# APPENDIX A. STAKEHOLDERS

## A.1 Stakeholder Meeting Notes

### Meeting with Bob Merrill, North Coast Coastal Commission 3/13/07

PS met with Bob Merrill to discuss the Coastal Commission's position and interest in the project.

Mr. Merrill explained that the Coastal Commission would view any fill in wetlands to accommodate the trail as a potential problem. The California Coastal Trail is a high priority and public access is a mission for the Coastal Commission, but the Commission would be concerned about large amounts of fill including boardwalks. He mentioned a project in San Diego where the Commission turned down a trail with a boardwalk. He offered to get more details on that particular project.

Mr. Merrill referenced the California Public Resources Code Section 30233 (4)(7)(3). Under this code the Commission has often allowed Caltrans and other road and highway entities to fill wetlands under section (4) where the road shoulder widening or encroachment falls under "incidental public services".

"30233. (a) The diking, filling, or dredging of open coastal waters, wetlands, estuaries, and lakes shall be permitted in accordance with other applicable provisions of this division, where there is no feasible less environmentally damaging alternative, and where feasible mitigation measures have been provided to minimize adverse environmental effects, and shall be limited to the following:

(1) New or expanded port, energy, and coastal-dependent industrial facilities, including commercial fishing facilities.

(2) Maintaining existing, or restoring previously dredged, depths in existing navigational channels, turning basins, vessel berthing and mooring areas, and boat launching ramps.

(3) In open coastal waters, other than wetlands, including streams, estuaries, and lakes, new or expanded boating facilities and the placement of structural pilings for public recreational piers that provide public access and recreational opportunities.

(4) Incidental public service purposes, including, but not limited to, burying cables and pipes or inspection of piers and maintenance of existing intake and outfall lines.

(5) Mineral extraction, including sand for restoring beaches, except in environmentally sensitive areas.

(6) Restoration purposes.

(7) Nature study, aquaculture, or similar resource-dependent activities."

He mentioned that the Commission would want to see an agency be responsible for the development and maintenance of the trail. He mentioned the Harbor District, who have a recreation component to their mission, Humboldt County, or a JPA between Cities of Eureka, Arcata and the County, or Non-profit group as possibilities.

### Meeting with Mitch Stogner, Executive Director, North Coast Rail Authority. 3/27/07

The North Coast Railroad Authority owns and manages the rail line from Samoa to Eureka and down to the San Francisco Bay Area. The railroad has not operated any trains on the tracks since the early 1990's because of damage to the railroad tracks in the Eel River Canyon. Several locomotives and other rolling stock have been marooned since that time in Eureka. The NCRA has been seeking funds to repair and reopen the tracks from the San Francisco Bay Area.

PS met with Mitch Stogner from NCRA on March 27. He provided a copy of the NCRA Strategic Plan. The plan shows

the railroad in the Humboldt Bay loop section being repaired and back in service by the end of 2011. However, Mr. Stogner mentioned that the primary goal at present is to get the Lombard (between Napa and American Canyon) to Willits section open. The NCRA have exclusive perpetual easement for freight service. NCRA recently signed a freight agreement with Northwestern Pacific Railroad (CEO John Williams). The cost of repairing and rehabilitating the tracks has risen sharply since HNTB's study in July 2002. The NCRA recently became eligible for federal and state funds for repairs to the tracks.

Mr. Stogner mentioned that there is a proposal to develop a deep water container port on the Samoa peninsula at Fairhaven. He stated that Ron Arkley, a local developer, was working with the new freight contractor, Northwestern Pacific Railroad on this concept. The port would use the rail line for between ten to twelve trains/day which would affect any reuse of the rail corridor for a trail. The port would have one 5000 TE Container ship dock per week. They are hoping that the project might be eligible for some Proposition 1B funds (Freight corridors to ports).

Mr. Stogner also mentioned that the City of Eureka was concerned about the affect of the trains coming through the waterfront area.

Mr. Stogner suggested talking with Dave Anderson NCRA Engineer, recently hired (he works for HNTB Consulting) and Dave Hull Executive Director of the Port of Humboldt.

## Teleconference with Eric Nelson, US Fish and Wildlife Service, Humboldt Bay. 4/3/07

The USF&WS owns and manages large areas of Humboldt Bay as part of the Humboldt Bay National Wildlife Refuge. The study are includes several locations where USF&WS would have interests in the trail project.

PS and Jen Rice interviewed Eric Nelson by telephone. Mr. Nelson explained that the USF&WS access point at Jacoby Creek is restricted at Highway 101. There are safety concerns because of problems with ingress and egress onto Highway 101. He acknowledged that there was established use of the area as an access point with hunters using the area in the duck hunting season (Late October to Late January). His impression was that Caltrans and the CHP allow hunters to pull off Highway 101 during duck hunting season to cross the tracks and access the bay. The salt marsh acts as a buffer between the bay and the railroad.

USF&WS does not own the bottom of Jacoby Creek, so hunters are supposed to access the area by boat, but many walk in up from the creek to hunt. The hunters use the area from Jacoby Creek to Bracut and even between Bracut and the Simpson site. Many users use boats to access the area. Hunters also use the area around Eureka Slough at the south end of the Humboldt Bay Trail Feasibility study area.

USF&WS may have concerns about "non-consumptive" users entering the area at times other than the hunting season because of possible disturbance to foraging birds. These could include kayakers and hikers. PS mentioned new study of San Francisco Bay by Dr. Lynn Trujillo on the effects of public access on birds foraging, where there is no effects. Mr. Nelson said that he would be interested in seeing that study.

Mr. Nelson stated when asked about what impacts fill might have on the area, that he would be less concerned about fill in areas of the salt marsh habitat, but would have concerns about any fill in the mudflats which are foraging areas for shorebirds. He would be concerned about any "trail head" Use of the existing Red House area around Jacoby Creek. He stated that there are some rare salt marsh plants in the area. He also mentioned that the Humboldt Bay National Wildlife Refuge is preparing a Comprehensive Plan that will involve the likely removal of the Red House building.

Mr. Nelson suggested talking with both Ducks Unlimited and the local chapter of the American Waterfowl Association.

## Meeting with Henri Appy and Rob Ricci, Simpson Lumber Company. 4/3/07

The Simpson Lumber Company owns a 75 +/-acre site located on the west side of the railroad tracks. The property is accessed from Highway 101. They have over three quarters of a mile of frontage onto the railroad tracks and Highway 101.

