

Harbor Safety Committee

of the San Francisco Bay Region

Mandated by the California Oil Spill
Prevention and Response Act of 1990

Minutes

Harbor Safety Committee of the San Francisco Bay Region

Thursday, February 8th, 2007

Port of San Francisco, Pier 1 Conference Center, The Embarcadero, San Francisco, California

Joan Lundstrom, Chair of the Harbor Safety Committee of the San Francisco Bay Region (HSC), Bay Area Conservation and Development Commission (BCDC); called the meeting to order at 1007. **Alan Steinbrugge**, Marine Exchange of the San Francisco Bay Region (Marine Exchange); confirmed a quorum of the HSC.

The following committee members (M) and alternates (A) were in attendance: **Capt. Esam Amso** (A), Valero Refining Company; **Capt. Pete Bonebakker** (M), ConocoPhillips; **Margot Brown** (M), National Boating Federation; **Sue Cauthen** (M), San Francisco Tomorrow; **Ron Chamberlain**, Port of Benicia; **John M. Davey** (M), Port of San Francisco; **Capt. Gary Fleeger** (M), Matson Navigation Company; **Capt. Fred Henning** (A), Baydelta Maritime; **Robert J. Lawrence** (M), U.S. Army Corps of Engineers (COE); **Daniel J. Massey** (A), Foss Maritime Company; **Michael McMillan** (A), Port of Oakland; **Alan Miciano** (A), General Steamship; **Richard Nagasaki** (A), Chevron Texaco; **Capt. Peter Peers** (M), National Cargo Bureau; **Capt. Robert Pinder** (M), San Francisco Bar Pilots (Bar Pilots); **Linda Scourtis** (A), BCDC; **Capt. Ray Shipway** (A) International Organization of Masters, Mates, & Pilots; **Rebecca Smythe** (A), National Oceanic and Atmospheric Administration (NOAA); **Keith Stahnke** (A), San Francisco Bay Area Water Transit Authority (WTA); **Denise Turner** (A), Port of San Francisco; **Capt. William J. Uberti** (M), U.S. Coast Guard (USCG); **Thomas Wilson** (M), Port of Richmond.

Also present were **Ken Leverich**, California State Lands Commission (State Lands); **Mike Coyne**, **Rick Holly**, OSPR; **Capt. Lynn Korwatch**, Marine Exchange; **Chris Beckwith** (State Lands) **Peter LaCivita**, COE; **LtCmdr. Kevin Mohr**, USCG; **Capt. Gary Toledo**, California Office of Spill Prevention and Response, (OSPR);

The meeting was open to the public.

Approval of the Minutes

There were corrections to the minutes of January 11th, 2007:

- The date in the header shall be corrected to 2007.
- On page one, the first sentence of the first bullet of Comments by the Chair should read: "...Brown will chair the session on *navigation...*"
- On page two, in the first sentence of the Coast Guard Report, replace the verb *levy* with the noun *levee*.
- The written report by **Lawrence** was not attached to the minutes in the mailing.

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Comments by the Chair – Lundstrom

- A draft application for HSC of the Year at the 9th Annual Harbor Safety Committee Conference was ready. Comments and suggestions were required by February 15th.
- The annual review of the Harbor Safety Plan is due in June. **Scourtis** will be handing out assignments at the March meeting.

Coast Guard Report – Capt. Uberti

- The search for the yacht *Tenacious* was suspended. No evidence like debris or an oil slick was uncovered during the search. That is unusual.
- Applications for the 2007 round of Port Security Grants are due March 6th.
- Operations in support of the visit of the *Queen Mary 2* went smoothly.

LtCmdr. Mohr read from reports that are attached to these minutes.

Clearinghouse Report – Steinbrugge

Steinbrugge read from a report attached to the minutes.

OSPR Report – Capt. Toledo

- OSPR will be studying the regulations on contingency plans in April. The goal is to condense them and make them simpler. Shoreline protection regulations will be looked at in September.
- OSPR is running late on finding a new dry cargo representative.
- Work on a database to collate information on vessel casualties is nearing the end of its first phase. OSPR will be making presentations about the system to the HSC's to get their comments and recommendations.

NOAA Report – Smyth

- NOAA is celebrating its bicentennial this year. Information on events should be coming out soon.
- Navigation Response Team (NRT) 6 will begin local operations at the end of February.
- The weather website is being revised to make it more user-friendly.
- The last ten years were the rainiest period recorded since record keeping began in 1820.

There was a question:

- **Smyth** said she would talk to **Gerry Wheaton (M)**, NOAA about the completion of the NRT's list of priorities from 2006.

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Army Corp of Engineers (COE) Report – Lawrence

- The COE is in the midst of moving to new offices. The situation was too chaotic to compile a written report.
- COE would like to invite members of the HSC to tour the dredge *Essayons* this summer. He will coordinate with **Steinbrugge**.

There were questions and comments:

- Maintenance dredging and the survey of Pinole Shoals will probably be done in June.

Wilson said that channel depths at the Port of Richmond are getting down to 33.7 feet deep when they should be at 38 feet. He said this is becoming a critical problem. **Lundstrom** said that the issue of dredging and funding for dredging will be on the agenda for the March meeting. The HSC can decide what steps they would like to take on the issue.

State Lands Commission Report – Leverich

This was **Leverich's** last meeting with the HSC. He said it had been a privilege to work with so many fine people, including **Brown**, staff from OSPR, and representatives from industry. **Lundstrom** presented **Leverich** with a plaque from the HSC. **Brown** presented a badge from the National Boating Federation.

Water Transit Authority (WTA) Technical Advisory Committee Report – McMillan

- Read from a report that is attached to the minutes.

There were questions and comments:

Stahnke said that conceptual planning has begun for additional berthing at the Port of San Francisco. **Lundstrom** asked if the WTA was analyzing the impact of new routes and berths on the ferry routing protocols that have recently been developed. **Stahnke** said that they are analyzing the data from the George Washington University study and working with USCG Vessel Traffic Service, Sector San Francisco.

Salmon and Steelhead Migration through San Francisco Bay – LaCivita

- The COE is studying the migration of fish through the Bay Area in order to determine the best times to schedule normal dredging operations so that they don't interfere with migration. These time periods are called environmental work windows.
- The COE is collaborating with NOAA Fisheries and the Bay Planning Coalition's (BPC) Environmental Windows Workgroup. The BPC workgroup pulls together, Federal, State, and stakeholders with an interest in this issue. Their meetings are open to the public.

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There was one question:

- Emergency dredging will always take precedence over migratory fish runs.

Lundstrom asked **LaCivita** to keep the HSC informed. He said there would be more information available in June.

Tug Escort Work Group – Capt. Henning

- They will soon begin meeting to review escort regulations. They were last reviewed five years ago.

Navigation Work Group – Capt. Pinder

- They are trying to schedule a meeting with representatives from the California Air Resources Board.

Ferry Operations Work Group – Davey

- They have not met recently. They will be meeting at the end of February to collect feedback on the test of the new ferry routes.

Prevention Though People Work Group – Brown

- Their next project will be an update of the **Where the Heck is Collinsville** brochure. The update will include the new names and codes developed by the HSC and VTS for the Automated Identification System (AIS).
- *Rules 5 and 9 Rules to Live By* will get another print run.
- The initial print run of caution placards for kayakers is complete.

Lundstrom asked if the caution placards were being distributed. **Brown** said that they were going out to renters and clubs. She would also be taking some to the next meeting on the Bay Area Water Trail.

Physical Oceanographic Real Time System (PORTS) Work Group – Capt. Amso.

- Their next meeting would be February 22nd.

PORTS Report – Steinbrugge

- All tide stations are working. The AMORCO current meter is working.
- The Marine Exchange has signed a contract with NOAA. NOAA is planning to reinstall the Richmond tide station. That is schedule for May. The Oakland wind sensor is also scheduled for May.

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- The Coast Guard says that they are hopeful buoys will be available for mounting sensors by the end of the year.

