Vista College/SFSU/Dominican University	1	
Walnut grove	1	
Walter Hays		1
West		1
West Portal	1	
Westlake	2	
Wilcox	1	
Windmill Springs		2
Woodrow Wilson Elementary	2	

5. In what district do you teach?

	Visited	All
Alum Rock		3
Bayshore		4
Belmont		1
Berryessa		6
Cabrillo		5
Cambrian		1
Campbell Union	1	4
Chabot-Las Positas	1	
Cupertino	1	
Franklin-McKinley	1	19
Fremont Unified	3	
Hayward	2	
Hillsborough		1
Jefferson	4	6
La Honda-Pescadero	2	
Lakeside		1
Las Vegas Diocese	1	
Los Altos	1	3
Menlo Park	2	
Millbrae		4
Milpitas Unified		3
Moreland	1	
Morgan Hill		3
Mt. View		3
N/A-Japanese cultural summer school in San Jose	1	
Oak Grove		5
Oakland Diocese	1	
Pacifica	9	1

Palo Alto Unified	2	8
Peralta	1	
Piedmont	1	
Pleasanton	1	
Private	3	
PSD	1	
Ravenswood		2
Redwood City	1	7
Roseville	1	
San Bruno Park		2
San Carlos	1	2
San Francisco Archdiocese	2	
San Francisco Unified	4	
San Joaquin	1	
San Jose Unified		2
San Lorenzo Unified	1	
San Mateo Community College District	1	
San Mateo County (park)	1	
San Mateo-Foster City		11
San Ramon Valley	1	
Santa Clara Unified	1	7
Saratoga		1
Seventh Day Adventist	1	
South San Francisco Unified	2	8
Sunnyvale		2
University of California	1	
Waterford Unified	1	
West Contra Costa	1	

6. On average, how many students are in your classroom each period?

	Visited	All
4	1	
6	1	
12	2	1
14		1
15	2	
16	1	1
18	1	
20	19	49
20-25	1	
20-30		2
20-32	1	
21		4
22	3	1
22-28		1
24	2	1
25	5	1

	Visited	All
25-30	1	1
27	1	2
28		4
28-30		1
29		2
30	12	17
31	1	6
32	5	22
32-34		1
32-35	2	
33	2	2
34		1
35	2	
330		1
N/A		2

7. Which of the following sources of information most directly influences your teaching?

	Visited	All
district standards	9	19
national standards		
scope and sequence	12	1

	Visited	All
state standards	35	75
state frameworks		1
adopted textbooks	8	16

8. Have you heard of the Fitzgerald Marine Reserve?

	Visited	All
yes	63	69
no	4	56

9. If yes, through what means?

	Visited	All
newspaper	3	6
website	11	2
Friends of Fitzgerald	7	6

	Visited	All
direct mailing	7	7
friend	39	33
district-approved list	4	8

10. Have you ever been to the Reserve?

	Visited	All
yes	60	59
no	8	65

11. Have you taken your students on a field trip to the Reserve?

	Visited	All
yes	58	44
no	10	79

12. If yes, what sites did you visit?

	Visited	All
Moss Beach Reef	49	34
Frenchman's Reef	6	1

	Visited	All
Pillar Point Marsh	5	5
cannot remember	6	10

13. Have your students taken a guided tour of the Reserve with Friends of Fitzgerald docents?

	Visited	All
yes	28	23
no	39	95

14. What month and year?

	Visited	All
1977		1
1998		1
2003		2
Spring 2002		1
Spring 2003		1
March, April, May, June, 1995-2004	1	
April 1998		1
April 2003	1	
April 2004	3	6
April, last 10 years		1
usually April or May, every year for the last 10 years (except this year)		1
May, many years ago		1
May 1994	1	
May 1996	1	
May 2002	1	

	Visited	All
May 2003	4	
May 2004	4	1
June, ?	1	
July 2003	1	
August 2003	1	
October, ?		1
October 2001	1	
October 2003	1	
November 2004	1	
usually November or December	1	
years ago		1
at least 5 years ago		1
last 15+ years		1
numerous times	3	
every fall and spring	1	

15. Did the Reserve seem crowded?

	Visited	All
yes	7	5
no	17	20

16. What two elements would likely improve your students' experiences at the Reserve?

	Visited	All
less crowding	3	2
descriptive signs	11	8
improved access	1	3
awareness of rules	1	1

	Visited	All
time in new Center	15	9
enforcement of rules	2	2
better preparation		2
docent "stations"	18	13

17. What two elements would you like to see developed at the new Reserve Interpretive Center?

	Visited	All
live animals	18	33
a place to rest	3	4
exhibit area	13	20
introductory talk	19	14
changing exhibits	7	5
access to library	2	
"hands-on" learning	32	67
introductory video	6	16
do not know	4	16

	Visited	All
other:		
visuals emphasis (not text)		1
docent led tours		1
I would like to bring my class		1
bathroom by beach	1	
option of docents with groups on beach	1	
available docents	1	
set times for guided tours	1	

18. Are you aware that currently groups of 20 or more must make reservations before visiting the Reserve?

	Visited	All
yes	59	62

	Visited	All
no	7	63

19. What are the two most important criteria for selecting field trips for your class?

	Visited	All
quality of program	40	81
proximity to school	7	10
availability of bus	4	6
cost	21	31

	Visited	All
hour of program	3	1
relevance to your class curriculum	51	70
relevance to standards	7	31

20. What are the two most significant factors that limit your selection of a field trip?

	Visited	All
distance to site	27	42
cost per person	42	66
curricular alignment	14	18
availability of funds	26	45

	Visited	All
availability of bus	14	31
administrative policies	2	8
standards alignment	3	20
# of chaperones	3	9

21. Which two of the following would enhance or justify a field trip experience the most?

	Visited	All
pre-trip material	39	78
scholarships	12	28
evaluation of student learning	9	7
loan of "hands-on" materials for class use	41	46

	Visited	All
post-trip material	10	18
bilingual material	1	5
alignment to state or district standards	14	55

