RESORT IMPROVEMENT DISTRICT NO. 1
SHELTER COVE – HUMBOLDT COUNTY – CALIFORNIA
9126 Shelter Cove Road, Whitethorn CA 95589-9079
707-986-7447, Fax: 707-986-7435, www.sheltercove-ca.gov

4 April 2016

State Water Resources Control Board
Division of Water Rights
ATTN: Mark Matranga
P.O. Box 2000
Sacramento, CA 95812-2000

Re: Request for Case-by-Case Exception for Water Right Application 32557 of Resort Improvement District No. 1 to Appropriate Water from Humboldt Creek in Humboldt County

References:

1. Policy for Maintaining In-Stream Flows in Northern California Coastal Streams, February 2014
2. California Water Action Plan, February 2014
3. North Coast Resource Partnership & North Coast Integrated Regional Water Management Plan, 2014
4. Storm Water Strategic Initiative, December 2015 – with Appendix A
5. State Water Resources Control Board Mission Statement, 2015
6. Humboldt County Local Coastal Program, South Coast Area Plan, April 1990
7. Governor of California, Drought Declaration, January 2014
8. Final Assessment of the National Marine Fisheries Service's Critical Habitat Analytical Review Teams (CHARTs) for Seven Salmon and Steelhead Evolutionary Significant Units (ESUs) in California, July 2005

Greetings,

The Resort Improvement District #1 (RID) is requesting an exception to the policy established in Reference 1, Paragraph 2.4.1, "On-Stream Dams on Class I Streams". The following is provided, in accordance with Section 9 of Reference 1, to support the request.

1. Reasons for the Request
    a. An exception to policy for on-stream dams on Class I streams fully supports the DWR's mission (Reference 5), *"to preserve, enhance and restore the quality of California's water resources, and ensure their proper allocation and efficient use for the benefit of present and future generations".* The exception, which will enable greater storm water capture and storage, will achieve drought resiliency for the present, as well as, for the future of the Shelter Cove community.
    b. The RID needs to build drought resiliency to secure the future of safe drinking water for the Shelter Cove community. Due to the surrounding topography and geographic isolation of Shelter Cove, the RID has extremely limited options to gain drought resiliency. Although several producing wells were established in the past 8 years, these new wells are now experiencing the full effects of the current drought, and their capability to withstand prolonged drought conditions is unknown. Bringing water in from other municipalities is economically impossible.

c. The current drought in the North Coast region is providing less than the average rainfall for this area; however, each rain season still provides a large amount of water which flows directly to the ocean from the three coastal streams located on RID lands. There are no available areas to create off-channel reservoirs due to the topography and the limited land space available (see Attachment #1). In order to reservoir the large volume of water for future use, a dam on Humboldt Creek is a viable and available means to increase the RID's drought resiliency.

d. Recent Regulatory improvements seek new, innovative ways to enable communities to build drought resiliency. Reference 4 presciently outlines new approaches to help communities such as Shelter Cove to improve drought resiliency. In particular, the Proposed Project List contained in Appendix A includes Storm Water Capture and Use as the first project listed. There are numerous astute observations written throughout the paragraphs of this project description, nearly all of them support this request for an exception to policy, especially considering the geographic isolation and topographic constraints of the RID service area. Furthermore, Paragraph c. of Project 1, "Increase Storm Water Capture and Use through Regulatory Approaches" reads as if it is specifically intended to allow for exceptions to existing policy, or a complete rewriting of existing policy in order to achieve the objectives for this type of project. *"Options for regulatory requirement-based actions and incentives could include: ... (4) using existing regulatory authority to ensure implementation of multiple-benefit projects and retrofits."*

e. A reservoir is a greener alternative. The RID relies upon a combination of surface water (Telegraph Creek) and groundwater wells to serve the geographically isolated community of Shelter Cove. Understandably, both of these sources are highly susceptible to drought conditions. The nearest municipal water source which could potentially relieve water shortages experienced by the RID is approximately 20 miles away (Redway, CA). The rugged topography in which Shelter Cove is located greatly limits areas for off-channel storage of water; however, the Pacific Ocean is the western boundary of Shelter Cove, and desalination is a potential drought resiliency solution for the community.

    i. The challenges for implementing desalination technology in Shelter Cove appear to be greater than those required to developing an on-stream reservoir. The rugged topography greatly limits the available land to accommodate a desalination plant footprint, and most of the land capable of such a footprint is either private or federal land (Bureau of Land Management). The offshore area of Shelter Cove is an Area of Special Biological Significance (ASBS #7) and the ASBS is also bounded by Marine Protected Areas (MPA). These factors increase the challenge of brine discharge, the waste by-product of desalination, and the monitoring of this waste discharge could potentially impact these protected areas, as well as, create an additional increase in cost of water production. Because the water potentially captured by a Humboldt Creek on-stream reservoir would be collected passively, the only energy required would be in the potable water treatment process through a co-located onsite package treatment plant. A desalination plant would require far greater energy to pump water from the ocean, desalinate it, and then discharge the waste.

    ii. Furthermore, because the water supply needed to increase the RID drought resiliency is seasonal (summer months only), the maintenance and operations (M&O) costs would significantly increase the cost per gallon of water produced over a 4 to 5-month period versus a 12-month period. Although the construction of an on-stream dam would be environmentally disruptive, after the reservoir is filled and the habitat evolves to its presence, in the long run, the natural surroundings of the reservoir could potentially increase wildlife habitat opportunities.

2. North Coast Instream Flow Policy provisions involved;
    a. Section 2.1, Principles for Maintaining Instream Flows. Once filled, the seasonal flows which bypass the dam would maintain the flow which periodically does reach the ocean; although water would be collected during the highest stream flows, (i.e. winter) there is no scientific evidence the native coastal trout which currently inhabit the stream need passage to the ocean; the collection of water would extend the fish habit to the upper reaches of Humboldt Creek which the native fish population does not inhabit (see Attachment 3); the larger body of water created by the reservoir would protect the fish and their habitat; the concept for a Humboldt Creek reservoir does envision a method for seasonal fish passage.
    b. Section 2.2.1, Regionally Protective Criteria, See Attachments 1, 2 and 3.
    c. See Reference 4, Executive Summary; Section 1, Introduction; Section 2, Background; and, Section 3, Collaboration, Outreach and Process
    d. See Reference 4, Appendix A, Guiding Principle 1, Project 1.c., Regulatory Approaches
    e. See Reference 7.
3. Documentation Why the Exception Will Not Compromise Maintenance of Instream Flows in the Policy Area
    a. See Attachment 1, prepared by RID Staff, Background, Historical Information of Humboldt Creek and how Goals of North Coast Regional Partnership and North Coast Integrated Regional Water Management Plan will be met through the creation of a reservoir on Humboldt Creek.
    b. See Attachment 2, LACO Technical Memorandum, Biological Stream Classification Results, Humboldt Creek
    c. See Attachment 3, Ross Taylor and Associates, Findings for Fish Presence-Absence Sampling on Humboldt Creek
    d. Reference 8 directly addresses the issue of Endangered Species critical habitat areas. In addition to identifying that salmonid life history (Section B, page 8) requires a "highly productive estuarine environment (as) an important feeding and acclimation area for juveniles preparing to enter marine waters" (pg. 9), something Humboldt Creek naturally lacks (an estuary), the CHART Assessment neither lists nor reflects on a map Humboldt Creek (Hydrologic Unit 1112, Cape Mendocino) for any of the seven salmon or steelhead species for which the assessment was made.
4. How Exception Will Serve the Public Interest
    a. Granting an exception to policy for an on-stream reservoir on Humboldt Creek would provide the RID and Shelter Cove community a drought resiliency solution through a regulatory exception.
    b. A reservoir will conserve treated drinking water within the community by providing an alternative non-ocean water source for wildfire firefighting agencies (state and federal) to abate wildfires in the King Range (see 2015 CDF Horse Fire incident). These agencies ALL rely upon RID water to combat wildfires in the King Range area, and the greatest source of fresh water, currently, is the community's treated drinking water in storage tanks.
    c. There is a sizeable rural population outside of Shelter Cove proper in the Whitethorn area, and should drought conditions ever warrant, a reservoir in Shelter Cove would be able to provide water to surrounding rural populations as well.
    d. Humboldt Creek has several unique characteristics which make it extremely well suited for consideration towards this endeavor, and it provides the State another option in dealing with the potential devastation created by prolonged droughts. This project could serve as the model for site specific solutions for other coastal areas and inland areas as well.
    e. A Humboldt Creek reservoir would substantially increase the fish habitat in the upper reaches of the creek during the diversion season since the water pooled in the reservoir would increase the depth upstream of the collected water.