Lundstrom asked how the new communication system was working out. **Steinbrugge** said that the new phone system was in the final "beta" stage of development.

Public Comment

There were no comments.

Old Business

Lundstrom said that the dredge funding would be discussed at the March meeting.

New Business

Lawrence said that a coworker had informed him that the crew of the San Francisco fire boat was in a different location from the boat during repair work on the pier. The possible issue would be a delay in response time. **Lundstrom** said that it was up to the committee if they want to pursue the issue.

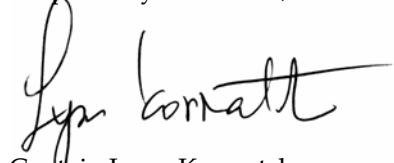
Next Meeting

Lundstrom said that the next meeting would convene at 1000, March 8th, 2007 in the 7th Floor Conference Room, Port of Oakland, 530 Water Street, Oakland, California.

Adjournment

A motion to adjourn was made and seconded. There was no discussion. The motion passed unanimously. The meeting adjourned at 1120.

Respectfully submitted,



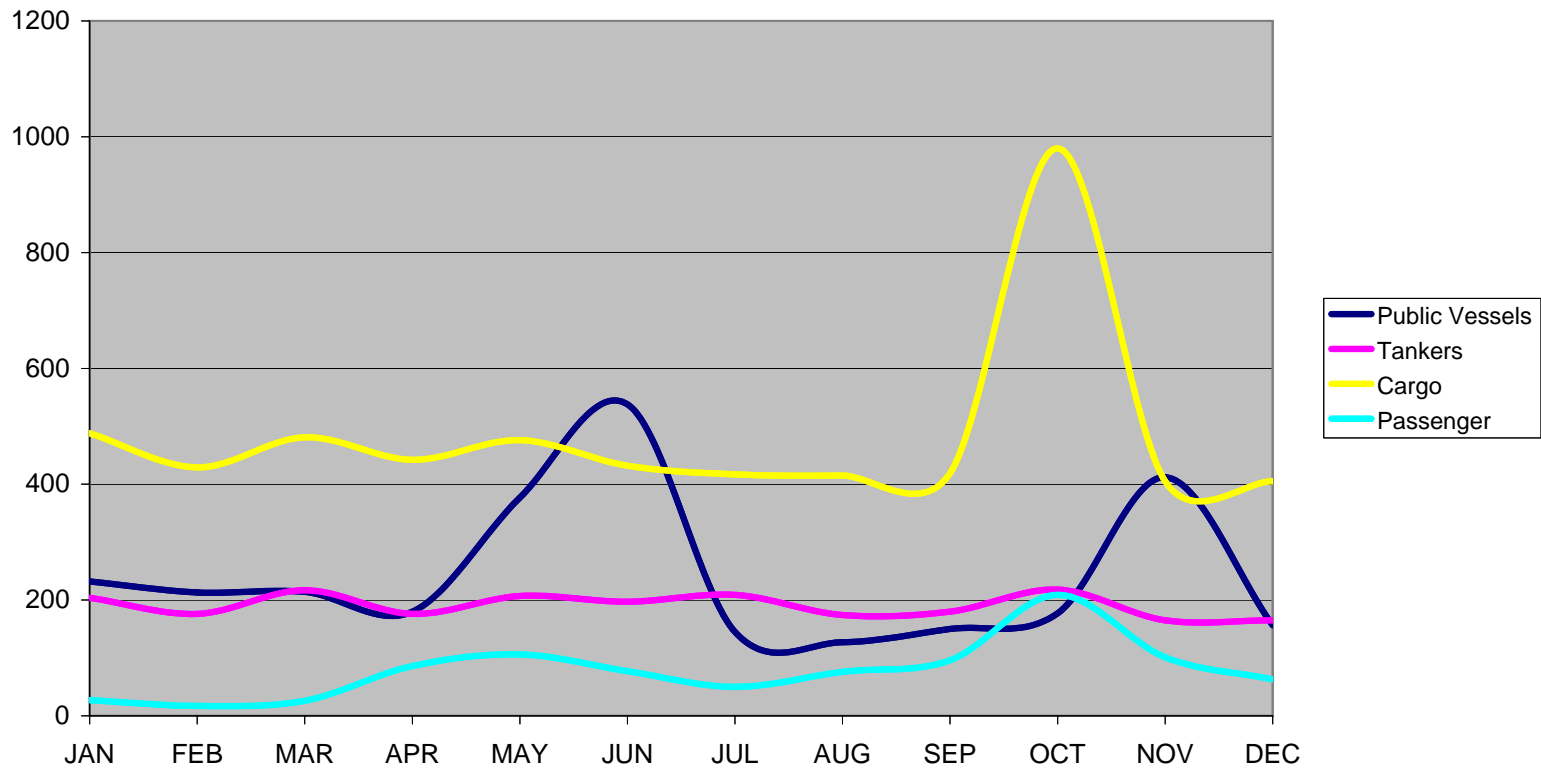
Captain Lynn Korwatch
Executive Secretary

USCG SECTOR SAN FRANCISCO	
PREVENTION / RESPONSE - SAN FRANCISCO HARBOR SAFETY STATISTICS	
January-07	
PORT SAFETY CATEGORIES	
	TOTAL
1. Total Number of Port State Control Detentions for period:	0
SOLAS (0), MARPOL (0), ISM (0), ISPS (0)	
2. Total Number of COTP Orders for the period:	9
Navigation Safety (9), Port Safety & Security (0), ANOA (0)	
3. Marine Casualties (reportable CG 2692) within SF Bay: Allison (1), Collision (0), Fire (0),	9
Grounding (1), Sinking (0), Steering (2), Propulsion (4), Personnel (0), Other (1)	
4. Total Number of (routine) Navigation Safety related issues / Letters of Deviation	3
Radar (1), Steering (0), Gyro (1), Echo sounder (0), AIS (1), AIS-835 (0)	
5. Reported or Verified "Rule 9" or other Navigational Rule Violations within SF Bay	1
6. Significant Waterway events or Navigation related cases for the period:	0
7. Maritime Safety Information Bulletins (MSIBs): MSIB 06-05	0
Total Port Safety (PS) Cases opened for the period:	22
MARINE POLLUTION RESPONSE	
	TOTAL
Total Oil/Hazmat Pollution Incidents within San Francisco Bay for Period	36
* Source Identification (Discharges and potential Discharges):	
TOTAL VESSELS	6
Commercial Vessels	2
Public Vessels (Military)	1
Commercial Fishing Vessels	2
Recreational Vessels	1
TOTAL FACILITIES	17
Regulated Waterfront Facilities	2
Other Land Sources	15
UNKNOWN/UNCONFIRMED	13
*Spill Information	
Pollution Cases Requiring Clean-up	11
Federally Funded Cases	0
Oil Discharge and Hazardous Materials Release Volumes by Spill Size Category:	
1. Spills < 10 gallons	24
2. Spills 10 - 100 gallons	4
3. Spills 100 - 1000 gallons	0
4. Spills > 1000 gallons	0
5. Spills - Unknown	8
Total Oil Discharge and/or Hazardous Material release volumes:	180
1. Estimated spill amount from Commercial Vessels:	1
2. Estimated spill amount from Public Vessels:	5
3. Estimated spill amount from Commercial Fishing Vessels:	3
4. Estimated spill amount from Recreational Vessels:	0
5. Estimated spill amount from Regulated Waterfront Facilities:	0
6. Estimated spill amount from Other Land Sources:	151
7. Estimated spill amount from Unknown sources:	20
Penalty Action:	
Civil Penalty Cases for Period	0
Notice of Violations (TKs)	1
Letters of Warning	3

