



**M e m o r a n d u m**  
**Oregon Department of Fish and Wildlife**

**Date:** January 12, 2018

**To:** Chief, Operations Division  
Portland District  
U.S. Army Corps of Engineers  
P.O. Box 2946  
Portland, Oregon 97208-2946

**From:** Bryan Wright, Oregon Department of Fish and Wildlife  
Steven Jeffries, Washington Department of Fish and Wildlife  
Doug Hatch, Columbia River Intertribal Fish Commission

**Subject:** Research Packet – Project Impacts Document

Enclosed is our request to conduct sea lion capture, marking, tracking, hazing, and removal operations in the Boat Restricted Zone at Bonneville Dam in 2018.

The work we are proposing for 2018 has not changed significantly from that conducted in recent years. Our Bonneville Project contact for this work is Ben Hausmann. Please contact Ben or myself if you have questions or need additional information on our work. Thank you for your assistance.

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**RESEARCH PACKET – PROJECT IMPACTS DOCUMENT**

**CAPTURE, MARKING, TRACKING, HAZING AND REMOVAL OF SEA LIONS  
TO REDUCE PREDATION ON SALMONIDS  
IN THE BONNEVILLE PROJECT BOAT RESTRICTED ZONE  
IN 2018**

Oregon Department of Fish and Wildlife  
Washington Department of Fish and Wildlife  
Columbia River Intertribal Fish Commission  
Pacific States Marine Fisheries Commission  
National Marine Fisheries Service

January 12, 2018

**CAPTURE, MARKING, TRACKING, HAZING AND REMOVAL OF SEA LIONS  
TO REDUCE PREDATION ON SALMONIDS  
IN THE BONNEVILLE PROJECT BOAT RESTRICTED ZONE  
IN 2018**

**BACKGROUND**

Prior to the early 2000s, sea lions were rarely seen near Bonneville Dam. Since that time sea lion numbers and foraging activity in the area have increased significantly. The U.S. Army Corps of Engineers (USACE) Fisheries Field Unit at Bonneville Dam has documented the abundance of California sea lions (CSL) and Steller sea lions (SSL) and the levels of predation on salmonids and sturgeon in the tailrace Boat Restricted Zone (BRZ) since 2002. USACE observations have shown that many of these sea lions are identifiable individuals which have returned year after year to repeatedly forage near the dam.

Concern over this relatively new source of mortality of adult salmonids, particularly those listed as threatened or endangered under the Endangered Species Act, has been expressed by resource managers at USACE, Bonneville Power Administration, National Marine Fisheries Service (NMFS), Oregon Department of Fish and Wildlife (ODFW), Washington Department of Fish and Wildlife (WDFW), Idaho Department of Fish and Game, and Columbia River Intertribal Fish Commission (CRITFC) among others. An extensive history of the project can be found at the West Coast Region website of NOAA Fisheries<sup>1</sup>. The purpose of the following information is to describe the pinniped research and management activities to be conducted in and around the BRZ in 2018 by ODFW, WDFW, CRITFC, PSMFC, and NMFS.

**OBJECTIVES**

- 1) Capture and permanently remove individual predatory CSL from the Bonneville Dam area as permitted under Marine Mammal Protection Act (MMPA) Section 120 Authority granted to the States by NMFS.
- 2) Increase the proportion of marked CSL and SSL found in the Bonneville Dam area.
- 3) Improve our understanding of salmonid predation levels below Bonneville Dam.
- 4) Increase our sea lion food habits and prey genetics databases.
- 5) Minimize predation and limit the recruitment of new pinniped predators to the area below Bonneville Dam by use of non-lethal hazing activities.

