

# Derelict Fishing Gear Removal Guidelines



Washington Department of  
**FISH AND WILDLIFE**

# **Derelict Fishing Gear Removal Guidelines**

*Developed in consultation with*

Northwest Straits Commission

Washington Department of Natural Resources

United States Coast Guard

National Oceanic and Atmospheric Administration

United States Navy

Washington Department of Labor and Industries

United States Department of Labor, Occupational Safety and Health Administration

Washington Department of Ecology



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Department of*  
**FISH and  
WILDLIFE**

**November 2002**

## **Acknowledgements**

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Development of the Derelict Fishing Gear Removal Guidelines involved a variety of organizations and individuals. A heartfelt thank you is given to all who participated in the committees and subcommittees, or who reviewed drafts of the work in progress. The expertise brought to the development of the Guidelines was invaluable.

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Special mention must also be made of the Department of Natural Resources (DNR). DNR, perhaps, has the most experience of any agency in actual removal of derelict nets in Puget Sound. Leigh Espy, Assistant Division Manager for Aquatic Resources for DNR participated in development of the Guidelines. The input from Doug Williams, who has led most of DNR's derelict net removal operations, was invaluable.

The other organizations and individuals that were part of the committee or reviewed the guidelines as they were being developed included:

National Oceanic and Atmospheric Administration: David Dinsmore and Dr. Perry Gayaldo

Tulalip Tribes: Vern Ledford

US Navy: Michael Matta

U.S. Coast Guard: Craig Petersen

Washington Department of Labor and Industries: Chuck Lemon

United States Department of Labor, Occupational Safety and Health Administration: Gwen Spargo

The staff in the Department of Fish and Wildlife involved in the development included Tim Smith, Mary Lou Mills, Wayne Palsson, Don Rothaus, Gayle Kreitman, Randy Thurston, Randy Carmen, Bob Burkle, John Carlton, and Margie Schirato. In addition, numerous other WDFW staff members reviewed drafts of the document or were in contact with some of the people mentioned above regarding the guidelines. The time and input of all has been appreciated.

# Table Of Contents

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Introduction .....	1
Context for Guidelines .....	1
Projects in Accordance with Guidelines .....	1
Description of Problem .....	3
Types of Derelict Fishing Gear .....	4
Gillnets .....	4
Purse Seine Nets .....	5
Trawl Nets .....	5
Longlines .....	6
Pots .....	7
Aquaculture Materials .....	7
Recreational Fishing Gear .....	8
Notification, Permits and Legal Issues .....	8
Environmental Issues .....	10
Habitats of Concern .....	12
Marine Protected Areas .....	13
Contaminated Sediments .....	14
Habitat Restoration .....	14
Insurance and Liability Issues .....	14
Derelict Gear Removal and Disposal Plan .....	15
Derelict Gear Removal Methods .....	16
Removal from the Intertidal .....	17
Diver Removal .....	19
Nets, Lines, and Aquaculture Net Pen Material .....	20
Pots and Traps .....	21
Surface Craft Derelict Fishing Gear Removal .....	22
Disposal .....	22
Record Keeping and Reporting .....	24

## Appendix A Table of Contents

---

General .....	A-1
Training .....	A-1
Depth .....	A-1
Dive Team .....	A-2
Dive Platform .....	A-2
Equipment .....	A-2
Communications .....	A-2
Knives/Cutting Instruments .....	A-3
Redundant Air Systems .....	A-3
Straps, Gear Clips, Hoses/Umbilicals .....	A-3
First Aid/Oxygen Kit .....	A-3
Procedures .....	A-4
Pre-removal Inspection Dive(s) .....	A-4
Pre-removal Briefing .....	A-4
Removal Operation .....	A-4
Entanglement .....	A-6
Aborting Dives .....	A-7
Post-Operation De-briefing .....	A-7

# Introduction

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## Context for Guidelines

In 2002, Washington Senate Bill SB6313 was passed requiring the Washington Department of Fish and Wildlife (WDFW) in partnership with a variety of organizations to develop guidelines for removal of derelict fishing gear. The following agencies provided staff time to participate in development of the guidelines as they were being developed:

Northwest Straits Commission

Washington Department of Natural Resources

United States Coast Guard

National Oceanic and Atmospheric Administration

United States Navy

Washington Department of Labor and Industries

United States Department of Labor, Occupational Safety and Health Administration

Washington Department of Ecology

This document provides the guidelines for the environmentally acceptable removal and disposal of derelict fishing gear from the waters of Washington State.

## Projects in Accordance with Guidelines

Under Washington Senate Bill SB6313, derelict gear removal projects that are conducted in accordance with these guidelines will be subject to no other permits from the WDFW. This document provides the procedure for determining that a project is in accordance with the guidelines, the intent of the guidelines, and some alternative methods that might be used to meet the intent of the guidelines. The WDFW will determine if a proposed derelict gear removal project can be conducted in accordance with the guidelines based on a derelict fishing gear removal plan prepared by the proponent of the project. The derelict fishing gear removal plan must address the guidelines for the environmentally acceptable removal and disposal of derelict fishing gear provided in these guidelines. The plan must be submitted to WDFW for consideration 30 calendar days before the project is to commence.

Plans for operations should be submitted to:

Fish Program  
Washington Department of Fish and Wildlife  
600 Capitol Way North

Olympia, WA 98501-1091

If the derelict fishing gear removal plan will result in a project that is in accordance with the guideline, the WDFW will respond with a letter to that effect. The letter shall be on site during removal operations and made available to WDFW staff that request to see it. If WDFW determines that the plan presented cannot be conducted in accordance with the guidelines, the project may require modifications, special provisions or additional permits prior to undertaking some, or all, of the derelict fishing gear removals proposed.

Derelict fishing gear removal operations must respect private property and, as appropriate, conform to Admiralty Law, the Washington State Uniform Unclaimed Property Act (Chapter 63.29 RCW), Occupational Safety & Health Administration (OSHA) and Washington Industrial Safety and Health Act (WISHA) safety standards and other local, state, federal and tribal regulations.

These guidelines apply to removal of gear when the removing party does not know the ownership of the gear involved. Removal of the gear by the owner is not subject to the procedures herein.

These guidelines were designed to cover marine waters and removal of gear in these areas. Freshwater occurrences of derelict gear present very different removal issues and are not covered under these general guidelines. They will require separate consideration by the organizations involved. If parties have an interest in removal of gear they feel is derelict in freshwater, contact with WDFW Fish Program in Olympia (360 902-2700) should be made.

Review and sanction of any derelict fishing gear removal plan by WDFW does not entail any explicit or implied guarantee of the safety of the participants. That shall be the responsibility of the individuals and/or proponents of the event.