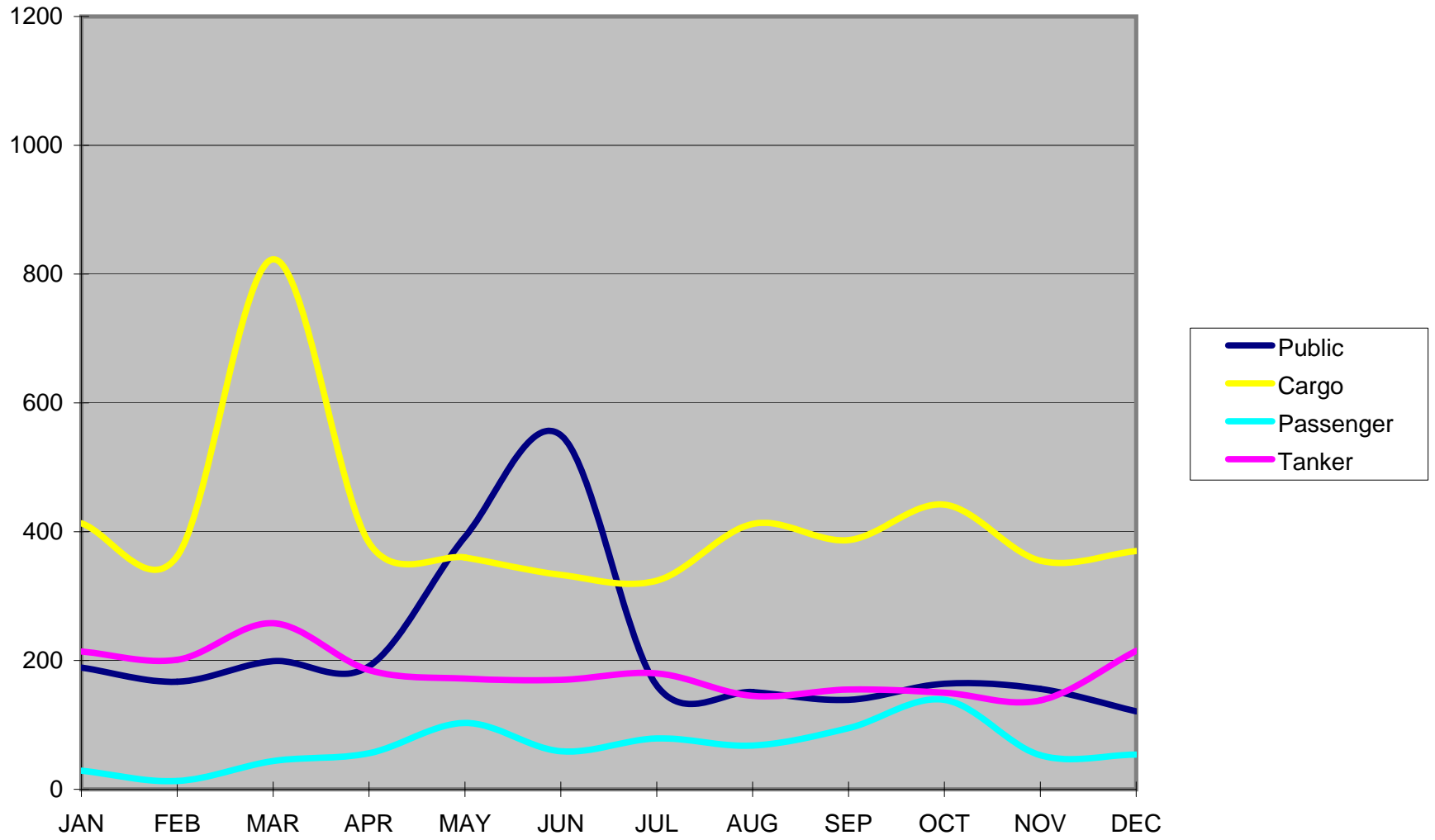
** SIGNIFICANT PORT SAFETY & SECURITY (PSS) CASES **	
* A. MARINE CASUALTIES - PROPULSION / STEERING	
Loss of Propulsion, ITB MOKO PAHU (03 Jan): Integrated Tug & Barge (ITB) suffered high back pressure on starboard engine lube pump while inbound to Howard Terminal. Vessel moored with its port engine without incident, and the Coast Guard issued an 835 requiring repairs. Repairs were made, the 835 was rescinded, and the vessel was allowed to depart for Crockett.	
Loss of Propulsion, GOLDEN GATE FERRY (08 Jan): After the vessel departed San Francisco en route to Sausalito, it suffered a reduction in propulsion capacity in Richardson Bay with 136 passengers on board. The vessel turned around and moored in San Francisco without incident. Vessel issued 835 to affect repairs. Investigation revealed that the clutch did not engage properly, limiting the vessel from going full ahead. Proper repairs were completed on 09 Jan and COTP was rescinded.	
Loss of Propulsion, M/T SANTA FIORENZA (16 Jan): Vessel's main engine experienced reduction in power due to damage to the #4 cylinder. COTP order was issued requiring a two-tug escort from Mile Rock to its mooring at Berth 59. Repairs were made and the COTP order was rescinded on 18 Jan.	
Loss of Steering, T/V AGIASMA (16 Jan): Vessel experienced inoperable starboard steering pump while inbound to Stockton, and moored safely using port steering pump. On 24 Jan, Coast Guard inspectors witnessed the satisfactory testing of the pump following repairs.	
Loss of Propulsion, ITB MOKO PAHU (16 Jan): Vessel experienced loss of propulsion with starboard engine while leaving Crockett, and moored without incident using port engine. COTP order was issued requiring a two-tug escort until repairs could be made. Repairs were made on 19 Jan and the COTP order was rescinded.	
Loss of Steering, BAY BREEZE FERRY (18 Jan): Vessel's jet propulsion hydraulic line to the jet bucket for the starboard main engine failed while departing SF terminal. Vessel turned around and moored at the SF terminal using its port engine and without incident. The vessel was issued a "No Sail" 835 to affect repairs. Repairs were made on 19 Jan, and the "No Sail" was rescinded.	
* B. MARINE CASUALTIES - VESSEL SAFETY CONDITIONS	
Grounding - M/V DA YA HAI (10 Jan): While vessel was en route to Stockton, pilot reported that vessel had touched bottom at Antioch Point. Due to the possibility of undetected hull and structural damage, the vessel was issued a COTP order to conduct an underwater survey upon arrival. Divers found no evidence of grounding. COTP order was rescinded on 13 Jan after the conditions leading up to this order were sufficiently resolved.	
Allision - P/V QUEEN ELIZABETH II (24 Jan): Vessel suffered an allision with Pier 35 when it "brushed with the pier" during mooring operations. Damage sustained was minimal including crushed pilings and scratched paint, 50 feet in length on the starboard quarter. There were no reports of injury and no other reports of damage.	
Grounding - TUG MARSHALL FOSS (24 Jan): Tug with a draft of 17 feet ran aground near Richmond Long Warf (position 37 54.63 N and 122 25.01W) in an area charted with a depth of 24 feet. Immediately after the report was received, a Marine Safety Information Broadcast (MSIB) was issued warning mariners of potential shoaling. CGC ZEPHYR launched a small boat to verify the depth of the reported grounding location, and found the minimum depth to be 27 feet with an average of 29 feet. Determination was made that shoaling did not exist, and that charted depths were accurate. MSIB was cancelled.	
Violation - M/V SONOMA (25 Jan): Rule 9 violation occurred when a pleasure craft cut in front of the M/V SONOMA in Central Bay. Vessel Traffic Service (VTS) reported incident to Contra Costa police who were in the vicinity, and conducted a boarding of the pleasure craft. Police determined that alcohol was not a factor. Investigation pends.	
* C. COAST GUARD - GENERAL SAFETY/SECURITY CASES	
Navigation Safety - M/V LOS ROQUES (14 Jan): Vessel reported inoperable AIS and was issued an inbound Letter of Deviation (LOD). Proper repairs were made and the LOD was rescinded on 18 Jan.	
General Safety - SPV NEW CAPTAIN PETE (19 Jan): A "No Sail" 835 was issued to the Small Passenger Vessel (SPV) due to a cracked collar on its rudder post discovered during an annual Coast Guard inspection. The vessel was properly fixed and the 835 was rescinded.	
Navigation Safety - T/V BRUSSELS (22 Jan): Vessel was issued an LOD for inoperable gyrocompass while transiting from Sacramento to Anchorage 9. On 23 Jan the LOD was rescinded after repairs were made.	