PS and Jen Rice met with Mr. Appy and Mr. Ricci to explain the feasibility study. Mr. Appy stated that in the past Northwestern Pacific Railroad, the predecessor to NCRA used to ship about 70% of all timber products from the Simpson site. They still have a railroad spur that enters the site. However with the down sizing of the timber industry, improvements in road transportation this amount steadily declined. The closure of the rail line and non operation of the railroad meant a switch to all road transport. He also explained that the time it took to ship products by rail and spoilage had been a problem in the past as the railroad had declined.

Mr. Appy and Mr. Ricci expressed some concerns about a trail crossing their access road. The ingress and egress from Highway 101 is already less than ideal. There are plans for Caltrans to provide better acceleration and deceleration lanes to the property. They instruct their drivers not to use the median crossing at the existing Highway 101 median for heading north. There is also a second abandoned access road at the south end of the property that would not be improved. It has not been in use for several years.

Their other concern was security, but they acknowledged that they have a security fence already in place.

The drainage from the site which is surrounded by a levee, goes out through a 48 inch diameter culvert at the south end of the site and under Highway 101 to Fay Slough. They would be concerned about any construction that might affect that.

They stated that they would be willing to have a member of their staff attend any workshop regarding the trail.

## Meeting with Rick Hess, Bracut Business Park. 4/4/07

The Bracut Business Park owns a 23 acre site located on the west side of the railroad tracks. The property is accessed from Highway 101. They have approximately four tenths of a mile of frontage onto the railroad tracks and Highway 101. Adjacent to the northwest corner of the property is the 9 acre Bracut Marsh which is owned by the Redwood Community Action Agency. Access to the marsh is through the Bracut Business Park. RCAA's former manager says that access was permitted by the Bracut Business Park, but there is no formal agreement.

PS and Jen Rice met with Mr. Hess to describe the feasibility study. Mr. Hess stated by way of background that the Bracut Business Park owns the property over which the railroad has an easement. It was Mr. Hess' understanding from the easement language that the railroad may have forfeited their use of the easement because there is a clause that states that if the railroad does not use the easement for two years, it reverts back to the owners.

The Business Park has several tenants. The property is in the unincorporated are a of the County and does not have city water or sewer service. The property has an MG zoning. Lowe's, a national hardware store chain, had offered $10 million to acquire the property in the mid 1990's, but the deal was not consummated.

Historically the site had a frontage road off Highway 101 with two access points. These were reduced to one at some time in the 1970s. Mr. Hess said that he might be able to locate some historic aerial photos of the site from that period.

He expressed concerns about possible impacts from trail users on his tenants. However, he also stated that he might see other business users being drawn to a trail in the area such as a bike rental or a coffee shop. If such businesses were to occur, he would be interested in getting city sewer and water. He was interested in any trail studies involving impacts on adjoining businesses.

Mr. Hess was aware of Caltrans plans for improving the acceleration and deceleration lanes in front of his driveway access.

## Meeting with Kim Floyd, Todd Lark and Rex Jackman of Caltrans. 4/4/07

Caltrans maintains Highway 101 between Arcata and Eureka. The stretch of freeway has several at grade crossings (Indianola, Bayside, Simpson, Bracut and Jacobs). These have raised safety concerns in the past and Caltrans would like to eliminate these. In the interim, the area has been designated a Safety Corridor and there are signs and other warning devices that promote traffic calming.

This particular stretch of freeway allows cyclists to use the shoulders. In a survey conducted in 1999 by the Redwood Community Action Agency there was an average of sixty cyclists using the road shoulders a day. Pedestrians are not allowed to use the shoulders of Highway 101, but several were observed while driving the corridor using the shoulders, particularly the west shoulder.

Caltrans have two projects occurring within the Humboldt Bay Trail Feasibility Study corridor:

- The first that will be constructed in 2010 involves safety improvements at the two businesses on Highway 101. These include improved acceleration and deceleration lanes.
- The second project involves the elimination of at grade crossings (crossing the medians) on Highway 101. There is a proposal to elevate the freeway at Indianola and have an underpass where the existing at grade crossing is located. This project is not yet funded and there will soon be an EIR released on the project.

Although Caltrans is not adverse to the idea of constructing a Class I bike path on the west side of Highway 101 , there are concerns about how this would work. It is not simply an issue of replacing the existing bike lane on the west side as this bike lane also serves as a road shoulder for safety. The western boundary of the Caltrans right of way is contiguous with the eastern boundary of the North Coast Railroad Authority's right of way. The project is funded for design but right of way acquisition or construction.

Caltrans is already having problems with their proposed acceleration and deceleration lanes project, by having to encroach into the NCRA right of way. There is also a substantial wide ditch that runs parallel with Highway 101, where there are wetlands. Any widening of Highway 101 to the west to accommodate a bike path would involve partially filling the wetlands. There is also a section of the right of way consisting of almost a mile where Eucalyptus trees are growing close to the freeway.

## Teleconference with Karen Kovacs, California Department of Fish and Game and Eric Nelson U.S. Fish and Wildlife Service. 5/1/07

The telephone conference was conducted with both Eric Nelson and Karen Kovacs whose respective agencies are responsible for natural resource management in the Humboldt Bay area.

Ms. Kovacs clarified that the Eureka Slough is now under the ownership and management of the United States Fish and wildlife Service.

Both Ms. Kovacs and Mr. Nelson expressed concern about possible disturbance of shorebird roosting habitat. Ms. Kovacs stated that the shorebirds often use the rip rap areas on the west edge of the NCRA railroad right of way for roosting during high tides. They both agreed that shorebirds do acclimatize to disturbance over time. They suggested that if the project proceeds it should consider impacts on shorebirds and it might be necessary to study levels of impact of disturbance. Mitigation measures might involve isolating roosting habitat at high tide or increasing the size of other high tide roosting habitat at other locations, such s Sand Island. They suggested the existing research work by Mark Cowell at Humboldt State University.

They both mentioned that they hoped the proposed trail project would not create any conflicts with existing hunting uses during the duck hunting season.

# A.2 Stakeholder Workshop Summary

On May 9, 2007, a workshop was conducted with planning team members and major stakeholders. During the workshop, participants were asked to evaluate alternative alignments as shown on the alternatives maps (Section 6.5). Evaluation criteria were developed based on guidelines developed by the Planning Team as part of the Planning Framework. While several of the criteria are met by each alternative, the goal of the workshop was to address the most challenging questions. Participants were asked to choose the alternative that best satisfies each of the criteria below:

1) **Consistency with Future Plans** – The alternative provides full consideration of existing and future highway and rail uses and opportunities.
2) **Environmental Impacts** – The alternative is consistent with Coastal Act policies and related local, state and federal regulations, promoting protection of wetland, wildlife, and other natural resources.
3) **Security and Private Property Impacts** – The alternative respects the needs of private and public land owners and managers.
4) **Compatibility with Existing Uses** – The alternative does not compromise existing recreational uses including hunting and other existing, allowable recreational uses.
5) **Aesthetics and Education** – The alternative offers a variety of wildlife viewing sites and places to stop and enjoy the Bay and provides opportunities to integrate interpretation of natural, cultural, and historic resources in trail planning and design.

