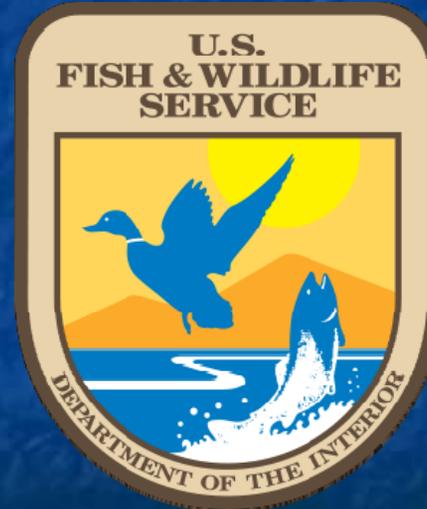


HACCP

Hazard Analysis and Critical Control Point

Planning to Prevent the
Spread of Invasive Species



WORKSHOP OUTLINE

Introductions

Regional Invasive Species
and Pathways

HACCP History and
Overview

HACCP Form and Function



Introductions

1. Name
2. Present Position and Employer
3. Your Biggest Invasive Species or Non-target Concern
4. What You Want to Accomplish with HACCP
5. ...

Chapter 1: Invasive Species Impacts

Learning Objectives

- Identify invasive species impacts.
- Define non-indigenous species vs. invasive species (and synonyms).
- Define target, non-target, pathway and vector.
- Identify local and global invasive species pathways.
- List key invasive species legislation

Define Terminology

Native

vs.

Invasive (aka...)

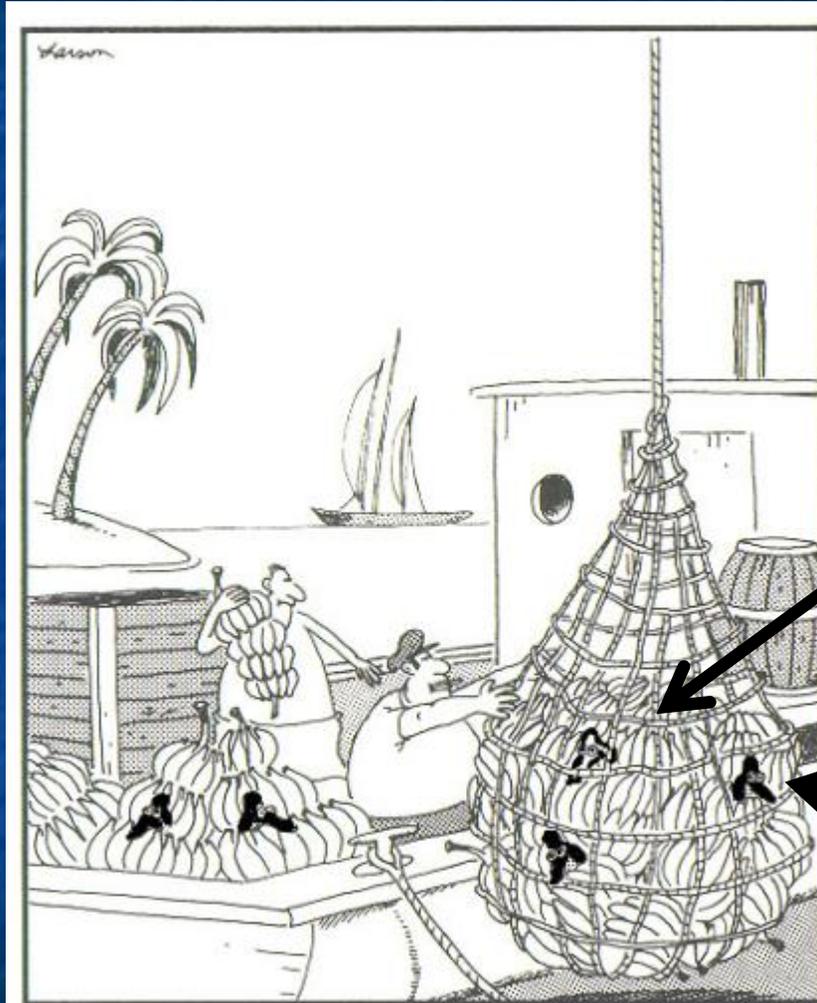
Nuisance / Introduced
Alien / Foreign / Non-native
Non-indigenous / Exotic
Established / Naturalized

HACCP definitions:

- Target Species
- Non-target species (NTS)



Target versus Non-target



Target

Non-target

How Poodles Came to America

" Invasive species are probably the single greatest threat in our country to our native wildlife".

– Sam Hamilton, former Director of the U.S. Fish & Wildlife Service

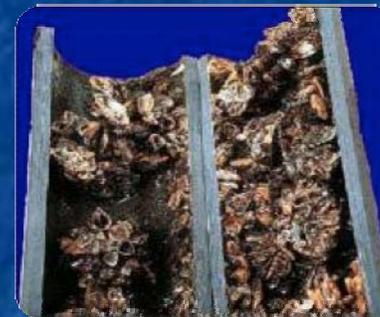
Severe, Irreversible Environmental Impacts

- 2nd leading cause of native species' global biodiversity loss



Costly Economic Impacts

- Worldwide Cost = \$1.4 trillion
- U.S. = \$138 billion



Risk to Human Health

- Diseases, pesticides

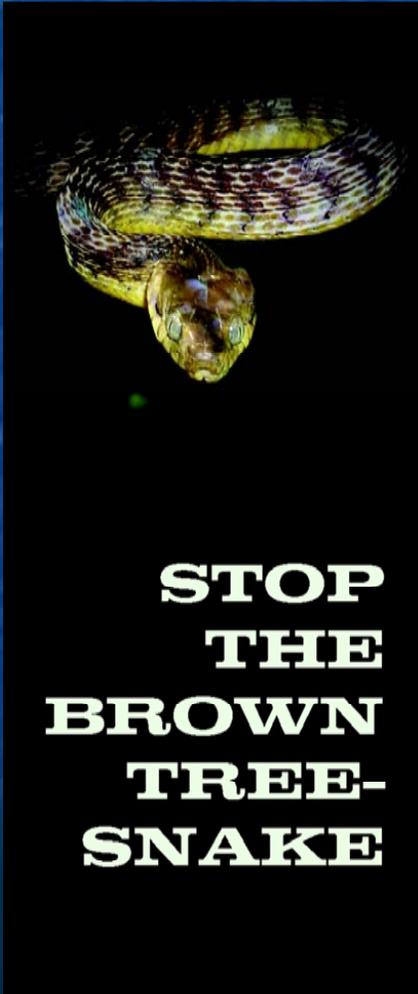
Cultural

- Aesthetics, recreation, heritage

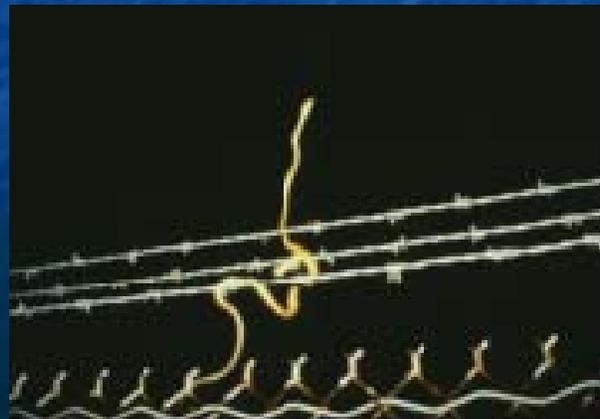


Impacts: Ecological

Brown Tree Snake (*Boiga irregularis*)



- Introduced to Guam in 1952
- Previously snake-free island, today Guam has the highest snake density in the world (>20 snakes / acre)
- Severely impacted native populations of birds, amphibians and reptiles.



Impacts: Ecological Kudzu (*Pueraria lobata*)

- Crowds out native species
- Introduced in 1876 - Centennial Exposition in Philadelphia
- Originally an erosion control and garden plant
- Kudzu Clubs honoring miracle vine
- Declared a weed in 1972
- Noxious Weed in 1997
- Grows 1 foot per day



Impacts: Economic

Emerald Ash Borer (*Agrilus planipennis*)



- First discovered in June of 2002 in Wisconsin
- Has spread to 22 states within the U.S. and 3 Canadian provinces
- Killed tens of millions of ash trees
- High costs to municipalities, property owners, nursery operators and forest products industries

DON'T MOVE FIREWOOD

Our forests are threatened by nonnative insects that can kill large numbers of trees. Three recently introduced insects—emerald ash borer, Asian longhorned beetle, and Sirex woodwasp—are wood-infesting species that can be transported long distances in firewood. Once transported into new areas, these insects can become established and kill local trees. We must **STOP THE SPREAD** of these insects and protect our forests and trees.

How you can help:

- Leave firewood at home—do not transport it to campgrounds or parks.
- Use firewood from local sources.
- If you have moved firewood, burn all of it before leaving your campsite.