<p>Navigation Safety - M/V ROBERTO C. (24 Jan): Vessel's 10 cm radar malfunctioned during its transit to Schnitzer Steel dock in Oakland. LOD was issued requiring repairs. LOD was rescinded on 28 Jan and vessel departed Bay Area.</p>	
<p>Cargo Operations - T/V E.W. HARDING (25 Jan): Vessel's Number 1 and Number 5 starboard valves on cargo tank would not open during cargo operations in Stockton. COTP order issued to repair inoperable valves, but allowed vessel to transfer 2600 metric tons of its cargo from Number 1 Starboard and Number 5 Starboard Cargo Tanks to Number 1 Center and Number 5 Center Cargo Tanks via a portable pump. COTP order was rescinded on 26 Jan after repairs were made and verified by class society.</p>	
<p>SIGNIFICANT INCIDENT MANAGEMENT DIVISION (IMD) CASES:</p>	
<p>None.</p>	
<p>SIGNIFICANT PORT SAFETY INFORMATION or EXERCISES</p>	
<p>On 17 Jan, the Environmental Protection Agency (EPA) led a Multi-Agency Strike Force Operation (MASFO) with three Federal, State & local agencies, including the Coast Guard and the California Highway Patrol (CHP). During the MASFO, random container inspections were conducted on Maritime Avenue in the Port of Oakland. Three containers were placed on hold due to structural and inspection deficiencies out of 68 containers inspected (2 hazmat and 66 freight of all kinds). All containers tested negative for gamma and neutron radiation.</p>	

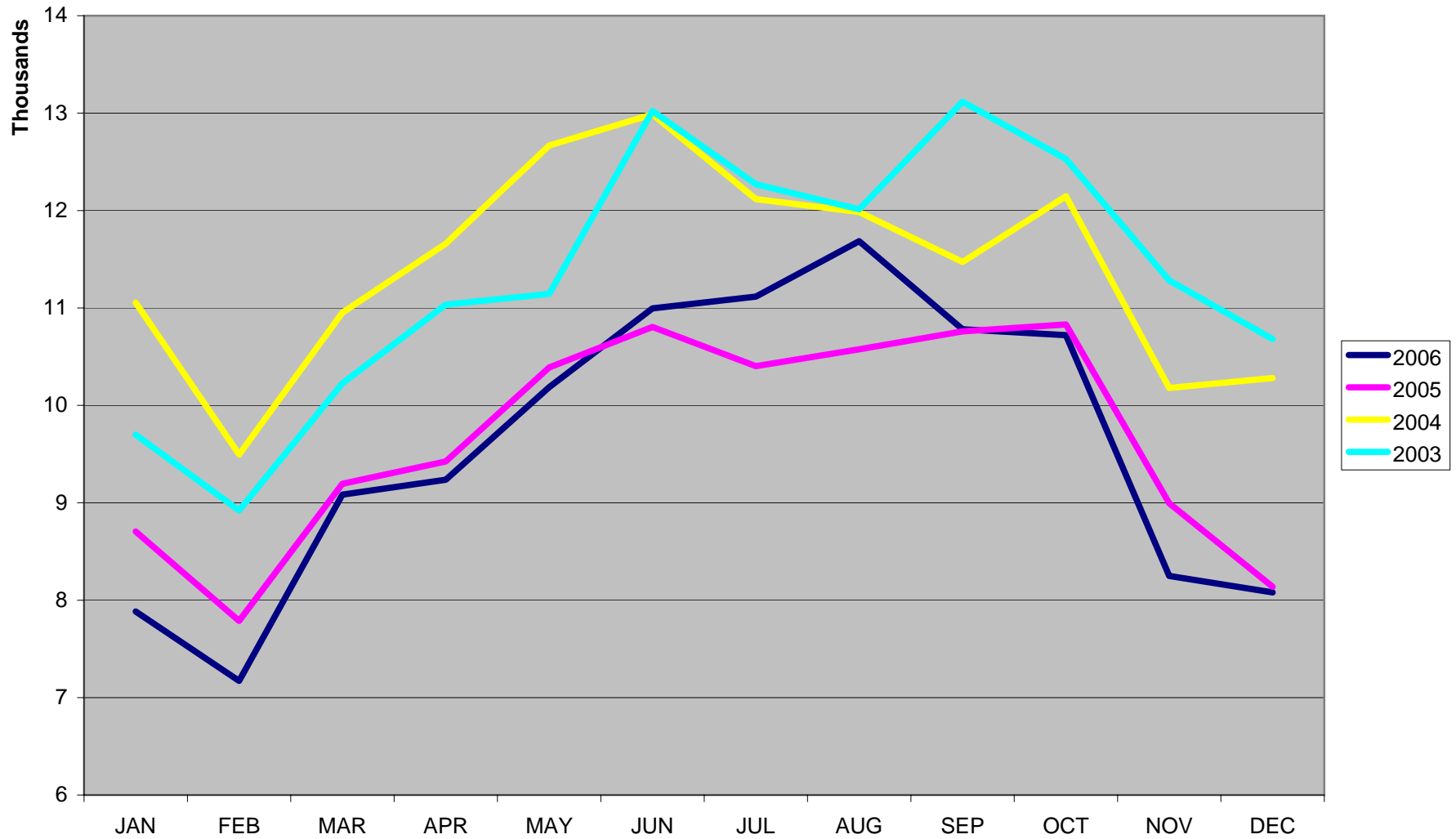
2005 By month Except Ferries/ Tugs



2006 By Month except Ferries/ Tugs



Total Transits by Month



Transits include: all inbound, outbound & intrabay transits	# Transits Last month	# Transits this month	Pct chg fm last month	# Transits a year ago	Pct chg fm a year ago
Vessel Category	Dec-06	Jan-07		Jan-06	
PUBLIC (incl ACOE, Research, USCG, Naval etc.)	121	234	93%	189	24%
TANKER (incl: ITB's)	215	152	-29%	214	-29%
CARGO (incl container, bulker, & freight vsls)	370	389	5%	413	-6%
TUGs with TOWS (incl: ATB's and tank barges)	2085	1208	-42%	1513	-20%
FERRIES (incl both commuter and bay cruise ferries)	5235	4965	-5%	5526	-10%
MISC (incl: school ships, recreation, fishing, & unknown vsls)	2033	2150	6%	1263	70%
PASSENGER (incl cruise ships, and smaller charter vessels)	54	39	-28%	29	34%
TOTAL vsl transits	10113	9137	-10%	9147	0%

San Francisco Bay Clearinghouse Report For January 2007

San Francisco Bay Region Totals

			<u>2006</u>
Tanker arrivals to San Francisco Bay	65		64
Total tank ship & tank barge movements	343		351
Tank ship movements	203	59.18%	211
Escorted tank ship movements	105	30.61%	110
Unescorted tank ship movements	98	28.57%	101
Tank barge movements	140	40.82%	140
Escorted tank barge movements	76	22.16%	71
Unescorted tank barge movements	64	18.66%	69
Percentages above are percent of total tank ship & tank barge movements for each item.			
Escorts reported to OSPR	0		0

Movements by Zone	Zone 1	%	Zone 2	%	Zone 4	%	Zone 6	%	Total	%
Total movements	208		311		0		184		703	
Unescorted movements	97	46.63%	147	47.27%	0	0.00%	85	46.20%	329	46.80%
Tank ships	63	30.29%	95	30.55%	0	0.00%	45	24.46%	203	28.88%
Tank barges	34	16.35%	52	16.72%	0	0.00%	40	21.74%	126	17.92%
Escorted movements	111	53.37%	164	52.73%	0	0.00%	99	53.80%	374	53.20%
Tank ships	63	30.29%	97	31.19%	0	0.00%	50	27.17%	210	29.87%
Tank barges	48	23.08%	67	21.54%	0	0.00%	49	26.63%	164	23.33%

Notes:

1. Information is only noted for zones where escorts are required.
2. All percentages are percent of total movements for the zone.
3. Every movement is counted in each zone transited during the movement.
4. Total movements is the total of all unescorted movements and all escorted movements.