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<sup>1</sup> [http://www.westcoast.fisheries.noaa.gov/protected\\_species/marine\\_mammals/authorized\\_states.html](http://www.westcoast.fisheries.noaa.gov/protected_species/marine_mammals/authorized_states.html)

## METHODS

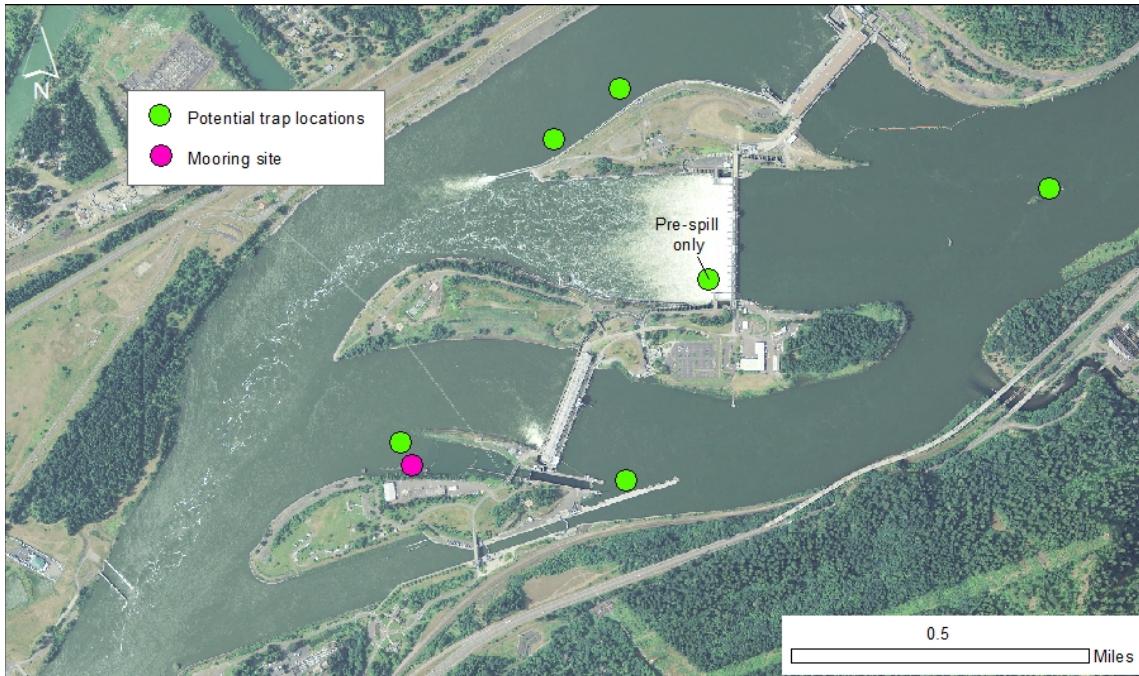
Objectives 1 and 2. Capture and permanently mark as many CSL and SSL found in the BRZ as possible during March, April and May. Knowing CSL as individual salmonid predators is prerequisite to lethally removing them under Section 120 of the MMPA. In addition, increasing the number of permanently marked CSL and SSL found in the Bonneville area will aid in predation observations, estimation of sea lion abundance, and evaluation of salmonid losses. The ability to capture CSL at Bonneville Dam is essential to the States' request to NMFS for lethal removal authority. Capture and transfer to permanent holding facilities will be the first option for removal of individual CSL predators. When permanent captivity options are not available, predatory CSL will be captured and chemically euthanized. Finally, selective use of gunshot, as allowed under the MMPA Section 120 removal authority and as approved in consultation with USACE Bonneville Project staff and other agencies involved, may be used when capture options for individual predators are not effective.

Between January and March 2018, prior to the arrival of most CSL at Bonneville Dam, we will anchor our floating sea lion traps in areas where CSL and SSL are typically found resting in the water or hauled out on structures. These traps and our sea lion handling barge are currently moored below the old navigation lock on the south side of PH1.

Active trapping operations may begin in late March and continue through May.

Placement of additional traps and movement of traps to increase opportunities for sea lion captures may take place at any time during the year. Traps may be located above the dam in the forebay area, in the area immediately below the spillway (prior to spill operations), below the old navigation lock near PH1, and along the Corner Collector wall below PH2 (see figure below). Traps will be temporarily anchored to the bottom during capture operations and may be removed to moorings below the old navigation lock at the end of the spring season. One or more traps may be redeployed in the fall of 2018 if CSL are observed preying on fall migrating salmonids.