HELP STOP INVASIVE PESTS

For more information, visit the following Web sites:
www.emeraldashborer.info
www.na.fs.fed.us/tp
www.aphis.usda.gov/ppppp



USDA Forest Service
Northeastern Area
State and Private Forestry
NA-PB-00-09
April 2006
www.na.fs.fed.us

Impacts: Economic Quagga and Zebra Mussels

(Dreissena rostriformis bugensis and D. polymorpha)

- Clog water intakes and pipes
- Damage pump
- Decrease power production
- Increase maintenance costs
- Harm commercial fisheries
- Damage boat engines
- Increase watercraft maintenance
- Sharp shells hurt!
- Foul odor



Impacts: Cultural *Hydrilla* (*Hydrilla verticillata*)

- One fragment can lead to introduction
- Shades out competitors
- Millions of dollars are spent in Florida and California on control.
- Clogs water delivery canals



Impacts: Human Health Lionfish (*Pterois* spp.) and Cholera (*Vibrio cholerae*)

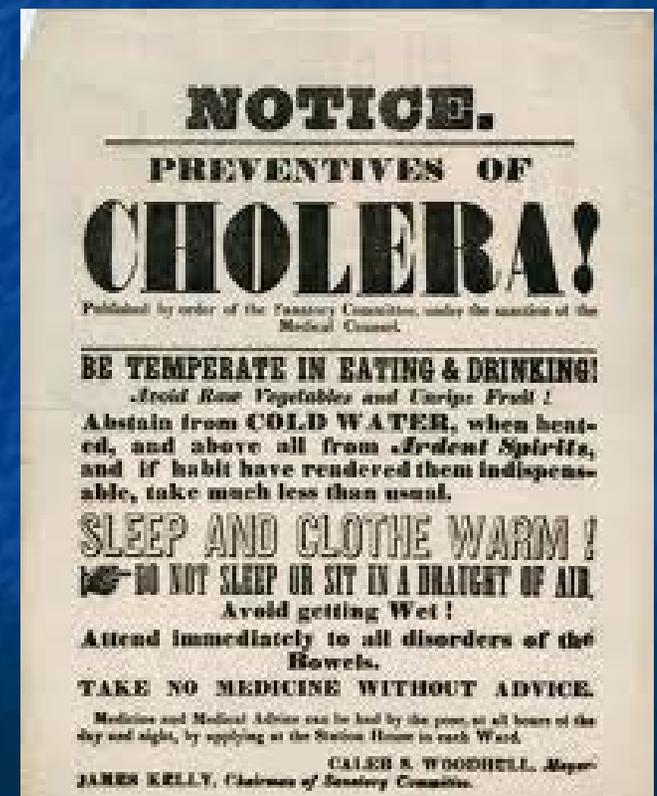


Lionfish

- Envenomation risk
- High densities = high encounter rates

Cholera

- Transferred by ballast water or live food trade



Pathways and Vectors

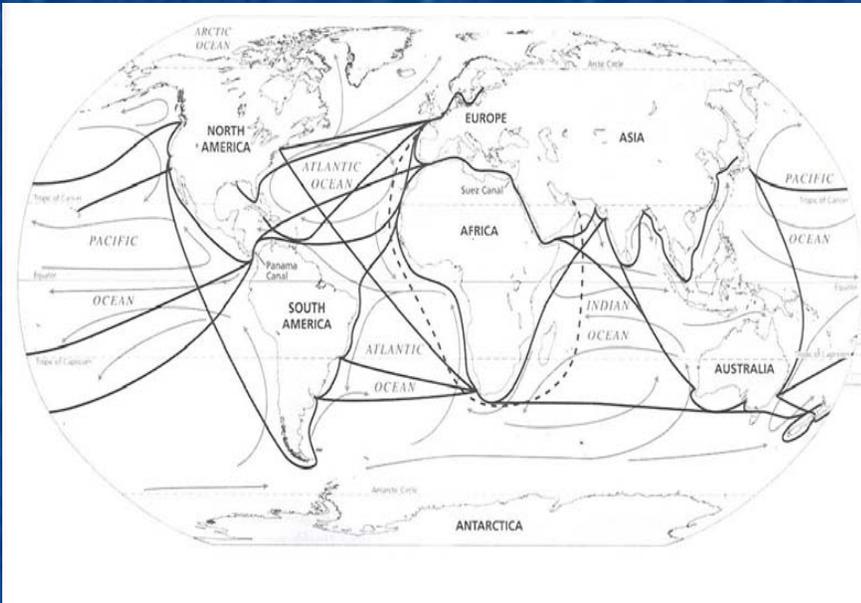
Pathway – an activity or process through which a species may be transferred to a new location where it could become invasive

Vector – the specific means by which an invasive species moves within a particular pathway

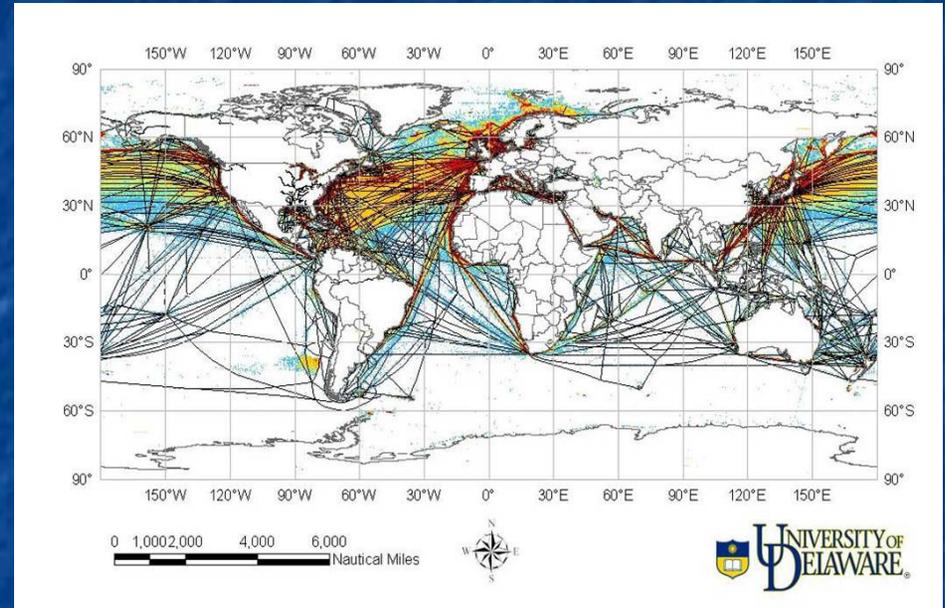
Daily Flights, Global Pathways



Global Shipping Traffic



Main Ocean Stream Routes
1850s to 1950s



Main Ocean Stream Routes
Today

Pathways of Introduction

How do they get here:

- Ballast water operations
- Biofouling of ship hulls
- Release of unwanted pets and fishing bait
- Release or escape of classroom and laboratory animals
- Escape from aquaculture facilities, nurseries, or water gardens
- Intentionally stocked as food or recreational sources
- Released as biological control of existing an existing invader
- Introduced for habitat restoration or erosion control efforts



Pathways of Introduction

How they are spread once there are here:

A single pathway may move many non-target species, including:

- Natural Resource Management Activities
- Fire Management
- Restoration activities
- Vehicles and Construction Equipment
- Recreational Watercraft
- Outdoor Recreation



Invasive Species National Laws and Regulations

- Lacey Act
- Non-indigenous Aquatic Nuisance Prevention and Control Act
- National Invasive Species Act
- Executive Order 13112

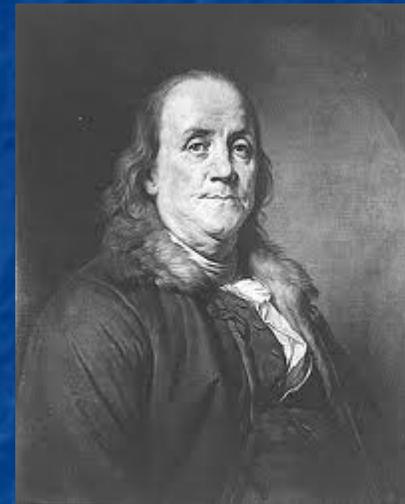
Executive Order 13112 of February 3, 1999 -- Invasive Species

a) Each Federal agency whose actions may affect the status of invasive species shall, to the extent practicable and permitted by law...

(3) not authorize, fund, or carry out actions that it believes are likely to cause or promote the introduction or spread of invasive species in the United States or elsewhere unless, pursuant to guidelines that it has prescribed, the agency has determined and made public its determination that the benefits of such actions clearly outweigh the potential harm caused by invasive species; and that all feasible and prudent measures to minimize risk of harm will be taken in conjunction with the actions.

Preventing the Spread of Invasive Species

“An ounce of prevention is worth a pound of cure.”



Chapter 1: Invasive Species Impacts

Skill check

- ✓ Identify invasive species impacts.
- ✓ Define non-indigenous species vs. invasive species (and synonyms).
- ✓ Define target, non-target, pathway and vector.
- ✓ Identify local and global invasive species pathways.
- ✓ List key invasive species legislation

Exercise: A Day in the Life of Captain HACCP

Group Activity: 5 – 10 minutes.



Sooper Yooper,
Mark Newman and Diane Heckman

Chapter 2: What is HACCP?



Chapter 2: What is HACCP

Learning Objectives

- Explain why "planning is essential"
- Describe the five steps of HACCP Planning.
- Explain the benefits of a strong HACCP Planning team.

What is HACCP?