Sincerely,

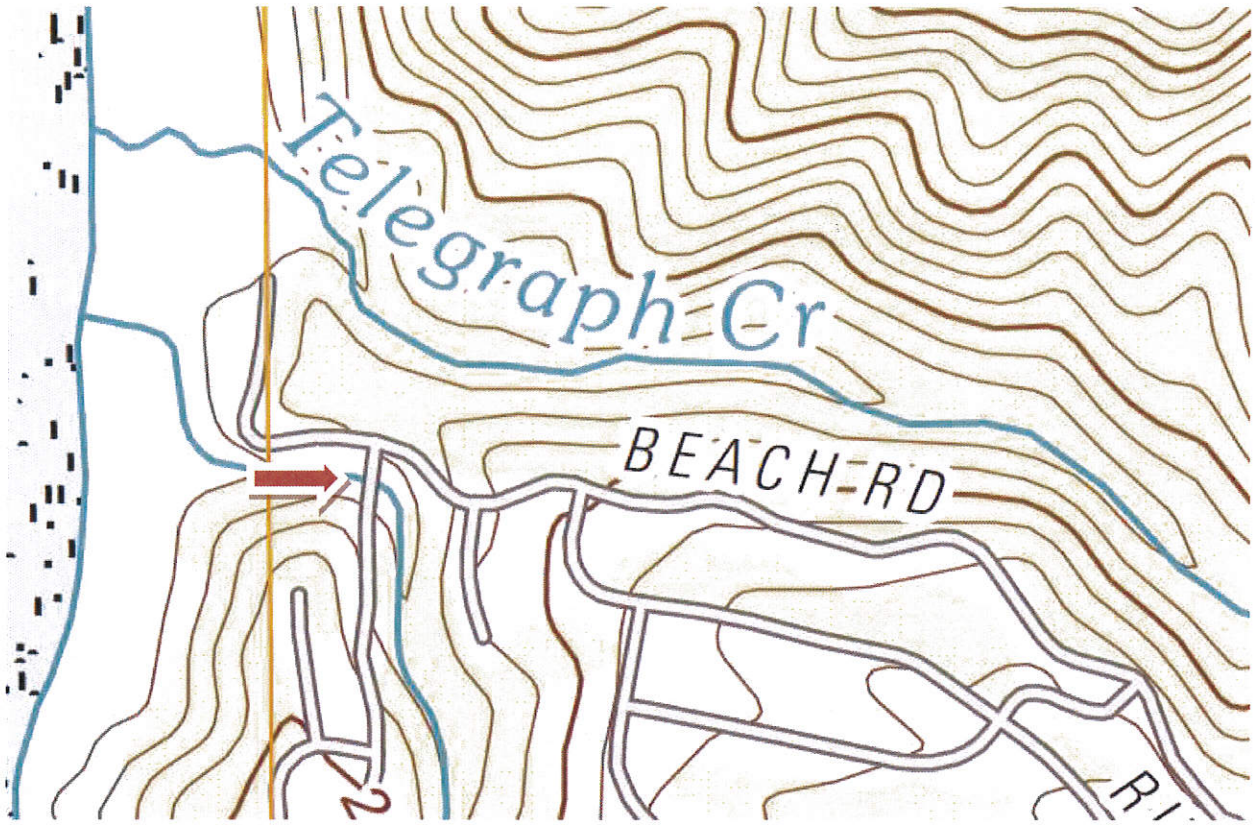
Philip W. Young
General Manager
Resort Improvement District #1
gm@sheltercove-ca.gov

Enclosures:
Attachment 1, Humboldt Creek History
Attachment 2, LACO Technical Memorandum, Biological Stream Classification Survey Results, dated January 10, 2014
Attachment 3, Ross Taylor & Associates, Report of Fish Presence-Absence Sampling on Humboldt Creek, dated August 21, 2014

ATTACHMENT #1

The Resort Improvement District #1 in Shelter Cove seeks authorization to study the feasibility of constructing an onstream dam on Humboldt Creek, a Class I stream, in Shelter Cove. The location of the dam would be near the existing outflow to the ocean at the intersection of Beach Road and Humboldt Loop, and it would replace the existing Humboldt County culvert located approximately 80 feet below Humboldt Loop road surface. The resulting reservoir would fill the creek channel for approximately three-quarters of a mile.

BACKGROUND: The continuing drought conditions in California, coupled with the future uncertainties being created by global climate change, will continue to imperil the drinking water supplies of communities, like Shelter Cove, which rely upon surface water sources for the majority of their drinking water supply. In the statewide election of 2014, Californians overwhelmingly passed Proposition 1 in order to address the issue of inadequate water storage capacity in California, among other drinking water supply issues. An onstream dam on Humboldt Creek would contribute to the solutions being applied in Humboldt County and the state to address drinking water supply and storage. Such a project would provide for the long-term drinking water supply security of the Shelter Cove Community while having a minimal impact, after mitigation procedures are applied, on the natural habitat of the community. Depending upon the maximum water level achieved through a dam, the reservoir has the potential to store 43-75 acre feet of water (approximately 14 million to 24.4 million gallons).



Conceptual dam location would be at tip of red arrow.

HISTORICAL INFORMATION -- Shelter Cove Water Source Development: Humboldt Creek is a very short coastal stream approximately 7100 feet in total length (1.34 miles). It is entirely endemic to Shelter Cove, and all of its flow is sourced from surface water and groundwater flows collected entirely within the Shelter Cove watershed. It neither feeds nor is fed by other perennial streams, and its total creek channel footprint is approximately 200 acres.