**Harbor Safety Committee
Of the San Francisco Bay Region**

**Report of the
U.S. Army Corps of Engineers, San Francisco District**

February 8, 2007

1. CORPS 2006 O&M DREDGING PROGRAM

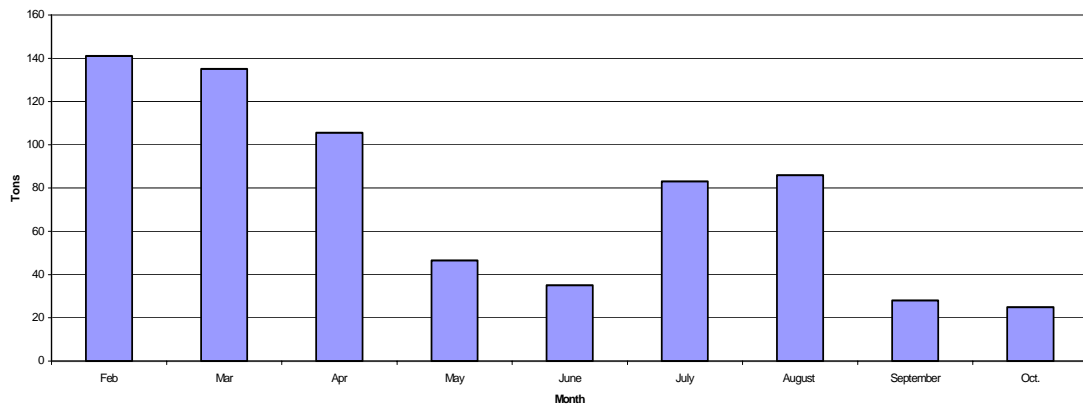
The following is this years O & M dredging program for San Francisco Bay.

- a. **Main Ship Channel** – Nothing to report.
- b. **Richmond Outer Harbor and Southampton Shoal** – Nothing to report.
- c. **Richmond Inner Harbor** – Surveys were posted on February 6, 2007. The Corps is working on resuming the dredging as soon as the wildlife agencies will allow work to continue.
- d. **Oakland O & M Dredging** – The Inner Harbors were dredged until December 31. Surveys were conducted as the dredging proceeded so they have been completed and posted.
- e. **Suisun Bay Channel** – Dredging is technically completed to a dredge depth of -35 feet MLLW plus a two-foot over depth allowance - one foot paid and one foot unpaid. The Corps contracting people need to evaluate the post-dredge surveys for accuracy and payment purposes. Once the surveys are approved, they will be posted as soon as possible – which should be within two weeks (from now).
- f. **Pinole Shoal** – Same as Suisun Channel, above. The Corps plans to use the Essayons in June to dredge the Pinole Shoal. If the HSC has an interest in touring the vessel let me know and I will pass along the word. Who in the HSC would be a point of contact?
- g. **Redwood City/San Bruno Shoal** – Corps is awaiting the 2007 budget to be passed. If it is passed and there is enough money in it, Redwood City will be dredged this summer. Disposal location is yet to be determined.

2. DEBRIS REMOVAL

For the month of January 2007, the Raccoon collected 62 tons of debris; the Grizzly collected 39.5 tons. This is a significant reduction from the January 2006 total of 426 tons. (I am having problems with the program for this graph. I hope to have it figured out for the next report.)

Debris Removal
2006/2007



3. UNDERWAY OR UPCOMING HARBOR IMPROVEMENTS

Oakland 50-ft Deepening Project

The Oakland Harbor Entrance is currently at -43.8 feet MLLW. The dredging equipment for this work was relocated in order to dredge the Oakland Inner Harbor in December 2006 in order to work during the extended work window. The contractor is going to relocate a cutterhead dredge from southern California to finish this work and place the material in Middle Harbor. Clamshell dredging and transportation of this material to Montezuma would cost three times as much. This deepening work can occur any time and is expected to be finished by spring – hopefully much sooner.

4. EMERGENCY (URGENT & COMPELLING) DREDGING

There was no emergency dredging in FY 2006.

5. OTHER WORK

a. **San Francisco Bay to Stockton** Essentially, no change since last report. There is no money in the Continuing Resolution for this project so what carry-over money there is from FY 2006 is being used sparingly. This project is in the 2007 budget so it will probably be January before funds are realized.

b. **Sacramento River Deep Water Ship Channel Deepening**

No change – is the same as the San Francisco Bay to Stockton Project.

6. HYDROGRAPHIC SURVEY UPDATE

Address of Corps' web site for completed hydrographic surveys

<http://www.spn.usace.army.mil/hydrosurvey/>

Main Ship Channel – 16-21 June 2006.

Pinole Shoals – Aug. 28-29, 2006; Sept. 11, 26-27, 2006. **Surveys completed in October and November 2006 have been posted**

Suisun Bay Channel – **Surveys completed in August, September (New York Slough), and November 2006 have been posted.**

Suisun Bay Channel Bullshead – March 8, 2006

Redwood City – complete – January 4-5, 8 & 12, 2006

San Bruno Shoal – completed November, 2006. Not yet posted.

Oakland Inner and Outer Harbor – Survey done 19 July, 2006.

Southampton Shoal and Richmond Long Wharf – (North Ship Channel) surveyed May 17-24, 2006.

Oakland Outer Harbor 06&11 October 2006; and Oakland Inner Harbor 09, 15-17 November 2006.

Richmond Inner and Outer Harbors: Surveys conducted in October and November 2006 and January 2007 were posted February 6.

Juvenile Salmonid Outmigration and Distribution U.S. Army Corps of Engineers Contribution and Coordination with Related Studies: Study Design

Summary

This document describes the status of the Corps of Engineers work on tracking juvenile salmonids in San Francisco Estuary in an effort to provide enhanced scientific underpinnings for a possible reassessment of the current environmental work windows. Work in this area was identified as a very high priority by various dredging interests in a formal study completed in 2004. The study described herein dovetails with work being funded by CALFED to U.C. Davis and NOAA Fisheries to study salmonid migration in a broader geographic context and for different purposes. The two groups will collaborate in logistics, data sharing, and data analysis to obtain data the most cost-effectively. This is the first year of an anticipated three-year study; while data pertinent to adjusting windows may be obtained in the first year, the intent is fine-tune methods including such things as determining optimal sample size (e.g., number of fish studied). We anticipate similarly collaborating with local interests (e.g., BPC constituents) as well with specific concerns which the other groups are not able to address due in large part due to funding limitations. The design of this work has been performed in close collaboration with regulators at NOAA Fisheries, and has received the support of their administrators, such that finding might be used to adjust the duration of dredging work windows and/or dredging restrictions at particular sites.

Background

Dredging work windows for salmon and steelhead establish the period during which dredging and dredged material disposal can take place without the requirement for formal consultation under Section 7. These windows have both temporal and spatial components. There has been concern expressed that while these windows are based on the best available science, that such science could be augmented to better document the situation. Increased scientific knowledge could be used to adjust the duration of the windows (either increasing or decreasing the length) and/or the locations of restrictions.