As was done in previous years, once trapping efforts begin in late March, the traps will be monitored regularly day and night by our project staff and by USACE, USDA, Bonneville security, and Park Ranger staff. We will also use field cameras and sensors to remotely monitor the status of trap doors and animal presence. CSLs that have been identified for removal under the States' authorization from NMFS will be transferred to permanent holding facilities (if available) or euthanized using drugs. Options for use of firearms to remove predatory CSLs will be considered in consultation with all parties and according to guidelines developed jointly with USACE and law enforcement. Unknown animals that are captured will be marked and may be tagged for tracking purposes. While some newly marked sea lions may be relocated to other locations during the study period, most as yet unidentified predatory sea lions will be released on-site. Any marked CSLs later observed preying on salmonids will be identified as candidates for removal under the State's MMPA Section 120 authority.



We will use our outboard-powered sea lion handling barge with a platform scale, cages and equipment for handling and marking sea lions in the BRZ. This barge, along with our other vessels, will be used to expedite the removal of captured CSLs. The barge containing sea lions to be removed from the area (or for specific research purposes) is typically locked above the dam early in the morning for transfer of animals to cages in trucks at the gravel boat ramp behind the service building. We may occasionally request the assistance of the USACE rigging crew for animal removal from water to land or for removal of equipment from the water for maintenance operations on land. At the end of the season, the barge and traps would be moved to the mooring site below the old navigation lock (see figure above).

As in previous years, we will require access to and use of work space inside a building with a ceiling high enough to operate a forklift to its full height. For the past two years we have been working in a building located on the upriver, Oregon side of the spillway referred to as "Windy Welder". This location worked very well for us and we hope to conduct project operations at this site again in 2018 and beyond. We have trained forklift operators and will request the use of a forklift several days of each week to move animals and cages between trucks, trailers and the work building.

**Objective 3.** Apply tracking or bio-sampling devices to a sub-sample of the CSL and SSL captured at Bonneville Dam to track movements and describe foraging behaviors near the dam and in the lower Columbia River.

We may deploy various instruments to sea lions captured at Bonneville Dam in the spring of 2018. Monitoring of sea lion activities, in conjunction with USACE predation observations and non-lethal hazing efforts would continue through May of 2018. Data on individual animal activity patterns, movements, and foraging behaviors within the study

area will be recorded and analyzed. Tracking of sea lions in the area of the dam can provide information on movements at night related to foraging and allow an evaluation of the percentage of time that individual predators feed in areas that can be observed by USACE staff versus foraging behaviors that occur in other areas.

**Objective 4.** Collect scats (fecal samples) from all areas where sea lions haul out within the BRZ for food habits analysis and genetic identification of salmonid stocks consumed.

As in previous years, we plan to collect sea lion fecal samples as frequently as possible during 2018. These collections will be accomplished primarily from boats, but may also include shore-accessed areas in coordination with USACE staff. Individual samples will be bagged, labeled and frozen for analysis. Sea lion prey identification will be conducted by ODFW and WDFW staff and genetic analyses will be conducted by CRITFC staff. Any coded wire fish tags recovered will be reported to the appropriate parties.

**Objective 5.** Assist with non-lethal hazing activities to be conducted by USACE-USDA (on shore) and CRITFC (boat-based). Conduct limited non-lethal hazing (shore and boat-based) in conjunction with trapping operations and lethal removal.

Non-lethal hazing efforts to deter pinnipeds from foraging in the BRZ have not been highly successful in the past. However some level of non-lethal hazing is likely to continue as required by our NMFS CSL removal authority and in hopes of deterring any newly arriving predators that have not become acclimated to hazing efforts. We feel that some level of shore-based hazing near fishways is important and we support the continuation of this activity by USACE and USDA Wildlife Services staff. All hazing efforts will be coordinated directly with USACE and with USDA Wildlife Services.

Use of the non-lethal hazing tools will be carried out as outlined in recommendations made by FPOM in 2007. All interactions with sea lions and hazing efforts conducted will be recorded as they occur and summarized in a project report (prepared by ODFW, WDFW, and CRITFC).