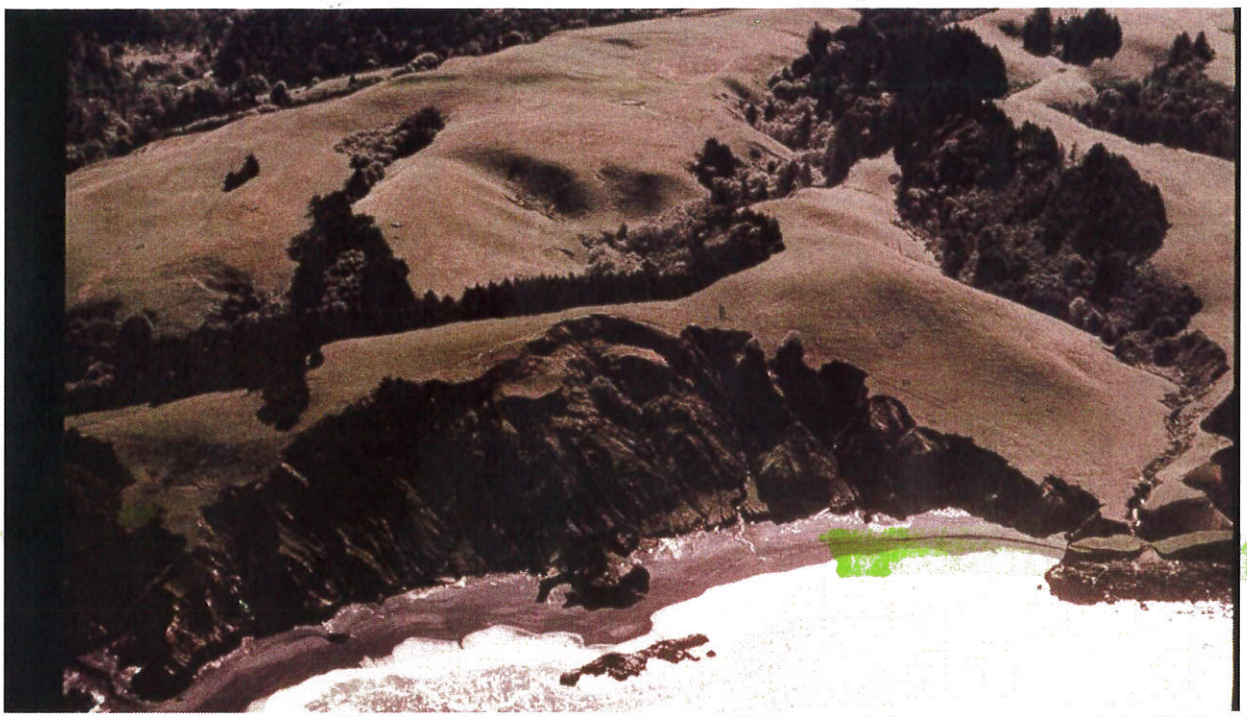


Photo of Humboldt Creek channel ca. 1963-64 prior to development. Ocean outfall is in lower left corner and stream channel is the treed area running from left to upper right of photo. Notice the abundance of coastal chaparral and the absence of trees.

Photo of Humboldt Creek channel ca. 1963-64 prior to development. Ocean outfall is on right side, middle, and creek channel is left to right in top, middle of photo. Notice the abundance of coastal chaparral and the absence of trees.

In 1965, the Resort Improvement District #1 (RID) was established and the Shelter Cove Sea Park development commenced shortly thereafter. Telegraph Creek was established as the primary drinking water source for the RID, and this source originally supplied 90-95% of the drinking water supply to the community. The remaining supply was provided by low-producing surface spring and a groundwater well. Beginning in 1968 water storage facilities were being built and eventually seven steel tanks and 11 redwood tanks were installed to store water throughout the community and to create pressure zones.

Circa 1972. Telegraph Creek outfall is in the lower left corner, and Humboldt Creek outfall is near center of photo. The road development around the Humboldt Creek channel is plainly visible, and the explosion of tree growth is not yet evident.

During the 1965 development, approximately 4400 lots were created. At Humboldt Creek outflow County culverts were emplaced and covered with approximately 80 feet of dirt to create Humboldt Loop and Beach roads. Culverts were installed to capture runoff collected on roads and draws along the creek, thereby increasing flows as less water was absorbed by the ground and more concentrated flows were directed to the creek.

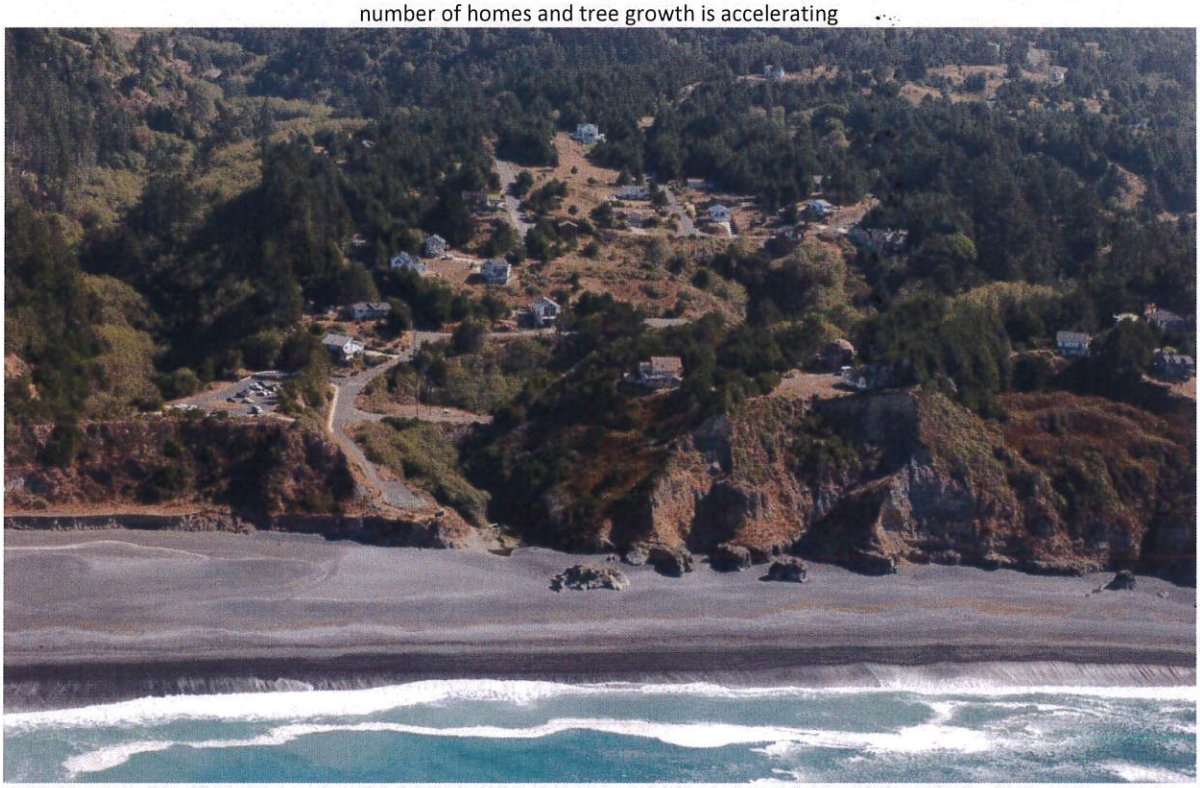
October 1979. In 1972, the Findley Creek Fire swept through the Humboldt Creek channel, and in 1973 aerial re-seeding of the King Range area spread into Shelter Cove. Tree "skeletons" can be seen in the creek channel in this photo.

In February 1971 a permit for diversion of water was issued to the RID to take water from Telegraph Creek with the provision that a minimum bypass flow of 0.8cfm must be maintained throughout the year. A secondary diversion located near the Beach Road – Humboldt Loop intersection (approximately 900 feet from the ocean outfall) was permitted in December 1985, with the same bypass requirements of the original permit.

June 1987. Increased tree growth is evident (throughout the Cove as well).

In October 1996, the Department of Health Services increased the number of drinking water service connections from 400 to 850. In September 2004, National Marine Fisheries Service issued a citation for an illegal take of endangered steelhead at the Telegraph Creek dam site. In 2008, the citation was dismissed, with prejudice, in lieu of a Settlement Agreement (SA) between the RID and NMFS calling for improved fish passage at the dam within 3 years. The District installed a Denil fish ladder at the dam site; however, the SA was renewed in 2011 as some staff at NMFS submitted the Denil was inadequate even though it was installed by staff of the CDFW. From 2008 to the present, the RID established 13 groundwater wells, thereby decreasing its reliance on Telegraph Creek and increasing bypass flows during low flow months. In January 2015, NOAA/NMFS dismissed the entire case; however, the District remains committed to improving fish passage on Telegraph Creek. Today (2015), there are 7 steel tanks and 5 redwood tanks, and since 2008 the RID has put 13 groundwater wells into service.

