Project Number: 040725

Project Title: Impacts of Seafood Waste Discharge in Orca Inlet, PWS

PI's: Drs. Richard E. Thorne and Mary Anne Bishop

Time Period: 24 February to 13 August 2004

Date: August 13, 2004

Work Performed:
The purpose of this project is to examine impacts of seafood waste discharge into Orca Inlet, including evaluation of alternative discharge and disposal methods that could be beneficial to fishermen, the processors and the community. The three objectives for the project for 2004 are to (1) Define collaborators, (2) Conduct baseline sampling, and (3) Develop a work plan. Objective 1 is essentially completed. Attached is a list of individuals whose interest and/or expertise in this problem have been identified (Appendix 1). The Prince William Sound Science Center is functioning as overall coordinator for the project. A memorandum of agreement (MOA) has been completed with the Alaska Department of Environmental Conservation for the collaboration of Kenwyn George, professional engineer, in the project. Kenwyn George worked on a similar but smaller scale study in Ketchikan in 2003, and the Department has an interest in reducing the adverse impacts of seafood wastes. The Copper River Watershed Project (CRWP) has been identified as a major collaborator because of their related interest in utilization of seafood wastes. CRWP has agreed to organize and host two workshops to address the seafood waste issue.

For objectives (2) and (3), the initial step for both baseline sampling and plan development is to determine the temporal and spatial characteristics of the discharge. Figure 1 shows the monthly waste discharge into Orca Inlet by the seafood processors for 2000 to 2002. The month of August is the peak month all three years, primarily due to the timing of the pink salmon return. July is consistently the month with the second highest discharge. Consequently, the baseline sampling effort is focusing on this time period.

To measure the hydrography (i.e. temperature and salinity) and circulation in and around the discharge sites, a series of transects were surveyed using a conductivity, temperature and depth recorder (CTD) and an acoustic Doppler current profiler (ADCP) in central and northern Orca Inlet. Neap and spring tidal cycles in July and August, respectively, were selected for sample periods. The first set of transects was surveyed July 11 and 13 during a neap tide. A 600 kHz ADCP provided by Alaska Department of Fish and Game was used to measure profiles of currents continuously over one semidiurnal tide cycle (13+ hrs) and CTD casts were also repeatedly performed at oceanographic stations during this period. A second series of oceanographic measurements will be conducted August 18-19 during a spring tidal cycle. In addition, in late August, a series of bottom grabs for invertebrates, dissolved oxygen measurements and underwater camera observations will

be conducted. The sampling will be conducted at the 20 stations previously sampled by Williams et al. (1999), which included three control stations (Figure 2), supplemented by new, additional controls located north of Observation Island. Additionally, the abundance of gulls in and around the discharge area has been monitored routinely throughout the project. Figure 3 is a typical digital photo illustrating the gull abundance. Gulls represent a major nuisance factor caused by the present discharge practices.

The work plan for 2005-6 will be developed during two workshops (Appendix 2). Because of the extremely busy schedule of the seafood processors, the first workshop will be held Oct 6, 2004, shortly after the silver salmon season. A second workshop will be held approximately one-month later. At the first workshop, participants will help identify experiment and control sites. Participants will also discuss grind sizes, seafood transfer and disposal methods, as well as desired future conditions for disposal areas. The second workshop will discuss scientific methods for assessing the effects of different disposal methods.
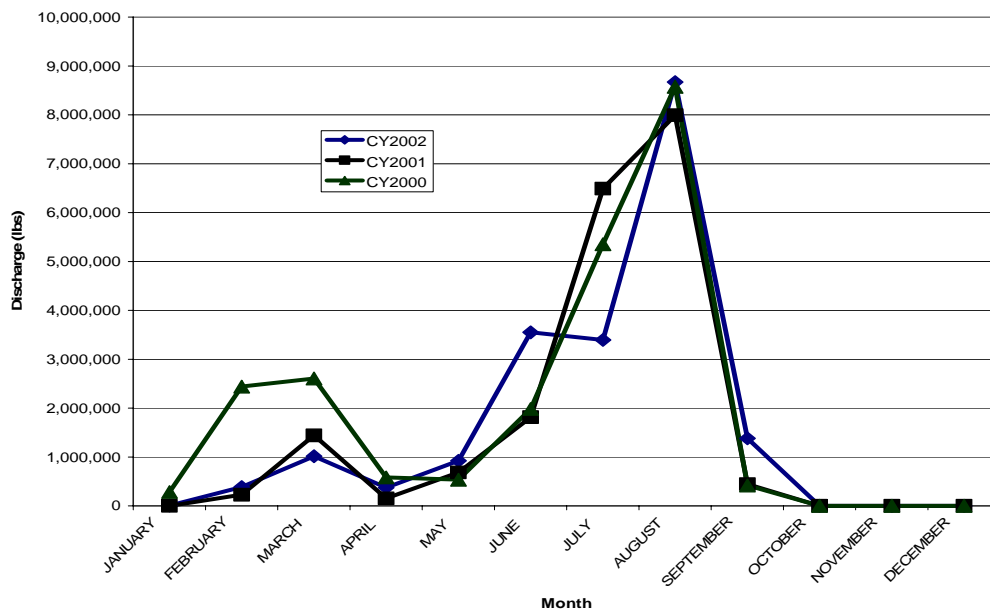

Figure 1. Monthly discharge of seafood waste into Orca Inlet for 2000-2002.

