2.0 STUDY METHODS

This second phase of study of public access alternatives consists of a more detailed technical analysis of the public access alignments and locations selected in the Phase I Study for their: a) technical feasibility for construction and long-term maintenance, b) acceptability from a land use point of view given proximity (if any) to adjacent landowners, and c) costs for construction and maintenance.

The selected consultant, LandPeople, landscape architects and planners, and their subconsultant, Jakaby Engineering, civil and structural engineers, prepared the current report covering the subjects listed above to aid the Park Service in obtaining further public input and selecting public access components consistent with project goals and objectives, and to evaluate potential significant impacts associated with the selected public access components. This report will be a technical support document for preparation of the environmental document for the overall Wetlands Restoration Project.

2.1 STUDY AREA

The Study Area, shown on Figure 2: Potential Public Access Alignments, includes a section of the undiked marsh to the north of the Wetlands Restoration Project Area, and is bounded to the west by the west side of Sir Francis Drake Boulevard, to the south by a point approximately 25 feet south of the south side of Levee Road, and to the east by the top of slope of Point Reyes Mesa and the north side of Mesa Road.

The Phase I report addressed thirteen potential trail alignments and five potential locations for viewing platforms/elevated overlooks. Based on the recommendations presented in the Phase I report, the Park Service has elected to narrow its consideration to the specific alignment and infrastructure locations listed below and shown in Figure 2. A total of nine trail alignments were evaluated, including several overlapping and parallel alternatives:

1. **Trail Alignment 1a** – Trail on alignment of present levee at north end of West Pasture.
2. **Trail Alignment 2c** – Trail on historic railroad grade from Mesa Road west and then north to Tomales Bay Trail.
3. **Trail Alignment 2d** – Portion of alignment of 2c, from Mesa Road west to Giacomini Hunt Shack (Overlook Point 4).
4. **Trail Alignment 2e** - Portion of alignment of 2c, from Tomales Bay Trail south to point where riparian vegetation currently blocks access.
5. **Trail Alignment 4a** – from Point Reyes Station near Giacomini dairy facilities southwest, west, and northwest around wetland area to Inverness Park, including bridge across Lagunitas Creek at former seasonal gravel dam location, through the existing County Park at White House Pool Park, and along Sir Francis Drake Boulevard.

6. **Trail Alignment 4b** – similar to 4a except connection from north of bend in Lagunitas Creek beyond White House Pool Park to Inverness Park would be by elevated boardwalk through West Pasture rather than along roadway.
7. **Trail Alignment 4c** – from alignments 4a/4b through community of Inverness Park from Gradjanski property north along east shoulder of Sir Francis Drake Boulevard to just north of Drakes View Drive.
8. **Trail Alignment 4d** – Point Reyes Station to Inverness Park via west shoulder of Highway 1, across "Green Bridge", then west along south shoulder of Levee Road/Sir Francis Drake Boulevard to White House Pool Park, then to Inverness Park via 4a or 4b alignment.
9. **Trail Alignment 4e** – same as 4d except uses the north shoulder of Levee Road/Sir Francis Drake Boulevard

Five overlook platform locations were evaluated:
1. **Platform/Overlook Location 1** – at Trail Alignment 1a
2. **Platform/Overlook Location 2** – at White House Pool Park, Trail Alignment 4a
3. **Platform/Overlook Location 3** – near Giacomini Dairy
4. **Platform/Overlook Location 4** – at Giacomini Hunt Shack, Trail Alignment 2d
5. **Platform/Overlook Location 5** – near end of Tomales Bay Trail at Railroad Point hilltop, Trail Alignment 2e

2.2 JURISDICTIONS

The Study Area includes lands under the jurisdiction of several public agencies. The Giacomini Ranch lands and the Olema Marsh lands to the south are owned and managed by the National Park Service. The right-of-way of Highway 1 is owned and maintained by the California Department of Transportation. Marin County owns the right-of-way of other public roads, including Levee Road and other portions of Sir Francis Drake Boulevard, and has responsibility for flood protection in the entire area. The White House Pool Park area is leased from the state of California's Wildlife Conservation Board by the County of Marin Parks and Open Space District (County Parks). The portion of the Olema Marsh south of Levee Road is owned by the non-profit Audubon Canyon Ranch.