The best alternative was selected for each segment. Many alternatives scored evenly based on the criteria of Consistency with Future Plans, Security and Private Property Impacts and Compatibility with Existing Uses. The criteria of Environmental Impacts and Aesthetics and Education most strongly differentiated the options. Option A, which occurs within the railroad right-of-way, was strongly preferred over option A for its aesthetic offerings and potential for education. Conversely, option B, which would be within the Caltrans Highway 101 right-of-way, was significantly preferred in terms of satisfying the environmental concerns.

Overall, when the criteria are considered equal and preferences are totaled, a slight preference is shown for an alignment within the railroad right-of-way (option A). Segment 7, which occurs at the Bracut Business Park and Bracut Marsh is the only option where preference is given to the option within the Caltrans right-of-way (option B).

The preferred alignment per each segment in shown in the table below. The % Preferred column quantifies how strongly the preferred alignment was chosen in comparison with other options:

| Segment | Preferred Alignment | Description | % Preferred |
|---|---|---|---|
| 1 | E | Marsh | 53 |
| 1A | G | G Street | 72 |
| 2 | B | G Street | 71 |
| 3 | A | RR R/W | 64 |
| 4 | A | RR R/W | 55 |
| 5 | A | RR R/W | 55 |
| 6 | A | RR R/W | 51 |
| 7 | B | 101 R/W | 64 |
| 8 | A | RR R/W | 55 |
| 9 | A | RR R/W | 52 |
| 10 | A | RR R/W | 51 |
| 11 | A | RR R/W | 68 |
| 12 | A/B | Tie | 50 |
| 12A | B2 | Northbound 101 Bridge | 68 |

In the north of the study area, alternatives included an option that follows the railroad right-of-way as well as an option that follows an existing trail through the Arcata Marsh. In this segment (segment 1), a strong preference

was found for the option occurring through the marsh following an existing trail alignment. Segment 1A options begin at the Arcata Marsh Interpretive Center parking lot and either occurs on an existing trail through city marsh property or along G Street right-of-way. In this segment, the G Street alignment (option G) is preferred by 72%.

To the south, in Eureka, a trail may follow either the existing railroad bridge (segment 12) or the Highway 101 bridges (segment 12A). In segment 12, no preference was shown. In segment 12A, a preference was expressed for an alignment following the northbound Highway 101 bridge.

# APPENDIX B. COST ESTIMATES

## B.1 Bridges

### Purpose

This conceptual review is prepared for Alta Planning+Design as part of the assessment of the feasibility of constructing a pedestrian/recreational trail along Humboldt Bay, from Eureka to Arcata. SHN Consulting Engineers & Geologists, Inc. (SHN) is assisting with this assessment by reviewing specific bridges. This task involves limited conceptual review of the technical feasibility of cantilevering or otherwise attaching pedestrian/bike bridges from the existing Caltrans highway bridge at Eureka Slough, the railroad bridge at Eureka Slough, and the existing railroad bridge at Gannon Slough. No engineering calculations or drawings have been produced. This report summarizes the technical feasibility and preliminary budgeting engineering and construction costs estimated for retrofitting the bridges; costs for environmental permitting and compliance are not included. The following summary is based on SHN's general engineering conceptual review conducted in May 2007.

### Summary of Existing Bridge Characteristics and Status

The three bridges assessed for this conceptual review include: (1) the Eureka Slough Highway 101 (4th Street) bridge; (2) the Eureka Slough railroad bridge; and (3) the Gannon Slough railroad bridge.

#### Eureka Slough Highway 101 Bridge

The Eureka Slough Highway 101 (4th Street) concrete bridge is used for highway traffic with a 4-foot wide shoulder adjacent to the right lane. This narrow shoulder is used for bicycle traffic. Within the past 5 years, Caltrans constructed a number of improvements including conversion of the raised sidewalk to the 4-foot wide shoulder, although the overall width of the bridge was not changed. The 4th Street bridge covers a total length of approximately 800 feet, which includes a 200-foot long section supported by two pairs of steel trusses (100 feet each) near the south end. Each pair of steel trusses is supported by large concrete piers. Along the 100 feet to the south and 500 feet to the north of the steel trusses, the bridge deck is supported by three parallel concrete box girders set on concrete piles.

The Highway 101 (5th Street) concrete bridge also is used for highway traffic, and runs parallel to the 4th Street bridge. The 4th Street and 5th Street bridges are separated by a clear distance of approximately 40 feet. The 5th Street concrete bridge was not assessed because it is an older structure which may be replaced in the future, although Caltrans has not disclosed specific replacement plans.

#### Eureka Slough Railroad Bridge

The Eureka Slough railroad bridge is currently inactive for its intended use, as there is no rail traffic; activity is restricted to limited foot traffic. The bridge structure appears to be unmaintained and is made of concrete for most of its length, except for a 100-foot long steel hydraulic lift section near the western end. The running surface covers a total length of approximately 800 feet with a total width of 17 feet, which includes the railbed and walking surface on each side of the railbed. To meet the running surface elevation of the bridge, the approach to the bridge is raised relative to the surrounding topography at each end.

The bridge foundation supports include concrete box girders resting on steel-encased poured concrete pilings that penetrate the slough bottom. The steel hydraulic lift section rests, at both ends, on poured concrete footings. This lift section was retrofitted from a swinging section. The hydraulic lift section is rusted, inoperable, and unmaintained, and the controls have been vandalized.

The railbed is made of wooden railroad ties, steel rails, and gravel in-fill (on the concrete structural section). The existing walking surface is a 2-foot wide concrete sidewalk, with a steel grate surface on the hydraulic lift section of bridge. The concrete and steel grate walking surfaces are cantilevered from the railbed structure, extending to

a distance of 8.5 feet total from the railbed centerline. Steel posts are located at the outside edge of the walking surface, with three vertically aligned steel safety cables.

