HACCP Step 1 – Activity Description

Activity Description	
Facility: Red Bluff FWO	**Site**: Red Bluff Diversion Dam
Project Leader: James G Smith **Site Manager**: Bill Poytress **Address**: 10950 Tyler Rd. Red Bluff, CA 96080 **Phone**: 530.527.3043	**Activity: Mainstem Juvenile Monitoring Program** **Management Objective**: Estimating the abundance of winter, spring, fall, and late-fall chinook as well as steelhead trout and other native and non-native fish species passing the Red Bluff Diversion Dam (RBDD) via rotary-screw traps without transporting invasive species.

Project Description
i.e. Who; What; Where; When; How; Why

Who: Field crew biological science technicians and field crew/crew leader biologists.

What: Sample native and non-native fish species including anadromous (ESA listed winter Chinook, spring Chinook, green sturgeon and steelhead) and resident salmonids by rotary-screw traps in an effort to estimate passage by RBDD.

Where: The Bureau of Reclamation's Red Bluff Diversion Dam (RK 391/RM 243) on the Sacramento River, Red Bluff, CA 96080

When: Samples collected 1 or more times per 24hr period; up to 360 days/year.

How: Samples collected by four 8 ft diameter rotary-screw traps attached directly to RBDD. Access to the traps accomplished by boat(s). Passage of salmonids is estimated by dividing daily catch by trap efficiency. A simple least squares regression model has been developed to predict daily trap efficiency.

Why: To achieve management objectives by monitoring daily passage of juvenile salmonids passing RBDD to index the relative abundance of ESA listed and unlisted native anadromous salmonids. Additional objectives are to obtain life-history information and relative abundance of other species such as green sturgeon and Pacific lamprey.

HACCP Step 2 – Identify Potential Hazards

(to be transferred to column 2 of HACCP Step 4 – Hazard Analysis Worksheet)

Hazards: Species or Contaminants Which May Potentially Be Moved/Introduced
Vertebrates: Freshwater native/non-native fish species (ex. Centrarchidae, Percidae, Cyprinidae, Gobidae etc..), bullfrogs (*Rana catesbeiana*), rodents (ex. field mice).
Invertebrates: New Zealand mudsnail (*Polamophyrgus antipodarum*), zebra mussel (*Dreissena polymorpha*), freshwater Asian clam (*Corbicula fluminea*), crawdads, mitten crab (*Eriocheir sinensis*), Siberian prawn (*Exopalaemon modestus*), and exotic zooplankton spp.
Plants: **Aquatic**: Canadian waterweed (*Elodea canadensis and nuttallii*), Brazilian waterweed (*Egeria densa*), curly pondweed (*Potamogeton crispis*), hydrilla or waterthyme (*Hydrilla verticillata*), water hyacinth (*Eichhornia crassipes*), Eurasian watermilfoil or parrot's feather (*Myriophyllum* spicatum), floating primrose-willow or water primrose (*Ludwigia spp.*), and harmful algae. **Terrestrial**: Yellow starthistle (*Centaurea solstitialis*), Himalayan blackberry (*Rubus discolor*), Tree-of-Heaven (*Ailanthus altissima*), pepperweed (*Lepidium latifolium*), yellow flag iris (*Iris pseudacorus*), several Broom spp., black locust (*Robinia pseudoacacia*), purple loosestrife (*Lythrum salicaria*), giant arundo (*Arundo donax*), salt cedar or tamarisk (*Tamarix spp.*), and red sesbania (*Sesbania punicea*).
Other Biologics (e.g. genetics, disease, pathogen, parasite, or non-pathogens): West Nile, various fish diseases such as Ick, Whirling Disease, IHNV, BKD.
Others (non-biological contaminants e.g. pesticide residue, oil products, etc. or harborage via packing or construction materials, etc.): Small amounts of two stroke oil or gasoline, miscellaneous human related trash, miscellaneous aluminum, steel or plastic items derived from damaged rotary traps.