- Key components
- HACCP is a process
- Planning is Essential

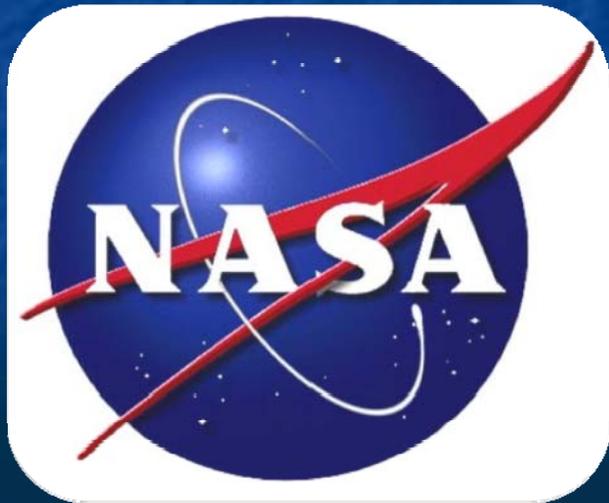




Origin of HACCP

50 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 AIS-HACCP

AIS-HACCP

Aquatic Invasive Species – Hazard Analysis and Critical Control Point



- USFWS modified HACCP for resource management activities

Five EASY Steps to HACCP Planning

Step 1 – Activity Description

Step 2 – Activity Flow Chart

Step 3 – Identify Potential Non-targets

Step 4 – Non-Target Assessment Worksheet (NTAW)

Step 5 – Non-Target Risk Action Plan (NTRAP)

“But we already have basic decontamination procedures...”

HACCP :

- **Step-by-step method to consider all pathways**
- **Targets control actions for “best” opportunity**
- **Methods to ensure prevention is successful**
- **Contingency plan if problem surfaces**
- **Documentation process**



Case Studies: When HACCP Could Have Helped

Inks Dam National Fish Hatchery (NFH)

- NFH located in TX near the CO River
- Raises and stocks bass (Target)
- Gizzard shad abundant in water used by NFH (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
- Introduction was a likely result of the “accidental” Morgan Lake population.
- Bad Press

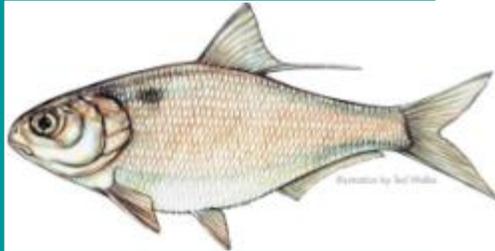
Fish and Wildlife Blunders in Lake Powell

by Skip Knowles
The Salt Lake Tribune

Tuesday,
August 27, 2002

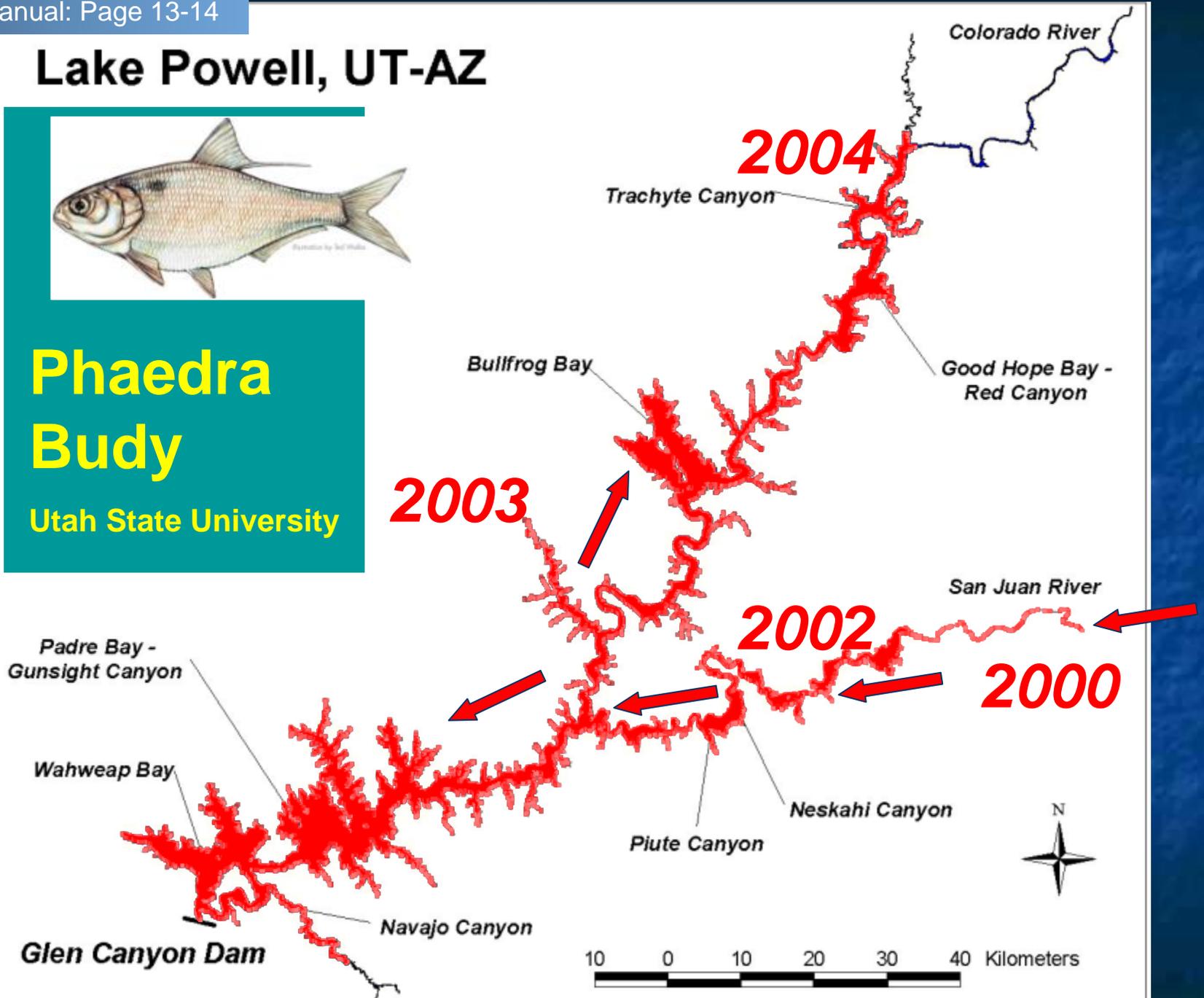
After years of telling Utah biologists to forget about stocking gizzard shad in Lake Powell because of concern for sensitive species, the U.S. Fish and Wildlife Service accidentally did just that.

Lake Powell, UT-AZ



**Phaedra
Budy**

Utah State University



Planning is Everything!

Managing Natural Resource Pathways

HACCP

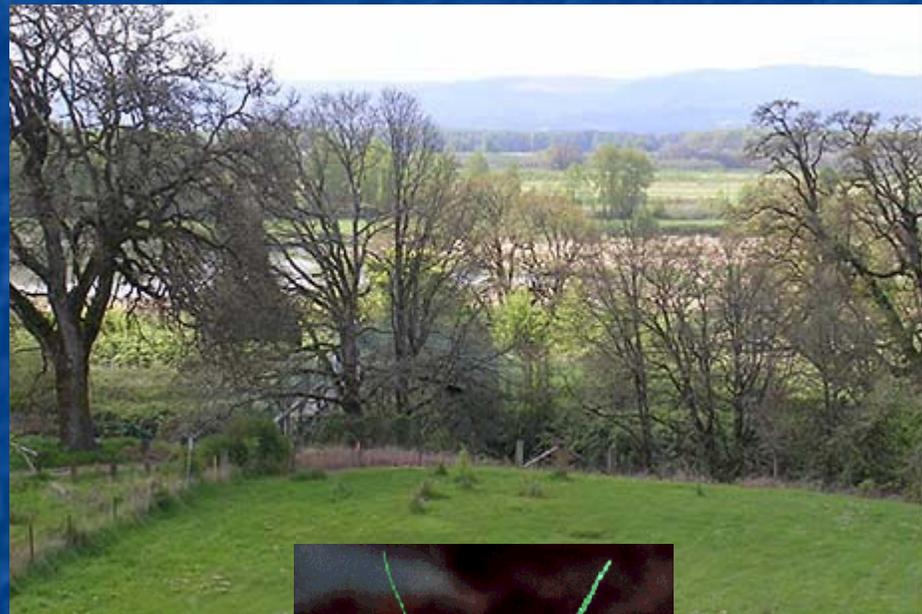
HACCP Could Have Prevented this
"Hatchery Release"



Case Studies: When HACCP Could Have Helped

Ridgefield National Wildlife Refuge

- NWR located in WA along the Columbia River
- Wetland plant seed from Sacramento Valley brought on site for restoration project (Target)
- Eurasian ricefield bulrush (Non-target) germinated in restoration site in 2000



Ridgefield National Wildlife Refuge - Grabbing the Bulrush By The Horns

- 8 wetlands originally contaminated
- At least 6 additional wetlands infested as bulrush spread via water flow and other pathways
- Refuge staff and volunteers now must invest resources into long-term monitoring and control



Volunteers search for and remove invasive ricefield bulrush from River S Unit

Planning is Everything!

Managing Natural Resource Pathways

HACCP

Could HACCP have protected the Refuge and its inhabitants from this invasive weed?



Chapter 2: What is HACCP Skill Check

- ✓ Explain why "planning is essential"
- ✓ Describe the five steps of HACCP Planning.
- ✓ Explain the benefits of a strong HACCP Planning team.

Step 1 - Activity Description

HACCP Step 1 – Activity Description

Management Objective & Contact Information	
HACCP Plan Title	
Management Objective:	Contact Person:
	Phone:
	Email:

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

Step 1 – Activity Description Learning Objectives

- Identify the essential components of a well-written Activity Description.
- Write an Activity Description encompassing all six description components.