### Gannon Slough Railroad Bridge

The Gannon Slough railroad bridge is currently inactive for its intended use, as there is no rail traffic; activity is restricted to limited foot traffic. The bridge structure appears to be unmaintained and is made of wood for its entire length. The running surface covers a total length of approximately 200 feet with a width of 16 feet, which includes the railbed and walking surface on each side of the railbed. The running surface of the bridge is at the same approximate elevation as the approaches at each end.

The bridge foundation supports include wood pilings, with some battered piles (set at an angle). The wood beam construction of the bridge includes attachment of the beams with lag bolts. Some rotting of timbers was observed at the tidal water level.

The railbed is made of wooden railroad ties and steel rails, with openings between the ties to the slough water below. The existing walking surface uses steel grating secured to 4x8-inch beams, which are supported by the railbed structure. The steel grate walking surfaces are located on each side of the railbed, each extending to a distance of 8 feet from the railbed centerline. Wooden posts are located at the outside edge of the walking surface, with two vertically aligned steel safety cables.

## Technical Feasibility and Estimated Cost Range for Cantilever Attachment

### Eureka Slough Highway 101 Bridge

Attaching a pedestrian/recreational trail onto the 4th Street bridge could involve adding an 8-foot wide traveling surface, plus structural supports and safety barriers, from the outside edge of the existing bridge structure. The cantilevered section could be attached, in the 200-foot section, by securing to the bottom chord of the steel truss and also to the three large concrete piers. In the 500-foot section to the north and the 100-foot section to the south of the steel truss, the cantilever could be attached by securing to the underlying concrete box girder with appropriate hardware and bracing.

Importantly, the integrity of the existing structural components was not evaluated as part of this assessment. Full structural analysis would be required to more accurately determine the feasibility and cost for retrofitting a cantilevered section onto the 4th Street bridge. Such an analysis would be used to determine if additional structural enhancements are needed to adequately support a cantilevered pedestrian/recreational trail section.

Attaching a cantilevered section onto the 4th Street bridge would involve operational challenges and significant cost because of construction over the water, use of special fittings and connectors to secure the cantilevered section to the concrete bridge structure, and structural enhancements and special materials required to comply with bridge safety and Caltrans standards. Also, a crane will be required to construct the cantilevered section, along with traffic control on Highway 101 during construction. The estimated preliminary budgeting cost to attach a cantilevered pedestrian/recreational trail section onto the 4th Street bridge is $3 million (plus 50% contingency).

### Eureka Slough Railroad Bridge

Attaching a pedestrian/recreational trail onto the Eureka Slough railroad bridge could involve adding an 8-foot wide traveling surface from the outside edge of the existing cantilevered sidewalk. To achieve the minimum separation distance of 8.5 feet from the railbed centerline, the traveling surface could start no closer than the outside edge of the existing walking surface. The cantilevered section could be attached by securing to the underlying concrete box girder with appropriate hardware and bracing. Attachment to the hydraulic lift section would involve securing to steel in a similar manner.

Importantly, the integrity of the existing structural components was not evaluated as part of this assessment. Full structural analysis would be required to more accurately determine the feasibility and cost for retrofitting a

cantilevered section onto the railroad bridge. However, due to the heavy load requirements designed to handle railroad traffic, the existing structure may be adequate to support a cantilevered section.

Attaching a cantilevered section onto the Eureka Slough railroad bridge would involve operational challenges and significant cost because of construction over the water, use of special fittings and connectors to secure the cantilevered section to the bridge structure, structural enhancements and special materials required to comply with current railroad regulations, and replacement of structurally unsound or deteriorated bridge materials. Also, a crane will be required to construct the cantilevered section. The estimated preliminary budgeting cost to attach a cantilevered pedestrian/recreational trail section onto the Eureka Slough railroad bridge is $2 million (plus 50% contingency).

### Gannon Slough Railroad Bridge

Attaching a pedestrian/recreational trail onto the Gannon Slough railroad bridge could involve extending the existing 8-foot wide traveling surface by another 8.5 feet. This new 8.5-foot wide section would be cantilevered with additional support braces. The cantilevered section could be attached by securing to the existing wood structure with appropriate hardware.

Importantly, the integrity of the existing structural components was not evaluated as part of this assessment. Full structural analysis would be required to more accurately determine the feasibility and cost for retrofitting a cantilevered section onto the railroad bridge. However, due to the heavy load requirements designed to handle railroad traffic, the existing structure may be adequate to support a cantilevered section.

Attaching a cantilevered section onto the Gannon Slough railroad bridge would require construction over the water, structural enhancements and special materials required to comply with current railroad regulations, and replacement of structurally unsound or deteriorated bridge materials. The estimated preliminary budgeting cost to attach a cantilevered pedestrian/recreational trail section onto the Gannon Slough railroad bridge is $300,000 (plus 50% contingency).

## B.2 Sheet Piling

This estimate is prepared for Alta Planning+Design as part of the assessment of the feasibility of constructing a pedestrian/recreational trail along Humboldt Bay, from Eureka to Arcata. SHN Consulting Engineers & Geologists, Inc. (SHN) is assisting with this assessment by estimating the cost for installing sheet piling on a lineal foot basis.

The ballpark estimate to install sheet piling and compacted fill is based on “Conceptual Section M” of the Railroad Track Shift Option. For this section, sheet piling would be installed on both sides of the trail/railroad prism at a height of 3 to 4 feet above the adjacent ditch. From previous SHN work on these types of applications, along with recent contact with contractors involved in this type of work, we estimate installation to cost $260 per lineal foot of sheet piling (one side of the section only). In addition, compacted fill is expected to cost $20 per lineal foot (one side of the section only), based on a total cost of $20 per cubic yard with 1 cubic yard of compacted fill per lineal foot.

If gabions are selected as an alternative for protecting the outside edge of the prism, the estimated cost would be $200 per lineal foot (one side of the section only).

Actual construction costs may deviate from these estimates based on soil conditions, availability of materials, and potential increases in contractor rates and material costs. However, we believe these estimates are appropriate for the ballpark level required in this feasibility assessment.

# APPENDIX C. RAILROAD REPORT & NCRA PLANS

## Train Utilization Issues Update

**April 13, 2007**

**Prepared by Arnie Herskovic**
**SHN Consulting Engineers & Geologists, Inc.**
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In order to assess the availability of rights-of-way for the Humboldt Bay Trail project, it is important to analyze the possible use of the existing rail track by the North Coast Railroad Authority (NCRA) and/or any potential lessee. At this time, the NCRA is actively pursuing funding from State and Federal sources to restore the entire rail corridor, in phases, to meet Federal Railroad Administration Level 1 Standards (up to 25 miles per hour) from Willits to the North End (Arcata area). To date, the NCRA has been successful in obtaining State Congestion Relief Project Funding for line improvements along the southern Willits-to-Lombard and Windsor corridor (referred to as the Russian River Division Phase 1 and Phase 2 areas).