HACCP Step 3 – Flow Diagram

Flow Diagram Outlining Sequential Tasks to Complete Activity/Project
Described in HACCP Step 1 – Activity Description
(to be transferred to column 1 of the HACCP Step 4 – Hazard Analysis Worksheet)

Task 1	Load gear into truck/boat at the station. Hook up boat and drive to launch site (Red Bluff Diversion Dam /Sycamore Grove boat ramp).
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Task 2	Launch boat(s) and operate to rotary-screw traps on Sacramento River.
⇓	
Task 3	Unload gear and conduct sampling activities.
⇓	
Task 4	Return to boat ramp, load boat onto trailer, and pack gear.
⇓	
Task 5	Return to Red Bluff office, unload boat, and put away gear.
⇓	
Task 6	
⇓	
Task 7	
⇓	
Task 8	
⇓	
Task 9	
⇓	
Task 10	

HACCP Step 4 – Hazard Analysis Worksheet

1 Tasks (from HACCP Step 3 - Flow Diagram)	2 Potential hazards identified in HACCP Step 2	3 Are any potential hazards significant? (yes/no)	4 Justify evaluation for column 3	5 What control measures can be applied to prevent undesirable results?	6 Is this task a critical control point? (yes/no)
Task 1 Load gear into truck/boat at the station. Hook up boat and drive to launch site (Red Bluff Diversion Dam boat ramp).	<u>Vertebrates</u> Fish Bullfrogs	Yes	Fish species cannot survive night in nets or other gear, but bullfrogs can.	Inspect sampling gear and equipment for potential hitchhiking organisms and remove before leaving the station.	Yes
	<u>Invertebrates</u> Exotic non-target invertebrate species (see step 2)	Yes	Invertebrate species can survive night in nets or other gear if not properly checked in task 5.	Inspect sampling gear, equipment, boats, trailers, and vehicles for potential hitchhiking organisms or material before leaving the station. Remove unwanted material from gear. Spray down vehicles, trailers, and boats.	Yes
	<u>Plants</u> Exotic non-target plant species (see step 2)	Yes	Plant species can survive night in nets or other gear if not properly checked in task 5.	Inspect sampling gear, equipment, boats, trailers, and vehicles for potential hitchhiking organisms or material before leaving the station. Remove unwanted material from gear. Spray down vehicles, trailers, and boats.	Yes
	<u>Other Biologics</u> Spread of unwanted pathogens, parasites, and disease (see step 2)	No	Gear, equipment, and boats were cleaned and treated in task 5.		No
	<u>Others</u> Two-stroke oil and gas Non-biological contaminants (see step 2)	Yes	Amount of oil, gas, and pesticide residue is minimal. Miscellaneous trash, metal, and plastic items have potential for escapement.	Make sure trash has been removed. Secure gear and personal items in vehicles and boats to prevent blowing away.	Yes

HACCP Step 4 – Hazard Analysis Worksheet (continued)

1 Tasks (from HACCP Step 3 - Flow Diagram)	2 Potential hazards identified in HACCP Step 2	3 Are any potential hazards significant? (yes/no)	4 Justify evaluation for column 3	5 What control measures can be applied to prevent undesirable results?	6 Is this task a critical control point? (yes/no)
Task 2 Launch boat and drive to rotary-screw traps.	<u>Vertebrates</u> Fish Bullfrogs	No	Inspected gear in tasks 1 and 5.		No
	<u>Invertebrates</u> Exotic non-target invertebrate species (see step 2)	No	Inspected gear in tasks 1 and 5.		No
	<u>Plants</u> Exotic non-target plant species (see step 2)	No	Inspected gear in tasks 1 and 5.		No
	<u>Other Biologics</u> Spread of unwanted pathogens, parasites, and disease (see step 2)	No	Gear, equipment, and boats were treated and cleaned in task 5.		No
	<u>Others</u> Two-stroke oil and gas Non-biological contaminants (see step 2)	No	Amount of oil, gas, pesticide residue, and is minimal. Trash was removed; gear and personal items were secured in task 1.		No

HACCP Step 4 – Hazard Analysis Worksheet (continued)

