#### **HACCP Step 1 – Activity Description**

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

1 1 1	(Red Bluff Diversion Dam /Sycamore Grove boat ramp).
	↓
Task 2	Launch boat(s) and operate to rotary-screw traps on Sacramento River.
	<b>↓</b>
Task 3	Unload gear and conduct sampling activities.
	$\downarrow$
Task 4	Return to boat ramp, load boat onto trailer, and pack gear.
	<b>↓</b>
Task 5	Return to Red Bluff office, unload boat, and put away gear.
	↓
Task 6	
1	<b>↓</b>
Task 7	
<u> </u>	<b>↓</b>
Task 8	
	<b>↓</b>
Task 9	
	$\downarrow$
Task 10	

## **HACCP Step 4 – Hazard Analysis Worksheet**

1	2	3	4	5	6
Tasks	Potential hazards	Are any	Justify evaluation for	What control measures can	Is this task
(from HACCP Step 3 -	identified in HACCP	potential	column 3	be applied to prevent	a critical
Flow Diagram)	Step 2	hazards		undesirable results?	control
		significant?			point?
		(yes/no)			(yes/no)
		1	T		
	Vertebrates Fish	Yes	Fish species cannot survive	Inspect sampling gear and	Yes
	Bullfrogs	163	night in nets or other gear, but bullfrogs can.	equipment for potential hitchhiking organisms and	163
Task 1			but buillings can.	remove before leaving the	
				station.	
Load gear into	Invertebrates		Invertebrate species can	Inspect sampling gear,	
truck/boat at the	Exotic non-target	Yes	survive night in nets or other	equipment, boats, trailers, and	Yes
station. Hook up boat	invertebrate species (see step 2)		gear if not properly checked	vehicles for potential hitchhiking	
and drive to launch	(See Step 2)		in task 5.	organisms or material before leaving the station. Remove	
site (Red Bluff				unwanted material from gear.	
Diversion Dam boat				Spray down vehicles, trailers,	
ramp).				and boats.	
1	Plants		Plant species can survive	Inspect sampling gear,	
	Exotic non-target plant species (see step 2)	Yes	night in nets or other gear if	equipment, boats, trailers, and	Yes
	species (see step 2)		not properly checked in task 5.	vehicles for potential hitchhiking	
			5.	organisms or material before leaving the station. Remove	
				unwanted material from gear.	
				Spray down vehicles, trailers,	
				and boats.	
	Other Biologics Spread of unwanted	No	Gear, equipment, and boats		No
	pathogens, parasites,	INO	were cleaned and treated in		INO
	and disease (see step		task 5.		
	2)				
	Others Two-stroke oil and gas	Yes	Amount of oil, gas, and	Make sure trash has been	Yes
	Non-biological	162	pesticide residue is minimal. Miscellaneous trash, metal,	removed. Secure gear and personal items in vehicles and	165
	contaminants (see step		and plastic items have	boats to prevent blowing away.	
	2)		potential for escapement.	Sould to provent blowing away.	
			,		

1	2	3	4	5	6
Tasks	Potential hazards	Are any	Justify evaluation for	What control measures can	Is this task
(from HACCP Step 3 -	identified in HACCP	potential	column 3	be applied to prevent	a critical
Flow Diagram)	Step 2	hazards		undesirable results?	control
		significant?			point?
		(yes/no)			(yes/no)
	<u>Vertebrates</u>		Inspected gear in tasks 1 and		N
Task 2	Fish	No	5.		No
	Bullfrogs				
Launch boat and drive	Invertebrates		Inspected gear in tasks 1 and		
to rotary-screw traps.	Exotic non-target	No	5.		No
as well as the second second	invertebrate species				
	(see step 2)				
	<u>Plants</u>		Inspected gear in tasks 1 and		
	Exotic non-target plant	No	5.		No
	species (see step 2)				
	Other Biologics		Comment of the state		
	Spread of unwanted	No	Gear, equipment, and boats were treated and cleaned in		No
	pathogens, parasites,	140	task 5.		140
	and disease (see step		task 5.		
	2)				
	0.1				
	Others Two-stroke oil and gas	No	Amount of oil, gas, pesticide		No
	Non-biological	INU	residue, and is minimal. Trash was removed; gear		INU
	contaminants (see step		and personal items were		
	2)		secured in task 1.		