This Phase 1 funding is for initial environmental analysis, permitting, and preliminary engineering, with a second phase to complete the environmental studies, along with design plans and specifications leading to construction of various bridge, signalization, and right-of-way improvements to reopen this southern service line. The NCRA has recently retained a private operator to conduct daily business and rail operations on its behalf along the length of the North Coast Rail Corridor. The operator, John Williams, has committed $100,000 in funding toward the reopening of the Canyon segment located due north of the Willits area, and is committed to pursuing other financing alternatives to advance the project.

Bringing together funds from the State Congestion Relief Program, Federal Emergency Management Agency financing, and the Sonoma County Transportation Agency voter-approved Measure M ¼-cent sales tax that was approved in November 2004, a total funding budget of approximately $48 million has been identified. The reopening of the rail line from Willits to Arcata (North End) is predicated on the realization of market demand for freight rail, obtaining environmental clearances, and availability of funding sources. The most recent estimate of costs to reopen the rail line between Willits and Arcata totals approximately $100 million. The project in this section would involve several phases, beginning with work to reopen the Canyon segment in the south, along with major line improvements, and culminating with the North End or Humboldt Bay segment. The timeline submitted by the NCRA in its March 14, 2007, funding application to the State Congestion Relief Program indicates construction of the Canyon portion beginning in 2009, with the North End project commencing in 2010, and completion slated by December 2011. In order to achieve these milestones, the NCRA would need to be successful in obtaining all project approvals and funding in a timely manner.

The NCRA is currently working closely with State Senator Pat Wiggins to seek approval for S.B. 861 authorizing $5.5 million in the form of a loan waiver, in order to continue with completion of the subsurface cleanup of 9 rail yards, as required by the 1999 court-ordered Environmental Consent Decree. This funding would also address emergency maintenance issues pending the restart of rail operations. These maintenance issues include:

- strengthening of levees,
- repair of highway crossings and signalization, and
- weed abatement and cleanup to address potential fire hazards in 8 North Coast cities.

The $5.5 million has been set aside in a State Local Agency Investment Fund since July 2000.

The S.B 861 legislation has received broad support from all North Coast cities and counties; regional transportation agencies; Chambers of Commerce; the Humboldt Bay Harbor, Recreation, and Conservation District (Harbor District); and various businesses along the Northwestern Pacific Rail line. The Humboldt Bay Trail project right-of-way was the location for a previous, detailed study in 2003 on the Humboldt Bay Short Haul Tourist and Excursion Train (Tourist Train). The focus of this study was to determine the potential for operating a seasonal short-haul passenger train between the Samoa area and Eureka. This study was funded by a State Community Development Block Grant received by the City of Eureka.

The Tourist Train would be operated as a short line "tenant" under an operating lease agreement with the NCRA. Surveys conducted locally revealed a preference for a steam locomotive train similar to the engine used by the Fort Bragg Skunk Train. The Tourist Train study identified the need for three full-time laborers and one full-time track supervisor/inspector in order to maintain the track right-of-way, crossings, and signals, and to inspect track conditions. The study indicates that the most likely scenario for this annual track maintenance would require an initial subsidy of $100,000 to cover maintenance of the track bed, with a goal of achieving break-even status within five years of startup. In order to meet Federal Railroad (FRA 1) standards, it can be assumed that maintenance costs for the NCRA freight rail operation would be higher. For the tourist train to operate, use of the rail right-of-way would need to be negotiated with the NCRA, which has established a priority to utilize the Eureka/Arcata rail line for freight movement. It should be noted that the proposed Marina Center on the so-called Balloon Track property in Eureka includes retaining the existing rail right-of-way for operational purposes.

The cost of implementing the Tourist Train, including capital equipment and maintenance improvements, was originally estimated at $4 to $8 million in 2003 dollars. Based on Engineering News Record data, cost escalation of 24% has occurred in capital costs between 2003 and 2007, which would add $1.863 million to the original estimate.

**Table A-1. Costs to Develop and Implement the Tourist Train**

| Item | Description | Cost |
|---|---|---|
| 1 | Replace a 57-foot long wood trestle (midway point, north of Mill Yard) | $ 380,000 |
| 2 | Replace ties along rail line (Eureka to Samoa) | $1,100,000 |
| 3 | Place heavy railroad stone ballast along track bed (replacing lighter ballast, thereby reducing annual track maintenance costs) | $1,003,000 |
| 4 | Repair Samoa Train Maintenance facility | $1,000,000 |
| 5 | Other needed capital costs, per HTNB Study) | $ 880,000 |
| 6 | Purchase locomotives and rail cars and refurbish, providing handicapped access, bathrooms, and ventilation systems | $1,000,000 |
| 7 | Construct a new Eureka Intermodal Rail Station (2001 Estimate) | $2,400,000 |
| | **Total Estimate (2003 dollars):** | **$7,763,000** |

In order to reestablish freight rail service along the Eureka/Arcata area corridor and utilize the Samoa Train maintenance facility, items 1-5 listed above would be necessary, at a cost of $5,410,120 in 2007 dollars, assuming 24% in cost escalation since 2003.

The Tourist Train study assumed the use and repair of the existing Samoa Roundhouse and Boiler Warehouse buildings for use as train repair and housing facilities. At this time, the Timber Heritage Museum program is in the process of moving and storing some 24 vintage railroad cars and locomotives in these buildings, under a lease with the Harbor District. The Harbor District has retained a consultant to prepare a feasibility analysis for the development of a new Redwood Marine Terminal in the Samoa area. This project could provide a large warehouse for storage of goods and materials that could be off-loaded from ships or barges and trans-shipped via future rail or highway connection to other destinations. The Redwood Marine Terminal Study will analyze the demand for this freight-to-rail connection and its market potential.

In a prior study completed for the Harbor District in 2003 by P.B. Marine and BST Associates, entitled "Long Term Economic Feasibility of the Northwestern Pacific Railroad," it was concluded that the greatest opportunities for growth in rail shipments were in the categories of solid waste, aggregates, inbound forest products, bulk cargoes,

and port-related marine industrial activities. This report also concluded that passenger excursion rail is more viable (along several routes served by the Northwestern Pacific Railroad) than commuter rail.