## **JUSTIFICATION OF THE PROPOSED STUDY AREA**

Much of the justification for this project is described in the background section of this document. Since Bonneville Dam is the first major restriction to fish passage on the mainstem lower Columbia River (RM145), it is the location where most pinniped predation activity is likely to occur. Several years of preliminary work on this issue has been carried out at this location documenting the problem and evaluating various tools and approaches to reducing salmonid losses caused by pinniped predation. Bonneville Dam is the site identified in the States' Section 120 request to NMFS for lethal removal authority. The ability to capture and remove sea lions in this area was demonstrated by the trapping operations conducted in 2007-2017.

## **SCHE**ULE

Planning, operations, and safety training. In consultation with Bonneville Project and USACE Fisheries Field Unit staff we will schedule planning meetings, training, and safety reviews prior to the initiation of major operations within the BRZ. Our first meeting with key project typically occurs in January or February. We will consult regularly throughout the season with USACE staff on all operations. While the bulk of trapping operations will end by June, other on-water operations in the BRZ (e.g., trap maintenance and any fall trapping activities) will continue through the end of 2018.

Placement and use of sea lion capture floats. We plan to move and anchor the floating sea lion traps into place below the dam (as described above) in March 2018. The traps will be locked closed to prevent use by sea lions until a week or two before trapping operations are scheduled to begin. We will begin capture, marking, and/or removal operations as soon as California sea lions appear in the area and begin using the traps as resting areas. We plan to use our barge to handle and mark the sea lions, but may occasionally request the assistance of the USACE rigging crew for the removal of predatory sea lions to our vehicles on shore. We will be able to provide ample notice of our needs to USACE staff, usually planning at least one day ahead of time. If sea lions are regularly using the trap, we anticipate capture and marking activities to take place 2-4 times per week, depending upon use of the trap by pinnipeds. Spring trapping and marking activities will occur through the end of May. Additional trapping, marking and removal operations may take place in the fall of 2018 if known predatory CSL are observed in the area at that time.

On-water pinniped hazing. Some non-lethal hazing from boats (and shore) focused on increasing trapping opportunities may begin once traps are deployed in early March. Staff involved in this activity will receive all appropriate training for these operations. Additional boat-based hazing activities directed toward CSL may take place through May. All boat-based hazing activities in the BRZ will be coordinated daily with Control Room staff, USACE Fisheries Field Unit personnel, and USDA Wildlife Services staff conducting hazing activities from the project facilities. VHF-radio contact will be maintained with Control Room staff are active in the BRZ.

### Trapping operations

Spring 2018 sea lion trapping and handling activities will begin in late March and continue through late May. Trapping operations in the Bonneville Pool may occur on an unpredictable basis depending upon use of traps by sea lions. All trapping operations will be coordinated with Bonneville Project staff and Control Room personnel.

In recent years, a small number of predatory CSL have been observed foraging for salmonids in the BRZ during fall months. We plan to be ready to capture and remove known individual predatory sea lions using the traps at any time of the year. This may necessitate redeploying the traps to alternate locations in the fall to entice the sea lions to

use them as resting areas. The timing and locations for this deployment will be determined by the presence and behaviors of the sea lions in the fall of 2018.

Removal of individual predatory sea lions.

Removal of predatory CSL would begin as soon as the animals arrive at Bonneville Dam, usually in late March or early April. As in previous years, we will coordinate these activities with USACE, NMFS, federal, state and local law enforcement, and others with respect to capture, relocation, removal, temporary holding, transportation of live animals, collection of biological specimens, and safety and security needs. We will schedule and hold project evaluation meetings on trapping and removal operations, and all other activities, as necessary through the end of the calendar year.

Scat (fecal) sample collections. We plan to collect fecal samples from any haul-out site used by pinnipeds within the BRZ that are accessible from shore or by boat, whenever staff are available and samples are likely to be found, throughout the year.

## **FACILITIES AND EQUIPMENT REQUIREMENTS**

Movement and mooring of the traps in the water will be conducted by our project staff and vessels. At the end of the project we request permission to moor the traps and handling barge against the existing pilings and in the dead water area below the old navigation lock on the south side of PH1.