## **Description of Problem**

Abandoned, lost, and discarded fishing gear can be found throughout the world's oceans including the waters of Washington State. Derelict fishing gear can be nets, lines, crab and shrimp pots or other equipment that is abandoned or lost during commercial and sport fishing operations. Since modern fishing equipment is often composed of synthetic materials, derelict fishing gear in the marine environment may remain in the environment for years or even decades. Derelict fishing gear can present safety, liability, and nuisance issues, as well as environmental impacts to species and habitat. It can entangle divers and swimmers. It can damage propellers and rudders of vessels, putting the vessel and crew in danger. Derelict fishing gear can continue to entrap and kill fish, shellfish, birds and marine mammals including endangered or threatened species. In addition to entangling animals, derelict fishing gear can negatively impact marine habitat and compromise the marine ecosystem.

Above all the removal of derelict fishing gear must be conducted in a safe and environmentally sensitive manner. There is an environmental benefit in removing derelict fishing gear from the marine environment if the removal can be accomplished safely and without unnecessary damage to the marine habitat and ecosystem. These removal and disposal guidelines provide a framework for the safe and environmentally sensitive removal and proper disposal of derelict fishing gear.

These guidelines address the different types of derelict fishing gear commonly found in Washington's marine environment, the circumstances under which removal should be attempted, the qualifications of the removal team, common methods that may be employed to locate and remove derelict gear, procedures for determining that the project can be conducted in accordance with the guidelines, disposal or recycling options, and the removal and disposal documentation and reporting process.

## Types Of Derelict Fishing Gear

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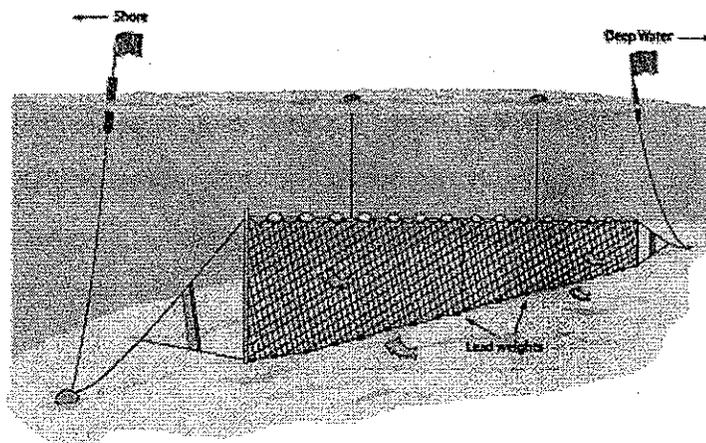
There are a variety of different types of derelict fishing gear in Washington's marine environment. Deliberate disposal of fishing gear in marine waters is prohibited by state and federal regulations. However, any time gear is deployed during normal fishing operations there is a chance that it can be lost and become derelict fishing gear. Derelict fishing gear can result from non-tribal commercial and recreational activities and from tribal fisheries.

Not all fishing gear encountered in the marine environment is derelict fishing gear. Fishers may not always be present when gillnets and pots are actively fishing. If in doubt about whether fishing gear is derelict or not, it is best to contact the proper authorities (WDFW or tribal enforcement) and report that the fishing gear may be derelict.

The following are the kinds of fishing equipment most commonly encountered as derelict fishing gear.

### Gillnets

Gillnets are used primarily in salmon fisheries but also in herring fisheries. Heavier braided material is used in dogfish shark gill nets. The gillnets are up to 1,800 ft in length and about 25 to 30 ft deep with floats on the top and a lead line on the bottom. The net is of variable mesh size and construction depending upon the species targeted.

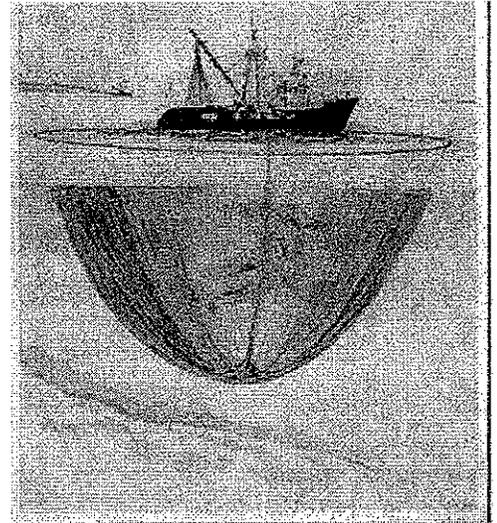


Gillnets may be lost during operation if entangled on rocks or other obstructions on the seabed. Some or much of the net may break free when retrieval is attempted. Gillnets can also be lost when entangled with surface vessels. Lost gillnets may drift away from the location where they were originally lost. Gillnets are designed to entangle the target species. Once lost, they can continue to entangle a variety of species including invertebrates, fish, birds, marine mammals

and, potentially, people. The gear adversely affects the quality of the habitat on which it comes to rest. Gillnets present one of the most dangerous and challenging removal operations of the common types of derelict fishing gear found in Washington's waters.

## Purse Seine Nets

Purse seine nets are used primarily for salmon but are also used for herring and, on the Washington coast, sardines and anchovies. They can be up to 1,500 ft in length and 100 ft deep. The top of the net has floats and the bottom of the net is equipped with a lead line and metal rings through which a purse line runs. The webbing used in the purse seine net is constructed of synthetic materials and is of variable mesh size depending upon the species targeted. The purse seine net is designed to encircle the target species not to entangle it so the strands of the net are coarser than gillnets.



Purse seine nets or portions of nets can be lost if entangled on rocks or other obstructions on the seabed. When entangled, the purse seine vessel attempts to recover the gear and often pulls off the float and purse lines, leaving behind mainly the mesh webbing in the body of the net. Although somewhat less entangling than gillnet, derelict purse seine netting can entrap a variety of animals and adversely affect the habitat. Purse seine nets are heavy and awkward underwater and removal of them can be dangerous and challenging.