June 1993. Humboldt Creek channel is depicted by orange lines. Telegraph Creek channel (partial) is depicted by the green line. Increasing number of homes and tree growth is accelerating



October 2002. The parking lot formerly on Black Sands Beach is gone and the new BLM King Range parking lot is now present on left, center of photo. Greater abundance and growth of trees is more noticeable.

September 2013. Mature Douglas Fir growth now dominates the landscape, drawing ever increasing amounts of water from the creeks and groundwater sources, especially during the dry months.

CONCEPT: Create a surface reservoir on Humboldt Creek by damming existing culvert area (new dam construction) and create stream by-pass to flow along existing route

- raise road levels of Humboldt Loop and Beach Road (intersection) 30-40 feet
- create interconnection to existing Telegraph Creek downstream intake (6"HDPE) to water plant
- relocate and/or raise existing utility infrastructure (lift station, utility poles)
- clear wooded slopes of Humboldt Creek channel to be filled by reservoir

Preliminary LIDAR analysis reveals the following water yields of the project.

PLANE HEIGHT (ft)	VOLUME (acre-ft)	VOLUME (cu.ft.)	VOLUME (gal.)	
85	3	130,680	977,554	
95	10	435,600	3,258,514	
105	22	958,320	7,168,731	
115	43	1,873,080	14,011,611	
125	75	3,267,000	24,438,857	

The Telegraph Creek ocean outfall is less than one-quarter mile from the Humboldt Creek ocean outfall. As part of the reservoir development concept, habitat flora and fauna which would be negatively impacted by a reservoir development would be transplanted to the Telegraph Creek riparian corridor. This stream channel is more than twice the length of Humboldt Creek and, like Humboldt Creek, it is entirely endemic to the Shelter Cove water shed and it is fed by an adjoining creek, Puma Creek, also endemic to the Shelter Cove water shed. Puma creek has many similar physical characteristics of Humboldt Creek in addition to size and shape. Such transplantation could actually improve species habitat by increasing potential population capacity and moving such species away

from greater human population dense areas. Additionally, if determined to be a benefit to endangered salmonids, a fish passage way could be constructed on the Humboldt Creek dam.

HUMBOLDT RESERVOIR SUPPORTS THE NORTH COAST RESOURCE PARTNERSHIP & NORTH COAST INTEGRATED REGIONAL WATER MANAGEMENT PLAN GOALS AND OBJECTIVES:

The following are the stated Goals and Objectives of the NCRP / NCIRWMP Plan III, and those listed below will be supported through the development of an on-stream Humboldt Creek Reservoir:

GOAL 1: INTRAREGIONAL COOPERATION & ADAPTIVE MANAGEMENT

- **Objective 1** - Respect local autonomy and local knowledge in Plan and project development and implementation
- **Objective 2** - Provide an ongoing framework for inclusive, efficient intraregional cooperation and effective, accountable NCIRWMP project implementation

GOAL 2: ECONOMIC VITALITY

- **Objective 3** - Ensure that economically disadvantaged communities are supported and that project implementation enhances the economic vitality of disadvantaged communities.
- **Objective 4** - Conserve and improve the economic benefits of North Coast Region working landscapes and natural areas

GOAL 3: ECOSYSTEM CONSERVATION AND ENHANCEMENT

- **Objective 5** - Conserve, enhance, and restore watersheds and aquatic ecosystems, including functions, habitats, and elements that support biological diversity
- **Objective 6** - Enhance salmonid populations by conserving, enhancing, and restoring required habitats and watershed processes

GOAL 4: BENEFICIAL USES OF WATER

- **Objective 7** - Ensure water supply reliability and quality for municipal, domestic, agricultural, cultural, and recreational uses while minimizing impacts to sensitive resources
- **Objective 8** - Improve drinking water quality and water related infrastructure to protect public health, with a focus on economically disadvantaged communities
- **Objective 9** - Protect groundwater resources from over-drafting and contamination

GOAL 5: CLIMATE ADAPTATION & ENERGY INDEPENDENCE

- **Objective 10** - Assess climate change effects, impacts, vulnerabilities, and strategies for local and regional sectors
- **Objective 11** - Promote local energy independence, water/ energy use efficiency, GHG emission reduction, and jobs creation

The following paragraphs delineate how the Humboldt Creek Reservoir (HCR) supports the above highlighted Goals and Objectives:

Intraregional Cooperation & Adaptive Management: The Resort Improvement District #1 (RID) is a public utility which provides drinking water, among other utility services, to the Shelter Cove community. The development of this reservoir would certainly provide recognition by the NCIRWP of the RID's knowledge and management, as well as respect, of its water resources afforded by the area's surface and ground water resources. The HCR would provide the RID with greater flexibility in managing its drinking water resources to the Shelter Cove community and also enable the RID to provide a ready water supply to the immediate surrounding communities in times of shortages. Additionally, the HCR would provide a large body of water to be drawn upon during wildfire fighting periods. Currently, wildfire fighting agencies draw water from the RID hydrant system which is treated drinking water. Having this valuable source of untreated water for wildfire fighting would reduce an economic burden from the RID during these periods, as well as, reduce the economic burden on neighboring communities during periods of shortages.

Economic Vitality: The Shelter Cove community is home to many low income residents and many of the neighboring communities surrounding Shelter Cove are economically disadvantaged, and all these communities are consistently challenged by threats to their drinking water supplies. HCR would stabilize and mitigate such threats, and in the process, reduce the RID reliance upon nearby Telegraph Creek during the low flow periods in the Summer and Autumn months. The Telegraph Creek dam area currently supports a native rainbow trout population. HCR would enable the RID to stop drawing water from Telegraph Creek during these periods and thus enable increased flow in Telegraph Creek (TC). This increased TC flow would directly contribute to conserving and improving the TC riparian area during these low flow periods.

Ecosystem Conservation and Enhancement: As stated above, with HCR in place, TC would directly benefit from a reduced water draw during Summer and Autumn low flow periods. Additionally, should salmonid populations increase to a point where TC, through additional restoration efforts, would again become a viable anadromous fish habitat. Furthermore, a larger body of water in the HCR corridor will potentially increase habitat for riparian and terrestrial flora and fauna, and, perhaps create new environment for currently displaced plants and animals. Lastly, any threatened species found in the HCR corridor could be quickly relocated to the TC riparian corridor.

Beneficial Uses of Water: Currently, there is no beneficial use of water flowing through the Humboldt Creek drainage area. It does not support any sizeable fish population nor is it used beneficially by the human population in Shelter Cove – it flows directly out to the Pacific Ocean. Not only does the current use fail to support any of the NCRP / NCIRWMP goals and objectives, but it also serves as a point of failure for the State Water Board's mission to " . . . ***ensure their (water resources) proper allocation and efficient use for the benefit of present and future generations*** ." This point of mission failure on the part of the SWRCB's in the Shelter Cove area would be remediated by the HCR. As important as the reduced reliance upon TC that the HCR would provide, all of the operational ground water wells (13-15) and ground water resources in the Shelter Cove water table would be further protected from over-drafting and/or contamination.