2.3 METHODOLOGY

2.3.a General Approach

A series of detailed Geographic Information System (GIS) maps of the trail alignments and overlook sites were prepared as a basis for evaluating existing conditions, and physical opportunities and constraints for trails. The alignments were evaluated through field reconnaissance, photography, and preparation of cross-sections to characterize typical conditions along the routes, building on preliminary cross-section data prepared by Kamman Engineering and Hydrology staff.

Prior studies and plans for trails and bicycle facilities in the Study Area were reviewed in detail and evaluated in the context of the current conditions, opportunities and constraints. The consultants walked trail alignments, made measurements, talked with

County and user group representatives, characterized sections of alignments – particularly road alignments -- according to condition, and evaluated one to three potential options for sections of alignments. Based on conceptual designs, including some alternative design features, potential costs and construction area impacts were estimated.

A series of neighbor and stakeholder meetings were held by the Park Service and facilitated by the consultants to obtain input about the specific conditions along the various alignments, and ideas and preferences regarding the location and configuration of potential trails, and particularly specific land use issues and potential conflicts between the trail and adjacent properties.

Based on the evaluation of conditions, constraints and opportunities; review of prior trail plans and studies, and input from the public, the more precise location and configuration of the public access improvements was defined with drawings and descriptions. These provided the basis for evaluation of the technical requirements to construct and maintain the improvements, the cost to construct and maintain, the relative impact of the alignments on riparian vegetation and potential wetlands, and the potential land use impacts of the trails on adjacent properties.

2.3.b Construction Cost Analysis

Potential construction costs are estimated for each trail alignment and overlook. The estimate spreadsheets include an "Other Project Costs" column that represents cost factors associated with implementing the construction, including Design/surveying (15%), the Environmental process (10%), Review and Inspection/project administration (15%), and Contingencies (15%), for a total 55%. San Francisco Bay Area regional costs are built into the unit prices in the estimates. All costs are in 2005 dollars and would need to be factored for inflation.

Where design options are provided for trail alignments, separate cost totals are included for each option, organized from the lowest cost to the highest cost option. In addition, a column was provided in the estimates to account for optional guardrails, which add to the totals for the trail design options. Tables 4-1 and 4-2 present a summary of the lengths, types and cost of the various trail alignments, and the overlook platform costs. Detailed construction cost opinions are presented in Appendix A, which includes a Cost Estimate table and a Costs Items table, the latter containing the detailed estimates for the overlooks.

In a technical study where the site conditions for construction, and the design itself, are not precisely defined, construction cost can be estimated in only the most general terms, requiring a series of assumptions. In any case the preferred design industry term is "opinion of probable construction cost". Construction costs are highly variable depending on the details and requirements of construction, the timing and procedures for bidding and contracting the work, the amount of work that is bid at one time, and economic

conditions. Costs are likely to be significantly higher in rural Marin County than in more urbanized and accessible areas. The construction cost opinions attempt to take these factors into account to create a reasonable model of potential construction costs, based on a set of typical conditions and solutions as indicated in the report and on the trail alignment maps.

2.3.c Construction Area Impact Analysis

The analysis of each trail segment includes a rough estimate of the area of construction impact under each alternative for each alignment. A delineation of jurisdictional wetlands was not available at the time of this study. The "construction area" identified in the estimates may or may not be Section 404 wetlands and waters under the jurisdiction of the U.S. Army Corps of Engineers and/or as defined by the California Coastal Commission. The estimate of construction area impacts is provided for general comparison purposes only. A specific analysis of wetland impacts by type may be completed for the environmental document to be prepared subsequent to this study. For the current study the term is used generally to describe low-lying areas typically featuring riparian or other wetland vegetation. Along the roadsides typically such vegetation is setback approximately 2' from the edge of the road shoulder. This 2' distance was used for estimating purposes.

A summary of the estimates is provided in Table 4-2. The estimates include the "footprint" of the improvements to be constructed. In each estimate the "Total Square Footage for Impacted Area" is the area that would be occupied by fill, retaining walls, boardwalk, etc. Note that in the case of the fill or boardwalk some of the vegetation would be able to re-establish or remain. The "Construction Access Impact Area" is an assumed 3' wide area beyond the constructed facilities that would presumably experience short-term impacts. The column for guardrails reflects the additional approximate 2' width of additional construction area that would be caused by additional shoulder width for the guardrail.