Step 1 - Activity Description

HACCP Step 1 – Activity Description

Management Objective & Contact Information	
HACCP Plan Title	
Management Objective:	Contact Person:
	Phone:
	Email:

Examples of Activities:

- Forest Thinning operations
- Stocking Fish
- Habitat Restoration
- Research field work
- Road construction
- Trail building
- Landscaping
- Invasive species removal

Activity Description Components Key Questions

Who
What
When
Where
Why
How



Activity Description Components

Who:

- Who is the project coordinator
- Who is the site manager
- Who are the hands-on-folks or crew
- Who comprises "THE TEAM"



Activity Description Components

What:

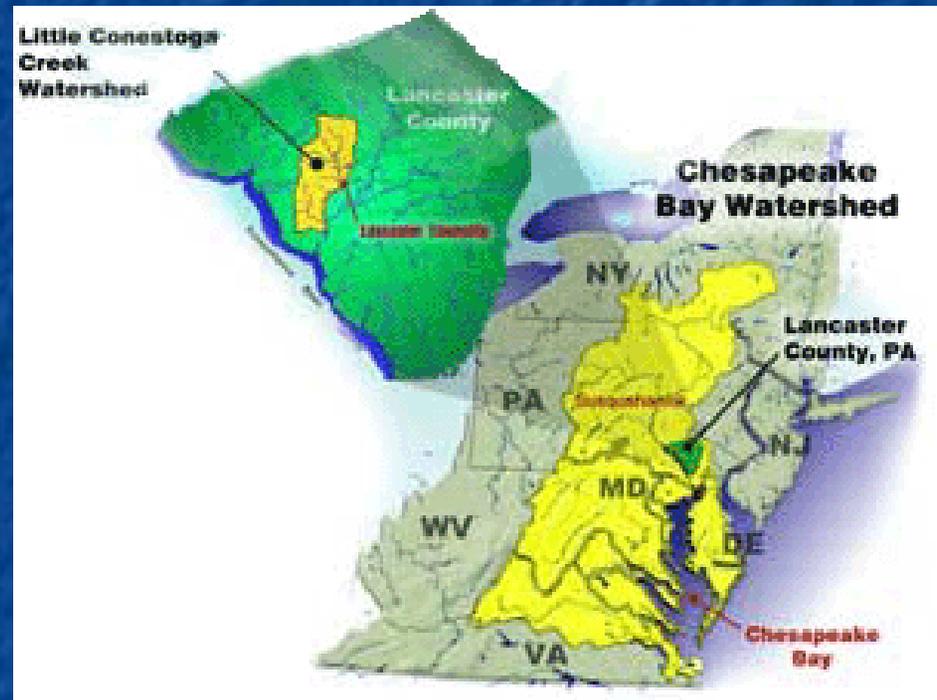
- What is the activity or action



Activity Description Components

Where:

- General:
 - State wide
 - Refuge
 - Watershed
- Site specific:
 - GPS coordinates
 - Stream/lake name



Activity Description Components

When:

- Finite time

One time occurrence vs.

- Habitat Restoration
- Construction

Continuously occurring

- Maintenance
- Annual surveys



Activity Description Components

How:

- Actions within the planned activity



Activity Description Components

Why:

- What is the need and objective of the activity



Hypothetical Example

(Manual page 18)

- Cutthroat Trout National Fish Hatchery staff measure riparian vegetation densities within the Thompson River Basin once a month throughout the year.
- The purpose is to gather information on riparian habitat to guide cutthroat trout recovery actions within the basin.
- Within the Thompson Basin, several potential invasive species, parasites or diseases have been determined to be of significant concern.

HACCP Step 1 – Activity Description

HACCP Plan Title: Hypothetical HACCP Plan

Management Objective: Survey riparian vegetation habitat based on the recovery plan for the cutthroat trout (CT).

Contact Person: Dave Britton

Phone: (800) LUV-FISH

Email: David_Britton@fws.gov

Activity Description

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

Who: Cutthroat Trout National Fish Hatchery personnel

What: Measurement of Riparian Vegetation Density

Where: Survey sites within the Thompson River Basin (Montgomery County, California). Waterbodies include the Thompson River, Patterson River, Britton Creek, and Pasko Creek. There are 20 sites within the basin (5 per river or creek). Survey sites are 100 meters in length.

When: Sites are sampled continuously throughout the year starting in April and ending in November. Only one site is sampled per day.

How: Retrieve the appropriate gear from a warehouse at the beginning of the day. Travel to the sampling site. Once at the site the survey is conducted by wading down the river and taking measurements on riparian vegetation density. Once activity is complete, return to the warehouse. Gear is unloaded and stored.

Why: To gather data and information on riparian habitat to help guide cutthroat trout recovery actions

Step 1 – Activity Description Skill Check

- ✓ Identify the essential components of a well-written Activity Description.
- ✓ Write an Activity Description encompassing all six description components.

Step 1 – Activity Description Group Exercise

- Read through the Hypothetical Activity Narrative
- Using information provided, complete an Activity Description.
- 10 minutes to complete



Step 2 – Activity Flow Chart

HACCP Step 2 – Activity Flow Chart Outline Sequential Tasks of Activity

Task 1	Title:
	Description:



Task 2	Title:
	Description:



Task 3	Title:
	Description:



Task 4	Title:
	Description:

Step 2 – Activity Flow Chart Learning Objectives

- Discuss the relationship between the Activity Description and the Activity Flow Chart.
- Identify all of the tasks required to complete the activity described in Step 1.

What Is An Activity Flow Chart?

- Breaks the Activity into Tasks
- All Tasks Listed, Sequential, Basic
- Contains Task Number, Title and Description
- Records What Should Happen
Not What Does Happen
- Parallel activities require individual plans

Lumpers vs. Splitters

- ⑩ **"Lumpers"** – groups task within an activity making it difficult to distinguish specific prevention opportunities.
- ⑩ **"Splitters"** – splits tasks within an activity causing there to be too many tasks.

A HACCP plan will not be effective if the tasks defined for your activity are too narrow or too broad. Be specific yet concise.



Best Management Practices



BMPs

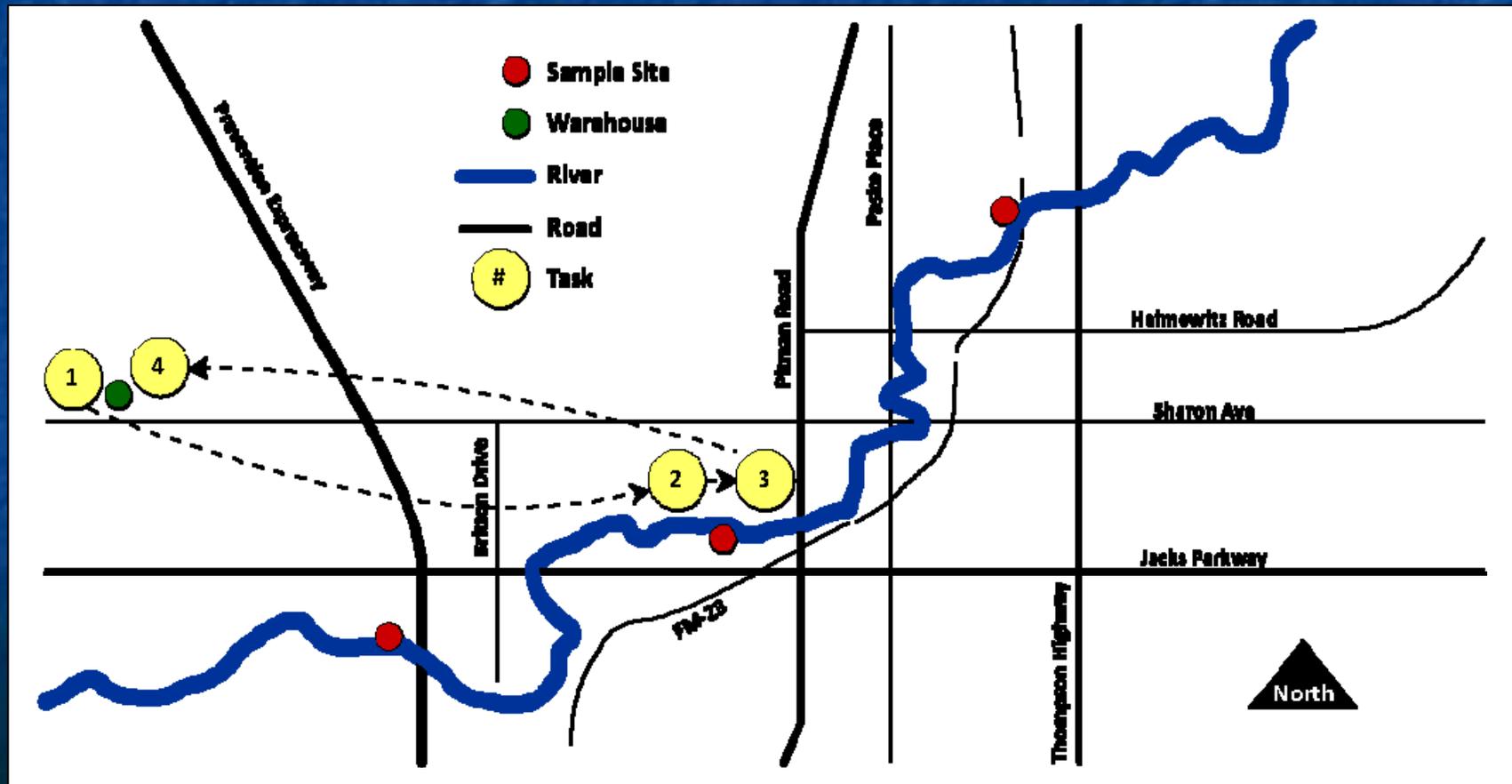


Tasks

BMPs will serve as control measures with prescribed ranges, limits or criteria

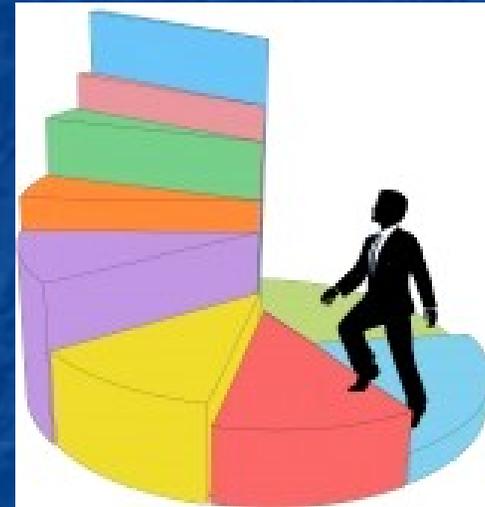
What is an Activity Flow Diagram?