Climate Adaptation and Energy Independence: As the RID implements sequential phases of its overall Strategic Plan, the HCR will enable the RID to reduce energy consumption through reduced well pumping and water movements throughout the RID distribution system. This will have increased significance as the RID begins to field alternative energy resources in the District area. Additionally, the HCR will create a very valuable water resource for the surrounding communities as the unpredictable impacts of climate change reveal their consequences on local water supplies. The HCR provides a unique opportunity for the RID to have more control of its destiny as the future unfolds.

ATTACHMENT #2

LACO

TECHNICAL MEMORANDUM

Biological Stream Classification Survey Results
Humboldt Creek, Shelter Cove, California
Assessor's Parcel Number 109-011-005

Date: January 10, 2014
Project No.: 7912.00

Prepared For: Resort Improvement District No.1
Phillip Young, District Manager

Prepared By: Gary Lester, Senior Environmental Scientist

Reviewed By: Christopher Watt, Principal Engineering Geologist

Appendix A: Figure 1: Location Map
Appendix B: Site Photographs

INTRODUCTION

Phillip Young, District Manager of Resort Improvement District No.1(RID #1, Client) requested professional services from LACO Associates (LACO) related to Humboldt Creek which is located on Client's property and subject to California State Water Resources Control Board (SWRCB) water rights permitting requirements. LACO performed a stream classification survey to support a possible water right permit application (Application to Appropriate Water) to be filed by Client. Humboldt Creek is located on RID #1 property in the community of Shelter Cove, Humboldt County, California; the creek has an estimated watershed area of 200 acres. The project area comprises one assessor's parcel (Assessor's Parcel Number [APN] 109-011-005) north of the Shelter Cove airport landing strip (See Appendix A: Figure 1 and Appendix B: Site Photos). This report was prepared by LACO's Senior Environmental Scientist in accordance with the scope of services described in the Agreement between Client and LACO dated November 19, 2013.

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Biological Survey

LACO's services were limited to a review of historic and current aerial photographs, topographic maps, and requested California Department of Fish & Wildlife (DFW) stream habitat survey reports, and a field survey of the project area to identify the upper limit of anadromy in relation to the project site. Evidence of perennial or ephemeral flow, and species present in or near the channel, were recorded. This written report of findings includes classification of the drainage from the Humboldt Creek headwaters to the Pacific Ocean, and identification of the upper limit of anadromy based on criteria established in *Policy for Maintaining Instream Flows in Northern California Coastal Streams* (SWRCB, 2010).

METHODS

A field survey of the project area was conducted on December 4, 2013, and involved approximately eight person-hours. LACO's Senior Environmental Scientist, Mr. Gary Lester, conducted the survey. With over 30 years of experience and an undergraduate degree in Botany, Mr. Lester is qualified to conduct biological surveys. Mr. Lester also has training in recognition of the local flora and fauna, rare plant identification, and survey protocol.

Project area topographic maps, current and historical aerial photographs (Historic Aerial Photographs [Google Earth, 2013]), the U.S. Geological Survey (1969) Shelter Cove 7.5-minute Quad Map, and the California Natural Diversity Database (CNDDB) (DFW, 2013) were reviewed prior to and during the survey to identify potential sensitive aquatic species occurrence. The Humboldt Creek main stem and lower portions of feeder drainages were surveyed, noting the physical and biological characteristics. Photographs documenting the visual characteristics of creek sections and features are included in Appendix B.

The survey was conducted following guidance from the California State Water Resources Control Board's *Policy for Maintaining Instream Flows in Northern California Coastal Streams* (SWRCB, 2010). A seasonally-appropriate survey was conducted that surveyed the potential stream source habitat and physical characteristics. Plants were identified to the lowest taxonomic level (genus or species) necessary for hydrophytic or aquatic plant identification. The plant scientific nomenclature follows the Jepson Manual (Baldwin, et. al. 2012).

STREAM CLASSIFICATION SURVEY RESULTS

Historical aerial photographs from 2005, 2006, 2009, 2010, and 2012, obtained from Google Earth (2013), showed visible stream flow onto Black Sands Beach at the Humboldt Creek mouth. The Google Earth (2013) inquiry of June 5, 2009 showed Humboldt Creek flowing to the ocean. The two historical aerial photographs from 2005 and 2006 showed an estuary lagoon developed from creek flow onto the beach. Dry-season flow is evidenced by visible stream channels on Black Sands Beach apparent in September 2010 and August 2012 photographs. The stream classification field survey recorded evidence of permanent stream flow, as well as biological and physical indicators of persistent water. During an earlier site survey conducted on October 31, 2013, the Humboldt Creek mouth was observed emptying onto Black Sands Beach, similar to historical Google Earth images from previous years (Please refer to Appendix A, Photo Location 1 and Appendix B, Photo 1). Open-channel creek flow onto the beach at the mouth was observed on December 4, 2013, even though accumulated rainfall for the season is approximately 48

percent below normal (NOAA, 2013). On December 4, 2013, the mouth was observed immediately upslope from the beach; heavy driftwood debris was visible (Please refer to Appendix A, Photo Location 2 and Appendix B, Photo 2). Humboldt Creek below the Humboldt Loop Road crossing is carried below base rock fill by three 24-inch corrugated metal culverts (Please refer to Appendix A, Photo Location 3 and Appendix B, Photo 3). A significant bedrock bench is located approximately 300 meters above the triple culverts (Please refer to Appendix A, Photo Location 4 and Appendix B, Photo 4). The step, although clearly a barrier to most fish at low flows, would be of insignificant height at swollen creek volumes. Relatively-level open-channel creek flow is present throughout most of Humboldt Creek (Please refer to Appendix A, Photo Location 5 and Appendix B, Photo 5). Humboldt Creek below Shelter Cove Road ceases the extent of open-channel flow and upper drainage slopes exceed 12 percent (Please refer to Appendix A, Photo Location 6 and Appendix B, Photo 6).

The triple culverts do not appear to be restrictive to fish passage (50 cm in height); however the flow velocity generated by heavy rain events may prevent anadromy (fish passage from ocean to freshwater for breeding purposes). The nearest stream within the range of anadromy is the Class I waterway of Telegraph Creek (300 meters north). Elevation readings were estimated at the Humboldt Creek mouth (5 feet above sea level) and approximately 7,000 feet upstream at Shelter Cove Road (380 feet above sea level); the estimated slope over that distance is approximately 5 percent (USGS, 1969). The maximum slope to support anadromy is approximately 10 to 12 percent (SWRCB, 2010). The response to a request to DFW for fish stream data from Humboldt Creek indicated that no data was known (pers comm., 2013). Based on stream channel grade and conditions observed during the field survey, historic anadromy to Humboldt Creek appears possible. However, there is no known documentation that supports fish presence in the stream. The following description is provided from observations of the length of Humboldt Creek, from ocean outfall to end of open-water channel and permanent flow.

Humboldt Creek Stream Description

All but the ill-defined channel at the beach outlet (Appendix B, Photo 1) has a nearly 100-percent overstory canopy. From +100 feet (confluence with ocean) to 7,000± feet upstream the overstory canopy is predominately Douglas-fir (*Pseudotsuga menzeisii*), red alder (*Alnus rubra*), big-leaf maple (*Acer macrophyllum*), tan oak (*Lithocarpus densiflora*), and California bay (*Umbellularia californica*). Widely-scattered shrubs include thimbleberry (*Rubus parviflorus*), California hazel (*Corylus cornuta*), red elderberry (*Sambucus racemosa*), and salmonberry (*Rubus spectabilis*). The slope of the active open channel upstream of the mouth is approximately 5 percent (presenting no limit of anadromy). Channel width is approximately 60 to 120 inches; channel depth is approximately 12 to 48 inches. Streambed material is primarily coarse gravel and widely-scattered boulders. Estimated stream flow on December 4, 2013, was approximately 0.5 cubic feet per second (estimated by bucket method). Instream cover plant species include five-fingered fern (*Adiantum aleuticum*), western colt's foot (*Petasites frigidus*), California blackberry (*Rubus ursinus*), and sword fern (*Polystichum munitum*). Additional prominent plant species include short-scaled sedge (*Carex deweyana*), lady fern (*Athyrium filix-femina*), youth-on-age (*Tolmiea diplomenzeisii*), and hedge nettle (*Stachys ajugoides*.