1	2	3	4	5	6
Tasks	Potential hazards	Are any	Justify evaluation for	What control measures can	Is this task
(from HACCP Step 3 -	identified in HACCP	potential	column 3	be applied to prevent	a critical
Flow Diagram)	Step 2	hazards		undesirable results?	control
		significant?			point?
		(yes/no)			(yes/no)
	No stab sata	Т			T
Task 3	<u>Vertebrates</u> Fish	No	Inspected gear in tasks 1 and 5.		No
l	Bullfrogs	110	5.		140
Unload gear and	_				
conduct sampling	Invertebrates Exotic non-target	No	Inspected gear in tasks 1 and		
activities.	invertebrate species	INO	5.		No
	(see step 2)				
	Plants		Inspected many in table 4 and		
	Exotic non-target plant	No	Inspected gear in tasks 1 and 5.		No
	species (see step 2)	110	3.		110
	Other Biologics Spread of unwanted	No	Gear, equipment, and boats were treated and cleaned in		No
	pathogens, parasites,	110	task 5.		140
	and disease (see step		task o.		
	2)				
	Others		Amount of oil, gas, pesticide		
	Two-stroke oil and gas	No	residue, and is minimal.		No
	Non-biological		Trash was removed; gear		
	contaminants (see step		and personal items were		
	2)		secured in task 1.		

1	2	3	4	5	6
Tasks	Potential hazards	Are any	Justify evaluation for	What control measures can	Is this task
(from HACCP Step 3 -	identified in HACCP	potential	column 3	be applied to prevent	a critical
Flow Diagram)	Step 2	hazards		undesirable results?	control
		significant?			point?
		(yes/no)			(yes/no)
	T	1			
Task 4	<u>Vertebrates</u> Fish	Yes	Fish species cannot survive	Inspect sampling gear and	Yes
	Bullfrogs	165	night in nets or other gear,	equipment for potential hitchhiking organisms and	168
Return to boat ramp,	Baimogo		but bullfrogs can.	remove when returning to the	
load boat onto trailer,				station.	
and pack gear.	Invertebrates		Travel and use of gear in	Inspect sampling gear,	
	Exotic non-target	Yes	other watersheds may	equipment, boats, trailers, and	Yes
	invertebrate species		contribute to spread of	vehicles for potential hitchhiking	
	(see step 2)		unwanted invertebrate	organisms or other material	
			species.	when returning to the station.	
				Remove unwanted material	
				from gear. Spray down vehicles, trailers, and boats.	
	Plants		Travel and use of gear in	Inspect sampling gear,	
	Exotic non-target plant	Yes	other watersheds may	equipment, boats, trailers, and	Yes
	species (see step 2		contribute to spread of	vehicles for potential hitchhiking	
			unwanted plant species.	organisms or other material	
				when returning to the station.	
				Remove unwanted material	
				from gear. Spray down	
	Other Biologica			vehicles, trailers, and boats.	
	Other Biologics Spread of unwanted	Yes	Although these are prevalent	Treat and clean gear,	Yes
	pathogens, parasites,	163	throughout the system, travel and use of gear in other	equipment, and boats before use in other watersheds or	165
	and disease (see step		watersheds may contribute to	when returning from another	
	2)		spread of unwanted biologics.	watershed.	
	,				
	Others Two-stroke oil and gas	No	Amount of oil, gas, pesticide	Avoid spilling oil/fuel, wipe up	No
	Non-biological	INO	residue, and is minimal. Trash was removed; gear	any oil or fuel that may fowl water and use bilge pads where	INO
	contaminants (see step		and personal items were	appropriate.	
	2)		secured in task 1.	appropriate.	

1	2	3	4	5	6
Tasks	Potential hazards	Are any	Justify evaluation for	What control measures can	Is this task
(from HACCP Step 3 -	identified in HACCP	potential	column 3	be applied to prevent	a critical
Flow Diagram)	Step 2	hazards		undesirable results?	control
		significant?			point?
		(yes/no)			(yes/no)
	I.M				1
Task 5	<u>Vertebrates</u> Fish	Yes	Fish species cannot survive	Inspect sampling gear and	Yes
	Bullfrogs	163	night in nets or other gear, but bullfrogs can.	equipment for potential hitchhiking organisms and	163
Return to office,			but buillings carr.	remove when returning to the	
unload boat, and put				station.	
away gear.	Invertebrates Exotic non-target	Yes	Travel and use of gear in other watersheds may	Inspect sampling gear, equipment, boats, trailers, and	Yes
	invertebrate species		contribute to spread of	vehicles for potential hitchhiking	
	(see step 2)		unwanted invertebrate	organisms or other material	
			species.	when returning to the station.  Remove unwanted material	
				from gear. Spray down	
				vehicles, trailers, and boats.	
	<u>Plants</u>		Travel and use of gear in	Inspect sampling gear,	
	Exotic non-target plant	Yes	other watersheds may	equipment, boats, trailers, and	Yes
	species (see step 2		contribute to spread of	vehicles for potential hitchhiking	
			unwanted plant species.	organisms or other material	
				when returning to the station.  Remove unwanted material	
				from gear. Spray down	
				vehicles, trailers, and boats.	
	Other Biologics		Although these are prevalent	Treat and clean gear,	
	Spread of unwanted	Yes	throughout the system, travel	equipment, and boats before	Yes
	pathogens, parasites,		and use of gear in other	use in other watersheds or	
	and disease (see		watersheds may contribute to spread of unwanted biologics.	when returning from another watershed.	
	step 2)		oprodu of anwanted biologics.	watershed.	
	Others		Amount of oil, gas, pesticide		
	Two-stroke oil and gas	No	residue, and is minimal.		No
	Non-biological contaminants (see step		Trash was removed; gear		
	2)		and personal items were secured in task 1.		
	,		Scource in task 1.		