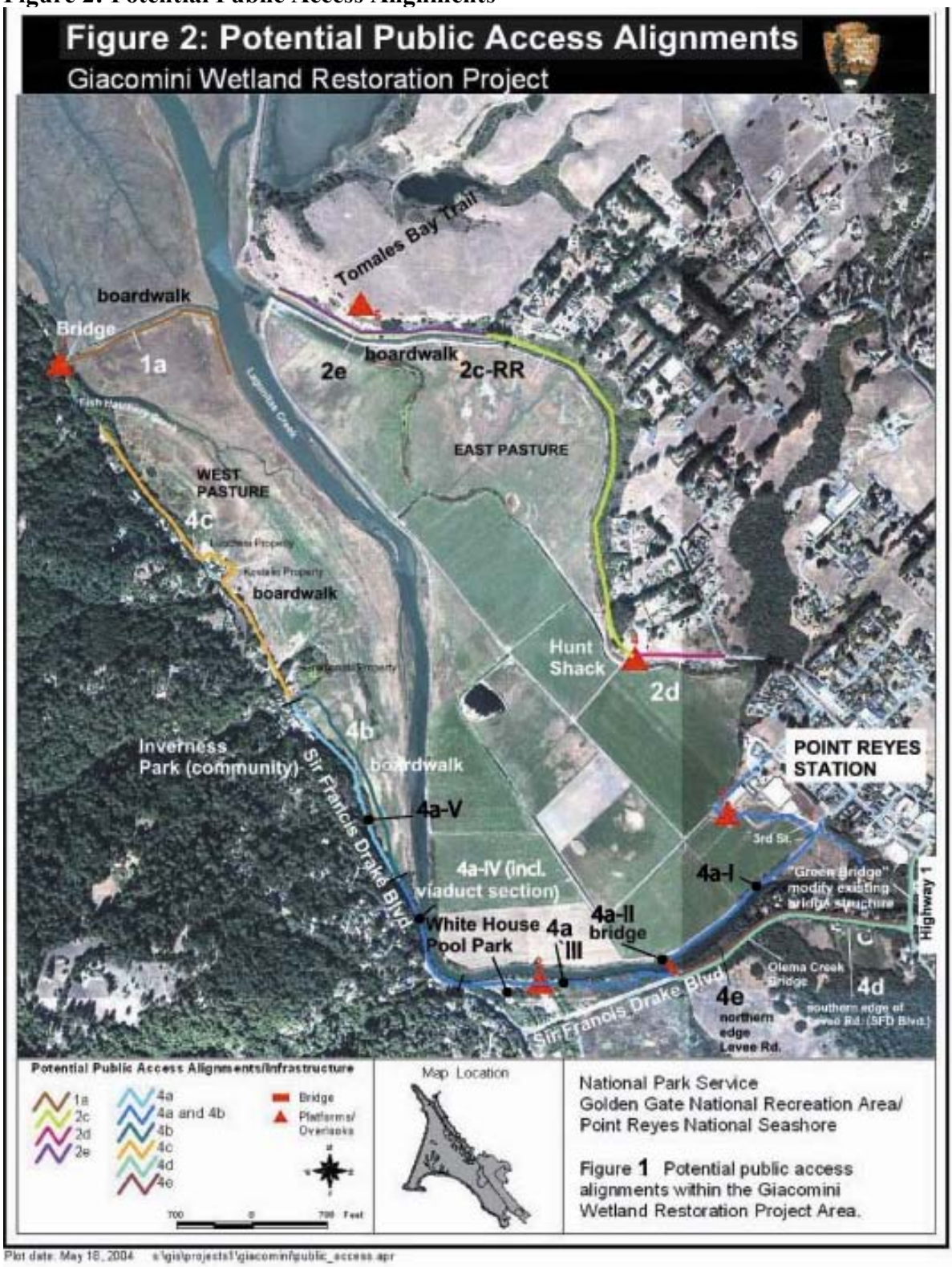
2.3.d Maintenance/Replacement Cost Analysis

The analysis of each trail segment and overlook platform includes an opinion as to the probable maintenance costs. This includes both the annualized cost for routine maintenance and periodic major maintenance, as well as the long-term replacement cost for the structure based on its projected lifespan. Summaries of the opinions of probable maintenance cost are presented in Tables 4-4 and 4-5. Maintenance costs are even more variable than construction cost, depending on who does the maintenance, and on a host of use and environmental variables. The maintenance cost opinions attempt to create a reasonable model for actual maintenance and replacement costs that could be experienced. This includes the estimated lifespan of the basic facility and the annualized cost of replacing it. All cost are in 2005 dollars and would need to be factored for inflation.

