

# HACCP

Hazard Analysis and Critical Control Point (HACCP) as  
a Planning Tool that Identifies and Evaluates Potential  
Risks for Introducing Invasive Species

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# Outline

- What is HACCP
- Why HACCP
- HACCP: Form and Function

HAZARD ANALYSIS & CRITICAL CONTROL POINT PLANNING FOR NATURAL RESOURCE MANAGEMENT

[WWW.HACCP-NRM.ORG](http://WWW.HACCP-NRM.ORG)

Planning is Everything!

*Managing Natural Resource Pathways*

**HACCP**

# What is HACCP

- Hazard Analysis and Critical Control Point planning
- Planning tool to remove contaminants (ex. Invasive species, oil, etc.)
- Focuses attention on critical control points where contaminants can be removed.
- HACCP= science based planning document



# Origin of HACCP

- 30 years ago—”...a program for the astronauts focuses on **preventing** hazards that could cause food-borne illnesses by applying science-based **controls**, from raw material to finished products.”  
U.S. FDA website

- <http://www.cfsan.fda.gov/~lrd/bghaccp.html>



# HACCP for NRM

- Sea Grant develops ANS-HACCP (wild bait fish)



- USFWS modified HACCP (Inks Dam)



# Inks Dam National Fish Hatchery

- NFH located in TX near the CO River
- Raises and stocks sport fish (HACCP=Target)
- Gizzard shad abundant in water used by NFH (HACCP=Non Target)



# Inks Dam NFH provides largemouth bass fingerlings to New Mexico's Morgan Lake



# Gizzard Shad





## How not to run a media campaign:

- Gizzard shad reported in Lake Powell in 2000
- Likely from Morgan Lake population.
- Bad Press

### **Fish and Wildlife Blunders in Lake Powell**

by Skip Knowles  
*The Salt Lake Tribune*

Tuesday,  
August 27, 2002

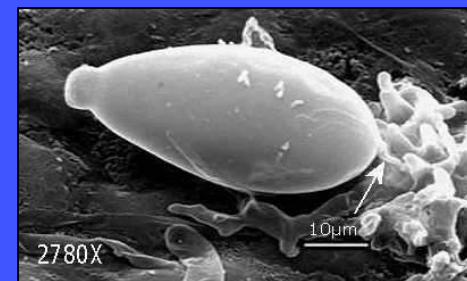
After years of telling Utah biologists to forget about stocking gizzard shad in Lake Powell because of concern for sensitive species, the U.S. Fish and Wildlife Service accidentally did just that.

# HACCP Could Have Prevented this "Hatchery Release"



# How HACCP Can be Used

- Hatcheries (Inks Dam ex.)
- Aquariums (*Caulerpa* ex.)
- Field biologists (NZMS ex.)
- Restoration work (SOD ex.)
- Vertebrates, plants, invertebrates, microbes



# Pathways of Introduction

## Could this be your team?



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Jerry Asher, USDI Bureau of Land Management,



Ken Davis, [www.wildlifefiles.com](http://www.wildlifefiles.com)



# HACCP Form and Function

- Key Terminology
- 5 Steps of HACCP with an Example



# Key HACCP Terminology

- Target - whatever is intentionally being moved from place to place
- Non-target - any species that may be present in the action area, but is not the species for which an action was initiated; aka hazards



# Key HACCP Terminology

- Pathway - an activity or process through which a species is transferred to a new location where it could become invasive
- Risk - an estimate of the likely occurrence of a hazard





# Key HACCP Terminology

- Control point - any step at which potential hazards can be controlled
- Critical control point (CCP) - the best point, step, or procedure at which significant hazards can be prevented or reduced to minimum risk



# Systematic Steps in HACCP Planning

- Step 1 - Activity Description
- Step 2 – Identify Potential Hazards
- Step 3 - Flow Diagram
- Step 4 - Hazard Analysis Worksheet
- Step 5 - HACCP Plan Form