22. Which two curricular areas would you like to see the Reserve field trips emphasize the most?

	Visited	All
science	64	114
visual/performing arts	2	5
English/language arts	9	24

	Visited	All
history/social science	35	74
mathematics	3	11
health/physical ed	2	3

23. What field trips do you currently participate in with your students?

	Visited	All
Academy of Science	2	6
Age of Sail	1	
Ainsley House	1	3
Alcatraz	2	
Alpine Pond		3
Alum Rock Park		1
Alviso Salt Marsh		1
American Legion	1	
Ana Nuevo/Elephant Seals	2	2
Angel Island	1	5
Ardenwood Historic Farm	1	
Arts Express		2
Art Museum		2
Asian Art Museum	1	1
Audubon Canyon Ranch	1	

	Visited	All
ballet		2
Bay Area Discovery Museum		1
Baylands Wild West		1
BFI Recyclery		1
Big Basin State Park		2
Big Trees RR	1	
birding in Mountain View	1	
Black Diamond Mines	1	
Cal State Hayward Theater	1	
California History Museum	1	
Camp Campbell Science Camp	1	1
Campbell Historical Museum	1	1
Cantor Arts Center	1	
Cantor Museum		1
Chabot Space and Science Center	2	3

	Visited	All
Charleston Slough		1
Children's Discovery Museum		7
Children's Theatre (History San Jose)		1
Coloma		1
County Museum		2
Covered Wagon		1
Coyote Hills	1	5
Coyote Point Museum	1	6
creek water quality	1	
Dauts Hall	1	
Detah Valley	1	
Discovery Voyage	1	1
Don Edwards NWR		4
Edgewood Park	1	
Egyptian Museum		1
Elkhorn Slough	1	
Elkus Ranch		1
environmental service		1
EV Earthquake		1
Exploratorium	6	12
Factory Tours	1	
Farm Trip		1
Filoli Nature Hike	1	3
Firehouse	1	
Fish Hatchery	1	
Fiitzgerald Marine Reserve	15	2
Foothill College		1
Fort Funston	1	
Fort Point	1	
Francis State Beach		1
Guide Dogs San Rafael		1
Hall of Health	1	
Headlands	1	
Hellyer Park		1

	Visited	All
Hidden Villa		4
Hiller Air Museum	2	
Historical Museum		1
Hitler Aviation Museum		1
HMB State Park		2
indoor climbing		1
inland seas		1
Intel Museum	1	1
Jason Broadcast		1
Kids are Giants Too	1	
Lawrence Hall of Science	2	3
Library	3	1
Linda Mar Call Center	1	
Lindsay Museum	1	
local ecosystem	1	
local watershed	1	
Marin Museum of American Indians	1	
Marine Mammal Center	1	1
Marine Science Institute	4	3
Maritime Museum		1
Memorial Park Redwoods	1	
Missions	1	5
Mission Dolores de Asis	2	1
Mission San Juan Bautista	2	14
MOMA		1
Monterey Bay Aquarium	3	16
Monterey Bay Whale Watch		1
Moss Beach	7	
movie theatre/behind scenes	1	
Muir Woods	1	1
Museums	1	3
Museum of Modern Art		1
mushroom hike	1	
music	1	1

	Visited	All
Mussel Rock Beach	1	
NASA	1	8
natural bridges		1
Natural History Museum		1
nature hikes		1
Nutcracker Ballet	1	
Oakland Museum	1	5
Oakland Zoo		1
Ohlone Indian studies		
O'Neil Sea Odyssey		1
Orange Park		1
outdoor ed	2	4
Palo Alto Arts Center		1
Palo Alto Baylands	1	2
Palo Alto Park		1
parks	4	
People like me		1
Peralta Adobe	1	1
performing arts		16
Pescadero Wetlands	1	
Pigeon Point	1	
Pillar Point	1	
Planetarium	1	8
plays	3	
Point Lobos	1	1
Point Reyes Ed Center		1
public library	1	
Purisma Open Space		1
Randall Museum	1	
Redwood City Museum		1
Redwood Grove Nature Preserve		2
Reserve		1
Roaring Camp	2	
roller rink	1	

	Visited	All
Rosicrucian Museum	1	2
Sacramento	1	
Sacramento Ballet	1	
Sacramento Capitol		6
Sacramento Railroad Museum	1	
San Andreas	1	
San Bruno Mountain State/County Park		1
San Francisco Ballet	2	
San Francisco Concert for Kids		1
San Francisco Opera		1
San Francisco Symphony	1	2
San Franciso Zoo	2	8
San Jose		3
San Jose Arts Council Performances		1
San Jose History Museum		4
San Jose Historical Park		1
San Jose Museum of Art	1	
San Jose Tech Center	1	
San Jose's Japantown	1	
San Mateo County Historical Museum	1	5
Sanchez Adobe		2
Santa Cruz		1
Santa Cruz Museums	1	
Santa Cruz Natural Bridges		1
Save the Bay		1
science camp		4
science museums		1
Sea Odyssey Boat Trip		2
Serpenarium	1	
Seymour Marine Lab		3
SFACTSpace and Science Center	1	
Sierra Mountains	1	
SJSU		1
SPCA		1

	Visited	All
State Museum		1
Steinhart Aquarium		1
sticker factory	1	
Strybing Arboretum		1
Sun Gallery	2	
Sutter's fort	1	2
Symour Museum		1
Symphony	1	4
Tech Museum	2	12
teddy bear factory	1	
tidepools	3	6
trips on BART	1	
UCD Raptor Center	1	
university visits		1
Vida Verde		2
Villa Mentalvo		1
Walden West		3
walking trips	1	
Westward Ho!		1
wetlands	3	

24. What one field trip format do you prefer?

	Visited	All
one-hour tour	5	10
two-hour tour	21	44
half-day tour	27	39

	Visited	All
Wild Things in Salinas	1	
Winchester House	1	
woodside store	2	3
Youth Science Institute	1	3
Zeum	2	1
Zoo		2
We go on a wide variety of trips as long as the price is low or free.	1	
Anything that has hands-on experiences		1
science field trips	1	1
We go on an average of one a month! Our curriculum is rich with these in-field experiences.		1
I set them up in the summer but don't participate-I plan a wide variety of field trips that are theme based.	1	
Those that align with standards science, language arts, math.	1	
Too many to list!	3	

	Visited	All
full-day tour	10	27
overnight program	1	
multiple visits	1	

25. What two activities would be of greatest benefit to your students?

	Visited	All
guided tour of the tidepools	54	98
guided tour of the bluffs	13	20
exhibit viewing in the new Center	15	23

	Visited	All
hands-on investigations near, but not in, the tidepools	41	75
long-term service-learning opportunities	5	9