2.3.e Land Use Impact Analysis

The series of meetings with local residents and adjacent property owners provided input to analyze potential land use impacts of the trail segments, along with field reconnaissance and analysis of maps, and follow-up phone calls and emails. Meetings were held during early 2005; on March 1 with Inverness Park Area neighbors; March 22 with Point Reyes Station C Street Area neighbors and (separately) Levee Road Area neighbors; March 25 with Mesa Road Area neighbors, and April 11 with representatives of local, community, and special interest groups.

Figure 2: Potential Public Access Alignments



2.4 BACKGROUND INFORMATION

2.4.a Trail Design Standards

Publicly adopted standards for pathways and trails differ depending on the agency. Funding or approval from federal or state agencies is often contingent on meeting these standards. The standards address accessibility for persons with disabilities to implement the Americans with Disabilities Act (ADA), as well as basic design and safety.

Federal Standards. ADA sets standards for maximum gradient, cross-slopes, width, surface, and many other pathway features. Not all paths must meet ADA access standards; the law requires that the public program or activities being offered are accessible, not necessarily every facility. Guidelines interpreting ADA are contained in the Americans with Disabilities Act Guidelines (ADAG) or the Uniform Federal Access Standards (UFAS). Guidelines specific to trails exist as draft standards scheduled to be adopted as part of the implementation of ADA. The federal guidelines address trails and paths in rural and parkland settings, which is consistent with the Giacomini Wetlands access alternatives on both counts. They offer a great deal of flexibility as to width, gradient, surface, and other features compared to federal standards for urban facilities. The federal guidelines are maintained online at <http://www.acess-board.gov/outdoor/outdoor-rec-rpt.htm>. They are interpreted in a Federal Highway Administration publication, *Designing Sidewalks and Trails for Access, Part 2: Best Practices Design Guide*, September 2001. It offers an excellent guide for designing trails and pathways, especially in rural and parkland settings.

The National Park Service complies with federal regulations on ADA and generally follows the stricter of either the ADAG or UFAS. [1] Walks or paths that connect to accessible features need to be ADA-compliant. Key features in the Park need to be made accessible. However, paths need to be kept consistent with preserving the natural and cultural resources of the Park, so, if the same experience can be provided on some portion of the alignment or a different trail, there is more flexibility in the access standard.

California Trail Standards. While the California Department of Parks and Recreation has its own trail standards, the California Department of Transportation (Caltrans) standards are pertinent to the current study. Caltrans has adopted standards for bikeway facilities in Chapter 1000 of the Highway Design Manual. A "Class I Bikeway" or separate bike path (typically also used by pedestrians) must be paved, at least 8' wide, with 2' graded shoulders. There must be at least 5' of separation between the edge of the roadway pavement and the pathway pavement, unless a safety barrier is provided. A "Class II Bikeway", or bike lanes, must be paved at least 4' wide on the shoulder on each side of the road. Caltrans standards for pedestrian facilities are much more general than bikeway standards, including many types of sidewalks or paths. These standards are mandatory within state right-of-way or for facilities constructed with Caltrans funding, unless a formal exception is granted.

[1] Joanne Cody, Park Service, Denver Service Center, personal communication.

Caltrans has recently adopted a new guideline for pedestrian facilities that for the first time specifically addresses trails. Updated Design Information Bulletin No. 82, November 19, 2004, includes reference to multi-use trails that also accommodate bicycles and/or horses, but are not designated as bikeways. This Caltrans guideline, in turn, references the federal guidelines for trails and paths in rural and parkland settings noted above.

State Accessibility Standards. The Division of State Architect (DSA) is the California state agency that interprets and approves the state's standards for handicapped access. States are free to adopt standards that are more stringent than ADA, and in some aspects California's standards are more stringent. While Caltrans has reflected the federal guidelines that differentiate rural and parkland trail facilities in its recently updated pedestrian design bulletin, DSA has not yet recognized the guidelines. This will require project proponents on state land or using state funds to go individually to DSA to secure an exception to the more rigorous urban standards

Marin County standards for bicycle and pedestrian facilities within its right-of-ways are generally consistent with the Caltrans standards. The County has some flexibility to depart from them if the project is not in state ROW or funded by the state.