The impetus for this study is in the “Framework for Assessment of Potential Effects of Dredging on Sensitive Fish Species in San Francisco Bay”, 2004, developed by LFR under contract to the S. F. Bay Long-Term Management Strategy (LTMS) Science Group. This document identifies topics related to the effects of dredging on fish species of concern and lists the key scientific questions associated with each topic. These topics, questions, and proposed work, to help resolve the questions were developed on the basis of interviews with agency personnel and review of the scientific literature. Priorities for the issues and proposed work are also presented. Work on salmon and steelhead, such as will be carried out in this study, was identified as a very high priority in the Framework document (pp 65-66) and this was corroborated by the San Francisco Bay Long-Term Management Strategy Science and Data Gaps Work Group (Science Group). In projections for recommended funding for FY07-09, this project received the highest rating by the Science group for each year. The study is being carried out by the San Francisco District of the Corps of Engineers with oversight by the LTMS Science

group; the Corps is coordinating its effort with other groups with similar interests on tracking salmon and steelhead to maximize the cost-effectiveness of data collection, analysis, and interpretation.

The collaborating groups chose to use late-fall run Chinook salmon and steelhead because (1) they are candidates for listing (late-fall Chinook) or listed as threatened (steelhead) under the U.S. Endangered Species Act, (2) are important ecological and socioeconomic resources to California and (3) are large enough at the time of smolt outmigration to carry an ultrasonic tag. Late-fall run Chinook yearlings can be considered as surrogates for the ESA-listed threatened spring-run because of their overlapping early life history.

Introduction

The project has three specific technical objectives. The first is to estimate transit rates of juvenile steelhead and Chinook salmon between the Carquinez Strait, the Richmond-San Rafael Bridge, and the Golden Gate Bridge. The second objective is to obtain better information regarding locations and habitat types used during outmigration. The third is to document the temporal occurrence of the two fish species.

To address these objectives, we will determine the spatio-temporal distribution of late-fall run Chinook salmon (*Oncorhynchus tshawytscha*) and steelhead (*O. mykiss*) smolts as they migrate through the Carquinez Strait, San Pablo Bay, and San Francisco Bay into the ocean. The fish which are tracked will be those of two collaborating research groups: the Corps and the CALFED group (U.C. Davis and NOAA Fisheries, Santa Cruz Laboratory). While the fish will be from the same source, carry identical tags, and be tracked by identical monitors; they will be released at different locations. The CALFED group will release fish further upstream than the Corps; the Corps' fish will make up for losses during the upstream migration such that sufficient numbers should be available to track through SF Bay to make proper statistical inferences and address the objectives. Detailed methods are presented below.

Although some data exist on migration of juvenile Chinook in watersheds north of central California, only one published paper addresses migration through the San Francisco estuary. The paper (MacFarlane & Norton, 2002) examined physiological development of juvenile Chinook salmon during their migration through the San Francisco Estuary and early residence in the coastal waters of central California. The juvenile Chinook spent about 40 d migrating through the 65 km long San Francisco Estuary (1.6 km/d) based on mean age differences of fish entering the estuary and fish leaving the Golden Gate. Very little is known about juvenile steelhead survival and migration patterns.

Methods

This section contains pertinent methodology for the Corps' work and some information on collaboration with work by others. Further literature research and details on salmon and tracking are contained in the Appendix.

Background. Considerable work in recent years has been performed on determining migratory patterns of fish using telemetric methods. The Corps (notably Seattle District), the academic community, and others have studied such patterns for salmonids in various parts of the U.S.

CALFED project. The CALFED team established an array of tag-detecting monitors along the Sacramento River. Seventy four monitors are placed at the junctions between the mainstem and

tributaries over a 500 km reach of the Sacramento River, from Rio Vista at the mouth of Grizzly Bay to the headwaters at the base of Keswick Dam. Monitors, each separated by 250 m, have been installed at the mouth of the Sacramento River at the northernmost end of Grizzly Bay to detect the arrival of juveniles to Grizzly and Suisun Bays. Monitors separated by a similar distance are installed across the Carquinez Straits to detect the arrival of juveniles at the entrance to San Pablo Bay. The expanse of the CALFED team’s array also includes monitors that are located at the mouths of the sloughs and rivers leading into Grizzly, Suisun, San Pablo, and San Francisco Bays, which will ascertain whether juveniles might stray from their path directly through the bay, and become stranded in rivers during the strong reverse flows occurring from slack to high tide during the periods of full and new moons. The CALFED project does not cover monitor sites west of the Carquinez Straits. Thus, there is considerable overlap in monitor sites needed by the CALFED and Corps projects and justified the need for close collaboration.

Fish. The Corps arranged to obtain sufficient late-fall run salmon and steelhead from Coleman National Fish Hatchery (CNFH) such that 50 of each species were tagged and tracked. Calculations for the number required include pre-release mortality (i.e., from tagging, transportation) and also “chaperones” to be released simultaneously with the experimental fish. See table 1 below.

Species	# fish to be tagged	# chaperones (5 chaperones/1 tagged fish)	# buffer fish (to offset mortality)	Total
Steelhead	50	250	200	500
Late-fall run Chinook	50	250	200	500

Table 1. Number of fish, by species, received from CNFH.

Fish from CNFH were selected because of (1) availability, (2) ease of conducting the tagging and evaluation of tagged fish, and (3) the hatchery’s location at the northern end of the Sacramento River system, thus encompassing the entire migratory corridor for anadromous salmonids. Although it might have been preferable to use wild late-fall Chinook salmon and steelhead juveniles, they are not available caught in sufficient numbers to make statistically valid comparisons.

The fish were transported from CNFH to the Center for Aquatic Biology and Aquaculture (CABA) in Davis, CA on January 10th by means of a fish transport tank truck borrowed from the Don Clausen Fish Hatchery at Lake Sonoma. After arrival at CABA, the fish were separated by species and transferred into four 1000-gallon tanks (approximately 250 fish in each tank). In order to allow the fish to acclimate to the new environment and to rehabilitate from the stressful transport from CNFH, the salmonids held in the tanks for seven days until we began the tag implanting surgeries.

Currently, we have had no fish mortalities due to transport or the stress from the transport. The extra fish will be released into the Sacramento River as “chaperones” to the tagged fish throughout the duration of the release schedule.

Tags, tagging, and release procedure. We tagged the individuals following the procedure of Moore *et al.* (1990) as modified by Lacroix *et al.* (2004). Each juvenile was held initially in a 40-liter cooler with local well water and anesthetized with 90 mg/L of MS-222, which is 99.5% pure

Tricaine Methanesulfonate. This FDA-approved-for-aquaculture substance is the most widely used and trusted anesthetic for aquatic animal use in aquaculture, fishery and veterinary settings. The individual was removed from the anesthetic solution when it lost equilibrium. The fish's weight, fork length, and the condition of its scales, fins and eyes were recorded. A digital picture of the fish alongside its individual identification number was taken.

The fish was placed ventral-side up on a surgery cradle. Water anesthetized with 30 mg/L of MS-222 passed through tubing from a container using a submersible pump and was forced into a pipette that was inserted into the fish's mouth, which then flushed over the fish's gills. A 10mm-incision was made parallel to and 3 mm to the side of the ventral midline and 3 mm anterior to the pelvic girdle. We inserted a sterilized, individually-coded, cylindrical ultrasonic tag into the peritoneal cavity of the fish. The tag was positioned so it is lying just under the incision. The incision was closed with two simple interrupted sutures using 3-0 Supramid Extra Nylon Cable Sutures. The fish was placed into a 75-gallon tank to recover from anesthesia and surgery. This procedure was repeated so that a total of 10 late-fall run chinook and 10 steelhead were tagged. After a five-day holding period, the implanted tags were checked for proper function using Vemco VR60 manual tracking receiver. The tagged fishes and approximately 90 "chaperones" of each species were released into the Sacramento River in Rio Vista, CA. This site was chosen because there was easy boat access and a VR2 monitor in place at the release site, which recorded when the individuals left the reach and began their downstream migration.

Given our requirement of tag battery life of at least 60 d (to at least migrate through the Golden Gate) and an approximate fish weight of 37g for a 150 mm FL chinook smolt and 78 g for a steelhead smolt, the most appropriate tag under the 8% limit was the Vemco V7-2L for salmon and V9-1L for steelhead. The tags comprised 4.9% of juvenile Chinook weight. With an average pulse interval of 60 s (range 30-90 sec) and R64K coding, this tag had an estimated minimum 95 d of life according to Vemco Ltd. Data from Vemco for battery life is typically conservative; it is expected that the tags will be substantially longer than 95 d, perhaps twice as long.