Aside from securing funding for the capital and operating costs identified above, there are a number of permitting and regulatory issues that will need to be addressed prior to reopening of the existing rail line. Regulatory review and permit applications to the California Coastal Commission, Department of Fish and Game, U.S. Army Corps of Engineers, and County of Humboldt will be required prior to constructing the replacement wood trestle, placement of new track ballast, and maintenance cleanup along the right-of-way. In all likelihood, any project within the vicinity of the existing rail track bed would involve implementation of mitigation measures to achieve regulatory compliance.

The Tourist Train study indicated a potential of 35,000 riders in its first year of operations, gradually increasing to a stabilized 58,000 riders within 3 years. The project would create 20 to 25 direct jobs, 30 to 40 indirect or secondary jobs, and 65 to 70 short-term construction jobs. The project could also extend the duration of visits by tourists to the area, resulting in additional dollars to the local economy. The Humboldt County Visitors and Convention Bureau data indicates that the average family visiting Humboldt County spends $150 or more per day for lodging, food, and entertainment.

The Tourist Train project and NCRA are eligible for a number of possible funding sources. It can be assumed that the Humboldt Bay Trail project would be similarly eligible to receive funding assistance. Sources available would include: Federal Transportation Enhancement Act funding (TEA-21), Federal Economic Development Administration (EDA), State Congestion Relief Program, State Coastal Conservancy, Roberti-Z'Berg Parks and Recreation Grants, Federal Land and Water Conservation Funding, State Proposition 1B funding, and other State bond-approved parks and recreation programs, such as Proposition 40.

An obstacle to obtaining TEA-21 funding is the required local 20% match. This issue is likely to also be a requirement for other State bond-approved programs. At this time, the use of State bond funding will trigger the payment of prevailing wages to workers hired to complete various project right-of-way improvements. This factor typically will add between 25 to 30% to the regular wage rates that the various trades are paid in Humboldt County. Subject to successful negotiations securing a lease-operating agreement from the NCRA, along with funding commitments for capital improvements and maintenance, it is possible that a Humboldt Bay Trail project or a Tourist Train could be implemented ahead of the planned reopening of the entire Willits to Eureka rail line operation.

# APPENDIX D. COMMENTS FROM THE PUBLIC WORKSHOP

## May 16, 2007

The following are comments that people wrote on the large map display at the meeting. The display consisted of large scale printed maps of the various segments, taped together. The Maps are numbered from North to South.

| **MAP 1** | **Map 1 consisted of Segments 1, 1A and 2** |
|---|---|
| Comment # | Comments |
| 1 | This segment is preferred (next to white line) ***Refers to Alternative A2*** |
| 2 | Blue line is bad; goes through nice salt marsh ***Refers to Segment A 2*** |
| 3 | Is there an opportunity to incorporate H.B.T. with Arcata's restoration efforts at the marsh that are planned over next few years with RCAA ,maybe for mitigation. |
| 4 | Traffic at this intersection is low; no special provisions needed (red circle on map) ***Refers to Crossing at City of Arcata Corp Yard.*** |
| 5 | Red line is preferred to here on west side of tracks.<br>***Refers to west side of tracks below Corp Yard.*** |
| 6 | Yellow line is preferred on west side of the tracks<br>***Refers to west side of tracks below Corp Yard.*** |
| **MAP 2** | **Map 2 consisted of Segments 3, 4 and 5** |
| 1 | If bridge needs to be replaced could we just have a separate bridge built for pedestrian use? I think the cost would be lower.<br>***Refers to Jacoby Creek Bridge*** |
| 2 | Does the bridge need to be replaced?<br>***Refers to Jacoby Creek Bridge*** |
| 3 | What about using this crossing to go from bay side to highway side? (purple asterisk)<br>***Refers to existing access that hunters use between Gannon Slough and Jacoby Creek.*** |
| 4 | Bridge crossing? (just past Jacoby Creek)<br>***Refers to Jacoby Creek Bridge*** |
| 5 | Why do they expect the rails back if the reutilize the corridor? They have to remember the existing ones anyway!<br>***Refers to costs associated with railroad rehabilitation costs.*** |
| **MAP 3** | **Map 3 consists of Segments 6 and 7** |
| 1 | Railbanking would allow cross traffic, giving access over right-of-way. Good option for junctions. |
| 2 | A connection to Hwy so people can exit on Bayside Cutoff (on blue line)<br>***Refers to crossing of Highway 101 that may be removed by Caltrans in the future.*** |
| 3 | Improve ROW for alternate route to Bayside |
| 4 | No barrier to keep people from entering from Bayside Cutoff<br>***Refers to crossing of Highway 101 that may be removed by Caltrans in the future.*** |
| 5 | Caltrans is planning to possibly (probably) cut off all access to Bayside Road from south bound lanes. Is there any way to create access for this trail to & from Bayside cutoff? |
| 6 | Old culvert? Adequately sized? |
| 7 | Bracut Marsh has a lot of restoration potential beyond what has already been there that could serve as mitigation for H.B.T.<br>***Refers to possibility of mitigation site.*** |
| 8 | Underground or over with bridge? (near red circle)<br>***Refers to Crossing at Bracut Business Park driveway.*** |
| 9 | Could use this crossing to bring trail back to Bayside. (near red circle)<br>***Refers to crossing of 101 south of Bayside Cutoff.*** |
| 10 | Why not west of Bracut? (south end of Business park)<br>***Refers to idea of a trail around the Bracut Business park next to bay.*** |