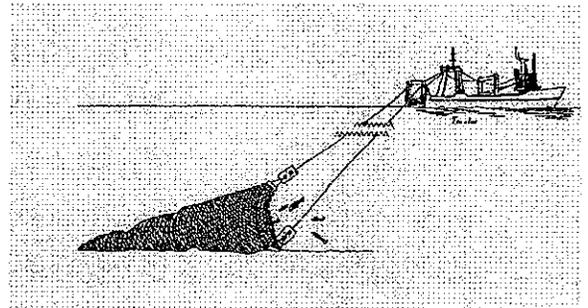
## Trawl Nets

Both bottom trawl and pelagic trawl nets (sometimes called mid-water trawls) are used by fishers in Washington waters, primarily off the coast, in the outer Strait of Juan de Fuca and northern Puget Sound. Tribal regulations may allow use of trawl gear in all of Puget Sound and coastal waters. In addition, research vessels also use trawl gear throughout Washington's marine waters. Trawl nets are actively dragged through the water column (pelagic trawl) or on the seabed (bottom trawl). They are used primarily for shrimp and groundfish. The nets are constructed of heavy synthetic webbing with floats on the top of the nets with bobbins or weights on the bottom of the net. Trawl "doors" are constructed mainly of steel and connected to the net by wire rope

and maintain the horizontal opening of the net. Alternatively, the net may be held open during operation by a bar across the bottom of the opening (beam trawl). The net is connected to the vessel by two heavy wire ropes or cables.

Trawl nets are designed to actively overtake and to capture their target species in the back of the net. Trawl nets can become derelict fishing gear if entangled on obstructions on the seabed. Typically the entire trawl net is not lost, only portions of the webbing in the net.

However, entire nets with trawl doors and wire ropes have been lost in Washington waters. Trawl nets are not designed to entangle their target species, however, they can entangle invertebrates, fish, birds and marine mammals when lost. They can also affect the quality of the habitat where they come to rest, and can act as an obstruction on the bottom to other fishing gear. Recovering derelict trawl nets can be difficult due to the depth at which they are fished and the heavy nature of the gear.

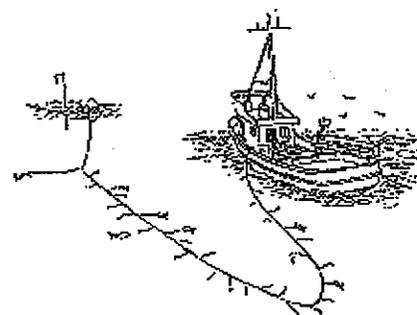


## Longlines

Longline fishing gear has been used to catch Pacific halibut, sablefish, rockfish and dogfish in Washington waters. Longline fishing occurs in the outer Strait of Juan de Fuca, off the Washington coast, and throughout Puget Sound. Longline fishing gear consists of a rope mainline with a series of leaders (gangions) with baited hooks spaced along it. The ends of the longline are anchored with surface floats to mark the location. Longlines are a variety of lengths up to several nautical miles long.

Portions of longlines are usually lost due to entanglements with obstructions on the seabed. They may also be lost if the surface floats are entangled with passing vessels.

Longlines can potentially entangle a variety of marine organisms and create an obstruction to other fishing gear on the seabed. Derelict longline gear is relatively easy to recover compared with nets but still offers safety and environmental issues.



## **Pots**

Non-tribal commercial and recreational fishers as well as tribal harvesters operate a variety of pots for fish, crab and shrimp. Pots vary in size and configuration, depending upon the target species and fishery. Pots may be set individually or multiple pots may be set on a single horizontal groundline, often referred to as a string of pots. Pots are fished throughout Washington's marine waters.

Pots become derelict fishing gear when either the surface floats are lost due to wear or entanglement. The pots may become entangled and "mudded in" the seabed and are lost. Off the Washington coast, storms have been known to move pots for considerable distances and/or bury them. Passing vessels may destroy or temporarily entangle the surface float and inadvertently tow the pots far from the location they were deployed before they drop off the vessel.

Derelict pots may continue fishing until the natural fiber escape panel required by regulation degrades allowing an escape path for animals. Derelict pots can act as obstructions for other fishing gear on the seabed. Recovery of derelict pots is typically easier and safer than recovery of nets or longline gear, but still offers safety and environmental issues.

## **Aquaculture Materials**

There are a number of aquaculture operations in Washington's marine waters that may contribute to derelict gear. Net pen material can be lost due to storms, marine mammal attacks and normal wear and tear of materials. A variety of netting, ropes, lines, buoys and other materials are used in marine aquaculture facilities that can become derelict gear. Much of this gear is similar in nature to that lost during commercial fishing operations and may be indistinguishable from fishing gear. Aquaculture materials might be involved in derelict gear removal plans when they cannot be distinguished from other types of derelict gear.

## **Recreational Fishing Gear**

A variety of recreational fishing gear is used in Washington's marine waters. Rod and reel fisheries use a variety of different fishing lines and terminal gear. Recreational fishers use pots for shrimp and crab similar to that used by commercial fishers although somewhat lighter in construction. Derelict recreational fishing gear includes synthetic fishing line, lead weights, hooks, flashers, stainless steel downrigger wire and lead balls, jigs, pots and other items. Derelict recreational fishing can entangle or entrap animals and can offer a threat to divers and surface craft. Recovery of derelict recreational fishing gear can be easier than recovery of commercial nets but still presents substantial safety and environmental issues. The diver fatality that occurred in recent years during a derelict gear removal operation took place during an attempt to remove recreational fishing line.

## **Notification, Permits And Legal Issues**

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Having a letter from WDFW stating that the proposed project will be in accordance with these guidelines means that no permits from WDFW will be needed. However, that does not obviate the proponents from complying with other federal, state or local laws and regulations.

If the location of derelict gear removal is on county or state aquatic lands or beaches the proper agency (e.g., county or city government, DNR, State Parks and Recreation) must be consulted about permits, permission, or approvals that may be required. If the beach or access to the beach is via private property, the owner of the property must give permission for the project. Written authorization to access the beach must be obtained from the appropriate landowner. The written authorization must include the dates of authorized access, a description of the derelict gear removal operations, the number of persons and types of equipment to be used, the removal methods to be employed and the removal schedule.

If the derelict fishing gear to be removed may be of identifiable tribal origin, the appropriate tribal government must be contacted prior to the removal. If the gear is known to be identifiable as tribally owned, it is not considered derelict gear (removal of derelict gear is defined as occurring when the ownership of the gear can not be determined in advance). If there is a possibility that the gear may be identified as tribally owned after it is recovered (as for some types of pot gear), the plan must include the mechanism to allow tribal members to reclaim the marked gear in compliance with Federal Admiralty Law and/or Washington State Uniform Unclaimed Property Act (Chapter 63.29 RCW).

If the gear removal operation is occurring on tribal lands or tribally owned shellfish beds, written permission from the appropriate tribal government to conduct the operation must be included in the plan submitted.

If and when the derelict gear removal plan is deemed to be in accordance with the guidelines by WDFW, notification providing the schedule and location of activities must be given to the WDFW (360 902-2700) one week prior to undertaking any derelict gear removal activities.

