



## SAMPLING OF COMMERCIAL FISH SPECIES, GEAR and VESSELS

### INTRODUCTION

The State of Alaska's zero tolerance policy extends not only to direct oiling of target fish species, but to contamination of fishing gear or vessels. Therefore, a commercial fisheries water quality sampling program may target fish species, gear, vessels, or any combination of these three.

Methods for assessing the potential contamination of commercial fish species generally involve collecting the species from the potentially impacted area and then using a standardized method to assess the level of contamination from the spilled oil. There are two primary methodologies for assessing impacts to fish species: organoleptic testing or tissue testing. Organoleptic testing involves the use of the human senses (see, smell, touch, taste) to evaluate the potential contamination of seafood products. Organoleptic testing should be performed by a qualified individual with appropriate training.

Tissue testing involves collecting tissue samples from commercial fish species and performing laboratory analyses on the chemical composition of those tissues to identify oil contamination. Tissue testing requires that tissues be collected, stored, and transported properly to a laboratory with the capability to perform the required tests. In order for tissue testing results to have meaning, it is useful to have information about background contamination levels in the area, since low level hydrocarbon contamination may already exist in many areas. Because of these limitations and the high cost of tissue testing, it may not necessarily be an appropriate method for collecting time-sensitive data for fishery managers.

Collection of fish for either organoleptic or tissue testing may be accomplished using commercial or personal use fishing methods. Scientific collection permits are generally required to collect commercial fish species as part of a fisheries sampling program. A copy of the ADFG Scientific Collection Permit for Fish is included in Appendix G.

If the sampling design involves the use of fishing vessels and gear, then these components may be monitored for signs of oil contamination as well. If a commercial fishery is ongoing, then data may also be collected from the fleet itself. The sampling program may include a reporting protocol whereby participants in the fishery



can report any observations of suspected oil contamination to vessels, gear, target species, or incidental catch species. Passive sampling devices may be distributed to the fleet and used to monitor for the presence of oil in fish holds or tanks. For the purposes of this manual, the method for sampling fish holds is included with other methods for monitoring seawater intakes.

### ***Detection Limits***

The sensitivity of fish, gear, and vessel sampling methods is limited by several factors, including the affinity of the spilled oil for the gear or vessels (how likely is it to stick or sheen?), the exposure pathways for commercial fish species, and the effectiveness of reporting from the fishing fleet or oil observations.

With organoleptic testing, the methods are limited to the sensitivity of trained inspectors to identify oil contamination. With tissue testing, it is important that samples also be taken from control sites to provide data regarding background contamination levels.

As with all commercial fisheries water quality sampling methods, it is possible that the oil detected may not necessarily be attributed to the spill source of concern. Background contamination levels vary in different water bodies. In areas with high vessel traffic, nearby oil and gas exploration, or adjacent to ports or marinas, background levels may be relatively high.



## HARVESTING COMMERCIAL FISH

### OBJECTIVE & STRATEGY

The objective of the Harvesting Commercial Fish sampling method is to harvest fish or shellfish for examination by trained seafood inspectors to monitor for signs of taint. Data collected through harvesting fish can provide information regarding potential exposure of fish or shellfish to spilled oil.

Commercial fish harvested through a water quality sampling program must be examined by a qualified seafood inspector using accepted methodologies. This tactic does not address those methodologies, which are well documented in several NOAA publications. This tactic describes general strategies for legally and effectively harvesting fish as part of a commercial fisheries water quality sampling program.

The sampling scheme should be designed based on the real time question posed for the incident. Different sampling schemes are required to determine the answer to the following types of questions:

- Have commercial fish or shellfish organisms been exposed to oil?
- Are oiling observations to fish or shellfish concentrated in certain areas?
- Is this area safe for commercial fishing?
- Should fisheries be closed to reduce the risk of seafood contamination?

Care must be taken to choose a sampling design that is appropriate to the questions being asked.

### TACTIC DESCRIPTION

#### *Operating Environments*

Harvesting commercial fish species may be conducted in any water body where commercial fishing activity occurs. Applicable operating environments include: nearshore and offshore marine waters, harbors, bays, rivers, and lakes.

Fishing vessels that are appropriately configured for the target species are the most logical choice for a platform. Vessels must be sufficiently seaworthy to suit the worst conditions expected in the operating area.