- Useful for visualizing the activity
- Aids risk analysis
- Simple to create... does not have to be fancy



How is the Flow Chart used?

- Each task will be analyzed individually for the risk of spreading non-target species
- The **Non-Target Analysis Worksheet** (Step 4)



HACCP Step 2 – Activity Flow Chart

Outline Sequential Tasks of Activity (page 24)

Task 1	Title: Load Gear and Drive to site
	Description: Arrive at warehouse and load appropriate gear for sampling activity. Drive to sampling site.
	
Task 2	Title: Unload gear and conduct survey
	Description: Unload gear from vehicle. Prepare gear to conduct sampling. Conduct survey by wading down river and taking measurements on riparian vegetation density.
	
Task 3	Title: Reload Gear
	Description: Return to vehicle and pack up gear.
	
Task 4	Title: Return to warehouse and unload gear
	Description: Return to the warehouse in vehicle with gear. Put equipment away to store for next use.

Step 2 – Activity Flow Chart Skill Check

- ✓ Discuss the relationship between the Activity Description and the Activity Flow Chart.
- ✓ Identify all of the tasks required to complete the activity described in Step 1.

Step 2 – Activity Flow Chart Group Exercise

- Read through the Hypothetical Activity Narrative
- Using information provided, complete an Activity Flow Chart.
- 10 minutes to complete



Step 3 – Identify Potential Non-targets

HACCP Step 3 – Identify Potential Non-Targets

Non-Targets That May Potentially Be Moved/Introduced

Vertebrates:

Invertebrates:

Plants:

Other Organisms (pathogens, parasites, etc.):

Step 3 – Potential Non-Targets Learning Objectives

- Discuss the difference between a target and a non-target
- Identify the different non-target categories
- Identify non-targets that potentially could be moved during your activities.

Key HACCP Terminology

Target:

Whatever is intentionally being moved from place to place (can be species or object).



Non-target:

Any species that may be present in the action area, but is not the species for which an action was initiated



Step 3 – Categories

HACCP Step 3 – Identify Potential Non-Targets

Non-Targets That May Potentially Be Moved/Introduced

Vertebrates:

Invertebrates:

Plants:

Other Organisms (pathogens, parasites, etc.):

Potential Non-Targets

- Vertebrates



- Invertebrates



- Plants



- Other Organisms



Developing Potential Non-Target List

- Does not have to be a full list of non-native species.
- If there is a potential to spread even one species, HACCP will prevent the spread of others of that type
- Local Experts can be beneficial
- Can be very general
- If your HACCP team is on the fence whether something should or should not be listed as a potential target, it probably should be listed

Precautionary Principle

HACCP planning for natural resource pathways is intended to remove all non-targets, following the **precautionary principle**:

- If not yet scientific consensus of harm, the burden of proof falls on those taking the action.
- Social responsibility to protect the environment from exposure to possible
- Relaxed only if scientific findings emerge that provide sound, convincing evidence that no harm will result.

(Some) Useful Resources to Identify Non-Target Species

USGS NAS (Non-indigenous Aquatic Species) Database

<http://nas.er.usgs.gov>

Great Lakes Aquatic Nonindigenous Species Information System (GLANSIS)

<http://www.glerl.noaa.gov/res/Programs/nrcrais/glansis.html>

National Exotic Marine and Estuarine Species Information System (NEMESIS)

<http://invasions.si.edu/nemesis>

USDA Plants Database

<http://plants.usda.gov/java/noxiousDriver>

NISbase - The International Nonindigenous Species Database Network

<http://www.nisbase.org>

HACCP Step 3 – Identify Potential Non-targets

Vertebrates:

Amphibians, Bullfrog (*Rana catesbeiana*)

Invertebrates:

New Zealand Mudsnaill (*Potamopyrgus antipodarum*)

Plants:

Eurasian milfoil (*Myriophyllum spicatum*)

Purple loosestrife (*Lythrum salicaria*)

Others (pathogens, parasites, etc.):

Chytrid fungus (Phylum *Chytridiomycota*)

Whirling disease (*Myxobolus cerebralis*)

Step 3 – Potential Non-Targets Skill Check

- ✓ Discuss the difference between a target and a non-target
- ✓ Identify the different non-target categories
- ✓ Identify non-targets that potentially could be moved during your activities.

Step 3 – Potential Non-Target Group Exercise

- Read through the Hypothetical Activity Narrative
- Using information provided, complete an list of potential non-targets.
- 10 minutes to complete



Step 4: Module 1: Non-Target Analysis Worksheet

HACCP Step 4 – Non-Target Analysis Worksheet						
1	2	3	4	5	6	7
Tasks (From Step 2)	Potential Non-targets (From Step 3)	Risk Assessment Are any non-targets significant? Yes or No	Justification Justify your answer in Column 3	Control What control measures can be applied during this task to reduce the risk of non-targets?	CCP? Is this task a CCP? Yes or No	Justification Justify your answer in Column 6
Task #	Vertebrates					
Title:	Invertebrates					
	Plants					
	Others					

Step 4 – NTAW Learning Objectives

- Describe the relationship between Steps 1, 2, 3 and 4 of the HACCP Planning Process.
- Evaluate the significance and severity of each non-target using risk assessment
- Complete the first four columns of the Non-Target Analysis Worksheet

Step 4: Module 1: Non-Target Analysis Worksheet

HACCP Step 4 – Non-Target Analysis Worksheet						
1	2	3	4	5	6	7
Tasks (From Step 2)	Potential Non-targets (From Step 3)	Risk Assessment Are any non-targets significant? Yes or No	Justification Justify your answer in Column 3	Control What control measures can be applied during this task to reduce the risk of non-targets?	CCP? Is this task a CCP? Yes or No	Justification Justify your answer in Column 6
Task #	Vertebrates					
Title:	Invertebrates					
	Plants					
	Others					

Task 1...

HACCP Step 4 – Non-target Analysis Worksheet

1 Tasks (From Step 2)	2 Potential Non-Targets (From Step 3)	3 Risk Assessment Are any non-targets significant? Yes or No	4 Justification Justify your answer in Column 3	5 Control What Control Measures Can be applied during this task to reduce the risk of non-targets?	6 CCP Is this task a CCP? Yes or No	7 Justification Justify your answer in column 6
---	---	---	---	--	--	---

Task 1 Load Gear and Drive to Site	Vertebrates Amphibians, including bullfrogs					
	Invertebrates NZMS					
	Plants Eurasian milfoil Purple loosestrife					
	Others Chytrid fungus Whirling disease					

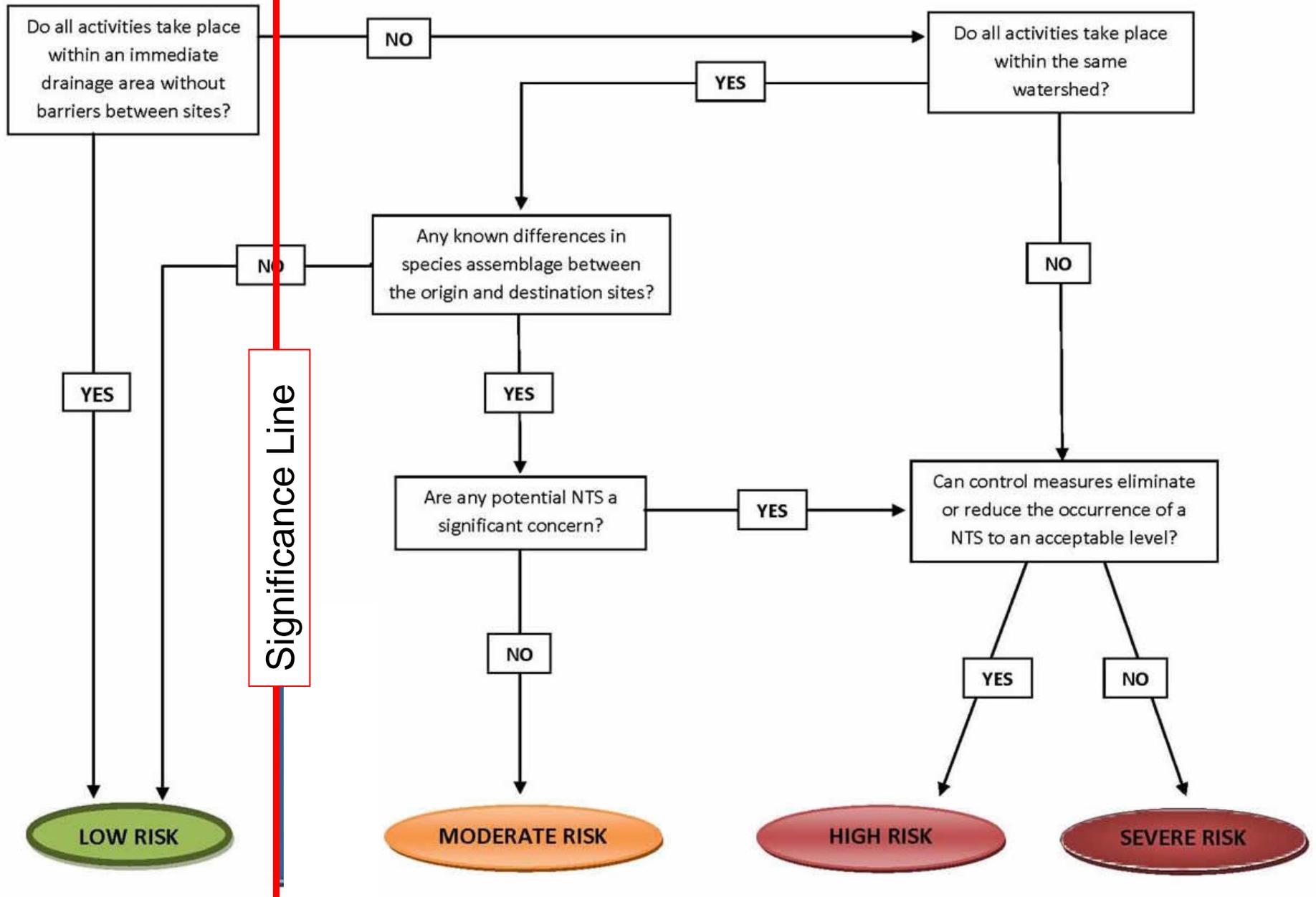
Are the Potential Non-Targets Significant?