Releasing fish over an extended period minimized the number of fish moving together through the river system, reduced the likelihood of "tag collisions" (multiple fish pinging at the same time at a given monitor) and increased detection rate. Furthermore, spreading out releases through time may allow for comparisons with varying environmental variables, such as flow rate.

Monitors. The sites at which the Corps placed monitors include those between the Carquinez Strait and the Golden Gate. While the Carquinez Strait monitors are those funded and operated by the CALFED study, the Corps has contracted with the CALFED group to operate those at the Golden Gate. The sites at which monitors are placed by the Corps are described below. Please refer to table 2 for monitor position coordinates.

Table 2. Positions of the Corps' monitor sites.

STATION	LATITUDE	LONGITUDE
RS BRIDGE STA A	37.94144	122.48017
RS BRIDGE STA B	37.93887	122.47659
RS BRIDGE STA C	37.93843	122.4735
RS BRIDGE STA D	37.93748	122.4706
RS BRIDGE STA E	37.93701	122.4671
RS BRIDGE STA F	37.93597	122.46394
RS BRIDGE STA G	37.93521	122.40662
RS BRIDGE STA H	37.93383	122.45728
RS BRIDGE STA I	37.93385	122.45345
RS BRIDGE STA J	37.93377	122.45018
RS BRIDGE STA K	37.93604	122.4529
RS BRIDGE STA L	37.9338	122.44208
RS BRIDGE STA M	37.93378	122.43196
RS BRIDGE STA N	37.9334	122.43584
RS BRIDGE STA O	37.93252	122.43245
RS BRIDGE STA P	37.93235	122.42889
RS BRIDGE STA Q	37.53.965	122.25.481
RS BRIDGE STA R	37.55.931	122.25.296
RS BRIDGE STA S	37.55.836	122.25.117
RS BRIDGE STA T	37.55.836	122.24.91
RS BRIDGE STA U	37.55.857	122.24.672
BOUY 9 WEST	38.02.825	122.21.133
BOUY 9	38.02.06	122.21.1
BOUY 10	38.02.4	122.20.9
BOUY 10 EAST	38.02.351	122.20.580
SF 10 NORTH	38.0.66	122.24.98
SF 10 SOUTH	38.00.5	122.25.15
ALCATRAZ	37.49.513	122.25.7
PETALUMA RIVER	38.06.798	122.30.101
RACCOON 1	37.52.33	122.26.82
RACCOON 2	37.52.23	122.26.71
RACCOON 3	37.52.12	122.26.44
RACCOON 4	37.52.02	122.26.44

Richmond-San Rafael Bridge. An “acoustic curtain” containing 21 monitors located near the Richmond-San Rafael Bridge will detect any tagged fish that make it south of the San Pablo Strait. The data from the monitors expanding across the top of the San Francisco Bay will tell us if the tagged smolts prefer to swim in either of the two shipping channels as they travel towards the ocean, or if they prefer the shallower water (4’-25’) on either side of the shipping channels.

San Pablo Bay Channel Markers. A shipping channel meanders through the delta to the Carquinez Strait and continues southwest through San Pablo Bay, south through San Francisco Bay, and out of the Golden Gate. Two different arrays of two monitors on either side of the San Pablo Bay Channel Markers will be the first two sites we will have to help us determine if the tagged salmonids prefer to utilize the shipping channel for their outmigration route. The first site is approximately 5.5 miles southwest of the mouth of Carquinez Strait.

San Pablo Bay Dredge Disposal Site (SF 10). Two monitors are placed on either side of the disposal site.

Alcatraz Disposal Site. One monitor is placed near the Alcatraz disposal site.

Petaluma River. This monitor can help determine whether tagged salmonids will forage in the Petaluma River, and possibly decide to reside there. Any evidence of this happening will affect dredging activity windows.

Raccoon Strait. An acoustic curtain containing four monitors is installed, spanning from Tiburon and ending near Angel Island. The data harvested from this array will help determine transit time from the Richmond-San Rafael Bridge to Raccoon Strait, and then the transit time to the Golden Gate.

Monitoring/Data Interrogation. Initial monitoring should begin approximately one to two weeks after the first release of the fish. Based on results from this and those of the CALFED study, we will monitor at weekly to monthly periods until all fish have passed through the system or it is (jointly by Corps/CALFED) decided that further monitoring will not produce usable results. We tentatively plan to remove the monitors in June of 2007, though other requirements (possible monitoring for green sturgeon) may preclude this.

Other collaborators.

Bay Planning Coalition (BPC). BPC has hired ECorps Consulting, Inc. to install monitors at the following sites: Port of SF (5), Port of Oakland (5), Marin (1), and Mare Island Strait (2).

Coordinates of the sites will be obtained and incorporated onto a map.

Sand Miners. The Sand Miner group has hired Hanson Environmental, Inc. to install monitors and periodically download the data from the monitors. The basic experimental design for tracking salmonids in areas of sand mining activity includes the deployment of five Vemco VR-2 units total: One Vemco VR-2 unit continuously monitoring in Montezuma Slough and four Vemco VR-2 units continuously monitoring within the main Suisun Bay and Carquinez Strait channel. Two units would be deployed in the channel near Chipps Island and two units would be deployed in Carquinez Strait near Dillon Point. One additional detector would be placed in Montezuma Slough.

Table 2. summarizes the current monitor sites with the exception of the Sand Miners sites.

Monitor Site	Fiscally-responsible party	Interrogation-repsonsible party	# Monitors
Richmond-San Rafael Bridge	USACE	USACE	21
Golden Gate Bridge	USACE/NOAA/CALFED	CALFED	20
Petaluma River	USACE	USACE	1
Buoy 9	USACE	USACE	2
Buoy 10	USACE	USACE	2
Raccoon Strait	USACE	USACE	4
SF10 (San Pablo Bay) Disposal Site	USACE	USACE	2
SF11 (Alcatraz) Disposal Area	USACE	USACE	1
Bay Bridge?	BPC	BPC	?
Marin?	BPC	BPC	1
Port of San Francisco?	BPC	BPC	5
Port of Oakland	BPC	BPC	5
Mare Island Strait	BPC	BPC	2

Table 2. Monitor sites

Monitor Mooring Configurations. Monitor array configurations vary depending on the site and how many monitors will be needed to cover the range of the given site. Monitors will be attached to individual mooring configurations. This will reduce the risk of the anchors and lines becoming tangled while deployed. The configuration will consist of: a large anchor weighing between

225-650lb, depending on current and flow rate at the given site; a long, cylindrical surface buoy, which will reduce the drag of the configuration; a line that connects the aforementioned components; and a second line with rings that will slide up and down the main line. The monitor will be attached to the second line, and will be suspended in the water column with a small buoy and anchor (see figure 1.)

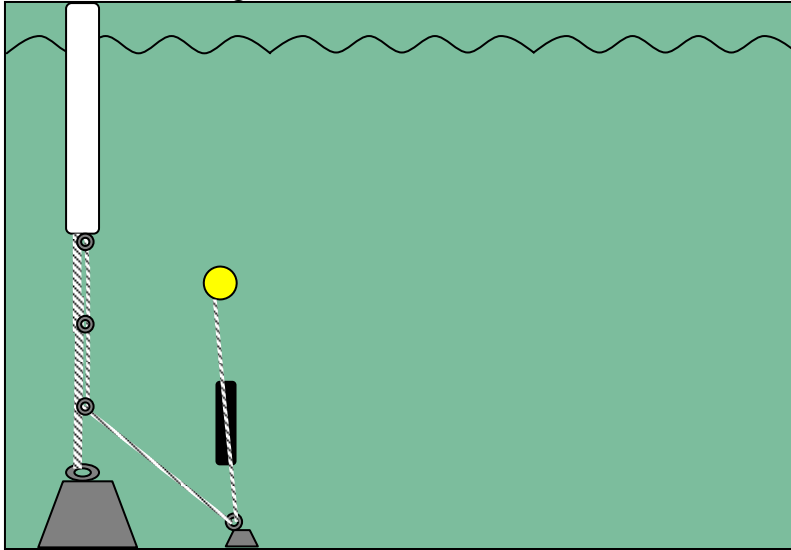


Figure 1. Individual monitor configuration.