Instream vertebrate wildlife observed include Pacific Giant Salamander (*Dicamptodon ensatus*) and Pacific tree-frog (*Pseudacris regilla*). Macroinvertebrates include water striders (Gerridae) and common riffle beetle (Coleoptera). No fish species of any kind were observed in the length of the open channel surveyed.

Approximately 2,500 feet upstream from the Humboldt Loop Road crossing, a single 24-inch corrugated metal culvert is located near a RID #1 wastewater lift station. Smaller unsecured pipes lying in the stream channel were observed as well as intact overhead water lines. There were no other permanent features seen in the channel or observed nearby, including house structures within 200' of the stream channel.

CONCLUSIONS AND RECOMMENDATIONS

Based on the observations described in this report, Humboldt Creek qualifies as a Class I drainage. Although no fish species were observed, for further evaluation of our findings we recommend that a fisheries biologist with a permit for electo-shocking sampling conduct a survey of the stream channel. If no fish are located in Humboldt Creek, consider retaining a qualified fisheries biologist to conduct a rapid bio-assessment of Humboldt Creek to determine if there is food available to support fish.

REFERENCES

Baldwin, B. G., D. H. Goldman, D. J. Keil, R. Patterson, T. J. Rosatti and D. H. Wilken. 2012. The Jepson Manual: Vascular Plants of California. University of California Press. Berkeley CA.

California State Water Resources Control Board, Division of Water Rights. September 28, 2010. Policy for Maintaining Instream Flows in Northern California Coastal Streams. Appendix A, Water Availability Analysis Requirements. Sacramento, CA.

California Department of Fish and Wildlife. November 2013. Michael van Hattem, Environmental Analyst. Humboldt Creek stream data inquiry. Eureka, CA.

California Department of Fish and Wildlife. December 2013. California Natural Diversity Database (CNDDB). Shelter Cove Quad. Sacramento, CA.

Google Earth 2013. "Humboldt Creek Mouth", 40° 02' 41.52 W, 124° 04' 44.36" 8/23/20, 9/15/10, 6/5/2009, 2/7/2006, 12/30/2005, 8/26/2005. (U.S. Geological Survey), December 11, 2013 (USDA, Farm Service Agency).

National Marine Fisheries Service. 2000. California Anadromous Fish Distributions (Mendocino County). Prepared by Weldon Jones. Draft January 2000. Santa Rosa Field Office, CA.

P:\7900\7912 Resort Improvement District No.1\7912.00 Humboldt Creek On-Stream Reservoir\03 Template Folders\06 Planning\Environmental Docs_CEQA_NEPA\Review Stream Classification Report\7912.00 Humboldt Creek Stream Classification Report 20131211.Docx

APPENDIX A

Figure 1: Location Map

Attachment #2

LACO
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PROJECT	STREAM CLASSIFICATION SURV	BY JB	FIGURE 1
CLIENT	RESORT IMPROVEMENT DISTRICT # 1	CHECK GSL	
LOCATION	SHELTER COVE, CA.	DATE 12/16/13	JOB NO. 7912.00
	LOCATION MAP		

Date: 12/16/2013 Time: 12:55:18 PM
Path: P:\7900-7912 Resort Improvement District No 1\7912.00 Humboldt Creek Channel\Reservoir\12 Figures\Mxds\GIS\7912.00 STREAM FIGURE 1.mxd

APPENDIX B

Site Photographs

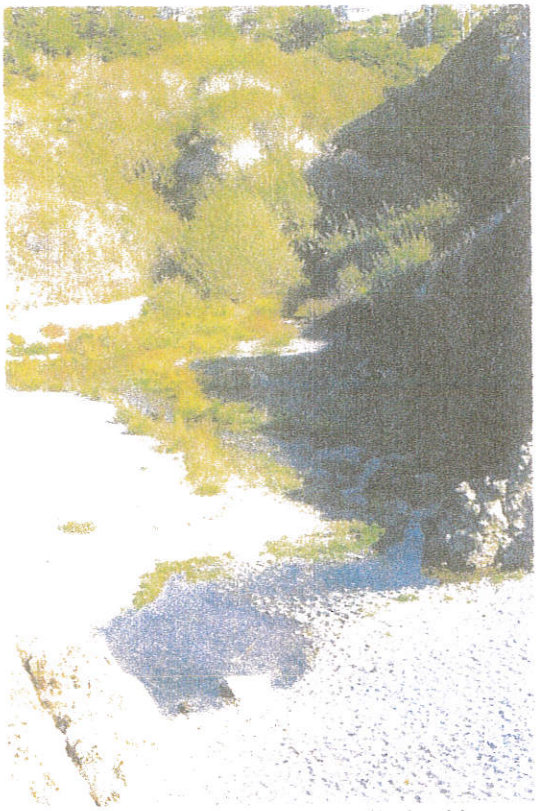

Photo 1 – Humboldt Creek mouth, looking east

Photo 2 – Humboldt Creek, immediately above beach, note driftwood

Photo 3 – Humboldt Creek, Humboldt Loop Road culverts

Photo 4 – Humboldt Creek, bedrock bench about 1 meter high, approx. 300 meters above culvert crossing

Photo 5 – Humboldt Creek, typical channel above previous bedrock bench at low flow

Photo 6 – Humboldt Creek, approximate end of upper reach of open waters, below Shelter Cove Road

ATTACHMENT #3

Findings Report for Fish Presence-Absence Sampling on Humboldt Creek

Humboldt Creek is a small coastal watershed with a drainage area of approximately 0.32 square miles (200 acres) located in Shelter Cove, California (Figure 1). Humboldt Creek has approximately 7,200 feet on blue-line channel on the USGS topographic map (Figure 1). The mouth of Humboldt Creek enters the Pacific Ocean just south of Telegraph Creek.

A biological stream classification survey was conducted for the Shelter Cove Resort Improvement District #1 by LACO Associates on December 4, 2013. This survey determined that Humboldt Creek had conditions suitable to support fish; however no fish were observed from the bank. Based on their stream survey, LACO concluded that Humboldt Creek should be classified a Class 1 stream. They also recommended that a qualified fisheries biologist sample the creek with an electrofisher and possibly conduct a rapid bioassessment of the benthic macro-invertebrates (BMI) to assess potential food sources to support a fish population. LACO's technical memorandum also noted that no habitat typing or fisheries information was available for Humboldt Creek from the California Department of Fish and Wildlife (CDFW).

The objective of conducting presence-absence fish sampling in Humboldt Creek was to determine if native salmonids and/or other native fish species were present in the watershed. Sampling was conducted with a backpack electrofishing unit and followed the NOAA Fisheries guidelines for sampling listed salmonids (NOAA 2000).