### Deployment Configurations

Methods for harvesting commercial fish species should mimic those methods used in the actual fishery, but on a smaller scale. For example, if a crab fishery is at-risk, then crab may be harvested using the same type of crab pots and bait as the fishery itself, but instead of setting hundreds of pots, the sampling program may set a much lower number. The sampling design may also call for a “representative sample” of catch to be taken from each location or haul. In this case, a pre-identified quantity of fish or shellfish would be retained to reduce the total number of organisms destroyed.

Typical harvesting techniques used in Alaska commercial fisheries include: pots, jigs, long lines, trawls, seines, and gill nets. Figure HCF-1 shows examples of the basic vessel configurations for each method of harvesting.

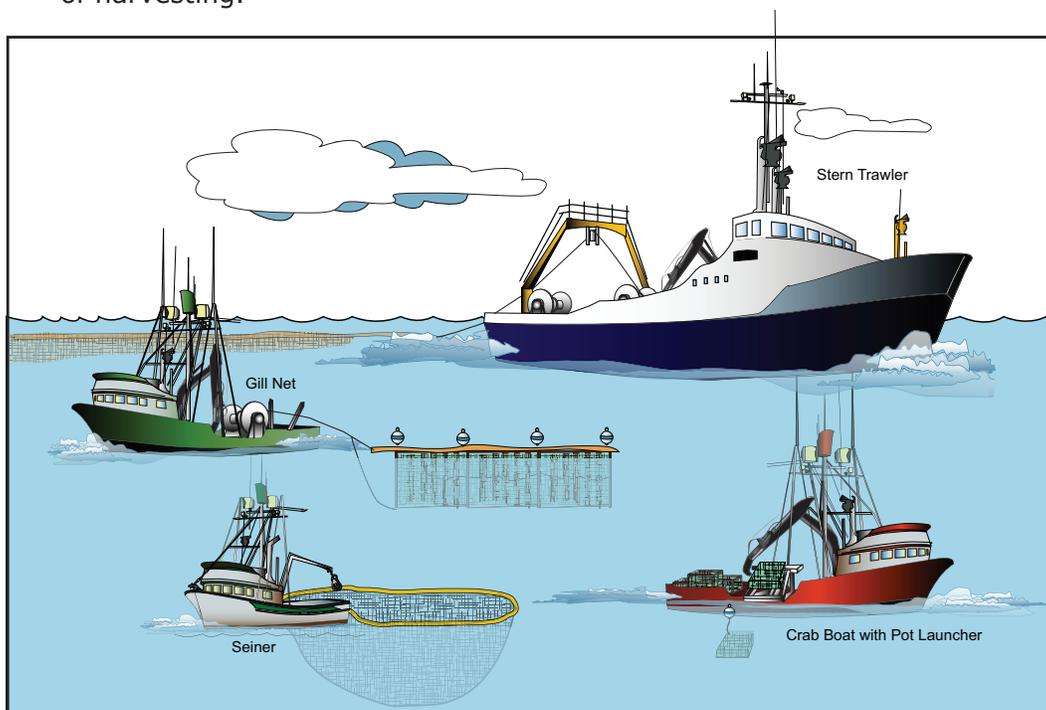


Figure HCF-1. Typical Alaska Commercial fishing vessel and gear configurations.

Commercial fish harvesting may be conducted in conjunction with other passive or active sampling activities. For example, oleophilic snare may be attached to baited crab pots or baited long line and used to assess the presence of oil in the water column or on the bottom. The sampling plan should identify whether such a combination of methods is to be used.

Harvesting commercial fish for the purpose of fisheries water quality sampling may require a permit from the fishery management agency with jurisdiction. Permits generally require that any seafood caught as part of a sampling program must be properly disposed of and may not be consumed or sold.