Receivers tethered to floatation devices should be separated far apart to minimize acoustic shadow (noise) from settling, fouling organisms, such as barnacles, hydroids and algae (Heupel *et al.*, 2006; Welch *et al.*, 2004).

Mooring deployment and retrieval will be performed using a research vessel. The fully assembled mooring will be lowered to the bottom using the ship's winch cable fitted with a mechanical release. Once close to the bottom the mooring will be detached by tripping the release with a messenger. The monitors will be retrieved, downloaded, and returned to their location as needed based on data collection

Data Analysis. While we anticipate downloading the data, we will use the CALFED system for preliminary organization of the data such that we can perform analyses needed for our objectives. Our analyses will likely also be a subset of those which CALFED performs for their own needs. The Corps is actively collaborating with the UC Davis and NOAA Fisheries group in formalizing data analysis procedures.

The basic data produced by the study are detections of tagged fish at various locations between the upper river and ocean monitors. We can infer that if a fish is detected at one site, but not detected at the next, the fish has done one of five things: (1) the fish was a victim of predation; (2) the fish resided somewhere in the bay for an extended amount of time; (3) the fish swam outside of the range of the other receiver sites; (4) the fish may have swam within the range of the receiver at the at the same time as another tagged fish, and there was a ping collision; or (5) the tag malfunctioned/the battery died. The data from the SF Bay sites can thus be used, over the duration of the study, to determine the presence or absence of the tagged fish.

The data will allow determination of movement rates between monitors. This analysis will be useful in identifying areas of importance to juvenile salmonids, such as holding/nursery areas, etc. that can be subsequently afforded protection to improve recovery. Interannual comparisons

of survival and movement patterns in relation to hydrologic variables, including flow dynamics and water temperature, will improve understanding of their effects on survival and migratory patterns. By gathering data in the coastal ocean, the influence of oceanographic conditions on migratory dynamics and survival can be assessed, which will improve the ability to resolve impacts of water projects on the animals. Data reduction will produce summaries of the path of each tagged fish. These data will be portrayed in both tabular and graphic format. Summary data will include residence time in the Estuary (means and measures of variation). Proximity to specific areas can then be inferred based on these data.

QA/QC. The Corps is actively collaborating with the UC Davis and NOAA Fisheries group in formalizing and finalizing QA/QC procedures. The manuals for the respective equipment will be the first source for such. Tentative procedures include the following examples. Monitors will be checked upon installation and soon before fish release. All tags will be checked for proper operation and transmittal of i.d. number before implantation. Initial data collection and collation shall be done using protocols established by the UC Davis group. All data handling will be done according to Ecological Society of America guidelines. Full data auditing will occur on a percentage of fish to be determined based on the total quantity of data obtained, but is expected to be on at least 5% of individuals. Since it is expected that results and conclusions of this study will be published in the peer-reviewed technical literature; data handling, data analysis, and conclusions will conform to contemporary scientific standards.

Fish should have their adipose fin clipped and have Coded Wire Tags (CWT). If the fish are clipped, then the head will be collected and the CWT can be used to identify which batch the fish was in. This info will provide a component of migration information for the fish.

Other possible work. Active Tracking of Late-Fall Run Juvenile Chinook Salmon and Steelhead Trout

Studies to define habitat use may be better served using active tracking. This method may not be suited for long-term studies because it is very time-consuming and labor-intensive. We are interested in actively tracking a tagged fish over the duration of a couple days, and possibly for a week to two weeks. The feasibility of this portion of the study is dependent on personnel availability and access to a research vessel.

The active tracking will occur after an unknown amount of tagged smolts will be released near the Carquinez Bridge by the CALFED team. The Carquinez Bridge is near the mouth of the Carquinez Strait, which flows into the San Pablo Bay. The mouth of the Carquinez Strait is an established monitor site, and will be the starting point for our active tracking. This location is desirable because the deepened channel (43'-72') characterized by the Strait continues southwest through San Pablo Bay, and is surrounded by relatively shallow areas (ranging from 1'-10'). The diversity in habitat will allow us to describe habitat preferences as the smolt disperse.

Reporting: We anticipate completing preliminary data collation and analysis by June, 2007. We will produce a letter report based on these and associated data by July 2007 for presentation at the LTMS Science group and hope to jointly meet with other participants about this time. A draft final report containing findings of the FY07 study with recommendations for subsequent years will be produced and distributed by September 2007.

Memorandum

Date: February 8, 2007

To: Harbor Safety Committee, San Francisco Bay Region

From: Len Cardoza

Subject: Water Transit Authority Technical Advisory Committee Report

Updates (in bold text).

1. The new address for WTA is: Pier 9, Suite 111, The Embarcadero, San Francisco, CA 94111. POC: Lauren Duran at 415-291-3377 or by e-mail at duran@watertransit.org.

2. **The WTA Administrative/Legislative/Finance Committee meeting scheduled for February 13, 2007 has been cancelled. The WTA Planning and Development Committee meeting scheduled for February 14, 2007 has also been cancelled. The next meeting of the Administrative Committee is rescheduled to take place on Tuesday, March 13, 2007. The next meeting of the Planning Committee is scheduled to take place on Wednesday, March 14, 2007 at 1:00 pm. There is no TAC meeting scheduled in the near future.**

3. Spare Vessel. Mary Frances Culnane, Manager, Marine Engineering, WTA, culnane@watertransit.org; reports that the Spare Vessel contract was executed on 1/4/07. The delivery date for the two vessels is on or about September, 2008, but could be less. **Two questions came up at the HSC meeting on 1/11/07:**

a. Will the two vessels be available to other companies?

Answer: Mary Culnane reported that “The Spare Vessels are 149 passenger, 25 knot catamarans that meet the extremely high emission (85% better than EPA Tier II [200] standards) and wake standards created by the WTA. They are funded via RM2. By The time these vessels are delivered (4Q2008 and 1Q2009) they will be utilized for WTA's South San Francisco to Jack London Square service which is scheduled to come online about that timeframe. Our Community Relations Manager, Shirley Douglas, douglas@watertransit.org, could provide you with any other information you may request.”

b. Why are these vessels called “spare vessels”

Answer: Mary Culnane (culnane@watertransit.org) further reported that “Spare Vessels was terminology utilized to get a jump start on boat construction. Since the terminal planning was quite far in the future and we desired to move on vessel construction (to provide the boats for other public operators if needed in the interim or for emergencies) we went forward with the Spare Vessel concept. However, timing worked out differently and the Spare Vessels come online just in time to be utilized as opposed to being "spares.”

Visit their website at: www.watertransit.org

Background.

The WTA is a regional agency authorized by the State of California to operate a comprehensive San Francisco Bay Area public water transit system. The WTA's goal is "To develop a reliable, convenient, flexible and cost-effective expanded Bay Area water transit system that will get drivers out of their cars and onto environmentally responsible state-of-the-art ferries".

The enabling legislation for the WTA, Chapter 1011 of the Statutes of 1999, requires the formation of the Technical Advisory Committee (TAC). The roles of the TAC include the following:

- The TAC will serve as a conduit to interested agencies, identifying key contacts within those agencies and facilitating discussions on specific technical items.
- Provide review and comment to WTA staff and its consultants on the myriad of technical reports and studies that will be prepared in the development of the Implementation and Operations Plan.
- Review the findings and the recommendations for consistency to promote inter-agency cooperation and integration with ongoing planning efforts.

The wind and the waves are always on the side of the ablest navigators
- Edward Gibbon (1737-94)