Derelict fishing gear removal operations targeting a specific gear type such as gillnets or pots should not be conducted during an active tribal or non-tribal fishing opening for that gear type in order to avoid the accidental recovery of legal fishing gear. Longline fishing (and some types of pot fishing) may be open all year round in some parts of the state. If these types of gear are encountered in areas with no closed season, removal shall not fall under these guidelines.

Derelict fishing gear, including pots and nets, may be marked such that the original owner can be identified. The marking may be on the gear or buoys associated with the gear. Buoys for fixed nets are required to carry some ownership identification. Gear itself (especially pots) may also have some indication of ownership such as a numeric code on a tag or a color-coding that can be traced to an owner. Recovery of such gear may fall under federal Admiralty Law and/or Washington State Uniform Unclaimed Property Act. Where applicable, these laws must be complied during any derelict fishing gear removal operations and may require identifying the original owner of the fishing gear and providing him/her with an opportunity to reclaim the recovered gear. The method of compliance with these regulations must be addressed in the derelict fishing gear removal plan.

In developing contracts and arrangements with organizations such as salvage companies or other competent parties to conduct gear removal, payment should be related to the time the organization works rather than to the amount of gear removed. The alternative, a per gear bounty arrangement, may encourage inadequate attention to safety and environmental protection measures since safe, environmentally sound removal may take more time per gear unit. In order to assure safe, environmentally sound derelict fishing gear removal, organizations contracting on their behalf for derelict fishing gear removal operations should arrange a fixed price or daily fee basis of payment.

## Environmental Issues

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Care must be taken to prevent damage to marine habitat and loss of marine species during the derelict gear removal operation. In some cases where damage to the environment from the removal operation will exceed the damage caused by the gear, it is more appropriate to leave the derelict gear in place or to disable the derelict gear in place instead of removing it. The derelict gear removal plan should include evaluation of this option, particularly in shallower waters (less than 100 feet deep) where more flexibility in removal operations is possible.

If netting, ropes, or synthetic line have become too deeply incorporated into hard substrate habitat, it is preferable to cut the derelict gear away from the habitat as close as possible to the natural habitat or, perhaps, to bundle it in place in lieu of destroying habitat. For netting, lines, and ropes buried in the sand or gravel in waters shallower than 100 feet that cannot be easily uncovered with simple hand digging, the gear material should be cut as closely to the surface as possible and the remaining buried gear left in place. Under no circumstances are mechanical means (e.g., a winch from the surface) to be employed to dislodge buried, partially buried or entangled derelict fishing gear from marine habitats shallower than 100 feet.

Use of mechanical means (winches, etc.) in these areas can result in recovery of only part of the gear and reduce the chances of successful removal of the rest of the gear later. For example, the portion of a net that can be pulled up using mechanical advantage is often the lead line (and/or cork line if that is still attached). These will often separate from some or all of the netting, leaving the netting (the more dangerous portion of the gear) on the bottom. Without the heavier lines attached, removal of the mesh later will be much more difficult or impossible. In addition to the issues regarding habitat damage and removal success, use of mechanical advantage to pull gear free that is incorporated into the habitat will suspend bottom sediments. Suspension of bottom sediments in the water column must be avoided where such suspension may have a negative impact of nearby marine biota.

While derelict fishing gear may entrap some animals, other animals and marine plants may attempt to use it as habitat. Prior to removing the derelict fishing gear, entangled or associated

live animals and vegetation should be removed if possible and left in place where the gear was encountered.

Retention of fish or shellfish that could be readily removed from the gear is not in accordance with the guidelines.

## Habitats of Concern

Impacts from derelict fishing gear removal to the near shore and beach environments are of special concern, particularly those habitats identified in WAC 220-110-250:

- Surf smelt (*Hypomesus pretiosus*) spawning beds - located in the upper beach area in saltwater areas containing sand and/or gravel bed materials.
- Pacific sand lance (*Ammodytes hexapterus*) spawning beds - located in the upper beach area in saltwater areas containing sand and/or gravel bed materials.
- Rock sole (*Lepidopsetta bilineata*) spawning beds - located in the upper and middle beach area in saltwater areas containing sand and/or gravel bed materials.
- Pacific herring (*Clupea pallasii*) spawning beds occur in lower beach areas and shallow subtidal areas in saltwater areas; and include eelgrass (*Zostera spp*) and other saltwater vegetation and/or other bed materials such as subtidal worm tubes.
- Rockfish (*Sebastes spp*) settlement and nursery areas - located in kelp beds, eelgrass (*Zostera spp*) beds, other saltwater vegetation, and other bed materials.
- Lingcod (*Ophiodon elongatus*) settlement and nursery areas - located in beach and subtidal areas with sand, eelgrass (*Zostera spp*), subtidal worm tubes, and other bed materials.
- Juvenile salmonid (Family salmonidae) migration corridors, and rearing and feeding areas are ubiquitous throughout shallow nearshore saltwater areas of the state.
- The following vegetation is found in many saltwater areas and serves essential functions in the developmental life history of fish or shellfish:
  - Eelgrass (*Zostera spp*);
  - Kelp (Order *Laminariales*);

- Intertidal wetland vascular plants (except noxious weeds).

The local WDFW Area Habitat Biologist must be contacted for information on the presence of the above habitats of special concern in the vicinity of the derelict gear removal project. To obtain the name and phone number of the appropriate WDFW Area Habitat Biologist, please call (360) 902-2534, Habitat Management in Olympia with information regarding the location of the proposed project.

Timing of activities is critical to avoid periods of important use of such habitats. The local WDFW Area Habitat Biologist must be provided with an anticipated schedule of derelict gear removal activities and the type of activities to be conducted. The local WDFW Area Habitat Biologist may provide a window for the work appropriate to minimize impacts to be included in the derelict gear removal plan. This is particularly true for all work in less than 100 feet of water, including intertidal removal (described later in these Guidelines). If no window is available to avoid impact on local resources, the project cannot be conducted in accordance with these guidelines. For example, there are some beaches that have year-round smelt spawning. Intertidal removal of derelict gear on such a beach would require specialized consideration.

Any impact to marine habitat and biota that may occur as a result of the removal of derelict fishing gear must be included in the derelict fishing gear removal plan submitted to WDFW, documented during the removal operation and reported to WDFW after gear removal.

### **Marine Protected Areas**

Marine protected areas (MPAs), underwater parks and preserves may have special habitat protection measures that must be addressed in any derelict fishing gear removal plan. Prior to any derelict fishing gear removal operations being conducted in these areas, WDFW Fish Program in Olympia, (360) 902-2700, should be contacted to establish the location of MPAs in the vicinity of the proposed derelict fishing gear removal location and to determine any special measures required to protect the habitat and species within these areas.