1 Tasks (from HACCP Step 3 - Flow Diagram)	2 Potential hazards identified in HACCP Step 2	3 Are any potential hazards significant? (yes/no)	4 Justify evaluation for column 3	5 What control measures can be applied to prevent undesirable results?	6 Is this task a critical control point? (yes/no)
Task 3 Unload gear and conduct sampling activities.	<u>Vertebrates</u> Fish Bullfrogs	No	Inspected gear in tasks 1 and 5.		No
	<u>Invertebrates</u> Exotic non-target invertebrate species (see step 2)	No	Inspected gear in tasks 1 and 5.		No
	<u>Plants</u> Exotic non-target plant species (see step 2)	No	Inspected gear in tasks 1 and 5.		No
	<u>Other Biologics</u> Spread of unwanted pathogens, parasites, and disease (see step 2)	No	Gear, equipment, and boats were treated and cleaned in task 5.		No
	<u>Others</u> Two-stroke oil and gas Non-biological contaminants (see step 2)	No	Amount of oil, gas, pesticide residue, and is minimal. Trash was removed; gear and personal items were secured in task 1.		No

HACCP Step 4 – Hazard Analysis Worksheet (continued)

1 Tasks (from HACCP Step 3 - Flow Diagram)	2 Potential hazards identified in HACCP Step 2	3 Are any potential hazards significant? (yes/no)	4 Justify evaluation for column 3	5 What control measures can be applied to prevent undesirable results?	6 Is this task a critical control point? (yes/no)
Task 4 Return to boat ramp, load boat onto trailer, and pack gear.	<u>Vertebrates</u> Fish Bullfrogs	Yes	Fish species cannot survive night in nets or other gear, but bullfrogs can.	Inspect sampling gear and equipment for potential hitchhiking organisms and remove when returning to the station.	Yes
	<u>Invertebrates</u> Exotic non-target invertebrate species (see step 2)	Yes	Travel and use of gear in other watersheds may contribute to spread of unwanted invertebrate species.	Inspect sampling gear, equipment, boats, trailers, and vehicles for potential hitchhiking organisms or other material when returning to the station. Remove unwanted material from gear. Spray down vehicles, trailers, and boats.	Yes
	<u>Plants</u> Exotic non-target plant species (see step 2	Yes	Travel and use of gear in other watersheds may contribute to spread of unwanted plant species.	Inspect sampling gear, equipment, boats, trailers, and vehicles for potential hitchhiking organisms or other material when returning to the station. Remove unwanted material from gear. Spray down vehicles, trailers, and boats.	Yes
	<u>Other Biologics</u> Spread of unwanted pathogens, parasites, and disease (see step 2)	Yes	Although these are prevalent throughout the system, travel and use of gear in other watersheds may contribute to spread of unwanted biologics.	Treat and clean gear, equipment, and boats before use in other watersheds or when returning from another watershed.	Yes
	<u>Others</u> Two-stroke oil and gas Non-biological contaminants (see step 2)	No	Amount of oil, gas, pesticide residue, and is minimal. Trash was removed; gear and personal items were secured in task 1.	Avoid spilling oil/fuel, wipe up any oil or fuel that may fowl water and use bilge pads where appropriate.	No

HACCP Step 4 – Hazard Analysis Worksheet (continued)

1 Tasks (from HACCP Step 3 - Flow Diagram)	2 Potential hazards identified in HACCP Step 2	3 Are any potential hazards significant? (yes/no)	4 Justify evaluation for column 3	5 What control measures can be applied to prevent undesirable results?	6 Is this task a critical control point? (yes/no)
Task 5 Return to office, unload boat, and put away gear.	<u>Vertebrates</u> Fish Bullfrogs	Yes	Fish species cannot survive night in nets or other gear, but bullfrogs can.	Inspect sampling gear and equipment for potential hitchhiking organisms and remove when returning to the station.	Yes
	<u>Invertebrates</u> Exotic non-target invertebrate species (see step 2)	Yes	Travel and use of gear in other watersheds may contribute to spread of unwanted invertebrate species.	Inspect sampling gear, equipment, boats, trailers, and vehicles for potential hitchhiking organisms or other material when returning to the station. Remove unwanted material from gear. Spray down vehicles, trailers, and boats.	Yes
	<u>Plants</u> Exotic non-target plant species (see step 2	Yes	Travel and use of gear in other watersheds may contribute to spread of unwanted plant species.	Inspect sampling gear, equipment, boats, trailers, and vehicles for potential hitchhiking organisms or other material when returning to the station. Remove unwanted material from gear. Spray down vehicles, trailers, and boats.	Yes
	<u>Other Biologics</u> Spread of unwanted pathogens, parasites, and disease (see step 2)	Yes	Although these are prevalent throughout the system, travel and use of gear in other watersheds may contribute to spread of unwanted biologics.	Treat and clean gear, equipment, and boats before use in other watersheds or when returning from another watershed.	Yes
	<u>Others</u> Two-stroke oil and gas Non-biological contaminants (see step 2)	No	Amount of oil, gas, pesticide residue, and is minimal. Trash was removed; gear and personal items were secured in task 1.		No