# Step 1 - Activity Description

## HACCP Step 1 – Activity Description

| Activity Description |                                |
|----------------------|--------------------------------|
| Facility:            | Site:                          |
| Project Coordinator: | Activity/Management Objective: |
| Site Manager:        |                                |
| Address:             |                                |
| Phone:               |                                |

| Project Description<br>i.e. Who; What; Where; When; How; Why |
|--|
|  |

**Stockton Fish and Wildlife Office Delta Juvenile Fish  
Monitoring Program Hazard Analysis Critical Control Point  
Plan #1: Beach Seine Sampling of Juvenile Fish**

Last Revised December, 2005



# HACCP

## Delta Juvenile Fish Monitoring Program

| Activity Description  |  |
|---|--|
| Facility:STFWO  | Site:  |
| Project Leader: Kim Webb ( acting )   | Activity/Management Objective:<br>Biological sampling of juvenile fishes within the Sacramento and San Joaquin Rivers, tributaries and bays without transferring invasive and non-target species between sample locations. |
| Project Manager: Paul Cadrett   |  |
| Address:<br>4001 North Wilson Way<br>Stockton, CA 95204   |  |
| Phone: 209-946-6400   |  |
| Project Description<br>i.e. <b>Who; What; Where; When; How; Why</b>   |  |
| <p>The juvenile fishes monitoring program <b>field crew</b>, including biological science technicians, boat operators, and biologists, conduct different types of sampling which require a vehicle. The <b>types of sampling include beach seining, and rotary screw trapping</b>. Beach seining is <b>conducted within the Sacramento San Joaquin River, tributaries and bays, and is performed year around at least once per week, and up to three times a week</b> during times of peak juvenile salmon migration (October-December). Beach seine investigations are conducted with a 15mX1.2m beach seine with 3.2 mm delta mesh. Beach seine sample locations are sampled by truck, depending on their location. <b>All beach seine equipment is designated to each individual region</b>. The rotary screw trapping sites require a vehicle to transport crew and equipment. Rotary screw trap sampling is conducted three days a week and is ongoing for an unspecified amount of time. The juvenile fishes monitoring program samples year round to:</p> <ol style="list-style-type: none"><li>1. Monitor sensitive juvenile salmon populations for delta water operations.</li><li>2. Monitor trends of overall juvenile fish populations and fish distribution.</li></ol> |  |

# Step 2 – Identify Potential Hazards

## 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:

Invertebrates:

Plants:

Other Biologics (e.g. genetics, disease, pathogen, parasite, or non-pathogens):

Others (non-biological contaminants e.g. pesticide residue, oil products, etc. or harborage via packing or construction materials, etc.):

# 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:

Bullfrogs (*Rana catesbeiana*), All exotic and invasive fish species

### Invertebrates:

New Zealand Mudsnailes (*Potamopyrgus antipodarum*), Zebra Mussels (*Dreissena polymorpha*), Quagga Mussels (*Dreissena bugensis*) Asian Clams (*Corbicula fluminea*), Siberian Prawns (*Exopalaemon modestus*), Bubble Snails (*Haminoea japonica*), Jellyfish (any sp.), Crawdads (any sp.), Mitten Crabs (*Eriocheir sinensis*), Green Crabs (*Carcinus maenas*)

### Plants:

Purple Loosestrife (*Lythrum salicaria*), Broadleaved pepperweed (*Lepidium latifolium*), Brazilian Waterweed (*Egeria densa*), Water Hyacinth (*Eichhornia crassipes*), Watermilfoil (*Myriophyllum aquaticum*), Giant Arundo (*Arundo donax*), Yellow Flag Iris (*Iris pseudacorus*), Scarlet Wisteria (*Sesbania punicea*), Hydrilla (*Hydrilla verticillata*), Canadian Waterweed (*Elodea Canadensis*), Ludwigia (*Ludwigia grandiflora*)

Other Biologics (e.g. genetics, disease, pathogen, parasite, or non-pathogens):