Risk assessments measure:

- Likelihood of an event (movement of non-target) occurring
- Severity of negative impacts from such an event.

Remember: HACCP uses the **Precautionary Principle**
(page 10)

- Risk assumed equal for all species and situations therefore - **All impacts assumed to be significantly negative**
- Leaves only likelihood to be assessed.



Risk Assessment vs. Risk Management?

Risk Assessment:

- Evaluates severity and probability of an event occurring

Risk Management includes:

- Identification
- Assessment
- Prioritization
- Control to minimize the risk
- Monitor impacts

Task 1...

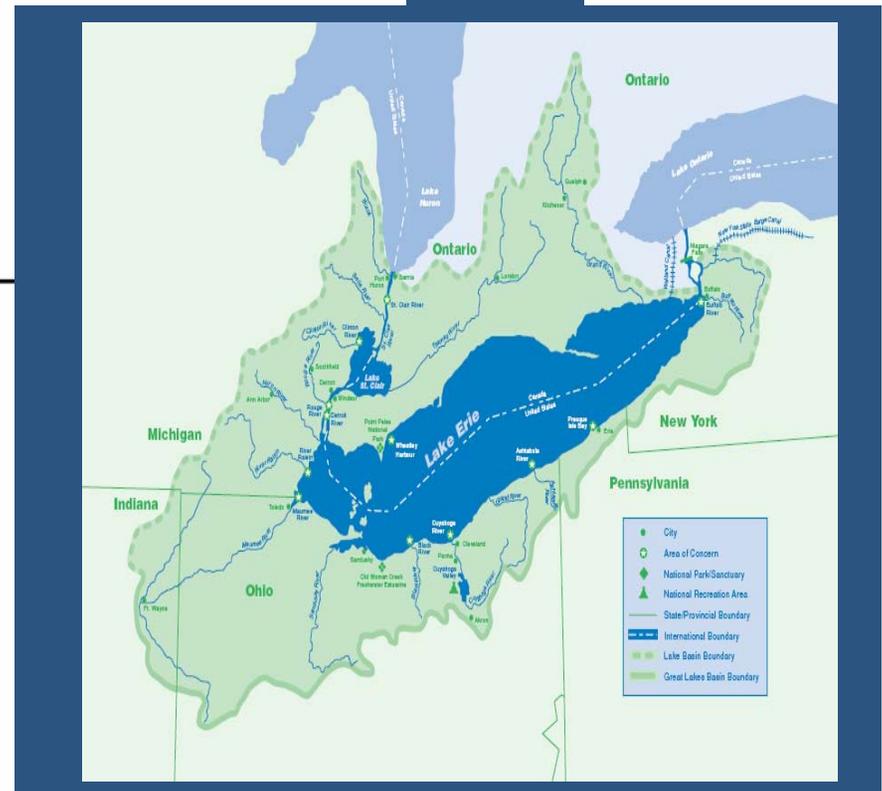
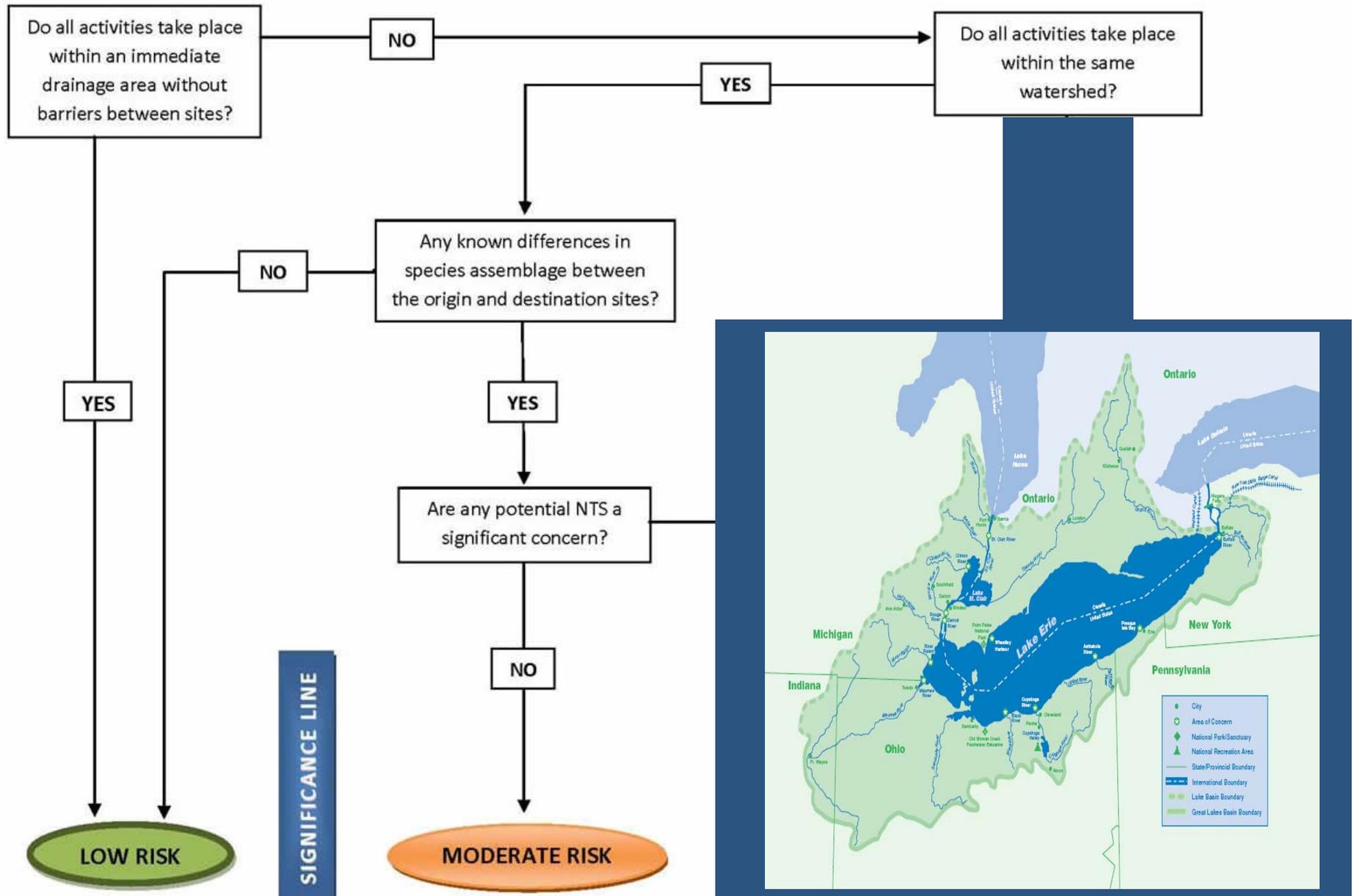
HACCP Step 4 – Non-target Analysis Worksheet

<p>1 Tasks</p> <p>(From Step 2)</p>	<p>2 Potential Non-Targets</p> <p>(From Step 3)</p>	<p>3 Risk Assessment</p> <p>Are any non-targets significant? Yes or No</p>	<p>4 Justification</p> <p>Justify your answer in Column 3</p>	<p>5 Control</p> <p>What Control Measures Can be applied during this task to reduce the risk of non-targets?</p>	<p>6 CCP</p> <p>Is this task a CCP? Yes or No</p>	<p>7 Justification</p> <p>Justify your answer in column 6</p>
---	---	--	---	--	---	---

<p>Task 1</p> <p>Load Gear and Drive to Site</p>	<p>Vertebrates Amphibians, including bullfrogs</p>	
	<p>Invertebrates NZMS</p>	
	<p>Plants Eurasian milfoil Purple loosestrife</p>	
	<p>Others Chytrid fungus Whirling disease</p>	



RISK ASSESSMENT DIAGRAM FOR AQUATIC MANAGEMENT ACTIVITIES



Task 1...