## **HACCP Step 5 – HACCP Plan Form**

	HACCP Plan Form				
		column 6 of HA	CCP Step 4 – Hazard Analysis Worksheet)		
(1) Critical Contro		•	into truck/boat at the station. Hook up boat and (Red Bluff Diversion Dam boat ramp).		
Significant Hazard	(s): Und	letected vertebra	tes, invertebrates, plants, and miscellaneous		
		erials may have remained on boats, vehicles, and gear from			
		/ious use.			
Limits for Each Co	ontrol Measure:		, trailers, and sampling gear are free of debris,		
	1	mud, and orgai			
What:			, trailers, and sampling gear.		
	How:	•	vehicles, trailers, and sampling gear for potential		
			anisms or material before leaving the station.		
			nted material from all equipment and gear. Spray		
Monitoring			trailers, and boats. Make sure trash has been		
			ure gear and personal items in vehicles and boats to		
	_	prevent blowing			
	Frequency:		aving the station.		
	Who:		ogists, technicians, and boat operators.		
Evaluation & Corre	ective Action(s)	Determine that	control measures are in place and working.		
(if needed):	. (16				
Supporting Docum	` ,,				
		>>>>>>>>	><<<<<<<<<		
(2) Critical Contro			oat ramp, load boat onto trailer, and pack gear		
Significant Hazard	hitcl	hhiked on boats,	orates, plants, and other biologics may have vehicles, and gear.		
Limits for Each Co	ontrol Measure:		Boats, vehicles, trailers, and sampling gear are free of debris, mud, and organisms.		
	What:	Boats, vehicles	, trailers, and sampling gear.		
	How:	Inspect boats,	nspect boats, vehicles, trailers, and sampling gear for potential		
Monitoring		hitchhiking orga	anisms or material before leaving the boat ramp.		
Monitoring		Remove unwar	nted 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 & Corre (if needed):	ective Action(s)	Determine that	control measures are in place and working.		
Supporting Documents (if any):					
>>>>>>>>					
Facility: Red Bluff Fish and Wildlife Office		fe Office	Activity/Management Objective:		
			Mainstem Juvenile Monitoring Program/		
Address: 10950 Tyler Rd., Red Bluff, CA 96059		luff, CA 96059	Rotary Screw Trapping		
Signature:			Date:		
HACCP Plan was	followed				
TIAGGI I IAII WAS	TOHOWEG.				

## **HACCP Step 5 Continued – HACCP Plan Form**

HACCP Plan Form				
(all CCPs or "yeses" from column 6 of HACCP Step 4 – Hazard Analysis Worksheet)				
>>>>>>>>	·>>>>>>>	>>>>>>>>>	><<<<<	
(2) Critical Contro	l Point: Tas	k 5: Return to c	office, unload boat, and put away gear.	
Significant Hazard(	Significant Hazard(s): Vertebrates, invertebrates, plants, and other biologics may have			
			vehicles, and gear.	
Limits for Each Cor	ntrol Measure:	Boats, vehicles mud, and organ	s, trailers, and sampling gear are free of debris, nisms.	
	What:	Boats, vehicles	s, trailers, and sampling gear.	
Monitoring	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 retu	rning to the station.	
	Who: Field crew biologists, technicians, and boat operators.			
Evaluation & Corred (if needed):	ctive Action(s)	Determine that	control measures are in place and working.	
Supporting Docume	ents (if any):			
>>>>>>>	·>>>>>>	>>>>>>>	><<<<<<<<<<	
Facility: Red Bluff Fish and Wildlife Office			Activity/Management Objective: Mainstem Juvenile Monitoring Program/	
Address: 10950 Tyler Rd., Red Bluff, CA 96059		luff, CA 96059	Rotary Screw Trapping	
Signature:			Date:	
HACCP Plan was followed.				