## **Contaminated Sediments**

Removal of partially buried derelict fishing gear in contaminated sediments can re-suspend hazardous materials in the water column or expose them at the surface of the substrate.

Generally, removal of derelict fishing gear in areas of contaminated sediments must not be attempted if disruption of the sediments may occur. Removal of derelict fishing gear in areas of contaminated sediments may require the approval of the appropriate water quality control agencies (The Environmental Protection Agency, EPA, and the Washington Department of Ecology, WDOE) and does not fall within the guidelines.

## **Habitat Restoration**

Negative habitat impacts from derelict fishing gear removal must be avoided if at all possible. However, if the removal of a high priority derelict fishing gear is deemed necessary by WDFW and some negative habitat impacts are anticipated, the removal proponent may be required to include a habitat restoration plan as part of the derelict fishing gear removal plan.

## **Insurance And Liability Issues**

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Any organization that undertakes derelict fishing gear removal and disposal activities should have proper insurance coverage for the participants as required by the State of Washington and the federal government.

# **Derelict Gear Removal And Disposal Plan**

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Prior to undertaking any derelict fishing gear removal operation, the removal proponents must develop a Derelict Fishing Gear Removal and Disposal Plan following the guidelines in this document. The Plan must include information regarding:

1. Who will be sponsoring and participating in the gear removal operation and their qualifications/experience;
2. Where the removal operation will be conducted (in latitude and longitude to the nearest second or GPS coordinates to five decimal places);
3. What types of gear will be removed and how it will be identified and located (or how it was identified if already found);
4. The methods, procedures and equipment that will be employed;
5. The environmental impacts of the removal operation;
6. Any required mitigation;
7. All notification, permits, permit waivers sought and verification of legal access from responsible parties, compliance with all other applicable laws including Federal Admiralty Law and/or Washington State Uniform Unclaimed Property Act (Chapter 63.29 RCW);
8. Proposed procedure for documenting and reporting of activities; and
9. Proposed disposal/recycling plans.

## **Derelict Gear Removal Methods**

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There are a variety of methods that can be employed to remove derelict fishing gear. Derelict fishing gear found within the tidal range on beaches can be removed by hand at low tide without the necessity of divers or surface craft. Removal of derelict fishing gear in relatively shallow water (less than 100 ft) should involve divers. Derelict fishing gear in deeper waters may be removed by mechanical means if the precise location of the derelict gear is known by remote operated vehicle or other effective means.

Whatever method is employed to remove derelict fishing gear, above all, the safety of the removal personnel must be considered. The impact of the gear removal operation on the environment must also be considered and weighed against the environmental impact of the derelict fishing gear if not removed. A thorough understanding and implementation of the proper methods and procedures outlined in these guidelines must be employed in any gear removal operation. A derelict gear removal plan must be developed and sanctioned as being in accordance with these guidelines prior to undertaking any derelict gear removal operations.

### **Removal from the Intertidal**

Derelict fishing gear may occur above extreme low tide line and be accessible by foot from the beach or with a shallow draft vessel from the water. The most common type of derelict fishing gear found on beaches are gillnets, ropes, buoys and monofilament fishing line. The derelict fishing gear is often entangled in rocks, woody debris or may be partially buried in sand or gravel. Volunteers can safely conduct removal of derelict fishing gear from beaches if common sense safety precautions are followed. It is also important to contact the proper land management organization (e.g., local park districts, WDFW, DNR, State Parks and Recreation or tribal governments) and/or private landowners to gain written approval to access the property and conduct the operation before undertaking derelict fishing gear removals on beaches. The written authorization must include the dates of authorized access, a description of the derelict gear removal operations, the number of persons and types of equipment to be used, the removal methods to be employed and the removal schedule.

Although beach removal of derelict fishing gear is probably the safest and most straight forward operation for derelict fishing gear removal, certain safety procedures should be followed to assure protection of the participants. Removing derelict fishing gear including gillnets, lines, ropes, and synthetic fishing line typically requires the use of knives or scissors to cut the gear loose from rocks, woody debris or from burial in sand or gravel. Heavy gloves should be worn and people using cutting tools should be instructed in the safe use of these instruments. Scissors are much safer than knives and do an excellent job of cutting most netting materials. A basic medical kit should be available and the location of the nearest emergency hospital should be known in case of an injury.

The beach removal should be scheduled to coordinate with the tidal cycle at the cleanup site. One person should be designated as the derelict fishing gear removal coordinator and assure that other people involved in the removal operation pay attention to the height of the tide during the operation to avoid getting stranded or washed over by the incoming tide. Beach substrate must be sufficiently firm to withstand the repeated traverse involved in the removal operation. Attempting removal from extremely soft sediment beaches can be difficult or dangerous for participants and should be avoided. Hypothermia can result from getting wet and all participants should wear proper clothing including rain gear and rubber boots as necessary.

Derelict fishing gear can be quite heavy and difficult to dislodge on beaches, however, no mechanical advantage equipment (vehicles, winches, come-along, etc.) should be used to dislodge or uncover derelict fishing gear. No heavy equipment (vehicles, etc.) is allowed on the beach below ordinary high water. Care should be taken when using a shallow draft vessel to support beach derelict gear removal operations. Vessel operations must comply with Coast Guard regulations. Large woody debris associated with derelict fishing gear may shift and roll during the removal operation and all participants should stand clear. If holes are dug in the beach using hand tools to uncover buried derelict gear, they must be refilled to prevent injury to someone falling into the hole and to protect marine animals. Refilling holes will cover animals inadvertently exposed during excavation and uncover those that have been buried when beach material was piled up.

## Diver Removal

Diver removal of nets, lines and many other types of derelict fishing gear requires special commercial salvage diving experience and a thorough understanding of the safety and environmental issues of derelict gear removal. Experienced, organized recreational divers with a WDFW approved derelict fishing gear removal plan may conduct recovery of derelict crab and shrimp pots in shallow water. No divers shall undertake any activities beyond their experience and capabilities. All diver safety procedures included in this document for net removal that are appropriate to pot removal should be used.

Review and sanction of the derelict fishing gear removal plan by WDFW does not entail any explicit or implied guarantee of the safety of the participants. That shall be the responsibility of the individuals and proponents of the event.

Recreational divers and inexperienced commercial divers must not attempt the removal of the more dangerous derelict fishing gear such as gillnets, purse seines and aquaculture net pen material. All professional diver operations for the recovery of derelict fishing



gear must comply with OSHA/WISHA safety and equipment requirements (WAC 296-37 and OSHA CFR 29, 1910, Subpart T). Only divers with experience and training in derelict gear removal should attempt the removal of these more dangerous derelict fishing gears. Appendix A to these guidelines may serve as a reference for professional divers planning derelict gear diving operations.