| MAP 4 | **Map 4 consists of Segments 8 and 9** |
|---|---|
| 1 | Why can't we Phase 1—Rail Bank  Phase 2—Improvements to Rail & Trail at the same time  This approach makes the most fiscal sense. |
| 2 | We own the RR & the right of way so how do we get control of it? |
| 3 | Cost comparison—Rails with trails, Rails to trails, Rail banking |
| 4 | Interchange would help bikers/pedestrians safely across Hwy 101 at Indianola<br>***Refers to Caltrans plans for a Highway 101 overcrossing at Indianola.*** |
| 5 | Indianola cutoff & old Arcata Road are not preferred bikeroutes.  Planning efforts should focus on trailheads at Indianola, not crossings for the HBT.<br>***Refers to Caltrans plans for a Highway 101 overcrossing at Indianola.*** |
| 6 | Access to get on Indianola?<br>***Refers to Caltrans plans for a Highway 101 overcrossing at Indianola.*** |
| 7 | Caltrans should pay for a trail before even thinking about an underpass here.  Indianola cutoff)<br>***Refers to Caltrans plans for a Highway 101 overcrossing at Indianola.*** |
| 8 | Why do we need to alter Indianola?  Could we invest in more buses to reduce traffic instead?<br>***Refers to Caltrans plans for a Highway 101 overcrossing at Indianola.*** |
| 9 | Can we hope for overpasses one day & include bike lanes for crossing?<br>***Refers to Caltrans plans for a Highway 101 overcrossing at Indianola.*** |
| 10 | Is there a prioritized list of transportation needs on the 101? |
| **MAP 5** | **Map 5 consists of Segment 10** |
| 1 | Why not west of the Simpson site?  (red circle)<br>***Refers to trail going around the western levee of the Simpson site.  Simpson owners did not favor that idea because of security concerns and that their office building projects out from the levee.*** |
| 2 | Put trail on east side of hwy.<br>***Refers to another corridor outside of the scope of this study, but studied some years ago by Redwood Community Action Agency.*** |
| 3 | Cut the Eucs down.<br>***Refers to eucalyptus trees between Indianola and the south end of Simpson site.*** |
| 4 | Replace Eucalyptus with native shrubs<br>***Refers to eucalyptus trees between Indianola and the south end of Simpson site.*** |
| 5 | Take advantage of this project to remove tide gates & improve fish passage from creeks to sloughs to bay |
| 6 | Eucalyptus trees are non-native & invasive & should be replaced<br>***Refers to eucalyptus trees between Indianola and the south end of Simpson site.*** |
| 7 | Euc is non-native, kills native birds & drops fruits that suck to bike over.<br>***Refers to eucalyptus trees between Indianola and the south end of Simpson site.*** |
| 8 | This row of Eucalyptus trees is a unique & valuable asset to this corridor.  Ride a bike—enjoy the Eucalyptus oil smell!<br>***Refers to eucalyptus trees between Indianola and the south end of Simpson site.*** |
| 9 | I prefer an alternative that would remove Eucalyptus trees.<br>***Refers to eucalyptus trees between Indianola and the south end of Simpson site.*** |
| 10 | About Eucalyptus trees  keep path away from directly under due to seed pods from trees bad for bike tires.<br>***Refers to eucalyptus trees between Indianola and the south end of Simpson site.*** |
| MAP 6 | Map 6 consists of southern part of Segment 10 |
| 1 | Please do not remove the Eucalyptus.<br>***Refers to eucalyptus trees between Indianola and the south end of Simpson site.*** |
| 2 | Ditto the trees.<br>***Refers to eucalyptus trees between Indianola and the south end of Simpson site.*** |

| | |
|---|---|
| 3 | Anywhere the trail can be placed west of commercial developments at Braward & Bracut traffic Safety & scenic value would be enhanced. This would require additional R.O.W. perhaps donated By Simpson & Bracut.<br>***Refers to trail going around the western levee of the Simpson and Bracut sites. Simpson owners did not favor that idea because of security concerns and that their office building projects out from the levee*** |
| 4 | Option to coordinate trail with the rehab of the railroad may halt or slow forward progress of the HBT.<br>***Refers to NCRA plan to recommence rail service.*** |
| 5 | And perhaps a small warming hut or two for inclement weather?<br>***Refers to facilities that might be included along the trai.*** |
| 6 | This is frightening on bike. (points to Jacobs intersection)<br>***Refers to Caltrans plans for eliminating the cutoffs on this stretch of Highway 101.*** |
| **MAP 7** | **Map 7 consists of Segments 11, 12 and 12A** |
| 1 | This indirect routing would not be optimal for commuters. (purple/green line)<br>***Refers to proposal to route bike trail under Highway 101 bridge (southbound) and to cross Eureka Slough via a cantilevered bike/pedestrian bridge attached to 5th Street bridge.*** |
| 2 | Many riders will just feel they have to get off the trail & ride the 101 shoulder—something we are trying to move away from.<br>***Refers to proposal to route bike trail under Highway 101 bridge (southbound) and to cross Eureka Slough via a cantilevered bike/pedestrian bridge attached to 5th Street bridge.*** |
| 3 | Wetland issues here make railbanking very attractive. (blue line)<br>***Refers to proposed trail alignment crossing the marsh at Eureka Slough.*** |
| 4 | This route option would be such a "wow" compared to using the 101 bridge—so much more interesting & currently inaccessible. (blue line)<br>***Refers to proposed trail alignment crossing the marsh at Eureka Slough.*** |
| 5 | This side is preferred. (west of hwy green line)<br>***Refers to bike path on cantilevered bike/pedestrian bridge attached to Highway 101 4th Street bridge(Southbound).*** |
| 6 | No room for pedestrian & cycle simultaneous. ( green line west of hwy)<br>***Refers to bike path on cantilevered bike/pedestrian bridge attached to Highway 101 4th Street bridge(Southbound).*** |
| 7 | This sidewalk needs to be removed, need solid barrier between bike/pedestrian. (green line w/101)<br>***Refers to existing sidewalk on 5th Street bridge(Highway 101Nothbound)*** |
| 8 | This bridge keeps many potential cyclists from riding between Arcata & Eureka. ( green line)<br>***Refers to existing bike lane on45th Street bridge(Highway 101 Southbound)*** |
| 9 | Would love to see connection with trail behind Target & ultimately the Eureka waterfront.<br>***Refers to existing trail constructed along Eureka Slough in the Target shopping center.*** |
| 10 | Having ridden rail trails for years, taking the trail up to the 101 hwy bridges is a terrible idea.<br>***Refers to existing sidewalk on 5th Street bridge(Highway 101Nothbound)and bike lane on 4th Street bridge (southbound)*** |
| 11 | Safer than going straight. Need to connect Target trail through Old town boardwalk all the way out to Baystown Mall.<br>***Refers to crossing at entry to Target shopping center.*** |
| 12 | This ought to extend to under the 255 bridge. (south end yellow line)<br>***Refers to trail connection to the south but out of study area.*** |
| 13 | Yes-or foot of H Street.<br>***Refers to trail connection to the south but out of study area.*** |