HACCP Step 5 – HACCP Plan Form

HACCP Plan Form (all CCPs or "yeses" from column 6 of HACCP Step 4 – Hazard Analysis Worksheet)		
(1) Critical Control Point:		**Task 1: Load gear into truck/boat at the station. Hook up boat and drive to launch site (Red Bluff Diversion Dam boat ramp).**
Significant Hazard(s):		Undetected vertebrates, invertebrates, plants, and miscellaneous materials may have remained on boats, vehicles, and gear from previous use.
Limits for Each Control Measure:		Boats, vehicles, trailers, and sampling gear are free of debris, mud, and organisms.
Monitoring	What:	Boats, vehicles, trailers, and sampling gear.
	How:	Inspect boats, vehicles, trailers, and sampling gear for potential hitchhiking organisms or material before leaving the station. Remove unwanted material from all equipment and gear. Spray down vehicles, trailers, and boats. Make sure trash has been removed. Secure gear and personal items in vehicles and boats to prevent blowing away.
	Frequency:	Once before leaving the station.
	Who:	Field crew biologists, technicians, and boat operators.
Evaluation & Corrective Action(s) (if needed):		Determine that control measures are in place and working.
Supporting Documents (if any):		
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(2) Critical Control Point:		**Task 4: Return to boat ramp, load boat onto trailer, and pack gear**
Significant Hazard(s):		Vertebrates, invertebrates, plants, and other biologics may have hitchhiked on boats, vehicles, and gear.
Limits for Each Control Measure:		Boats, vehicles, trailers, and sampling gear are free of debris, mud, and organisms.
Monitoring	What:	Boats, vehicles, trailers, and sampling gear.
	How:	Inspect boats, vehicles, trailers, and sampling gear for potential hitchhiking organisms or material before leaving the boat ramp. Remove unwanted material from all equipment and gear.
	Frequency:	Prior to leaving boat ramp area or departing Sycamore Grove.
	Who:	Field crew biologists, technicians, and boat operators.
Evaluation & Corrective Action(s) (if needed):		Determine that control measures are in place and working.
Supporting Documents (if any):		
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Facility: Red Bluff Fish and Wildlife Office	**Activity/Management Objective:** Mainstem Juvenile Monitoring Program/ Rotary Screw Trapping
Address: 10950 Tyler Rd., Red Bluff, CA 96059	
Signature: **HACCP Plan was followed.**	**Date:**

HACCP Step 5 Continued – HACCP Plan Form

HACCP Plan Form (all CCPs or “yeses” from column 6 of HACCP Step 4 – Hazard Analysis Worksheet)		
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(2) Critical Control Point:	**Task 5: Return to office, unload boat, and put away gear.**	
Significant Hazard(s):	Vertebrates, invertebrates, plants, and other biologics may have hitchhiked on boats, vehicles, and gear.	
Limits for Each Control Measure:	Boats, vehicles, trailers, and sampling gear are free of debris, mud, and organisms.	
Monitoring	What:	Boats, vehicles, trailers, and sampling gear.
	How:	Inspect boats, vehicles, trailers, and sampling gear for potential hitchhiking organisms or material after returning to the station. Remove unwanted material from all equipment and gear. Spray down vehicles, trailers, and boats. Treat and clean gear, equipment, and boats before use in other watersheds or when returning from another watershed.
	Frequency:	Once after returning to the station.
	Who:	Field crew biologists, technicians, and boat operators.
Evaluation & Corrective Action(s) (if needed):	Determine that control measures are in place and working.	
Supporting Documents (if any):		
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Facility: Red Bluff Fish and Wildlife Office	**Activity/Management Objective:** Mainstem Juvenile Monitoring Program/ Rotary Screw Trapping	
Address: 10950 Tyler Rd., Red Bluff, CA 96059		
Signature: **HACCP Plan was followed.**	**Date:**	