When sea lions identified for removal are captured we will request to barge these animals through the navigation lock and above the forebay to the gravel ramp behind the Bonneville service building. We have successfully used this ramp over many years to launch and retrieve boats, equipment, and sea lions. On occasion we may request assistance from the Bonneville rigging crew to remove individual predatory sea lions from our handling barge on the water to our transport vehicles on shore or to remove equipment (e.g. traps or barge) from the water for maintenance. We expect trapping to occur 2-4 days per week and will make every attempt to schedule particular days for this activity so that we minimize conflicts with other project work.

We request permission to moor one vessel at the dock below the navigation lock on a daily basis, as in previous years. Having a boat at this location is essential for quick access to our other vessels moored below the old navigation lock and our traps. This is particularly important for pre-dawn capture operations, security, and the ability to quickly respond to any emergency situation involving the traps. We will make every effort to keep our boat on the inside of this dock (except during extremely low water conditions). Our other boats and barge will be moored at the log booms below the old navigation lock.

We will require access for our staff to enter and leave both the Oregon and Washington sides of the facility on a daily basis. We request access to the project at night, primarily late evening and pre-dawn hours, to monitor and operate the sea lion traps. In recent years, our most successful trapping has occurred during the two hour period before

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daylight. We will contact Bonneville Control upon entry to the project during these hours.

There may be additional needs related to removal of live or dead sea lions (e.g., use of a fork lift and work space). We will plan to use the immediate area and building at the “Windy Welder” location for handling sea lions to be euthanized and examined post-mortem. Additional requests for assistance or equipment will be discussed with Bonneville Project staff as needed during the work season.

## **PROJECT IMPACTS**

### **Project Services**

Our staff will need security access to both sides of the Bonneville Project on a daily basis from January 1 – December 31, 2018. We request permission to operate our vehicles on the project to access our sea lion capture equipment (Cascades Island), Service Building boat ramp area (Bradford Island) and moored vessels below the navigation lock (Robins Island). All project staff will require USACE identification badges. Hard keys to access locked areas will be limited to select project staff.

### **Security**

Since our sea lion capture operations will take place in the BRZ, these activities and equipment will be secure from public access. Our vessels will be used daily in the BRZ and secured nightly at the mooring dock below the navigation lock (one boat) and below the old navigation lock (2 boats and barge). Standard sea lion capture, marking, and release operations should not require additional security. However, increased security including staff from the States’ Fish & Wildlife law enforcement teams may be used during any permanent removal operations (e.g., transfer to captivity or lethal removal). At least a moderate level of public interest can be expected, including the potential for protests by some groups opposed to permanent removal operations.

### **Safety**

#### **General**

All project staff will read the Corps of Engineers General Safety Requirements Manual (#385-1-1). All staff will receive a safety briefing by USACE staff and a complete orientation of the project, including identification of hazards on land and in the water.

#### **BRZ Boat Operations**

In addition to the standard review of safe boat operations in the BRZ provided by Ben Hausmann (Bonneville Project), state agency staff will provide boat operators and crew with a thorough briefing to include the following: safety equipment checklists, vessel safety checks, review of appropriate clothing and use of floatation gear, radio communication checks (in and out of BRZ) with Bonneville Control, other communication methods and protocols (e.g. cell phones, contact names and numbers),

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procedures for reporting an emergency, “man over board” equipment and procedures review, etc. We will conduct in-season safety reviews and discussions among our staffs and at the request of Bonneville Project staff to review specific issues that arise during the year.

**Sea lion handling**

At the suggestion of Bonneville Project management in 2009, we added additional precautionary actions to our Job Hazard Analysis for handling sea lion cages with cranes. These include restricting access to the work area to all but the essential crew members and insuring the use of hard hats by our staff.

**Job Hazard Analyses**

The Job and Activity Hazard Analyses for activities related to this work are attached to this document.

**Accident Prevention Plan**

An Accident Prevention Plan is included with this application.