***Summary Results of Survey (103 Surveys) - May 16, 2007***

| | | | | | |
|---|---|---|---|---|---|
| 1. Do you use the existing bike shoulders along Highway 101 between Eureka and Arcata? (Circle one). | Yes 54 | No 49 | | | |
| What do you like best about the experience? | Flat and direct, close to Bay.* | | | | |
| What do you like least about the experience? | Proximity to traffic, danger noise, debris on shoulder.* | | | | |
| 2. Have you ever walked along the railroad tracks between Eureka and Arcata? (Circle one). | Yes 40 | No 63 | | | |
| What did you like best about the experience? | Solitude, wildlife, away from traffic.* | | | | |
| What did you like least about the experience? | Uneven footing, blocked by blackberries* | | | | |
| 3. On a scale of 1 to 5 rank with 5 being the highest value, what would make a trail between Eureka and Arcata attractive to you? | 1 | 2 | 3 | 4 | 5 |
| Opportunity to enjoy views of the Bay | | | Av.3.93 | | |
| Opportunity to ride bicycle or walk to Eureka or Arcata for recreation | | | | Av 4.35 | |
| Opportunity to commute by bicycle to Eureka or Arcata | | | Av 3.71 | | |
| 4. Would riding a bike or walking next to a railroad with a few trains a week be better or worse that riding or walking next to Highway 101? | Better 96 | Worse 1 | | | |
| 5. When considering connections to existing bike routes as well as recreation and work destinations, would you prefer the trail to be on the East side of Highway 101 or the West side of Highway 101? | West 84 | East 7 | | | |
| 6. If the trail was constructed, how many times a month would you use it? | 1-2 27% | 3-5 20% | 6-10 28% | 10-20 20% | >20 5% |

* These are comments that were generally repeated in the answers.

# APPENDIX E. RAILBANKING

Page 1 of Railbanking PDF

# APPENDIX F. CULTURAL RESOURCES

April 20, 2007

Philip Sales, Associate
Alta Planning + Design
1355 Felder Road
Sonoma, CA 95476

Dear Philip:

I write to provide you with the results of archival research for the Humboldt Bay Trail project, Humboldt County, California. The project area extends from Arcata to Eureka, and generally follows the route of the Northwest Pacific Railroad. Deviations occur:

- just south of Arcata where the proposed trail route bifurcates with one route extending along G Street and the other along the railroad to Samoa Road;
- at Bracut;
- at Brainard;
- just east of Eureka Slough where the proposed trial route bifurcates with one route extending along Highway 101 and the other along the railroad to X Street in northeastern Eureka.

The Arcata South and Eureka 7.5 minute USGS topographic maps include the areas where the trail (railroad) route and deviations are planned.

Archival research included examination of the official base maps and site record files at the North Coastal Information Center, Klamath, and examination of materials on file at the offices of Tom Origer & Associates, Santa Rosa. Materials examined at the offices of Tom Origer & Associates are shown on the accompanying pages titled "References."

Archival research found that one previous cultural resources study in the south Arcata area appears to have included an approximately ¼ mile segment of the railroad grade/trail route, and that study resulted in the discovery of no sites within or in close proximity to the railroad grade (Roscoe 2003). Several other studies have been completed within one-half mile of the railroad grade/trail route, but none of those showed sites that could extend into the current project area (Basin Research 2003; Douglas 1985; Heald n.d.; Rich, Roscoe, Van Kirk 2003; Roscoe 1990, 1992, 1993a 1993b, 2005; Smith 2005; Woodward-Clyde Consultants 1985). However, Loud (1918) depicted six (6) sites that could be within the project area. Loud's 1918 publication and the North Coastal Information Center's archaeological base maps show that Loud's Site 42 was situated near the G Street and/or railroad segment of the trail in southern Arcata. Three archaeological sites (Site 48, 49, & 50) were at Bracut, and two archaeological sites (Site 61 and 62) were located near the Eureka terminus of the proposed trail along the west bank of Eureka Slough. None of the six Loud sites (Sites 42, 48, 49, 50, 61, & 62) were found during the cultural resources studies cited above. The possibility is considered good that site locations have been developed and the sites are covered with fill material and/or buildings with associated parking lots and landscaping.

In addition to Native American archaeological sites, the railroad itself is an historical feature. The Northwestern Pacific Railroad and its associated branch lines date from the mid-19th century, with the primary line extending from Trinidad in the north to Sausalito, Marin County, in the south (Codoni and Trimble 2006; Kneiss 1956). Maps that show the project area prior to construction of the Northwestern Pacific Railroad depict the proposed trail route primarily as a marshy zone adjacent to Humboldt Bay.

While not exhaustive, this level of archival research shows that very little of the proposed trial route has been subjected to prior cultural resources study. Also, several sites previously discovered and reported by Loud in 1918 are within or in close proximity to the trail route. Finally, the Northwestern Pacific Railroad route is a historical resource.

Please do not hesitate to contact me with any questions. We look forward to working with you on subsequent studies for this project.

Cordially,

Thomas M. Origer, M.A.

Registered Professional Archaeologist

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# APPENDIX G. SHOREBIRD ROOSTING

## 1. Roost Fidelity and Factors That Might Influence the Extent of Roosting

Humboldt Bay, in coastal northern California, is a Western Hemisphere Shorebird site of international importance (Conklin et al., in press). According to Conklin et al. (in press), consistency of roost use is one important measure of the extent to which roost availability limits a population. Highly predictable roost use may reveal a lack of options (Gill et al., 2001). For dunlin (Calidris alpina), Conklin et al. (in press) showed that diurnal roosts at Arcata Bay were highly variable on a weekly, monthly, and yearly basis. In Conklin et al. (in press), radio-marked dunlin showed that roost site use was unpredictable, which was consistent with population level observations, suggesting low fidelity to roost sites especially during the day. Furthermore, Conklin et al. (in press) found that most dunlin roosts in Arcata Bay (including 8 of the 12 most-used roosts) are in human-created or altered habitat and that conversion of land for cattle grazing has maintained or increased the suitable habitat available for shorebirds at high tide.

The abundance of shorebirds at roosts is highly variable for reasons that may include: height of high tide coinciding with observations at roosts differing in elevation, b) availability of alternative foraging habitats, c) disturbance, either by predators or humans, and d) migratory movements (Colwell et al., 2003). In terms of dunlin conservation in Humboldt Bay, existing roost options appear to meet the needs of dunlin, but current data do not indicate how many roosts can be lost before negative population impacts occur (Conklin et al., in press).

## 2. Next Steps to Address/Mitigate Shorebird Roost Site Impacts

Direct interaction between human disturbance and roost sites should be limited in order to protect the long-term suitability of Humboldt Bay and adjacent important roost sites for shorebirds. Planning and placement of the trail must take into account flush distances of roosts. The next step in the planning process should include direct involvement of Dr. Mark Colwell. His knowledge of local, regional, and global shorebird ecology is a tremendous asset to responsible planning and implementation of any project involving potential impacts to shorebirds in the Humboldt Bay area.

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