There have been two significant developments associated with the seafood discharge problem during the first half of 2004. The first, early in the year, was the closure of the North Pacific Processors plant in Cordova, which had been the major contributor to seafood waste discharge. However, in late winter the plant was purchased by Bear & Wolf, and has become fully operational. Second, CRWP has obtained funding to build a pilot waste-to-meal conversion plant that will handle nearly 50% of the current waste production. That plant is scheduled to go on line in January 2005. That opens the possibility of an alternative strategy, to evaluate the effectiveness of the new plant,

including impacts of reduced discharge. Despite these changes, we do not anticipate the final experimental design exceeding the original budget projections.

Future Work:

Efforts for the remainder of this first year will be to complete the baseline measurements in late August, conduct the two workshops and develop the experimental plan for years two and three. It is anticipated that the bulk of the measurements and experiments to be conducted over the next two years will focus on the July/August time period.

Figure 2. Map of sample locations from Williams et al. (1999). Stations 18-20 are control stations. Additional control observations have been added north of this map off Observation Island.

Coordination/Collaboration:

This project is a collaborative effort among several entities. Major efforts to date have been conducted by PWSSC, CRWP and DEC. However, ADF&G, the Native Village of Eyak and the Cordova seafood processors will play a major role in the planning process and subsequent experiments, as will several other entities and interested members of the

community as evidenced by the draft list of invitees to the planning workshops (Appendix 1).

Figure 3. Typical high gull abundance during peak pink salmon processing. As the nesting season concludes in late June, thousands of Glaucous-winged gulls are visible in and around the Cordova canneries, including on rooftops, docks, and breakwaters.

Community Involvement/ TEK and Resource Management Applications:

The collaboration noted above has been facilitated by long-term community interest in this issue going back many years, which has included the Orca Inlet Issues Committee, and more recently, the PWS Utilization Committee, organized by CRWP. Many of the issues addressed by the PWS Utilization Committee are parallel to the concerns of this project.

 Information Transfer:

Information transfer at this early stage of the project has been limited to communication among the large group of interested, potential participants. The project will be incorporated into the PWSSC website in the near future.

Budget:

There are no substantial changes in the budget projections at this stage.

Appendix 1. Draft List of Invitees to Seafood Waste Workshop (Prepared by CRWP)

Name	Affiliation
Torie Baker	Marine Advisory Program, SeaGrant, Cordova
Bill Bailey	Copper River Seafoods, owner & fisherman
Bob Berceli	ADF&G, Shellfish Biologist
MaryAnne Bishop	PWS Science Center
Carl Burton II	fisherman, City Council member
Bruce Cain	Native Village of Eyak Director
Shelton Gay	PWS Science Center
Kenwyn George	State of Alaska, Dept. of Environmental Conservation
Bill Gilbert	Norquest Seafoods
Dan Gray	ADF&G
Scott Hahn	Cordova City Manager
Curt Herschleb	Fisherman, Cordova District Fisherman United (CDFU)
Tim Joyce	Subsistence Biologist, Chugach Natl. Forest
Deyna Kuntzsch	Fish Biologist, Chugach National Forest
Kim Lamborn	Ocean Beauty Seafoods
Brian Marston	ADF&G
Dale Muma	City of Cordova, Harbormaster
Diane Platt	Cordova District Fisherman United
Ken Roemhildt	Bear and Wolf (Seafood Processor)
Kristin Smith	Copper River Watershed Project
Hap Symmonds	Ocean Beauty Seafoods
Gary Thomas	RSMAS, Miami
Dick Thorne	PWS Science Center
James Thorne	PWS Science Center
John Wiese	Fisherman, Cordova District Fisherman United
Statistician	(TBN)

PWS Utilization Committee
PWS Science Center

Workshop Outline:

Fish Waste Disposal Methods in Orca Inlet

With grant funding from the *Exxon Valdez* Oil Spill (EVOS) Trustee Council, the PWS Science Center will examine the impacts of seafood waste discharge in Orca Inlet, Prince William Sound. Researchers will assess whether commercially harvestable species are increased by the dispersal of fresh seafood wastes of different sizes. The initial year is devoted to planning the experiment and collecting background or baseline data, followed by two years of fieldwork and experimentation.

Workshop 1:
Desired Future Conditions, Experiment/Control Locations

October 6, 2004
Masonic Hall

An agenda for this workshop will include:

I.   Introductions
II.   Overview of PWS Science Center grant from EVOS Trustee Council to inform the Cordova community of the scope of research
III.   Brief recap of research conducted on fish waste in Orca Inlet (PWSSC, Native Village of Eyak)
IV.   Review of seasonal waste disposal patterns (volume and timing)
V.   Consideration of experiment and control sites, including mark-up of Orca Inlet charts
VI.   Articulate desired future conditions for disposal areas: water quality, presence of disturbance-indicator species, species diversity, presence of historical species.
VII.   Discuss disposal methods, including range of grind sizes, placement, transfer of material.
VIII. Summarize key points for scientific analysis, next steps.

Workshop 2:
Scientific Methods of Analysis

November 3, 2004 (Tentative)
Masonic Hall

A second workshop will follow in November, 2004 to discuss scientific methods for assessing the effects of different disposal methods as well as the benefits of diverting fish waste to the fish meal plant due to be installed in January, 2005.
An agenda for this second workshop will include:

I.   Introductions
II.   Overview of October 2004 workshop and considerations that will guide research
III.   Outlining experimental design:
    a. Number of experiments, including initial baseline verification
    b. Periods of study (season and extent)
    c. Magnitude of waste to be analyzed
    d. Parameters to be measured: dissolved oxygen, temperature, conductivity and turbidity, benthic sampling, other.
IV.   Evaluation of sampling techniques, including:
    a. Diver observations
    b. Water quality sampling, benthic sampling
    c. Underwater cameras
    d. Net captures?
    e. Acoustics
V.   Lay out timetable for finalizing experiment design