26. Which two classroom resources and opportunities would you like to see the Reserve offer?

	Visited	All
pre-trip visit by staff or docent to school	29	76
post-trip visit by staff or docent to school	3	11
traveling trunk	16	24

	Visited	All
video or CD-ROM	20	37
teacher guides	32	34
booklets for students	31	44

27. On a scale of 1-4 with 1 being low and 4 high, indicate the likelihood of your class visiting the Reserve:

	Visited	All
1	2	12
2	1	33
2.5		4

	Visited	All
3	7	37
4	57	30

28. Please explain the reason for your rank.

Teachers who have visited:

1. Distance

1. We already visit the coast during Outdoor Ed. You'd have to offer something different.
2. It always seems to be such a hassle to make reservations for the tidepools

- 3. Cost and time.
- 3. It's close, if relevant to their experience. Do you have at least 2 hr of interesting curriculum?
- 3. If we have the funds, we'd be certain to come.
- 3. If more information becomes available and it relates to our curriculum, I'd love to take the students!
- 3. Kids haven't gone and I would love to take them.
- 3. Would like more info about the program.
- 4. We've been there twice and had great trips!
- 4. Will be there June 9th!
- 4. An excellent way to see marine life!
- 4. We love the reserve for all reasons!
- 4. It's close, fits curriculum and is really fun!
- 4. Fabulous experience, learning about local environment
- 4. We study tidepool animals
- 4. My students always say this is the best field trip ever. Hands on ocean visit/live animals.
- 4. My students enrich their learning and extend the curriculum with a hands on visit.
- 4. Have been there many times and is one of the best learning experiences in the Bay area.
- 4. We visit every two years-rotating curriculum.
- 4. Great hands-on field trip
- 4. Fitzgerald is the best and closest rocky tidal habitat to most Bay area schools.
- 4. We study oceanography-tidepools is culminating activity of unit
- 4. The reserve fits with the science curriculum and many of my students have never been to a tidepool.
- 4. Been there before-like it.
- 4. I've already booked the day and it must be on that day.
- 4. I love the tidepools and lessons they offer
- 4. Have taken classes to Preserve in past semesters and plan to go in Fall 2004.
- 4. Educational value is great
- 4. Successful previous field trips
- 4. I visit the tidepools for a self-guided tour every year with my 4th graders. I use to love the docent led tours.
- 4. We take kids frequently.
- 4. Great learning experience for the students.
- 4. I love it.

- 4. We visit every year. It is a culmination activity to our "Sea" unit.
- 4. Excellent opportunity for hands on with tide pools
- 4. We go every year.
- 4. They love science, loved learning about oceanography and loved this trip!
- 4. Relevance to curriculum, extreme value in interest, learning, and enjoyment.
- 4. Students have enjoyed going in the past.
- 4. Excellent previous experience.
- 4. We have a field trip to the Reserve, it is part of our curriculum.
- 4. The Fitzgerald trip is one of several field trips exposing the students to the different communities/ecosystems on the peninsula.
- 4. We attend science camp annually at Loma Mar.
- 4. It's a great site at low tide to see and experience a living tidepool. It is part of the curriculum (water).
- 4. It's a natural environment that shows all that we teach.
- 4. Proximity, quality of animals available in natural habitat.
- 4. Great hands-on experience for the students
- 4. We enjoy the trip and many of the students never leave their neighborhoods.
- 4. Has been successful.
- 4. I had accompanied another classroom last year and it was wonderful!
- 4. Excellent opportunities to learn about marine life-beautiful area.
- 4. Excellent program, hands on.
- 4. We've been there 3 years straight and love going there.
- 4. We've come each year for last 3 years and find it a valuable experience.
- 4. This is a field trip our 3rd grade classes do every spring (tied to our Life Science curriculum).
- 4. It is part of the 4th grade curriculum-seaweed
- 4. I lead 4 required trips to the reserve every year.
- 4. We have made going to the Reserve a 3rd grade tradition for 3 classes (we went in 2003 and 2004!)
- 4. We visit every year with k and 7th grade classes together in teams.
- 4. 8 week teacher prepared unit on tidepool is culminated with a trip to Fitzgerald.
- 4. I teach a college class (ecology) and we have 8 hour Saturday field trips-so we always come to Moss Beach (each semester).
- 4. We are scheduled to go on June 11th 2004.

- 4. I have been visiting the reserve with my class for the past 12 years and have established a curriculum around it.
- 4. Ties in with our study of ocean birds and environment.
- 4. Hand outs-most kids have not visited.

Entire Sampled Population:

? Do not know what is available.

1. I teach 1st grade.

1. Difficulty finding drivers.

1. Marine life does not hit 5th grade standards.

1. Location.

1. No docent tours-too many unsupervised children running around. This is the first year I haven't gone in ten years.

1. Money.

1. \$

1. No longer can count on getting docents!

1. We trade classes during science; 3rd grade studies this.

1. Cost, availability of bus.

1. I don't know where it is.

1. Distance.

1. The cost of getting a bus; connection to standards.

1. Distance to site is very far and our fifth graders go.

1. No funds.

1. Alum Rock district policy and funding.

1. Fourth grade does not do marine life in Palo Alto.

1. It's not in our science curriculum.

1. It's the end of the year.

2. Funds availability.

2. Difficult to align with curriculum for 5th grade-would love to take a mini weekend trip with some students.

2. \$, prep info offered.

2. Student too close to ocean.

2. 2nd grade usually goes there.