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**LIST OF BOATS, PERSONNEL AND VEHICLES**

REG.	NAME	LENGTH/MAKE	AGENCY	POC
R-4	Research 4	24' Almar	WDFW	Jeffries, Steve
R-5	Research 5	24' Almar	ODFW	Wright, Bryan
R-6	Research 6	22' Boston Whaler	ODFW	Wright, Bryan
R-7	Research 7	19' Boston Whaler	WDFW	Jeffries, Steve
OR 997UB	Duckworth	21' Duckworth	ODFW	Wright, Bryan
WDFW 539	WDFW 539	25' TuffBoat	WDFW	Jeffries, Steve
WDFW 501	WDFW 501	21' North River	WDFW	Jeffries, Steve
WDFW 31	WDFW 31	22' North River	WDFW	Jeffries, Steve
WDFW 901	WDFW 901	22' Boston Whaler	WDFW	Jeffries, Steve
CRITFC 1	CRITFC 1	22' Sea Dory	CRITFC	Hatch, Doug
CRITFC 4	CRITFC 4	26' Pacific Boats	CRITFC	Hatch, Doug

NAME	AGENCY	ACTIVITY
Brown, Robin	ODFW	BRZ Boat Ops, Sea Lion Captures
Jeffries, Steve	WDFW	" "
Wright, Bryan	ODFW	" "
Riemer, Susan	ODFW	" "
Jonker, Sandra	WDFW	" "
Brown, Mike	ODFW	" "
Shay Valentine	PSMFC	" "
Oliver, Josh	WDFW	" "
Lambourn, Dyanna	WDFW	" "
Heiner, Dan	PSMFC	" "
Hatch, Doug	CRITFC	" "
Whitaker, John	CRITFC	" "
Begay, Bobby	CRITFC	" "
Newell, Jeremiah	CRITFC	" "
Ikemoto, Aaron	CRITFC	" "
Seasonal staff	CRITFC	" "
Burco, Julia	ODFW	Veterinarian
Colin Gillin	ODFW	Veterinarian
Kristin Mansfield	WDFW	Veterinarian
Kathryn Prager	UCLA	Veterinarian

LICENSE	ST	DESCRIPTION	COLOR	AGENCY	POC
E270481	OR	Ford PU	White	ODFW	Wright, Bryan
E254783	OR	Ford PU	White	ODFW	Wright, Bryan
2633M	WA	Ford PU	Green	WDFW	Jeffries, Steve
1033M	WA	Ford PU	Green	WDFW	Jeffries, Steve
5840M	WA	Dodge PU	Green	WDFW	Jeffries, Steve
US Gov	US	Chev PU	White	NMFS	Gearin, Pat
G62 1465N	Fed	Dodge PU	Brown	CRITFC	Hatch, Doug

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G62 4027R	Fed	Dodge PU	Blue	CRITFC	Hatch, Doug
G62 2258P	Fed	Chevy PU	Brown	CRITFC	Hatch, Doug

### **BRZ Access Request**

Number: **2018-**

Date Requested: 01/12/18

Title: Sea lion capture, marking, tracking, hazing and removal in the BRZ

Project Point of Contact: Ben Hausmann

Requested By: ODFW, WDFW

Requester Point of Contact: Bryan Wright (ODFW); Steve Jeffries (WDFW)

Scope of work: Perform sea lion capture, marking, tracking, hazing, and removal operations in the BRZ to reduce predation losses of salmonids.

Schedule for 2018: Deployment of sea lion traps is planned for early March. Limited boat-based sea lion hazing activities in the BRZ may begin once traps are deployed. Boat operations in the BRZ to capture sea lions is expected to occur 2-4 days per week from March through May. Boat operations to conduct maintenance or to move sea lion traps may occur at any time during 2018, including all areas of the BRZ tailrace and forebay. Deployment and operation of sea lion trap(s) may also take place during September through December 2018 if predatory sea lions are observed in the BRZ as they were in the fall. Some level of boat operation in the BRZ related to the above tasks is requested for the 2018 calendar year under this permit.

Map: All areas of BRZ tailraces and forebay.

Boat Operators: ODFW, WDFW, NMFS, PSMFC and CRITFC trained boat operators.