## PROCEDURE

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- 1. Ensure that all required permits are in place before initiating commercial fish harvesting.**
- 2. Utilize vessel, gear, and trained crew appropriate to the fishery of concern.**
- 3. Collect fish or shellfish using appropriate gear and bait.**
  - a. When landing fish, segregate catch from each haul to avoid cross-contamination (e.g., use multiple fish totes, coolers, large plastic bags, onion sacks, etc.). Be sure that all containers are free of contamination.
  - b. Examine each fish for signs of contamination before storing in appropriate container. Store dead fish on ice or in refrigerated sea water. Store live fish in a circulating seawater tank.
  - c. Label catch with date, time, location caught, visual observations (potential oil contamination, other unusual physical characteristics).
  - d. Keep a log for each catch. Identify date, time, location, total number and species of fish caught, number and species of fish retained, oil observations on fish or gear (or passive sampling devices, if used). Collect photographs to document oil observations.
- 4. If oil contamination is observed or suspected, decontaminate all gear before re-setting.**
- 5. Coordinate return to port to ensure prompt catch inspection by qualified seafood safety inspector.**
  - a. Record results of seafood safety inspections for each fish landed.
  - b. Dispose of all fish and shellfish according to permit specifications.

## CONSIDERATIONS AND LIMITATIONS

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- + Detection limits may be affected by exposure pathways for target species, location and depth of fishing areas, and human error.
- + Daily weather evaluations are recommended, and should include distance to safe harbor, transit times and exposure of vessels.
- + Vessel masters should have experience in the appropriate operating environment and local knowledge is preferred.
- + Sampling plan may identify target locations for setting fishing gear; however, if the goal is to maximize the chance of catching fish, it may be best to defer to the professional judgment of the vessel master.



- + Use buoys, floats, or other obvious markers to mark fishing gear that may pose a navigational hazard.
- + This method does not include collecting tissue samples for chemical analysis. Such samples must be collected by dissection and freezing samples in the field. Specific sampling protocols must be developed in conjunction with the analytical laboratory.

## REFERENCES TO OTHER TACTICS

Other methods associated with Harvesting Commercial Fish include:

- All vessel-based sampling methods
- Waste Management
- Data Collection and Management
- Safety

## EQUIPMENT AND PERSONNEL RESOURCES

Resources for this tactic may include fishing vessels and gear ordinarily used in the commercial fishery, decontamination equipment, log books, and sampling technician(s). Configuration and specific resources required will be determined by site conditions, sampling design, and resource availability. Resource sets may need to be refined as site-specific requirements dictate.

### Harvesting Commercial Fish

Equipment	Function	Quantity	Notes
Fishing gear	Catch fish	Determined by fishery and sampling design	
Bait	Attract fish to gear	Defer to expertise of fishing vessel master and crew	
Sorbent pads	Line sorting/sampling table to examine fish.		
Segregated fish storage	Store collected fish in separated containers for delivery to port for inspection.	Varies	Fish totes or coolers work well for fin fish. Onion bags work well for crab in live tanks.
Sampling jars with associated documentation	Store samples of encountered oil for possible laboratory analysis.		Coordinate handling/storage of samples with laboratory. Follow chain-of-custody protocol.
GPS	Record position/location data (latitude/longitude) for fish sets and hauls.	2 (1 primary, 1 backup), with spare batteries	Recommend using combination of handheld GPS and vessel's GPS system.
Digital camera	Record images of sampling process and observations.	One per sampling technician	Ensure sufficient batteries, charger, and memory stick storage for length of sampling survey.
Vessel	Function	Quantity	Notes
Vessel configured appropriately for target fishery	Deployment platform	1 per sampling trip	Vessel should be inspected prior to use for safety equipment and communications capabilities.
Personnel	Function	Quantity	Notes
Sampling technician(s)	Deploy equipment, collect data.	2-3	Recommend at least 2 technicians per trip for safety. Technicians must have sufficient Hazmat certification and basic vessel safety training.



## MONITORING COMMERCIAL FISHING VESSELS and GEAR

### OBJECTIVE & STRATEGY

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The objective of Monitoring Fishing Vessels and Gear is to collect information from the commercial fishing fleet regarding oil observations on the vessels, gear, or personnel involved in a commercial fishery. Oil is detected through direct observation by commercial fishing vessel crew members. If feasible, samples may be retained for transfer to the Fisheries Water Quality Sampling program staff and possible laboratory analysis.

The sampling scheme should be designed based on the real time question posed for the incident. Different sampling schemes are required to determine the answer to the following types of questions:

- Has commercial fishing gear been contaminated by oil?
- Have commercial fishing vessels been contaminated by oil?
- In what geographic areas have oil observations been reported by the commercial fishing fleet?
- Is this area safe for commercial fishing?
- Should fisheries be closed to reduce the risk of seafood or gear contamination?

Care must be taken to choose a sampling design that is appropriate to the questions being asked.