Humboldt Creek – Sampling Methods:

On August 21, 2014 Ross Taylor and Associates (RTA) performed the presence-absence sampling. Ross Taylor is an American Fisheries Society Certified Fisheries Professional (#3438) with 28 years of field experience in northern California coastal watersheds. Taylor operated the electrofisher and RTA employee, Tom Grey, netted fish. Taylor also identified captured fish and estimated age classes, whereas Grey recorded the data as directed by Taylor. The electrofisher utilized was a Smith-Root LR-20B, serial #B25939. All sampling was conducted on a DC setting. The electrofishing sampling occurred in an upstream direction, starting at the inlet of the Humboldt Loop Road culvert and ending approximately 2,300 feet upstream at the RID#1 access road to a lift station. Electrofishing was concentrated primarily in higher-quality pools to increase the likelihood of detecting fish presence. RTA also collected the following habitat information: maximum depths of sampled pools, percent shade canopy with a densiometer, and noted presence of suitable spawning substrate for resident and anadromous salmonids. Water temperature was measured periodically throughout the field day. RTA also collected BMI samples with a kick-net at the riffle crests of sampled pools and within several riffles.

The electrofishing started at 1100 hrs and the water temperature at this time was 12.5°C (54.5°F) and the shaded air temperature was 17.5°C (63.5°F). The conductivity was 207µS/cm and was measured with a Milwaukee C65 conductivity meter (serial #M145947). The electrofisher was set at DC and depending on pool size; we used either 150 or 200 volts. The fish responded well to this setting – they were effectively immobilized, yet they recovered

quickly when the electrofisher's power was turned off. To maintain visibility, each pool was sampled in an upstream direction, starting at the bottom of each pool. We made three passes through each pool. All fish were temporarily held in a five-gallon pail with a battery-powered aerator (Figure 2). The pail was placed on a stable location in the shade to minimize any potential thermal increases. After a pool was sampled, the fish were identified to species, photographed, estimated to size-class, and released back into the location they were sampled from. Pools were identified to the Level IV hierarchy as described in Section III of CDFW's *California Salmonid Stream Habitat Restoration Manual* (CDFW 1998). Maximum pool depths were measured with a pocket survey rod to the nearest 0.05 feet. Types of shelter within each pool were identified and recorded. Shade canopy was measured with a densiometer following methods described in Appendix M of CDFW's *California Salmonid Stream Habitat Restoration Manual* (CDFW 1998). BMI samples were collected with a kick-net with a one-foot wide opening. The net was placed mid-channel and the channel substrate immediately upstream of the net was disturbed for 30 seconds. The net's contents were then placed in a white plastic container for sorting. All BMI's were classified to Order (common names provided), enumerated and released. The length of channel sampled between Humboldt Loop Road and the RID#1 lift station culvert was measured with a hip-chain. The location of each sampled pool was referenced as a channel distance with the inlet of the Humboldt Loop Road culvert as the "zero" location. All fish and habitat data were recorded in a bound, waterproof field notebook.

Humboldt Creek – Sampling Results:

Pool #1 located at 50 Feet:
Level IV Habitat Type = Corner pool.
Shelter Types = undercut bank and over-hanging vegetation.
Maximum Depth = 0.85 feet.
Substrate on Pool-tail = cobbles and gravels.
Percent Shade Canopy = 91.5%.
Fish Sampled = none.
BMI sampled = four stoneflies, 10 mayflies, one crane fly and one aquatic worm.

Run #1 located at 75 Feet:
Level IV Habitat Type = Run
Shelter Types = none present.
Maximum Depth = 0.55 feet.
Substrate on Pool-tail = cobbles and gravels.
Percent Shade Canopy = did not measure.
Fish Sampled = none.
BMI sampled = did not sample.
Note: sampled one Pacific giant salamander, approximately 60 mm (snout-to-vent length).

Pool #2 located at 95 Feet:
Level IV Habitat Type = Mid-channel pool.
Shelter Types = small boulders and small woody accumulation.
Maximum Depth = 0.60 feet.
Substrate on Pool-tail = gravels and sand.
Percent Shade Canopy = 76.5%.
Fish Sampled = one coastal rainbow trout, approximately 80 mm in length.
BMI sampled = two stick-cased caddisflies, six mayflies, one crane fly and one case-less predaceous caddisfly.

Pool #3 located at 170 Feet:
Level IV Habitat Type = Plunge pool - over boulders/bedrock with 3.2 foot drop.
Shelter Types = bedrock ledge, boulders and bubble curtain.
Maximum Depth = 2.00 feet.
Substrate on Pool-tail = cobbles and gravels.
Percent Shade Canopy = 85.5%.
Fish Sampled = one coastal rainbow trout, approximately 100-110 mm in length.
BMI sampled = did not sample.

Pool #4 located at 190 Feet:
Level IV Habitat Type = Mid-channel pool.
Shelter Types = small boulders.
Maximum Depth = 0.75 feet.
Substrate on Pool-tail = gravels and sand.
Percent Shade Canopy = did not measure.
Fish Sampled = none.
BMI sampled = did not sample.

Pool #5 located at 230 Feet:
Level IV Habitat Type = Step pool. A series of four small step-pools.
Shelter Types = small boulders and bubble curtain.
Maximum Depth = 0.80 feet in uppermost pool.
Substrate on Pool-tail = cobbles and gravels.
Percent Shade Canopy = 94.5%
Fish Sampled = one coastal rainbow trout, approximately 70 mm in length.
BMI sampled = five mayflies, one crane fly, one stonefly and one aquatic worm.

Pool #6 located at 320 Feet:
Level IV Habitat Type = Plunge-pool. Two-step plunge with two pools total.
Shelter Types = small boulders and bubble curtain.
Maximum Depth = 1.60 feet in uppermost pool.
Substrate on Pool-tail = cobbles and gravels.
Percent Shade Canopy = 79.5%

Fish Sampled = one coastal rainbow trout, approximately 70 mm in length in lower pool. Four coastal rainbow trout in upper pool, approximately 70-90 mm in length.
BMI sampled = two caddisflies, four stoneflies, one crane fly and one aquatic worm.

Pool #7 located at 410 Feet:
Level IV Habitat Type = Mid-channel pool.
Shelter Types = large boulder and small woody accumulation.
Maximum Depth = 1.20 feet.
Substrate on Pool-tail = gravels.
Percent Shade Canopy = 78.0%
Fish Sampled = two coastal rainbow trout, both approximately 90-95 mm in length.
BMI sampled = two predaceous caddisflies and two aquatic worms.
Note: one very large Pacific giant salamander observed, but not captured. At least 250 mm in total length (≈10 inches).

Pool #8 located at 575 Feet:
Level IV Habitat Type = Mid-channel pool.
Shelter Types = fully spanning log just above water surface.
Maximum Depth = 0.90 feet.
Substrate on Pool-tail = cobbles and gravels.
Percent Shade Canopy = 84.0%
Fish Sampled = two coastal rainbow trout, approximately 70 and 80 mm in length.
BMI sampled = not sampled.
Note: sampled one Pacific giant salamander, approximately 60 mm (snout-to-vent length).

Pool #9 located at 620 Feet:
Level IV Habitat Type = Mid-channel pool.
Shelter Types = fully spanning log just above water surface and small boulders.
Maximum Depth = 0.80 feet.
Substrate on Pool-tail = gravels.
Percent Shade Canopy = 84.0%
Fish Sampled = three coastal rainbow trout, between 60 and 80 mm in length.
BMI sampled = three stoneflies, two predaceous caddisflies, one hellgrammite (Dobsonfly) and one aquatic worm.
Note: a small tributary entered from the right-bank (facing downstream) and had surface flow.

Run #2 located at 670 Feet:
Level IV Habitat Type = Run.
Shelter Types = none present.
Maximum Depth = 0.60 feet.
Substrate on Pool-tail = cobbles.
Percent Shade Canopy = did not measure.
Fish Sampled = three coastal rainbow trout; approximately 60, 80 and 95-100 mm in length.
BMI sampled = did not sample.