#1 - Robin Brown (541-760-9545)  
#2 - Steve Jeffries (253-390-4963)  
#5 – Bryan Wright (541-760-9543)  
#7 – Dan Heiner  
#8 – Michael Brown (503-867-1457)  
#9 – Josh Oliver  
#10 – John Whitaker (503-475-7649)  
#11 – Bobby Begay (541-980-8380)

Boat Operators (cont.):

#12 – Doug Hatch (503-349-8210)  
#14 - Agnes Strong  
#15 – Jeremiah Newell (503-719-2509)  
#16 – Aaron Ikemoto (503-460-7972)

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Flag Issued: NO

JHA:

AHA:

Radio Frequency: Marine Band 14

Pre Work Safety Meeting: February (TBD) 2018

## JOB AND ACTIVITY HAZARD ANALYSIS: GENERAL OPERATIONS RELATED TO SEA LION TASKS

PRINCIPLE STEPS	POTENTIAL HAZARDS	RECOMMENDED CONTROLS
1. Hazing boat operations in BRZ.	Slip hazards on ramps and docks.	Wear rubber-soled boots and personal flotation at all times.
	Lifting heavy equipment; potential for muscle and back strain.	Never attempt to lift heavy objects alone; use safe lifting techniques such as lifting with legs rather than back.
	Working in severe weather.	Monitor weather forecasts; prepare for severe weather conditions. Wear appropriate layers of warm and waterproof clothing; carry spare dry clothing.
	Working in boats.	Conduct pre-season safety meeting to review all potential hazards, safety concerns, emergency response. Conduct twice monthly safety debriefings of boat crews to identify any new safety issues. Carry Bonneville Project staff (e.g., safety officers) as operations monitors as requested (as least monthly). Use dedicated boat operator with no additional duties at any time. Maintain safe and appropriate speeds and maneuvers as dictated by water conditions, proximity to structures, shorelines, anglers, etc. Wear personal floatation at all times; keep life ring with 50' line available at all times. Maintain VHF marine radio contact with Control Room for reporting emergencies; keep cell phones available and charged, along with emergency phone contact list. Be aware of all BRZ safety hazards such as underwater turbulence near spills and outflows, overhead wires and submerged equipment.
	Use of pyrotechnics; potential for burns, eye and hearing damage.	All staff will receive firearm safety and use training. Gloves will be worn as appropriate. Eye and ear protection will be used at all times. Specific instruction in the use and deployment of various hazing tools will be given to all staff. First aid supplies will be carried at all times.
2. Sea lion trap operations.	Lifting heavy equipment; potential for muscle and back strain.	Never attempt to lift heavy objects alone; use safe lifting techniques such as lifting with legs rather than back.

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PRINCIPLE STEPS	POTENTIAL HAZARDS	RECOMMENDED CONTROLS
	Potential for being struck by falling objects; head or foot injury.	Always wear hardhats and steel-toed boots. Be aware at all times of location of crane, boom and lift cables.
	Sea lion bites.	Only experienced staff will be in close proximity to sea lions, handling boards, and transfer cages. Gloves and protective clothing will be worn.
	Working on boats and trap in the water when sea lions present.	Always wear personal flotation (and safety lines as necessary). Keep life line and throw ring at ready.
3. Scat (fecal) collections.	Working near water.	Personal floatation will be worn at all times.
	Personal sanitation.	Gloves and other appropriate equipment will be used during collection, storage, and processing of samples.