## **Nets, Lines, and Aquaculture Net Pen Material**

Only professional divers in compliance with OSHA/WISHA safety standards should attempt the recovery of derelict fishing nets, lines and aquaculture net pen materials in the water. Divers must minimize disturbance to marine habitats and biota during derelict gear removal operations. In water less than 100 ft deep, divers should hand remove nets and lines from the seabed by cutting away encrusted or severely entangled lines or netting to minimize entanglement of fish or invertebrates. Air lift-bags can be applied to the netting to keep tension on the net as it is freed from the seabed and to float the released netting to the surface. Tying a lift-bag to a bundled net, particularly bundled netting with float or lead lines attached reduces the chance of the air lift-bag tearing out of the netting. Working on the up-current side of the entangled derelict net allows the current to carry the released netting up and away from the diver and improves visibility as sediment released by freeing the netting from the seabed is also carried away by the current.

Note that webbing may be old and fragile enough to tear apart in the hands of the diver when handled as individual strands. However, a small bundle of the netting may still be strong enough to entangle and hold a diver. Even old deteriorated nets can be a hazard underwater.

When one end of the net reaches the surface, the diver may apply a second lift-bag to the bundled net on the seabed to again apply an upward tension to the net. Under some conditions, it may be possible to apply tension on the net from a line to a surface vessel equipped with a net reel or winch as the diver hand releases the net from the seabed. However, in shallow water where divers can work effectively to loosen the net, the winch or reel on the vessel should not be used to mechanically dislodge the net from the seabed. Use of this mechanical force is significant and can dislodge rocks and bottom structure causing damage to the seabed habitat. Additionally, mechanical force may actually reduce the amount of gear recovered by inadvertently separating the lead and/or cork lines from the webbing. The webbing, which is the more dangerous portion of the net, may be more difficult to locate and remove when separated.

Where nets are encountered in shallow water (100 ft or less) but continue into deeper waters, it may be appropriate to use mechanical advantage from the surface to remove as much of the deeper portions of the net as possible. The diver should remove the shallower portions of the

net, loosening them from the habitat. At that time the diver can securely bundle the net including any lead or float. At the deepest portion of the net that can be reached by the diver, a line to the surface should be attached.

Once the diver is safely out of the water, a winch, net reel or the vessel itself can be used to pull as much of the net free from the seabed as possible. The direction of the pull should be parallel to and follow the direction of the net leading into deep water. All attempts should be made to avoid tearing the lead or float line from the net leaving behind the more environmentally damaging webbing material.

Damage to the seabed and biota should be minimized however possible, and any damage that does occur during derelict fishing gear removal should be recorded and reported. Additionally, the amount of any netting left behind should be described and reported, including the location expressed as latitude and longitude to the nearest second or GPS coordinate to five decimal places.

### **Pots and Traps**

Experienced recreational divers may be qualified to recover derelict crab and shrimp pots. The following conditions apply to such a project: the project must be done in accordance with a WDFW approved derelict fishing gear removal plan; the project must include appropriate supervision of the team involved; and the operation must have a safety plan for the team. Some of the safety recommendations included in these guidelines and in Appendix A for other types of gear removal may be of value in developing the safety plan for the proposed operation.

Review and acceptance of the derelict fishing gear removal plan by WDFW does not entail any explicit or implied guarantee of the safety of the participants. That shall be the responsibility of the individuals and proponents of the event. One person should be designated as the supervisor and derelict fishing gear removal coordinator. This person should ensure that all people involved in the removal operation will be functioning within their level of training and ability. Emphasis should be placed on the safety of all participants involved in the removal operation.

It is advisable to reconnoiter for derelict pots or traps using SCUBA, ROV, sonar or other survey methods prior to undertaking actual removal operations. In shallow water operations, dive teams can survey for derelict pots or traps and mark those found with surface floats. The pots can then be removed with air lift-bags or hand positioned grapple. Blind grapple must be avoided.

Derelict pot or trap removal operations cannot be conducted in areas where active commercial pot fisheries are ongoing to reduce conflicts with legally fished pots. If the draft plan has not included a sign-off from all tribes that fish an area and has not incorporated state season information, WDFW may require that the proposed plan be modified to include timing to avoid such seasons.

Many tribal and non-tribal commercial crab pots and some recreational pots have owner identification tags or some sort of coded marking. Federal Admiralty Law and Washington State Uniform Unclaimed Property Act (Chapter 63.29 RCW) may require that the owners of the derelict pots or traps be contacted and provided a reasonable opportunity to recover their lost fishing gear. All derelict fishing gear removal plans must address compliance with these regulations during the removal operation.

### **Surface Craft Derelict Fishing Gear Removal**

Blind grappling from a surface craft is not an acceptable derelict fishing gear removal method. Grappling may do more environmental damage to the marine habitat than leaving the derelict fishing gear in place, depending upon the type and condition of the derelict gear, its location and the type of habitat in which it is located. Grappling can damage marine habitats, particularly rocky reef areas. It can also impact soft bottom habitats and damage or kill bottom dwelling organisms.



Removal of nets by surface craft with no diver support is appropriate only in waters deeper than 100 feet where divers cannot be used to minimize the environmental impact of removal.

Adequate mechanisms for precisely locating the gear and for minimizing the environmental impacts must be included in the plan submitted for the proposed project.

## **Disposal**

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Derelict fishing gear must be disposed of properly, or preferably recycled, after removal from the marine environment. Disposal or recycling arrangements must be made before the removal operation and must be outlined in any derelict fishing gear removal plan. Arrangements will be necessary for transport and final handling of the derelict gear in a timely manner. At the very least, the recycling or disposal company will need the following information about the derelict fishing gear:

1. Type of gear;
2. Length, width, volume or weight of gear;
3. Condition of the gear (bundled, loose, encrusted with algae or other marine life, etc.);
4. Highway transportation requirements (liquid containment, odor problem, containerized, etc.); and
5. Location, date and time of pickup.

Every effort should be made to handle the disposal or recycling of the derelict fishing gear in a timely manner since organic materials on the gear can cause an odor or even a public health issue the longer the gear is exposed out of water. As much of the sediment and organic matter as possible must be removed from the derelict fishing gear and returned to the marine environment in the vicinity of the removal site to reduce the weight and organic contamination of the gear.