- 2. Difficult for us to get there using public transportation.
- 2. Planning trips is difficult. Busses/money/etc.
- 2. Not enough information.
- 2. Too many trips already planned for 04-05.
- 2. I'm no sure how this would align with my curriculum-need more info.
- 2. Funds.
- 2. Already have many established trips.
- 2. Even though we study structures of life, time does not allow.
- 2. Financial reason.
- 2. Distance, cost of busing.
- 2. Location? I know nothing about the reserve at this point.
- 2. No funding for field trips-we go on those paid for by the district.
- 2. Don't know how it might fit with standards and money, other trips traditionally booked.
- 2. Very poor area with high focus on test scores (I would make it happen if we had a way to pay).
- 2. Need to know more!!
- 2. Not knowing the teaching/student learning outcomes, it is difficult to rank.
- 2. We don't have bus money, but the Reserve was one of the best trips ever!
- 2. No experience with Reserve.
- 2. The 3rd grade emphasis is wetlands. A possible tie-in could be our study of the Ohlone Nat. Am.
- 2. Funds!
- 2. I need to research the connection/relevance to state standards for 6th grade (e.g. conservation/ecology).
- 2. Cost and transportation.
- 2. Would like more info about standards.
- 2. The field trips my 4th grade class goes on are related to history, not science, though I think the Marine Reserve is an outstanding field trip.
- 2. I would have to win your lottery-relevance to my curriculum.
- 2. Past difficulty of making appointment for visit.
- 2. Seems to fit science for lower grades better. Also very difficult to reserve (long wait).
- 2.5 Right now with no added programs a ? due to distance-3 or 4 if programs are added.
- 2.5 Need more info about time, cost, location, reval. to cur./stn.
- 2.5 Likelihood would be based on what the program has to offer.

- 3. I haven't researched the program.
- 3. We'd love to go if the program matches our curriculum and fits our schedule.
- 3. I need to coordinate with other 3rd grades.
- 3. Scheduling a low tide day and making a reservation that works.
- 3. High interest in adding to science curriculum.
- 3. It's beneficial and goes along with the standards but there's no money for field trip.
- 3. Availability of funds for bus.
- 3. I'd like to learn more and I would consider going.
- 3. Love nature trips.
- 3. Used to be an annual tradition for our 3rd graders-but not aligned to standards enough to justify-like focus to move to "adaptations".
- 3. I would love to, but difficult to get 1 class there-too small for bus transportation-no parent help.
- 3. It depends on where and when/next year.
- 3. So many great places to go on field trips I need to prioritize.
- 3. Having taken the children for close to 40 yrs, I can see the damage we have done. I quit coming because of the crowds of people being so careless of the environment.
- 3. Fitting it in logistically is sometimes difficult.
- 3. I need to know the curriculum offered.
- 3. It is so close!
- 3. Not sure what you offer and how it fits with my science standards.
- 3. Difficult to get reservation time. Difficult to arrange/pay for bus.
- 3. Distance and not being familiar with the site.
- 3. We have gone in the past and enjoy it.
- 3. I believe strongly that students need more exposure to science.
- 3. If cost was low or scholarships were available, we would be more likely to go.
- 3. Obvious interest in teacher needs and perspective.
- 3. I taught 2nd gr. for the past 3 years and went each year. This year I teach 4th grade-new trips, but would still like to go.
- 3. Would like to go but heard it's not for 3rd graders.
- 3. Need more info.
- 3. Dependent on funds and collaboration with other staff.

- 3. You present an excellent learning opportunity for students on multi-level goals.
- 3. Costs, administrative requirements, logistics.
- 3. Choice between Charleston Slough.
- 3. I haven't seen it yet, and am not sure how long a bus ride it is.
- 3. If I receive materials that explain and it seems beneficial.
- 3. We had a great experience the last time.
- 4. It has always been an informative and fun field trip.
- 4. This trip culminates our study of the rocky shore habitat, wetlands, and sandy beach.
- 4. We are focusing on math and science specifically water, so the more opportunity to discover our are the better.
- 4. I think it would be a great field trip-never thought about going before.
- 4. Distance of site.
- 4. Grade level does yearly tidepool unit.
- 4. I just need to plan the visit with the tides.
- 4. It is close and is a great educational place-hard to get one there though.
- 4. It provides the class with a live experience that most don't get.
- 4. Students need the hands on learning & self exploring of the tidepools. They don't get this opportunity with their family.
- 4. Foss science-study of crayfish.
- 4. We enjoy an annual trip to the reserve.
- 4. It fits with our coastal habitats unit.
- 4. Sounds like a great learning experience.
- 4. I've visited a marine reserve before with a class and it was OUTSTANDING! but very expensive!!
- 4. It covers a major part of our 3rd grade science standards.
- 4. If I knew I could get a reservation I'd be there, I quit coming when it was hard to get a visit date.
- 4. We went a year ago with no guide and little pre-trip info and loved it.
- 4. Hands-on experiences with animals for out study of animals in their habitat.
- 4. We go every year because it's the best science education one could offer.
- 4. Local and regarding natural environment.
- 4. It was a great field trip.
- 4. It is the highlight of our 3rd graders year.
- 4. We go there.

- 4. Excellent hands-on opportunity.
- 4. If I taught 6th again-it's hands on.
- 4. Matches our curriculum.
- 4. Wonderful trip for sci. standards.
- 4. I love it!
- 4. Habitat-standard in science.

29. Using the same 1-4 scale, indicate the likelihood of your participation in a visiting classroom program by Reserve staff or docents:

	Visited	All
1	14	11
1.5		1
2	8	19
2.5	2	3

	Visited	All
3	14	38
3.5		1
4	28	49

30. Please explain the reason for your rank.

Teachers who have visited:

- ? I love classroom visitors if they have new and interesting material.
- 1. Generally, not enough time for the things I already have to teach.
- 1. It's just not the same as hands on in the field.
- 1. I can provide better expertise.
- 1. I have school and homework, and ballet after school but I might be able to attend.
- 1. I prefer that my students experience the tidepools personally.
- 1. I teach them before we go.
- 1. Not as interesting.
- 1. Not needed
- 1. Students have lab activities already

1. Such programs usually are elementary school level! My students are not biology majors and often lack a biology background but they are adults anyway.
1. Too far, I am familiar already with intertidal ecology.
1. We are far away.
1. We are in Las Vegas, NV.
1. Would prefer to visit on site.
2. A lot would depend on time needed and when for visit.
2. How much \$?
2. Limited amount of time, cost
2. Not sure what it would look like.
2. Time constraints
2. Unsure how this would work since we are quite a ways from you!
2. We're pretty far away.
2. Would be less effective than first hand visit. Some of my students have never seen the ocean, let alone tidepool animals.
- 2.5 If cost of visiting reserve became prohibitive, I'd rather have a visit to our class than nothing.
- 2.5 Don't know.
3. less time commitment.
3. Depends on cost and time
3. Depends on cost.
3. Depends on the content and the type of activities students could engage in.
3. I would be interested in the material that would be covered.
3. If there is enough time available to take a day for great lecture.
3. It would be great to have someone visit.
3. The students would learn more, but this also doesn't apply to 6th grade science standards.
3. We have an existing excellent program. If we can find an open date, we would like a visit, but we are not "in need".
3. We would welcome the chance to have an in-class program.
3. Would like more info about the program.
3. Would love to given the opportunity.
4. Always if available