HACCP Step 4 – Non-target Analysis Worksheet

1 Tasks (From Step 2)	2 Potential Non-Targets (From Step 3)	3 Risk Assessment Are any non-targets significant? Yes or No	4 Justification Justify your answer in Column 3	5 Control What Control Measures Can be applied during this task to reduce the risk of non-targets?	6 CCP Is this task a CCP? Yes or No	7 Justification Justify your answer in column 6
---	---	---	---	--	--	---

Task 1 Load Gear and Drive to Site	Vertebrates Amphibians, including bullfrogs	Yes
	Invertebrates NZMS	Yes
	Plants Eurasian milfoil Purple loosestrife	Yes
	Others Chytrid fungus Whirling disease	Yes



Task 1...

HACCP Step 4 – Non-target Analysis Worksheet

1 Tasks (From Step 2)	2 Potential Non-Targets (From Step 3)	3 Risk Assessment Are any non-targets significant? Yes or No	4 Justification Justify your answer in Column 3	5 Control What Control Measures Can be applied during this task to reduce the risk of non- targets?	6 CCP Is this task a CCP? Yes or No	7 Justification Justify your answer in column 6
---	---	---	--	--	---	---

Task 1 Load Gear and Drive to Site	Vertebrates Amphibians, including bullfrogs	Yes	There is risk of moving the potential non- targets from the warehouse to the next site because equipment was used at a different site during a previous survey. Organisms could remain viable from this point until this day's survey site is reached.
	Invertebrates NZMS	Yes	
	Plants Eurasian milfoil Purple loosestrife	Yes	
	Others Chytrid fungus Whirling disease	Yes	



Task 2...

HACCP Step 4 – Non-target Analysis Worksheet

<p>1 Tasks</p> <p>(From Step 2)</p>	<p>2 Potential Non-Targets</p> <p>(From Step 3)</p>	<p>3 Risk Assessment</p> <p>Are any non-targets significant? Yes or No</p>	<p>4 Justification</p> <p>Justify your answer in Column 3</p>	<p>5 Control</p> <p>What Control Measures Can be applied during this task to reduce the risk of non-targets?</p>	<p>6 CCP</p> <p>Is this task a CCP? Yes or No</p>	<p>7 Justification</p> <p>Justify your answer in column 6</p>
---	---	--	---	--	---	---

<p>Task 2</p> <p>Unload gear and conduct sampling</p>	<p>Vertebrates Amphibians, including bullfrogs</p>	<p>No</p>
	<p>Invertebrates NZMS</p>	<p>No</p>
	<p>Plants Eurasian milfoil Purple loosestrife</p>	<p>No</p>
	<p>Others Chytrid fungus Whirling disease</p>	<p>No</p>



Task 2...

HACCP Step 4 – Non-target Analysis Worksheet

1 Tasks (From Step 2)	2 Potential Non-Targets (From Step 3)	3 Risk Assessment Are any non-targets significant? Yes or No	4 Justification Justify your answer in Column 3	5 Control What Control Measures Can be applied during this task to reduce the risk of non- targets?	6 CCP Is this task a CCP? Yes or No	7 Justification Justify your answer in column 6
---------------------------------	--	--	---	--	--	---

Task 2 Unload gear and conduct sampling	Vertebrates Amphibians, including bullfrogs	No	Risk is low for moving potential non-targets because all sampling equipment was cleaned following last use and will remain at this site.
	Invertebrates NZMS	No	
	Plants Eurasian milfoil Purple loosestrife	No	
	Others Chytrid fungus Whirling disease	No	



Task 3...

HACCP Step 4 – Non-target Analysis Worksheet

1 Tasks (From Step 2)	2 Potential Non-Targets (From Step 3)	3 Risk Assessment Are any non-targets significant? Yes or No	4 Justification Justify your answer in Column 3	5 Control What Control Measures Can be applied during this task to reduce the risk of non-targets?	6 CCP Is this task a CCP? Yes or No	7 Justification Justify your answer in column 6
---	---	---	---	--	--	---

Task 3 Reload gear	Vertebrates Amphibians, including bullfrogs	Yes
	Invertebrates NZMS	Yes
	Plants Eurasian milfoil Purple loosestrife	Yes
	Others Chytrid fungus Whirling disease	Yes



Task 3...

HACCP Step 4 – Non-target Analysis Worksheet

1 Tasks (From Step 2)	2 Potential Non-Targets (From Step 3)	3 Risk Assessment Are any non-targets significant? Yes or No	4 Justification Justify your answer in Column 3	5 Control What Control Measures Can be applied during this task to reduce the risk of non- targets?	6 CCP Is this task a CCP? Yes or No	7 Justification Justify your answer in column 6
---------------------------------	--	--	---	--	--	---

Task 3 Reload gear	Vertebrates		
	Amphibians, including bullfrogs	Yes	High risk that bullfrog eggs or adults may be in gear after sampling and could be transported
	Invertebrates	Yes	High risk that invertebrates could be in gear after sampling and could be transported
	NZMS		
	Plants	Yes	High risk that plants or seeds could be attached to gear after sampling and could be transported
	Eurasian milfoil Purple loosestrife		
	Others	Yes	High risk that unwanted organisms could survive on gear and could be transported
	Chytrid fungus Whirling disease		



Task 4...

HACCP Step 4 – Non-target Analysis Worksheet

1 Tasks (From Step 2)	2 Potential Non-Targets (From Step 3)	3 Risk Assessment Are any non-targets significant? Yes or No	4 Justification Justify your answer in Column 3	5 Control What Control Measures Can be applied during this task to reduce the risk of non-targets?	6 CCP Is this task a CCP? Yes or No	7 Justification Justify your answer in column 6
---	---	---	---	--	--	---

Task 4 Return to warehouse and unload gear	Vertebrates Amphibians, including bullfrogs	Yes
	Invertebrates NZMS	Yes
	Plants Eurasian milfoil Purple loosestrife	Yes
	Others Chytrid fungus Whirling disease	Yes



Task 4...

HACCP Step 4 – Non-target Analysis Worksheet

<p>1 Tasks</p> <p>(From Step 2)</p>	<p>2 Potential Non-Targets</p> <p>(From Step 3)</p>	<p>3 Risk Assessment</p> <p>Are any non-targets significant? Yes or No</p>	<p>4 Justification</p> <p>Justify your answer in Column 3</p>	<p>5 Control</p> <p>What Control Measures Can be applied during this task to reduce the risk of non-targets?</p>	<p>6 CCP</p> <p>Is this task a CCP? Yes or No</p>	<p>7 Justification</p> <p>Justify your answer in column 6</p>
---	---	--	---	--	---	---

<p>Task 4</p> <p>Return to warehouse and unload gear</p>	<p>Vertebrates</p> <p>Amphibians, including bullfrogs</p>	<p>Yes</p>	<p>There is risk of moving the potential non-targets from this site to the warehouse and then to a site during subsequent field work. Organisms could remain viable from this point until the next survey site is reached.</p>
	<p>Invertebrates</p> <p>NZMS</p>	<p>Yes</p>	
	<p>Plants</p> <p>Eurasian milfoil</p> <p>Purple loosestrife</p>	<p>Yes</p>	
	<p>Others</p> <p>Chytrid fungus</p> <p>Whirling disease</p>	<p>Yes</p>	



Step 4 – NTAW Skill Check

- ✓ Describe the relationship between Steps 1, 2, 3 and 4 of the HACCP Planning Process.
- ✓ Evaluate the significance and severity of each non-target using risk assessment
- ✓ Complete the first four columns of the Non-Target Analysis Worksheet

Step 4 – NTAW Group Exercise

- Read through the Hypothetical Activity Narrative
- Using information provided, complete ONLY Columns 1 – 4 on the NTAW .
- 15 minutes to complete



Step 4: Module 2: Non-Target Analysis Worksheet

HACCP Step 4 – Non-Target Analysis Worksheet						
1	2	3	4	5	6	7
Tasks (From Step 2)	Potential Non-targets (From Step 3)	Risk Assessment Are any non-targets significant? Yes or No	Justification Justify your answer in Column 3	Control What control measures can be applied during this task to reduce the risk of non-targets?	CCP? Is this task a CCP? Yes or No	Justification Justify your answer in Column 6
Task #	Vertebrates					
Title:	Invertebrates					
	Plants					
	Others					

Step 4 – NTAW Learning Objectives

- Define control measure and control point
- Understand the concept of minimizing risk vs. eliminating risk.
- Complete Column 5 of the NTAW

Step 4: Module 2: Non-Target Analysis Worksheet

HACCP Step 4 – Non-Target Analysis Worksheet 1

1 Tasks (From Step 2)	2 Potential Non-Targets (From Step 3)	3 Risk Assessment Are any non-targets significant? Yes or No	4 Justification Justify your answer in Column 3	5 Control What Control Measures Can be applied during this task to reduce the risk of non-targets?	6 CCP Is this task a CCP? Yes or No	7 Justification Justify your answer in column 6
Task # 1 Title: Load gear and drive to site	Vertebrates: Amphibians, including bullfrogs	Yes	There is risk of moving the potential non-targets from the warehouse to the next site because equipment was used at a different site during a previous survey. Organisms could remain viable from this point until this day's survey site is reached.			
	Invertebrates: NZMS	Yes				
	Plants: Eurasian milfoil Purple loosestrife	Yes				
	Others: Chytrid fungus Whirling disease	Yes				

Control Measures – Actions that can be used to control and remove identified non-targets.

Control Point – the point during a task at which potential hazards are controlled by a control measure.