In most cases, if the derelict fishing gear has been in the marine environment for any significant amount of time, it will have significant growth of algae and other marine plants and animals and will very likely be difficult to recycle. Clean gillnets and purse seine nets, ropes, lines and monofilament line can be recycled at several of Washington's commercial fishing ports.

However, prior arrangements must be made and only gear that meets the recycler's specifications should be delivered. Some nets and pots may be of commercial value and can be identified regarding the owner. The fisher that originally lost the gear must have an opportunity to reclaim the gear. Sale or donation of the gear would be contingent upon appropriate compliance with Admiralty Law and/or Washington State Uniform Unclaimed Property Act (Chapter 63.29 RCW).

However, most derelict fishing gear will be of such condition that disposal is the only alternative. Prior arrangements must be made with a municipal, county or private company for disposal of derelict fishing gear. The disposal entity must be made fully aware of the type, volume and condition of the derelict fishing gear as indicated above and they must agree to handle the derelict fishing gear as delivered.

The derelict fishing gear can be modified to assist in disposal. For example, derelict fishing gear removed from beaches can be cut into manageable pieces and secured in plastic trash bags for easier handling and containment of organic matter. Larger nets can be tightly bundled together to decrease the volume of the material, promote ease in handling, and prevent entanglement of birds and other terrestrial animals prior to being covered in the landfill.

Under no circumstances should derelict fishing gear be disposed of in public disposal containers at parks without prior permission from and coordination with the park maintenance supervisor. Derelict fishing gear must not be dumped or disposed of in any disposal facility that is not properly commissioned and licensed due to the potential health hazard from decaying organic matter on the gear.

## **Record Keeping And Reporting**

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Record keeping and reporting the results of derelict gear removal operations is important to Washington's derelict gear removal program. The collection and reporting of removal and disposal information provides background information on the derelict fishing gear problem and its solution and allows program managers to keep track of derelict gear in Washington's waters. Information from a number of derelict fishing gear removal operations will allow for analysis of the derelict gear problem, and provide the basis for strategic efforts to reduce the loss of fishing gear and to assure timely removal of derelict gear.

The following list is a guideline regarding the type of data that should be collected and reported to WDFW for any gear removal operation. Unless other arrangements are made, the post-recovery report is due to the agency within 60 days of completion of the operation or every six months if the project is of long duration. The type of data is as follows:

1. Participation (organizations and individuals);
2. What organization conducted the removal operation;
3. List of participants;
4. Sponsoring organization;
5. Disposal entity;
6. Cost of removal and disposal (as much detail as possible);
7. Date and Time:
  - Date(s) and time of removal,
  - Hours of effort and number of individuals,
  - Disposal date and time;
8. Location:
  - Latitude and longitude of removal location(s) (to the nearest second) or GPS coordinates (to five decimal places),
  - General description of location (i.e. reef off Reed Harbor on Stuart Island),
  - Depth range of gear,
  - Habitat type (soft bottom, rocky reef);
9. Nature of Derelict Gear Removed:

WDFW derelict gear database gear report ID number (if the gear was previously registered in the WDFW derelict fishing gear database),

Type(s) of gear,

Number, volume, weight, length of gear removed,

Condition of gear (frayed, brittle, etc.),

Shape (balled, draped, floating, roped),

Estimated age of lost gear;

10. Removal Method(s) Employed:

Type of removal (describe procedures),

Equipment used (vessels, vehicles, hand tools),

Problems encountered,

Suggestions for improvement in method;

11. Environmental Consequences:

List of entrapped or entangled animals (species & estimated number),

Data on dead animals (species & estimated number),

Degree of incorporation of the gear into the environment,

Threat of the gear to humans, surface craft, animals,

Environmental impact of removal;

12. Type, volume and condition of any derelict fishing gear that was not removed; and

13. Disposal Method:

Returned: to whom,

Recycled: where and how,

Disposal: where and how.

# Appendix A

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## Example Diving Protocol For Derelict Net Removal

*This document is included as a general reference for companies planning removal of derelict nets using diving operations and funding agencies that need guidelines when establishing contracts with diving companies.*

### General

All diving operations must be in compliance with the diving safety requirements of the appropriate State (WISHA) or Federal (OSHA) Agency.

### Training

Dive team members participating in derelict net removal operations shall hold a commercial diving certification from a recognized commercial or military diving training facility or documented diving experience in the performance of debris removal or equivalent activities. Additionally, working in and around nets requires unique skills. At a minimum, dive team members shall have experience working in confined space environments and/or overhead obstructions. All personnel associated with the diving operation shall have current training in CPR, first aid, and emergency oxygen administration.

### Depth

This document assumes that diving operations will be confined to depths less than 100 feet of water and within the no-decompression limits of the US Navy Standard Air Tables. Dives greater than this depth and/or dive times exceeding the no-decompression limits require the presence of on board recompression chamber. Dives involving mixed gas and/or saturation diving are beyond the scope of this document and require special consideration.

## **Dive Team**

At a minimum, the dive team will be composed of one (1) diver working the net, one (1) support diver standing off the net (to assist the working diver if entanglement occurs), one (1) stand-by diver (suited and ready to enter the water within one (1) minute of notification to provide immediate assistance in the event additional help is required), and one (1) diving supervisor. If the vessel is to be moored, the diving supervisor and skipper can be the same individual (provided that the skipper is qualified to be the diving supervisor).

## **Dive Platform**

The vessel must be secured by a minimum of a two point mooring system. The position of the vessel must allow easy access to the work site and easy evacuation of an injured diver. A small chase boat will be in the water and available to retrieve any SCUBA divers that surface away from the moored vessel. Live boating should be avoided during the removal operation due to the difficulties it poses to surface supplied air diving. Live boating may be desired during the pre-removal inspection dive phase of the operation when SCUBA is employed. A net retrieval vessel shall be independent of the diving platform. All vessels involved in the operation will take their direction from the diving supervisor on the diving platform.

## **Equipment**

Diving mode is variable to the type of net, the nets condition and the environmental factors at the diving site. SCUBA and surface supplied diving modes are both appropriate. If SCUBA is chosen as the desired mode, the stand-by diver will have surface supplied air available to him/her in the case of an entanglement event. Typical gear requirements for either of these modes will apply. Additional considerations will be given to the following:

### **Communications**

All members of the dive team will use functional hardwire or wireless communications systems. Additionally, a surface communication box will allow the diving supervisor to

communicate with all divers. Communications will be “round robin”, allowing contact between all divers and surface personnel without the potential problems of relaying messages. The diving supervisor will also have direct communications to the skipper of all vessels involved in the removal operations.