**Whirling disease, (list others here)**

Others (non-biological contaminants e.g. pesticide residue, oil products, etc.  
or harborage via packing or construction materials, etc.):

**Small amounts of pesticide residue, oil, and human waste**

# Step 3 - Flow Diagram

## 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)

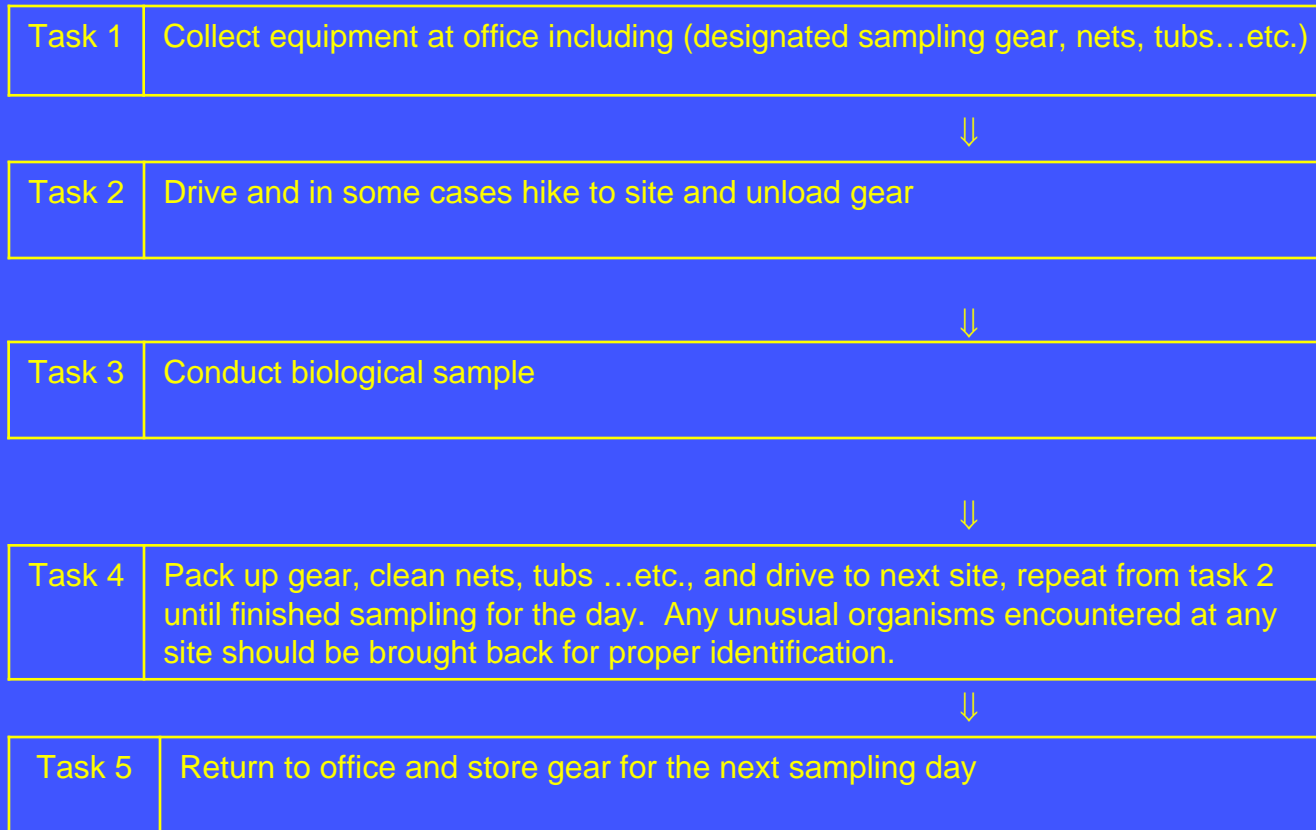
|           |   |
|-----------|---|
| Task<br>1 |   |
|           | ↓ |
| Task<br>2 |   |
|           | ↓ |
| Task<br>3 |   |
|           | ↓ |
| Task<br>4 |   |
|           | ↓ |
| Task<br>5 |   |
|           | ↓ |
| Task<br>6 |   |