### TACTIC DESCRIPTION

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#### *Operating Environments*

Monitoring Commercial Fishing Vessels and Gear may be conducted in any water body where commercial fishing activity occurs. Fishing vessels that are actively participating in in-season commercial fisheries are the primary platforms. Applicable operating environments include: nearshore and offshore marine waters, harbors, bays, rivers, and lakes.

Vessels-of-opportunity that are involved in other aspects of the Commercial Fisheries Water Quality Sampling Program may also be involved in this procedure. Vessels must be sufficiently seaworthy to suit the worst conditions expected in the operating area.



### **Deployment Configurations**

This method involves the collection of information from the commercial fishing fleet regarding oil contamination of fishing gear or any part of the vessel. Information may also be gathered by vessels-of-opportunity conducting other water quality sampling procedures that mimic commercial fishing vessel operations and use standard gear configurations. Refer to the Commercial Fish Harvesting procedure for a description of vessel and gear configurations.

This procedure relies on visual observations of fishing vessel crewmembers and sampling technicians regarding the oiling of gear or any vessel space. Oil may be observed on traps or pots, hooks, line, anchors, vessel hull, deck space, or the personnel themselves. Since this is primarily a monitoring technique, the procedure requires good record-keeping regarding oil observations. If feasible, samples may be taken of oil that is encountered on vessels or gear. Refer to the Sampling Handling and Storage Procedure for instructions on taking and storing samples.

If fishing vessel crew are instructed to take samples of the oil, they must be appropriately trained in sample collection procedures and they must be supplied with nitrile gloves and storage containers. Only those crewmembers with hazardous materials training should be allowed to handle samples. If no crewmembers are appropriately trained, they should be advised not to handle oil. Contaminated gear should be stored and transported to shore for decontamination by incident personnel. If possible, sampling technicians may be able to take samples prior to decontamination.

Establishment of a monitoring program for commercial fishery vessels and gear is implied under the state's zero tolerance policy. However, it may be useful to establish a formal program as a component of water quality sampling. The creation of a formal monitoring program will ensure that commercial fishing vessel operators receive the proper instruction and possibly equipment or training to conduct visual surveillance of vessels and gear for oil contamination. The program should also establish a central reporting point for all oil observations.

## **PROCEDURE**

### **1. Identify vessel fleet and gear type for participation in monitoring program.**

- a. Focus on fisheries at highest risk of encountering spilled oil.

### **2. Develop written instructions to vessel operators regarding what to do if oil is encountered.**

- a. Summarize zero tolerance policy as it relates to safety of catch.
- b. Request vessel crews to record data regarding location of oil observation, relative quantity, form, etc.
- c. Identify point of contact to report findings.



**3. If possible, dispatch sampling technician to meet the vessel when it returns to port to document oil observations.**

- a. Take photographs.
- b. Take samples, if possible.
- c. Record all results.

## CONSIDERATIONS AND LIMITATIONS

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- + Detection limits may be affected by vessel track through area of concern, affinity of spilled oil for gear and vessel, accuracy and reliability of reports from fishing fleet, and human error.
- + Daily weather evaluations are recommended, and should include distance to safe harbor, transit times and exposure of vessels.
- + Vessel masters should have experience in the appropriate operating environment and local knowledge is preferred.
- + Use informational bulletins or releases to inform vessel fleet about basics of sampling program. Provide information regarding the appearance/characteristics of the spilled oil, areas where oil has been observed, and other relevant information.
- + Since state regulations require that fishing vessels that have encountered oil must be decontaminated and inspected by ADEC/EH, and oiled fishing gear must be destroyed, fishing vessel crews may be reluctant to participate in this type of program.

## REFERENCES TO OTHER TACTICS

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Other methods associated with Monitoring Commercial Fishing Vessels and Gear include:

- All vessel-based sampling methods that utilize fishing gear
- Sample Handling and Storage
- Waste Management
- Data Collection and Management
- Safety

## EQUIPMENT AND PERSONNEL RESOURCES

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Resources for this tactic may include fishing vessels and gear ordinarily used in the commercial fishery, decontamination equipment, log books, and sampling technician(s). Configuration and specific resources required will be determined by site conditions, sampling design, and resource availability. Resource sets may need to be refined as site-specific requirements dictate.

Informational bulletins or notices may be prepared and distributed to advise the fleet of the program.



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