- 4. Cost would be more manageable.
- 4. Getting “into” the field trip before it happens greatly enhances the experience.
- 4. Good for prep
- 4. Great lead in to a visit.
- 4. I doubt if they could travel this far to present.
- 4. I would love to participate.
- 4. If it could be brought in we would love it.
- 4. If it were available to k.
- 4. It sets the students up for a positive experience-pre-knowledge.
- 4. It would be helpful to have a preview of what the class will be seeing so they can properly identify sea creatures.
- 4. It would enhance the on-site learning
- 4. My students need the scheme development. Hands-on is always best.
- 4. Pre-visit information by an “expert” would better prepare students for trip.
- 4. Students are receptive to another adult giving information.
- 4. The information is accurate.
- 4. The more informed the students are the more they get out of the program.
- 4. This would really enhance the visit! Having an expert with examples speak to the class.
- 4. Useful for students.
- 4. We have had someone come talk about tide pools before! It was great.
- 4. We’d love a visit to our site at Linda Mar School-we’re not that far from tide pools at Linda Mar beach-maybe a field trip there?
- 4. We’d love to have Ranger Steve Dunkin or someone else just as knowledgeable come and speak.
- 4. Would be a pre field trip visit
- 4. Would welcome a prep before visit to the Reserve.
- 4. Bringing it to school is great.
- 4. The kids would really benefit from a visit.
- 4. Hearing from an “expert” makes the students more interested.
- 4. The children remember these visits and draw on the information later.

Entire sampled population:

? Do not know what is available.

1. Cost and time.

1. Not sure what you mean.

1. Marine life does not hit 5th grade standards.

1. Only if we can get docents again.

1. With the current budget cuts and the socio-economic status of the school community, it's too expensive.

1. Already have so much going on with scheduling-think making time for it would be difficult.

1. Like to get out of the classroom for field trips.

1. It's not in our science curriculum.

1. Fourth grade does not do marine life in Palo Alto.

1. Our school year ends May 20th.

1.5 We prepare our students before trip-video would be nice addition. I'd rather have docents at reserve.

2. Time and not being familiar.

2. In 5th grade, our students go to outdoor education. They offer some instruction on tidepools.

2. Not enough information.

2. It depends on the cost. I have a lot of info/materials.

2. Not sure what that is.

2. The environment is what's important, and I'm not sure kids can get that without actually being there.

2. The hands on experience at Fitzgerald can't be duplicated in classroom.

2. Visiting here is fine.

2. Funds.

2. Funds/time availability.

2. Cost.

2. Would like more info about standards.

2. I am still new to teaching.

2. I'm not sure how this would align with my curriculum-need more info.

2. Time and packet (science).

2. Same (I would have to win your lottery-relevance to my curriculum).

2. Too many trips already planned for 04-05.

- 2. Classroom time is filled with teaching state requirements and students get this already.
- 2.5 1-funds! 4-funds!
- 2.5 Need more info, incl. \$.
- 3. Funding
- 3. Safety.
- 3. More likely to be cheaper to have someone come here.
- 3. I'd like it, but it's hard to make a call to commit.
- 3. Sounds great!
- 3. I am interested in making use of the resource.
- 3. Our school already has a program where your docents visit. It is excellent!
- 3. I didn't know it was offered.
- 3. I haven't researched the program.
- 3. Depends on quality.
- 3. Study of endangered species and human impact on the environment.
- 3. We'd love to go if the program matches our curriculum and fits our schedule.
- 3. Sounds good.
- 3. It would be easier to have a docent visit our school.
- 3. Need to be able to tie it into classroom curriculum.
- 3. It is located in San Mateo County.
- 3. This would be a great follow-up visit to "do" something with what they just saw with a docent.
- 3. Proximity and cost may be prohibitive.
- 3. Cost.
- 3. Much easier logistically.
- 3. Students are very responsive, it's effective.
- 3. It's always easier when you come to us. (bus availability difficulty)
- 3. Need more info.
- 3. I would welcome it, depending on how much the program would cost.
- 3. Same as above. You coming to us is easier than dealing with busses.
- 3. Kids' interest.
- 3. Tidepools would need to be covered in curriculum.
- 3. Classroom presentations are well received by students.

- 3. Same as 28 (It's beneficial and goes along with the standards but there's no money for field trip.)
- 3. Not sure what you offer and how it fits with my science standards.
- 3. We had a great experience the last time.
- 3. Seems interesting.
- 3. I would need more info first.
- 3. If the visiting program related to our science units on the interactions of living things, I would participate.
- 3.5 Likelihood would be based on what the program has to offer.
- 4. Kids benefit and no transportation needed.
- 4. It's easier to get people to our school than to take your class to a trip.
- 4. My demographic of kids need enrichment experiences and a view of the world outside of their street.
- 4. No problem with funding.
- 4. Easier to get one or two people here than to arrange to move 30.
- 4. I think it would be a great experience for the students to be introduced to it in our class.
- 4. The children will take more from the experience.
- 4. Would greatly enhance out existing unit.
- 4. Convenience.
- 4. Pre-activities always enhance student learning and understanding.
- 4. Oceans week-Bob Breen has come to Hatch in the past.
- 4. It would be very valuable during oceans week, but it is only wishful thinking as it seems hard to get staff here.
- 4. They have more knowledge about this than I do.
- 4. It takes less time away from teaching when people come to us.
- 4. It would be a great resource.
- 4. Lower expense.
- 4. I love having people visit our classroom, particularly with a science focus.
- 4. Would welcome the information and anticipation.
- 4. The availability of docents and hands on activities are more feasible-little parent help-transportation problems.
- 4. I think visiting staff could really help the children know about tidepools-with hands on stuff-of course.
- 4. They could come to us, no financial concerns.
- 4. This will enhance my ability to improve student learning.
- 4. I like the idea of docents coming and doing a program on site.
- 4. I would be very interested in setting this up.