## 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)



# Step 4 - Hazard Analysis Worksheet

HACCP Step 4 – Hazard Analysis Worksheet

| 1<br>Tasks<br>(from HACCP Step 3 -<br>Flow Diagram) | 2<br>Potential hazards<br>identified in HACCP<br>Step 2 | 3<br>Are any<br>potential<br>hazards<br>significant?<br>(yes/no) | 4<br>Justify evaluation for<br>column 3 | 5<br>What control measures can<br>be applied to prevent<br>undesirable results? | 6<br>Is this task<br>a critical<br>control<br>point?<br>(yes/no) |
|---|---|--|---|---|--|
|---|---|--|---|---|--|

|        |                 |  |  |  |  |
|--------|-----------------|--|--|--|--|
| Task 1 | Vertebrates     |  |  |  |  |
|        | Invertebrates   |  |  |  |  |
|        | Plants          |  |  |  |  |
|        | Other Biologics |  |  |  |  |
|        | Others          |  |  |  |  |

|        |                 |  |  |  |  |
|--------|-----------------|--|--|--|--|
| Task 2 | Vertebrates     |  |  |  |  |
|        | Invertebrates   |  |  |  |  |
|        | Plants          |  |  |  |  |
|        | Other Biologics |  |  |  |  |
|        | Others          |  |  |  |  |

### HACCP Step 4 - Hazard Analysis Worksheet (continued)

| 1<br>Tasks<br>(from HACCP Step 3<br>- Flow Diagram)   | 2<br>Potential hazards<br>identified in<br>HACCP Step 2  | 3<br>Are any<br>potential<br>hazards<br>significant?<br>(yes/no) | 4<br>Justify evaluation for<br>column 3   | 5<br>What control measures can<br>be applied to prevent<br>undesirable results?  | 6<br>Is this<br>task a<br>critical<br>control<br>point?<br>(yes/no) |
|---|--|--|---|--|---|
| <b>Task 4</b><br><b>Pack up gear,</b><br><b>clean nets, tubs</b><br><b>...etc., and drive to</b><br><b>next site, repeat</b><br><b>from task 2 until</b><br><b>finished sampling</b><br><b>for the day. Any</b><br><b>unusual</b><br><b>organisms</b><br><b>encountered at</b><br><b>any site should be</b><br><b>brought back for</b><br><b>proper</b><br><b>identification.</b> | Vertebrates<br>Fish<br>Bullfrogs   | Yes  | Fish and bullfrogs can hitchhike on sample gear and equipment from site to site   | Visually inspect nets and all associated sampling gear for possible hitchhiking vertebrates prior to going to next site          | Yes   |
|   | <b>Invertebrates</b><br><b>Exotic non-</b><br><b>target</b><br><b>invertebrates</b><br><b>(See step 2)</b> | Yes  | <b>Invertebrates can hitchhike on sample gear and equipment from site to site</b> | <b>Visually inspect nets and all associated sampling gear for possible hitchhiking invertebrates prior to going to next site</b> | Yes   |
|   | Plants<br>Exotic non-target plant species (See step 2)   | Yes  | Plants can hitchhike on sample gear and equipment from site to site               | Visually inspect nets and all associated sampling gear for possible hitchhiking plants prior to going to next site               | Yes   |
|   | Others Biologics<br>Whirling Disease   | No   | These are prevalent throughout the system   |  |   |
|   | Others<br>Oil spills, pesticide contaminants human waste   | No   | Amounts of oil or pesticides are too small to be concerned with                   |  |   |



# HACCP Planning

- Management commitment
- HACCP training
- Assemble the HACCP team



How Poodles Came to America

# Pathways of Introduction

## Could this be your team?



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