Pool #10 located at 695 Feet:
Level IV Habitat Type = Lateral scour pool – boulder formed.
Shelter Types = boulders and undercut bank.
Maximum Depth = 0.90 feet.
Substrate on Pool-tail = cobbles and gravels.
Percent Shade Canopy = 93.0%
Fish Sampled = three coastal rainbow trout, approximately 70, 80 and 95-100 mm in length.
BMI sampled = five stoneflies, three mayflies and one predaceous caddisfly.

Pool #11 located at 955 Feet:
Level IV Habitat Type = Mid-channel pool.
Shelter Types = overhanging vegetation and small woody accumulation.
Maximum Depth = 0.50 feet.
Substrate on Pool-tail = cobbles and gravels.
Percent Shade Canopy = 82.5%
Fish Sampled = one coastal rainbow trout, approximately 170-180 mm in length.
BMI sampled = none sampled at pool-tail, but sampled in immediate downstream riffle. This riffle sample contained: 22 stoneflies, four predaceous caddisflies and one aquatic worm.

Pool #12 located at 990 Feet:
Level IV Habitat Type = Corner pool with vertical left-bank.
Shelter Types = small boulders and undercut bank.
Maximum Depth = 0.90 feet.
Substrate on Pool-tail = gravels.
Percent Shade Canopy = 81.0%
Fish Sampled = two coastal rainbow trout, approximately 70-80 mm in length.
BMI sampled = did not sample.

Pool #13 located at 1,115 Feet:
Level IV Habitat Type = Plunge pool.
Shelter Types = boulders and bubble curtain.
Maximum Depth = 1.40 feet.
Substrate on Pool-tail = cobbles and gravels.
Percent Shade Canopy = 94.5%
Fish Sampled = two coastal rainbow trout, one approximately 80 mm and one 150-160 mm in length.
BMI sampled = none sampled at pool-tail, but sampled in immediate downstream riffle. This riffle sample contained: eight stoneflies and three hellgrammites.
Note: tributary entered at top of pool from right-bank side with connected surface flow.

Pool #14 located at 1,380 Feet:
Level IV Habitat Type = Mid-channel pool within narrow bedrock chute.
Shelter Types = large woody accumulation at top of pool and boulders.
Maximum Depth = 0.90 feet.
Substrate on Pool-tail = cobbles.
Percent Shade Canopy = 54.0%
Fish Sampled = two coastal rainbow trout, approximately 80 and 100 mm in length.
BMI sampled = did not sample.

Pool #15 located at 1,530 Feet:
Level IV Habitat Type = Plunge pool over fully-spanning alder tree.
Shelter Types = large wood, boulders and undercut bank.
Maximum Depth = 1.50 feet.
Substrate on Pool-tail = cobbles and gravels.
Percent Shade Canopy = 87.0%
Fish Sampled = two coastal rainbow trout, one approximately 80 mm and one 180-190 mm in length.
BMI sampled = none sampled at pool-tail, but sampled in immediate downstream riffle. This riffle sample contained: 10 stoneflies, two hellgrammites, one crane fly and one aquatic beetle.

Pool #16 located at 2,290 Feet:
Level IV Habitat Type = Outlet pool of twin culvert road crossing to RID #1 lift station.
Shelter Types = woody accumulation and overhanging vegetation.
Maximum Depth = 1.80 feet.
Substrate on Pool-tail = gravels and sand.
Percent Shade Canopy = 82.5%
Fish Sampled = four coastal rainbow trout, three approximately 70-80 mm and one 200-210 mm in length.
BMI sampled = did not sample.

The total electrofishing effort for the Humboldt Creek sampling was 1,187 seconds and the total catch of 34 coastal rainbow trout, by estimated age classes, was:

Probable age-0 fish (60-80 mm) = 22 fish
Possible age-1 fish (90-110 mm) = 8 fish
Age-2 and older fish (>150mm) = 4 fish.

Photographs were taken of some of the fish and BMI's captured within the reach of Humboldt Creek sampled on 8/21/14 (Figures 2-7). All captured fish were in good condition when released, no mortalities occurred.

Between 11:00AM and 2:30 PM, the water temperature measurements in Humboldt Creek varied by one degree Celsius (Table 1). The shaded air temperature was 17.5°C at 11:00AM and 19.0°C at 2:30PM.

Table 1. Water temperatures measured in Humboldt Creek on 8/21/14.

Time	Water Temperature	Measurement Location
11:00 AM	12.5°C	Start of survey
11:45 AM	12.5°C	Pool at 150 feet
12:40 PM	13.0°C	Pool at 620 feet
1:40 PM	13.5°C	Pool at 1,115 feet
2:30 PM	13.5°C	Pool at 2,290 feet

Discussion – Biological Sampling:

The electrofishing conducted on 8/21/14 documented that native coastal rainbow trout are present in Humboldt Creek. Our sampling showed that fish were well distributed throughout the lower 2,300 feet of the creek. Based on the sizes of fish caught, including age-0 fish, successful reproduction occurred in 2014 and there is sufficient year-round flow to support multiple age classes of fish. However; it is uncertain if the coastal rainbow trout sampled on 8/21/14 were resident fish or the progeny of anadromous steelhead because these are simply two life history patterns being expressed by a single species. To better determine if Humboldt Creek is accessible by steelhead, the connectivity of Humboldt Creek to the ocean during winter migration-level flows should be evaluated and the County-maintained culvert under Humboldt Loop Road should be assessed for fish passage.

Suitable habitat conditions for resident and anadromous salmonids were present in lower Humboldt Creek. Despite 2013-2014 being a drought year, there was ample surface flow throughout the 2,300 foot reach in late August and water temperatures were within the ideal range for native salmonids. Shade canopy values ranged between 54% and 94.5% with an average of 83.2%. Hardwoods comprised a majority of the shade canopy, along with conifers and shrubs. Humboldt Creek's channel had an overall slope of 2-3% and contained a diverse mix of pools, riffles and runs. Maximum pool depths were between 0.50 feet and 2.00 feet with an average of 1.03 feet. Most pool-tails had either gravel-sand or cobble-gravel as their two dominant substrate types in areas sufficiently sized for spawning by resident and anadromous salmonids.

The BMI sampling in pool-tails and riffles revealed an invertebrate community consistent with good water quality and relatively low levels of fine sediment, with mayflies and stoneflies being most abundant. The coarser substrate within the three riffles sampled contained the highest numbers of stoneflies; whereas the majority of the crane flies and aquatic worms (both moderately sediment tolerant) were captured in the pool tails with sand-gravel substrate.

Literature Cited:

CDFW. 1998. California salmonid stream habitat restoration manual. Inland Fisheries Division, CDFG, Sacramento, California.

NOAA. 2000. Guidelines for electrofishing waters containing salmonids listed under the endangered species act. 5 p.

Attachment 43

Figure 1. Start and end locations of fish presence-absence sampling conducted by RTA on Humboldt Creek

Figure 2. Coastal rainbow trout from Humboldt Creek in aerated bucket on 8/21/14.

Figure 3. Coastal rainbow trout sampled in Humboldt Creek from pool #3 on 8/21/14.

Figure 4. Age-0 coastal rainbow trout sampled in Humboldt Creek from pool #5 on 8/21/14.

Figure 5. Coastal rainbow trout sampled in Humboldt Creek from pool #11 on 8/21/14.

Figure 6. Coastal rainbow trout sampled in Humboldt Creek from pool #16 on 8/21/14.

Figure 7. Stoneflies sampled in Humboldt Creek on 8/21/14.