### **Knives/Cutting Instruments**

All members of the dive team will have three sharp and well maintained, cutting instruments. The primary blade will be appropriate to the type of mesh that is being removed. The secondary blade should be located in a position that will allow easy access by the working diver. The tertiary blade will be appropriate for the cutting of wire, lead line or heavier cordage. It should also be located in such a way as to allow easy access by the working diver. Additionally, EMT sheers or seatbelt cutters are often excellent tools for net removal operations.

### **Redundant Air Systems**

All divers will have a redundant air supply, regardless of mode, carried on their person. It shall be located in such a way to allow easy access in the event of an emergency or entanglement event. It shall allow a sufficient air supply to sustain life until arrival of the surface supplied stand-by diver. The surface supplied stand-by diver will have attached to his/her manifold block a long hose “safe second” stage (a.k.a. octopus) that will be capable of providing continuous air to the entangled diver during the extrication.

### **Straps, Gear Clips, Hoses/Umbilicals**

Fin and mask straps will be taped or secured in such a way as to avoid net entanglement. Hoses/Umbilicals shall be tended in a manner that will minimize the chance of entanglement. Gear clips, that have a high likelihood of becoming caught on the net, shall be removed.

### **First Aid/Oxygen Kit**

An appropriate diving first aid kit will be available on all vessels participating in the net removal operation. Additionally, an emergency oxygen kit capable of providing

therapeutic flow rates over the time needed to get an injured diver to the nearest emergency facility will be on site. At least one (1) individual, located topside, shall be trained and capable of administering first aid, CPR, and oxygen.

## **Procedures**

### **Pre-removal Inspection Dive(s)**

A pre-removal inspection dive(s) will be done during tidal periods similar to those predicted during the time of the removal operation. Since no actual contact with the net will be allowed during this phase, normal SCUBA or surface supplied diving protocols will be allowed. However, equipment must be available to effect a diver rescue in the event an entanglement should occur. Communications requirements outlined above will be mandated in the inspection phase. It is critical that all individuals who will be diving in the removal operation be allowed to participate in the pre-removal inspection dive. Critical information on type of net, size of net, type of entanglement, depth, current, and information regarding other underwater hazards be noted and recorded from these dives.

### **Pre-removal Briefing**

Based on information obtained in the inspection dive(s), a discussion involving all members of the dive team will be conducted the day of the removal operation. A written dive plan for removal (including depth, bottom time, removal strategy and emergency procedures) will be established and assignments will be allocated. All concerns of the dive team members will be addressed in this written plan.

### **Removal Operation**

During the removal operation the dive team may choose any of the following methods or combination of methods in securing and removing the net:

#### **Bundling**

The working diver bundles small (4 to 10 foot) sections of the net and secures them with rope lanyards or cable ties. Each bundle should be secured at multiple

points along its length. The bundle may then be cut free of the remaining net. A lift-bag appropriate to the task may be securely attached to the bundle. The bag may be filled using a remote air supply (not physically attached to the working diver). A separate recovery vessel should retrieve these bundles as they arrive at the surface. Divers should be alerted via the communications system as the bundles arrive at the surface. Work on the net should be suspended until successful recovery of the bundle is confirmed via the communications system.

### **Unzipping**

For nets that are “flagging” in the water column, the working diver may securely attach an appropriate lift-bag to a location near the first point of entanglement. The lift-bag should be filled using a remote air supply (not physically attached to the working diver). The bag should be filled in such a manner as to exert a pulling force on the entangled portion of the net. The working diver should then use his/her cutting edge to slowly free the net, web by web, from the entanglement, effectively “unzipping” the net from the bottom. As more net is freed from the bottom, it may be necessary to attach additional lift-bags to deal with the load. The working diver and support diver should be constantly communicating the position of the freed section during the operation. Once the lift-bag attached to the freed section of net reaches the surface, or a manageable section of net has been freed, the working diver should cut it free from the rest of the net.

Because of the drape effect of the two free ends of this long section of net, all divers should be removed from the water prior to the retrieval by the dedicated retrieval vessel.

### **Neutralizing**

Every effort should be made to remove nets that can be successfully bundled. However, for nets that are hopelessly entangled in complex habitat, the preferred option may be to simply neutralize the net. This involves securing and bundling sections of net so that their impact on marine life will be minimized. Plastic cable

ties are the preferred method of bundling or securing a net that cannot be removed. A large number of plastic cable ties will ensure that sections do not become active at later dates. Loose ends should be secured and fixed to the bottom.

### **Untouchables**

Nets that have become spread open across large areas of bottom and encrusted by marine life might be best left alone depending on their lethality. These nets have become such an integral part of the substrate that to remove them might damage habitat and potentially reactivate sections that were benign. Small parts of web that have draped across channels or spaces between rocks can be carefully cut away to reduce the potential impacts on marine life.

### **Entanglement**

In the event of entanglement, the affected diver should raise both hands to visually signal that he/she is trapped. Simultaneously the diver should verbally communicate the situation with information on the probable location of the entanglement. The support diver should move carefully into the working diver to evaluate the extent of the entanglement. If a simple remedy is possible, the support diver should effect release of the working diver, move back into position and removal operations can continue.

If the entanglement is critical, the stand-by diver should be deployed on surface supplied air to assist the entangled diver. The stand-by diver should immediately evaluate the air supply of the entangled diver and communicate the availability of continuous air from the safe second stage attached to the manifold block. When practical, the support diver may act as back up to the stand-by diver until the working diver is released. In severe cases it may be required that the working diver is removed with a small section of the net and the entanglement dealt with on the surface.

If more than one team is working on the net during an entanglement event, all work should be terminated and all divers not immediately involved in the entanglement extrication should be recalled to the surface. The diving supervisor should monitor the

progress of the extraction and hold the recalled divers in reserve in the event of a prolonged extrication.

Decompression status of the in-water personnel needs to be calculated and updated continuously during a prolonged extrication.

A severe entanglement should result in the temporary termination of the removal operation until the incident can be discussed and a plan put in place to minimize the reoccurrence.

### **Aborting Dives**

All divers have a responsibility to terminate diving operations when, in their experience or training, conditions exist that are likely to cause serious physical harm or significant risk to divers in the water. Once the decision is made to terminate a dive by one member of a dive team, all divers should be recalled until the situation is evaluated and a solution determined.

### **Post-Operation De-briefing**

Once the operation has been completed all dive team members should participate in a de-briefing. Careful notes/minutes of this meeting should be taken and attached to the diving log for the days diving activity. Information on bottom time, maximum depth, amount of net removed, unforeseen problems, the effect of current on the operation, habitat encountered (what entangled the net), number of diver entanglements, post dive condition of divers, and any additional safety concerns should be noted. These notes can be used in planning future operations.