### **JOB HAZARD ANALYSIS: BONNEVILLE SEA LION CAPTURE OPERATIONS**

PRINCIPLE STEPS	POTENTIAL HAZARDS	RECOMMENDED CONTROLS (FROM EM 385-1-1)
1. General boat operations in BRZ	All hazards	All boat operations in BRZ will be conducted under safety guidelines previously described in Job Hazard Analysis submitted for work in 2007 as permitted under BRZ permit Nos. 07-004 and 07-013; PFDs will be worn at all times (see Controls under “General Operations” in previous hazard analysis above).
2. Boat safety specific to capture operations	Collisions, anchor line entanglements, etc., during close operations near trap and other boats	Boats will be operated a very low speeds while near trap, anchor lines and other project vessels; communications between vessels will be maintained via VHF radios on working channel 82
	Man overboard (MOB) from boat or sea lion trap	Upon MOB incident, MOB alert will be relayed to all project staff, boat motors will be placed in neutral gear until whereabouts of MOB is clearly determined; all boats will be equipped with throw life rings, float cushions, safety lines and boat hooks; one boat (R-6 22' open Boston Whaler) is designated as primary MOB recovery boat; other boats will assist as necessary; all staff will receive instructions regarding MOB recovery; in each boat one person on each boat will be designated as lead for MOB recovery (responsible for safety ring, etc.); second person will assist with recovery; third will operate boat ONLY; condition of MOB will be assessed once onboard; if in danger of hypothermia, MOB will be immediately transported to Nav Lock dock for treatment; (emergency medical assistance may be requested); in the event MOB is unconscious, Bonneville Control will be notified immediately, emergency medical assistance will be requested to Oregon side, (Nav Lock dock); crew members will be CPR/First Aid certified

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PRINCIPLE STEPS	POTENTIAL HAZARDS	RECOMMENDED CONTROLS (FROM EM 385-1-1)
3. Working on sea lion trap	Falling in trap	Only experienced staff (10-20 yrs of trap procedure operations) will work on trap; there are multiple staff from ODFW, WDFW, and NMFS with this experience and will be so-designated; PFDs and hard hats will be worn at all times; crew on trap will be in VHF radio communications with boats and crane operation crew on shore; any injuries will be assessed immediately and appropriate medical response will be taken (e.g. first aid and/or call to Bonneville Control for emergency medical assistance to Oregon side, Nav Lock dock);
	Sea lion bites	Experienced staff on trap will remain vigilant regarding sea lion locations and movements within trap to minimize chance of being bitten; any one bitten will have injury assessed immediately; injuries worse than broken skin (e.g. open wound in muscle; broken bone) will result in immediate report to Bonneville Control requesting emergency medical assistance and transport of injured staff to Oregon side, Nav Lock dock
	Bodily injury from mechanical sources	Hardhats and protective gloves will be worn by staff working on trap; any injuries to extremities caused by movement of equipment will be immediately assessed and responded to as appropriate (see sea lion bites)
4. Crane work on deck	Potential for being struck by falling objects causing head injury or foot injury.	Project staff not part of USACE rigging crew will stay well clear of crane operations; be aware, at all times, of the location of the crane and the crane boom; staff may assist with transfer of sea lions from lifting cages to trailer or truck, following guidance of rigging crew; always wear hard hats, steel-toed boots and hand protection (*05.D.01, 02, 04, 05, A.08, and 08.A-.B). Avoid climbing on top of equipment; remain on ground.
	Lifting heavy equipment causing the potential for back strain.	Never attempt to lift a heavy object by yourself; use a back brace; use safe lifting techniques such as lifting with your legs rather than with your back.
5. General precautions	Crane operations	Be aware of crane boom position at all times; remain well clear of boom and lift cage until loading to trailer or truck is taking place; hardhats and protective gloves will be worn by staff working near crane, cages, trailer or trucks
	Working in severe weather.	Be alert to and prepare for severe weather; wear several layers of warm clothing for protection from the cold and, as the weather indicates, a waterproof over-garment to be protected from the rain (*06.J).

Bonneville Research Packet and Project Impact Document  
ODFW, WDFW, CRITFC, PSMFC, NMFS – January 12, 2018

PRINCIPLE STEPS	POTENTIAL HAZARDS	RECOMMENDED CONTROLS (FROM EM 385-1-1)
Crane, boats, sea lion trap, cages, trailer, trucks	Inspections and experience with equipment required prior to use	Instruction or review in using equipment according to the manufacturers' instructions; USACE rigging crew will oversee and conduct crane operations; all boat operators will be trained and have necessary levels of experience; only experienced project staff will work on trap; documented safety meeting prior to work. First Aid/CPR training (*03.A.02 and 03.D)