- 4. As a 2nd choice I'd like my students to learn from an experienced person.
- 4. More info would lead to richer experience.
- 4. Set a context for students before attending field trip.
- 4. It would be a great opportunity for my students.
- 4. We currently bring in CAS or MSI for such preparatory programs now.
- 4. We hope to add to our science curriculum.
- 4. Sounds like a good preparation for the field trip.
- 4. Easier than transporting students.
- 4. Relative, practical, convenient, engaging.
- 4. If the visit exposed student to the wetlands or Ohlone life.
- 4. Good learning opportunity.
- 4. We would not worry about travel arrangement.
- 4. Matches our curriculum.
- 4. Convenience.
- 4. Direct visits by experts with hands on experiences are retained by students.
- 4. Make experience more.
- 4. I would love to attend.
- 4. Hands on activities are always good for my students.
- 4. Cost, convenience, and duration of time.
- 4. I'd like to learn more about your program.
- 4. My past experiences have been great!
- 4. If available-that would be great!
- 4. Tidepool study is good match for life science unit.

31. Using the same 1-4 scale, indicate how prepared you feel to teach your students about tidepool ecology:

	Visited	All
1	1	23
1.5		1
2	15	33
2.5	2	3

	Visited	All
3	23	43
3.5	1	
4	25	18

32. Please explain the reason for your rank:

? I have done extensive training, created a unit, and visited at least 15 times with students.

1. My knowledge is limited.

1. Need more info.

1. No formal training.

1. No clue it existed.

1. I don't know much at all.

1. Don't know much.

1. I'm not very knowledgeable about this subject, but I'm willing to learn!

1. No experience or training.

1. Few resources and little knowledge.

1. Fourth grade does not do marine life in Palo Alto.

1. Lack of materials.

1. That's 1st grade stuff.

1. 3rd grade has focused on wetland areas. I believe k-1 emphasizes the tidepools.

1. Lack of opportunity.

1. Don't know anything yet. I never learned or taught it.

1. I have not focused on tidepools, usually just fish.

1. I'm from Colorado-not much experience with tidepools!

1. Yikes! No training-also not quite a standard.

1. Science isn't my area of expertise which is why I try to include it as a field trip experience.

1. No formal training.

1. Not really part of 4th grade curriculum.

1.5 Not good at science.

2. I am not intimately familiar with life in a tidepool.

2. Not really covered in text.

2. Marine science is not an area for which I have much experience.

2. Haven't taught this subject in 5 years.

2. Haven't done a training with you.

2. need more info.

- 2. When I taught younger grades we used to study tidepool life.
- 2. Students ask questions I don't know the answers to. More knowledge helps.
- 2. Need more hands on materials.
- 2. Not in my standard of third grade.
- 2. I don't have too much experience in tidepools.
- 2. Need to refresh.
- 2. Never been to one.
- 2. Little training.
- 2. Not teaching presently.
- 2. Only textbook knowledge and little hands-on experience.
- 2. I don't feel qualified.
- 2. We have no curriculum.
- 2. I need to learn more about tidepools myself-and how it aligns with 4/5 standards.
- 2. I taught oceanography before which included a small lesson on tidepools.
- 2. I need to review my materials and get current information.
- 2. I teach physical science(our 4th grade units are divided between 4th staff).
- 2. I would need to have a refresher course.
- 2. I had marine biology in college, however curriculum would help.
- 2. I have good general knowledge, but no standards aligned curriculum.
- 2. I would need to review but would be OK teaching even though it is not an area of expertise.
- 2. Have some info and could gather more. No materials.
- 2. I would need more information.
- 2. Not 100% knowledgeable about tidepool ecology.
- 2. Not part of my curriculum focus at present-lower grade focus.
- 2. Would like more info.
- 2. I would need a little refresher course.
- 2.5 New curriculum for me this year.
- 2.5 High interest so I would teach myself-have done some studying of tidepools but that was a long time ago.
- 2.5 Need brush up on facts.
- 3. From reading about, visiting the tidepools I learned a lot.
- 3. I would like more teacher resources.

- 3. I have had some experience with the tidepools.
- 3. Need refresher.
- 3. Coyote Point class for teachers “Teaching About Tidepools”.
- 3. I could use some more resources, lessons.
- 3. Doesn’t really fit into district standards, so the subject is no longer a focus of instruction.
- 3. Life experiences and teacher training using resources.
- 3. I’m sure there are things I don’t know but I do know something.
- 3. Site science teacher very capable.
- 3. Currently teach high-level tidepool ecology in oceanography unit.
- 3. Some experience-can name animals but can’t handle technical questions. Also not good at handling animals.
- 3. My husband is a marine biology major.
- 3. We study ecosystems in 6th grade-I’ve been to Point Lobos many times for tours.
- 3. Have collected other resources in teaching unit.
- 3. I haven’t done an ecology unit in the past.
- 3. I went to the teacher workshop!
- 3. I know a fair amount about tidepool ecology, but I don’t have much material on it.
- 3. I’m a natural science major, but haven’t taught tidepools specifically.
- 3. I read before taking kids on trips.
- 3. Done major study each year.
- 3. New science textbooks have more info.
- 3. Lots of resources available, many trips to tidepools.
- 3. Previous study on my part.
- 3. I have done it so many years-lots of reading and lots of visits.
- 3. Have participated for several years with MSI in Redwood City, Natural Science Museum SF, and Monterey Bay Aquarium.
- 3. We do a lot of pre-teaching before attending.
- 3. Some marine biology courses in high school and college-have visited tidepools up and down the coast recreationally.
- 3. Have previously trained as a docent at Fitzgerald.
- 3. We already teach kelp forest and many creatures are related.
- 3. Have taught previously, but would like more materials.