2.4.b PRIOR TRAIL STUDIES AND PLANS

There have been informal pathways through and around the Giacomini Dairy pasture lands for many years, and ongoing local discussions about more formal pathway improvements. The first formal attempt to address this issue was the *West Marin Pathways Study*, completed in 1988 by Brian Wittenkeller and Associates for West Marin Paths, a local non-profit group, and Marin County. This document was a detailed conceptual plan and cost estimate for a bicycle and pedestrian pathway system around the south end of Tomales Bay, including several alignments that are being considered in the current study. The concept plan was very comprehensive and ambitious. It included recommendations for bike lanes and/or paved multi-use paths along much of the route, including many routes that were on the then-private Giacomini property. It did not include a detailed evaluation of environmental, construction, and maintenance constraints and requirements. The West Marin Pathways Study was never adopted. According to local residents who participated in the process, this was because of the high (for the time) estimated implementation cost and due to environmental impacts. The estimated cost for the pathway improvements was approximately $2.75 million for design, construction, and construction contingencies, plus $1.5 million for land acquisition.

A more recent pertinent document that was adopted by the County is the June 2001 *Marin County Unincorporated Area Bicycle and Pedestrian Master Plan*, prepared by Alta Transportation Consulting for the Marin County Department of Public Works. This document contains analysis; goals, objectives and policies; a proposed system and improvements plan; and specific projects. Among the projects, on page 93, is a

recommended series of improvements in the Point Reyes and Inverness Area, including #4., Point Reyes Station to Inverness. The Plan refers to the 1988 West Marin Pathways Study. The Plan also recommends the use of railroad right-of-way, where feasible, to complete the recommended routes. The Plan does not go into detail on the precise location or configuration of these bicycle routes, but does include bikeway standards on page 8 that imply the routes would be either paved Class I separated multi-use path at least 8' wide, or paved bike lanes 4 to 5' wide on the road shoulder.

The *Marin Countywide Plan*, the County's General Plan, is currently being updated. A draft document released in February 2004 (currently posted on the County's web site at <http://www.co.marin.ca.us/pub/fm/CWP_TitlePage_Public_Draft.pdf>) includes a chapter on trails in the Natural Systems Element, and a series of maps comprising the Countywide Trails Plan. The trails chapter is very general, containing goals, policies and implementation measures to promote trails, and performance-type standards to ensure that they are useful, and well maintained. The document does not contain detailed policies or standards that would guide the evaluation of the trails under the current study. The Countywide trail maps, on Map 2-11b, show a proposed trail along Levee Road and Sir Francis Drake Boulevard the entire distance to Inverness, but the map doesn't specify the type of trail.

2.5 PUBLIC INPUT REGARDING DESIGN

For the purpose of this technical feasibility evaluation, public preferences for one trail alternative over another aren't directly considered – all the alternatives were derived from previous public scoping and environmental technical study, and all are evaluated only in terms of their construction and maintenance requirements, and potential land use impacts. Popularity of or opposition to trail alternatives should be factored into any decisions at a stage following this technical study and the subsequent environmental document. Public input is important at this stage to determine what configuration of trail should be evaluated, and to ensure that design, maintenance or use impact ideas and issues are not missed. In this respect the most significant consistent public input was that an informal, narrower than standard trail with a permeable surface is preferred by virtually all participants over a more formal asphalt paved path, or paved bike lanes (although there is not necessarily opposition to bike lanes). This preference is reflected in a statement from a 10 person Community Pathways Committee, signed by approximately 100 persons, that was presented during the earlier scoping period, requesting that the Park Service study an off-street path:

> "We envision that a perimeter path would be six feet in width wherever possible, and constructed of a durable, erosion resistant, permeable surface such as decomposed granite with a pine resin binder . . . "

This preference is significant because it departs from Caltrans or County bikeway standards and the 1988 West Marin Pathways Study, which called for a 10' wide asphalt paved path in most locations, as well as paved bike lanes along the road shoulders. The

above concept is consistent with Caltrans or federal standards for multi-use trails in rural or parkland settings.

Several participants in the public meetings requested a physical safety barrier between the trail and the roadway where the trail is in close proximity to the road.

Another design consideration resulting from the public input process is the idea that many local residents would like to use horses on the path. This has some special implications for design, and particularly for maintenance, since horses will cause much more wear on an improved path than bicycles or pedestrians. Also, a boardwalk surface could be slippery for horses, and horses' hooves on a boardwalk could generate substantially more noise than other users. The primary interest is apparently in riding along Alignment 2c, the Historic Railroad Grade, and along Alignment 4a to the old summer dam, or Alignment 4d along Levee Road to reach the Rift Trail. It is assumed that horse access is not required in White House Pool Park and on the trail alignments to the northwest (western portion of 4a, 4b, and 4c).