3. Every year, while at outdoor ed, we spend an afternoon at the tidepools. This is my 5th year.
3. We do a unit of study on tidepools.
3. Well prepared during credential program and ongoing prof. development.
3. I have done this type of thing before.
3. I have to be an expert on everything-that's difficult.
3. Science is my most important ed. area.
3. Resources from our library.
3. I have done a good deal of "tidepooling".
3. They would be interested in it.
3. I've taken students (past grade levels that I taught) to the tidepools (not Fitzgerald).
4. I was awarded teacher HP grant to Monterey Bay Aquarium-I have taught ocean unit for 12 years.
4. I participated in the Monterey Bay Aquarium Teacher's Institute and also wrote curriculum for them.
4. Have worked as a nature guide, know outdoor ed curriculum.
4. Important for their (our) future.
4. Prior experience at the reserve as well as accumulated materials.
4. I have shown my own children and one of them got their degree in college in biology/marine animals.
4. I have taught this unit for many years.
4. Many previous visits.
4. We have taken our class to an amazing program at Seymour Marine Discovery Center and Natural Bridges for 5+ years and learned a lot along the way. Always more to learn.
4. I go to Pillar Point a lot and keep learning more myself about tidepools.
4. Familiar with Santa Cruz area tidepools.
4. Took a class at Coyote Point-other teachers have taught unit before.
4. We have been developing our curriculum for many years.
4. I have many resources available to prepare me to teach.
4. Done it before.
4. I'm comfortable in my teaching abilities.
4. Was a docent there for 10 years. Took the marine biology class Bob Breen taught in 1985, and also took it again to update myself.
4. Personal interest and preparation to teach habitats to class.

33. What services offered by the Reserve staff and docents would make your job easier as a classroom teacher?

I liked the pre-trip visit, it was helpful.

Docents leading small groups of students at tidepools.

Traveling trunks, information site, report information.

Materials regarding info about the Fitzgerald Marine Reserve.

Because they exist, and know what to do, it makes my job easier.

At site visits, pre-trip slides/video.

Teacher ed materials, cross curriculum standards-based lessons and resources, pictures.

pre/post trips are great-plus hands-on activities or videos to help us teach.

Having the necessary materials to run a successful field trip.

Not sure what's offered.

All of the above (pre-trip material, post-trip material, science, history/social science, half-day tour, guided tour of the tidepools, guided tour of the bluffs, video or CD-ROM, and teacher guides).

Pre-trip material/visit.

Classroom materials, exhibits to look at, a guided tour.

Knowledge of what and how to observe tidepools.

A brochure explaining the program(s).

Pre-trip materials.

I would love to see my students exposed to their local environments.

Docents before and at trip teachers guide and traveling trunk professional development.

Student booklets.

Not sure-what services are provided?

Traveling trunk and loaner material.

Docents for outdoors.

Materials to use for pre-teaching and teacher workshop before field trip.

Training, pre-visit by Reserve staff.

More staff and dates available (wishful thinking), videos, hands on boxes to borrow, pre-trip materials or visit.

A docent that goes in the group and leads them. The children don't know what to ask or that they're missing anything.

Things have to be pointed out to them.

Classroom visit, rides and touring.

More materials on a 4th grade level, specific to our reserve.

An introductory talk would be great.

Familiarize students with a model of an ecosystem, etc.
Class visit-following with a trip out there.
Videos and materials to teach with.
Smaller number of students per docent (5-8, not 10-15)
Free bussing.
Intro video available, reproducible activities (or hands on suggestions) prior to visit.
Specific 5th grade matching of state standards with your curriculum and preview study materials for students.
Poster/Guidebook.
Lesson plans.
Hands on lessons led by a visiting docent.
Tours-I never go on tours. A fieldtrip without a guide.
Videos-work assignments.
Pre-trip and post-trip visits, guided tours there.
Answering questions near the tidepools.
Docent for actual field trip, docent/presenter for classroom.
Pre and post trip materials.
Don't know.
More docents.
The activities and books currently available are helpful.
I need docent led tours!
Being able to go (3rd grade materials) and previewing (videos, etc.).
2 docents to tidepools to allow more experts with students-a short discussion with students so they can be out on site as long as possible.
Classroom visitation, guidance.
Classroom visits and teacher/student materials to use in the classroom before the visit.
Students ask questions I don't know the answers to. More knowledge helps.
Meet and talk on the bus before we head out and bathrooms!
Providing standards the program addresses.
As stated in 26 a teacher guide so I can prepare the students and then follow up lessons.
A teacher guide or pre-trip visit.
Have a talk with students before they view tidepools.
Lessons on the tidepools/marshes etc.
Background resources for pre-trip teaching and tips for a successful field trip there.
Pre-trip classroom program; H.S. docents.

Don't know.

Tour explanation and hands on activities with pre and post trip materials.

Presentation of explanation and booklets or hand outs.

Website with research links. Pre-post activities/lessons.

Guided tours was very informative for us.

Connect the Reserve with the life of the Ohlone.

Classroom material/reproducibles

Pre-visit to help prepare us for a visit; teacher materials with standards alignment made explicit.

Background info; book lists; learning activities.

5-10 lessons that would coincide with the field trip.

I am not yet sure.

See #21 (pre-trip material and alignment to state or district standards).

Unsure.

Providing student materials to reinforce student learning from visit.

Not sure.

Training/more background info.

Easier accessibility to scheduling.

Information and what standards are covered.

Let a guide lead the group. Gives teachers a little break, even if teacher is following along.

Not sure.

Pre and post information and class activities.

Booklets for students/activities for students with docents.

Materials

All the above. Hands on activities, pre/post visits, loan of materials, teacher resources, especially books.

Prepared script or lesson plan that I could use in presenting.

Support materials.

Knowledge of your programs focus-brochure, outline, etc.

Pre-field trip visit!

Best time to schedule a trip-low tide schedule.

Appendix G, Estimated Implementation Costs and Next Steps

Note: All figures are rough estimates only. They should not be used as a basis for evaluation of responses to a Request for Proposal (RFP). Companies responding to an RFP will be able to provide firm numbers after a site inspection and thorough review of the interpretive plan materials.

Sign Inventory:

Exterior of Education Building:

- 3 interpretive panels (welcome, resource management jurisdiction, overview of region)
- 1 orientation panel (Reserve map)
- 4 directional signs for street and parking lot
- 1 donor acknowledgement feature

Pathway from Education Center to Moss Beach reef:

- 2-3 interpretive panels (tidepool ecology, marine mammal ecology, visitor etiquette)
- 2 concrete directional markers
- 1 regulatory sign

Moss Beach reef:

- 1 interpretive panel (tidepool ecology)
- 1 regulatory panel

Marine mammal overlook station:

- 2 interpretive panels (marine mammal behavior, visitor etiquette)
- 1-2 viewsopes with support stanchions

Seal Cove bluff:

- 2-4 interpretive panels (human history, visitor etiquette)
- 1 orientation panel (Reserve map)
- 2 concrete directional markers
- 1 regulatory sign

Pillar Point Marsh parking lot:

- 1 interpretive panel (Ohlone material culture)
- 1 orientation panel (Reserve map)
- 2 concrete directional markers
- 2 regulatory signs (one at each end of lot)

Ross Cove overlook:

- 1-2 interpretive panels (oceanic and geological processes)
- 1 orientation panel
- 1 regulatory sign (cliff warning)
- 2 concrete directional markers

Pillar Point beach and reef area:

- 1-2 interpretive panels (tidepool ecology, marine mammal ecology, visitor etiquette)
- 1 regulatory sign

Estimated Costs for Signs:

Outdoor interpretive panels: design and fabrication of (18) 36" x 48" porcelain enamel panels and steel frames and pedestals (\$85,000-120,000)

Orientation panels: design and fabrication of (4) identical 24" x 36" porcelain enamel panels and steel frames and pedestals (\$20,000-30,000)

Directional markers: design and fabrication of (8) sandblasted and stained concrete pillars (4" x 4" x 48") (\$12,000)

Directional signs: design and fabrication of (4) porcelain enamel street and parking lot signs (size TBD) (\$3,600)

Regulatory panels: design and fabrication of (7) 24" x 36" porcelain enamel panels and steel frames and pedestals (\$30,000-45,000)

Donor Recognition Monument Sign (\$3,000)

Estimated Costs for Interior Exhibits in Education Center:

Gallery exhibit design, fabrication, and installation (including seasonal exhibit and changing exhibit space for a total of 639 square feet @ \$300/square foot) (\$191,700)

Gallery mural design and creation (\$15,000)

Estimated Costs for Exterior Displays:

Ohlone exhibit: design and fabrication (with one interpretive panel, previously accounted for) (\$35,000-\$45,000)

Sculpture Garden: design and fabrication (with three interpretive panels, previously accounted for) (\$100,000-\$115,000)

Estimated Costs for Other Media:

View scopes: purchase of 2 viewsopes and stanchion bases (\$4,000-7,000)

Reef brochure: design and printing of 50,000 pieces (\$15,000)

Note: At the master plan level, many unknown factors make costs difficult to predict. For example, several variables can affect the price of porcelain enamel panels, including complexity of design and art commission fees, both of which can affect fabrication costs.

Estimated Costs for Site Improvements and Buildings:

The following estimated building costs include construction, bonds, and contractor's overhead and profit.

Center site improvements (\$200,000)

Education Center building (\$975,000)

Equipment and furnishing (\$100,000)

Restroom remodel (\$50,000)

Bridge (\$60,000)

Outdoor Classroom/ Amphitheater (\$50,000)

Contingency (\$100,000)

Total Estimated Costs for Site Improvements and Buildings (\$1,535,000)

Note: The construction bid climate in the United States is influenced by current events and other factors, including construction activity overseas, the war in Iraq, and increased costs of fuel and transportation. Rising costs in 2004, for example, reflect a 40% to 60% increase over those in 2003. Because it is difficult to predict future construction costs, it is prudent to add five percent to these proposed costs for each year beyond 2004. An additional 20 – 25% should be added for various required fees, reports, permits, tests, design and administration.

Next Steps

The San Mateo County Parks and Recreation Division and San Mateo County Parks and Recreation Foundation will need to engage in numerous additional steps to implement this plan. These activities include additional design work, additional environmental review, permit acquisition, and fundraising. The following list highlights the major activities required but is not a comprehensive list.

Phase I - Design & Permitting

Additional Designs and Studies

- Interpretive Signage
 - Text development and graphic design
 - Sign location
- Development of preliminary designs and specifications for site improvements
 - Building
 - Dimensions
 - Exterior treatments
 - Set backs
 - Parking and site improvements
 - Agreement with DPW about closing portions of North Lake and Nevada Streets
 - Landscape plan
 - Geotechnical and biological studies

Environmental Review and Permitting

The information collected during these studies will be used for:

- Focused or supplemental EIR, which will serve as an amendment to EIR for Master Plan
- Coastal Development Permit
 - Architectural Review
- Sewer connection permit

Phase II - Capital Phase

- Final architectural drawings and construction documents
- Building permits
- Construction

Appendix H, References Cited and Recommended Resources

Fitzgerald Marine Reserve Master Plan

Brady/LSA, May 2002

San Mateo County Parks and Recreation Division

Fitzgerald Marine Reserve: Resource Assessment

Tenera Environmental, November 2004

San Mateo County Parks and Recreation Division

The Natural History of the Fitzgerald Marine Reserve

Friends of Fitzgerald Marine Life Refuge

San Mateo Countywide Sustainable Buildings Guide

Downloadable at San Mateo County website (www.co.sanmateo.ca.us); click on the “RecycleWorks” link within the “Public Works” section.

Interpreter's Reference Library

Environmental Interpretation, a Practical Guide for People with Big Ideas and Small Budgets

Sam H. Ham, 1992

North American Press, Golden, CO

Interpreting for Park Visitors

William J. Lewis, 1991

Eastern Acorn Press (an imprint of the Eastern National Park and Monument Association, Yorktown, VA)

Interpretation for the 21st Century

Larry Beck and Ted Cable, 1998

Sagamore Publishing, Champaign, IL

Personal Interpretation: Connecting Your Audience to Heritage Resources

Lisa Brochu and Tim Merriman, 2002

InterPress (an imprint of the National Association for Interpretation, Fort Collins, CO)

Sharing Nature with Children

Joseph Cornell, 1998

DAWN Publications, Nevada City, CA

Interpreting Our Heritage

Freeman Tilden, 1957 (3rd edition 1977)

University of North Carolina, Chapel Hill, NC

Interpretation of Cultural and Natural Resources

Douglas M. Knudson, Ted Cable, and Larry Beck, (2nd edition, 2003)

Appendix I, Acknowledgments and Credits

The planners wish to thank Julia Bott, Executive Director of the San Mateo County Parks Foundation, for her tireless support throughout the preparation of this plan. Thanks also to the members of the Design Committee for their time, insight, and guidance. Special thanks go to Mary DeLong, President of Friends of Fitzgerald Marine Life Refuge, for her assistance with visitor survey administration.

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Jennifer Rigby and Allison Rigby

Maps on pages 3 and 54

Fitzgerald Marine Reserve Master Plan, Brady/LSA, 2002

Photography

With the exception of the Michael Levin photo preceding the Executive Summary, all photographs are by Ron Yeo or Rici Peterson