Method	Example
Chemical decontamination	Soak or spray equipment for at least 1 minute with a 2% bleach solution. I
Desiccation	Allow for 5 days of drying time before reuse.
Freezing	Expose equipment to 14 ° F for 2 hours
Manual Removal	Brush, Vacuum, Adhesive Roller
Heat Treatment	Use of steam, hot air, or hot water to bring an object's surface temperature up to 140 ° F for 30 seconds.
Water Washing	Pressure wash vehicles at minimum of 90 pounds per square inch (psi).
Dedicated Equipment	Wading gear only used in specific watershed
Managing Field Operations	Sampling a stream from upstream to downstream

Control Measures

- ⑩ Methods:
 - Chemical
 - Drying
 - Freezing
 - Manual Removal
 - Water
 - Heat Treatment
 - Dedicated Equipment
 - Managing Field Opera



Task 1...

HACCP Step 4 – Non-target Analysis Worksheet

1 Tasks (From Step 2)	2 Potential Non-Targets (From Step 3)	3 Risk Assessment Are any non-targets significant? Yes or No	4 Justification Justify your answer in Column 3	5 Control What Control Measures Can be applied during this task to reduce the risk of non-targets?	6 CCP Is this task a CCP? Yes or No	7 Justification Justify your answer in column 6
---	---	---	---	--	--	---

Task 1 Load Gear and Drive to Site	Vertebrates Amphibians, including bullfrogs	Yes	There is risk of moving the potential non-targets from the warehouse to the next site because equipment was used at a different site during a previous survey. Organisms could remain viable from this point until this day's survey site is reached.	Verify that equipment was stored properly	
	Invertebrates NZMS	Yes			
	Plants Eurasian milfoil Purple loosestrife	Yes			
	Others Chytrid fungus Whirling disease	Yes			

Task 2...

HACCP Step 4 – Non-target Analysis Worksheet

1 Tasks (From Step 2)	2 Potential Non-Targets (From Step 3)	3 Risk Assessment Are any non-targets significant? Yes or No	4 Justification Justify your answer in Column 3	5 Control What Control Measures Can be applied during this task to reduce the risk of non- targets?	6 CCP Is this task a CCP? Yes or No	7 Justification Justify your answer in column 6
---------------------------------	--	--	---	--	--	---

Task 2 Unload gear and conduct sampling	Vertebrates Amphibians, including bullfrogs	No	Risk is low for moving potential non-targets because all sampling equipment was cleaned following last use and will remain at this site.	NA	
	Invertebrates NZMS	No		NA	
	Plants Eurasian milfoil Purple loosestrife	No		NA	
	Others Chytrid fungus Whirling disease	No		NA	

Task 3...

HACCP Step 4 – Non-target Analysis Worksheet

1 Tasks (From Step 2)	2 Potential Non-Targets (From Step 3)	3 Risk Assessment Are any non-targets significant? Yes or No	4 Justification Justify your answer in Column 3	5 Control What Control Measures Can be applied during this task to reduce the risk of non- targets?	6 CCP Is this task a CCP? Yes or No	7 Justification Justify your answer in column 6
---	---	---	--	--	---	---

Task 3 Reload gear	Vertebrates Amphibians, including bullfrogs	Yes	High risk that bullfrog eggs or adults may be in gear after sampling and could be transported	Visually inspect all gear for non-targets and remove anything found by hand ".	
	Invertebrates NZMS	Yes	High risk that invertebrates could be in gear after sampling and could be transported		
	Plants Eurasian milfoil Purple loosestrife	Yes	High risk that plants or seeds could be attached to gear after sampling and could be transported		
	Others Chytrid fungus Whirling disease	Yes	High risk that unwanted organisms could survive on gear and could be transported		

Task 4...

HACCP Step 4 – Non-target Analysis Worksheet

1 Tasks (From Step 2)	2 Potential Non-Targets (From Step 3)	3 Risk Assessment Are any non-targets significant? Yes or No	4 Justification Justify your answer in Column 3	5 Control What Control Measures Can be applied during this task to reduce the risk of non-targets?	6 CCP Is this task a CCP? Yes or No	7 Justification Justify your answer in column 6
---	---	---	---	--	--	---

Task 4 Return to warehouse and unload gear	Vertebrates Amphibians, including bullfrogs	Yes	There is risk of moving the potential non-targets from this site to the warehouse and then to a site during subsequent field work. Organisms could remain viable from this point until the next survey site is reached.	Clean and disinfect all equipment using approved disinfectant solution.	
	Invertebrates NZMS	Yes			
	Plants Eurasian milfoil Purple loosestrife	Yes			
	Others Chytrid fungus Whirling disease	Yes			

HACCP Teamwork

What is the right control measure?

- Identify potential control measures that are:
 - 1) effective at reducing the non-target risk
 - 2) appropriate for severity of non-target risk.

What is an acceptable level of risk?

- Minimizing vs. eliminating risk

HACCP Teamwork

Considerations for developing effective control measures

- Include a variety of expertise on HACCP team
- Assemble supporting documents including current information on effective control measures
- Reach out to experts

Step 4 – NTAW Skill Check

- ✓ Define control measure and control point
- ✓ Understand the concept of minimizing risk vs. eliminating risk.
- ✓ Complete Column 5 of the NTAW

Step 4 – NTAW Group Exercise

- Read through the Hypothetical Activity Narrative
- Using information provided, complete **ONLY** Columns 5 on the NTAW .
- 10 minutes to complete



Step 4: Module 3: Non-Target Analysis Worksheet

HACCP Step 4 – Non-Target Analysis Worksheet						
1	2	3	4	5	6	7
Tasks (From Step 2)	Potential Non-targets (From Step 3)	Risk Assessment Are any non-targets significant? Yes or No	Justification Justify your answer in Column 3	Control What control measures can be applied during this task to reduce the risk of non-targets?	CCP? Is this task a CCP? Yes or No	Justification Justify your answer in Column 6
Task #	Vertebrates					
Title:	Invertebrates					
	Plants					
	Others					

Step 4 – NTAW Learning Objectives

- Identify critical control points versus optional control points
- Understand how to use CCP decision tree (tool) to determine if control measure action is critical or optional
- Complete non-target analysis worksheet

Step 4: Non-Target Analysis Worksheet

HACCP Step 4 – Non-Target Analysis Worksheet

1 Tasks (From Step 2)	2 Potential Non-targets (From Step 3)	3 Risk Assessment Are any non-targets significant? Yes or No	4 Justification Justify your answer in Column 3	5 Control What control measures can be applied during this task to stop the spread of non-targets?	6 CCP? Is this task a CCP? Yes or No	7 Justification Why is this task a CCP or why is it not?
---	---	---	---	--	---	--

Task #1 Title:	Vertebrates					
	Invertebrates					
	Plants					
	Others					

Optional Control Point – control point where control measures can be applied to prevent or reduce the risk of significant non-target hazards.

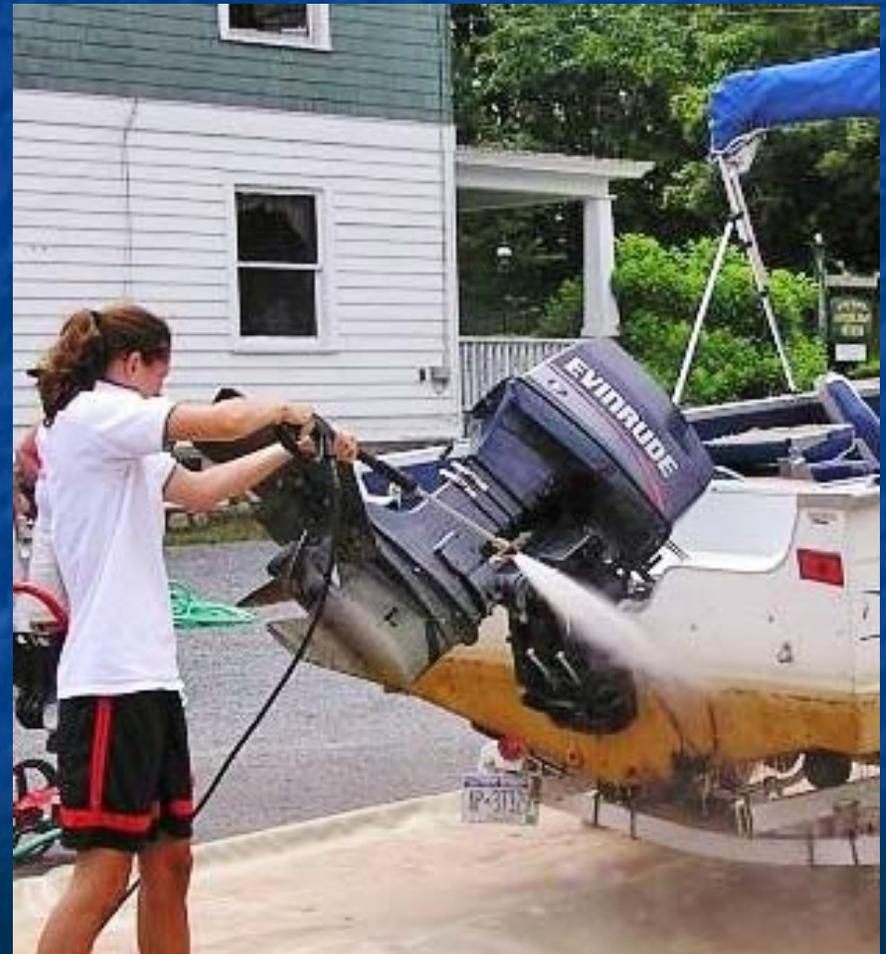
Although NOT critical, still may be important to help reducing any non-targets within the activity.

Critical Control Point – the best point at which significant hazards can be prevented or reduced to minimum risk.

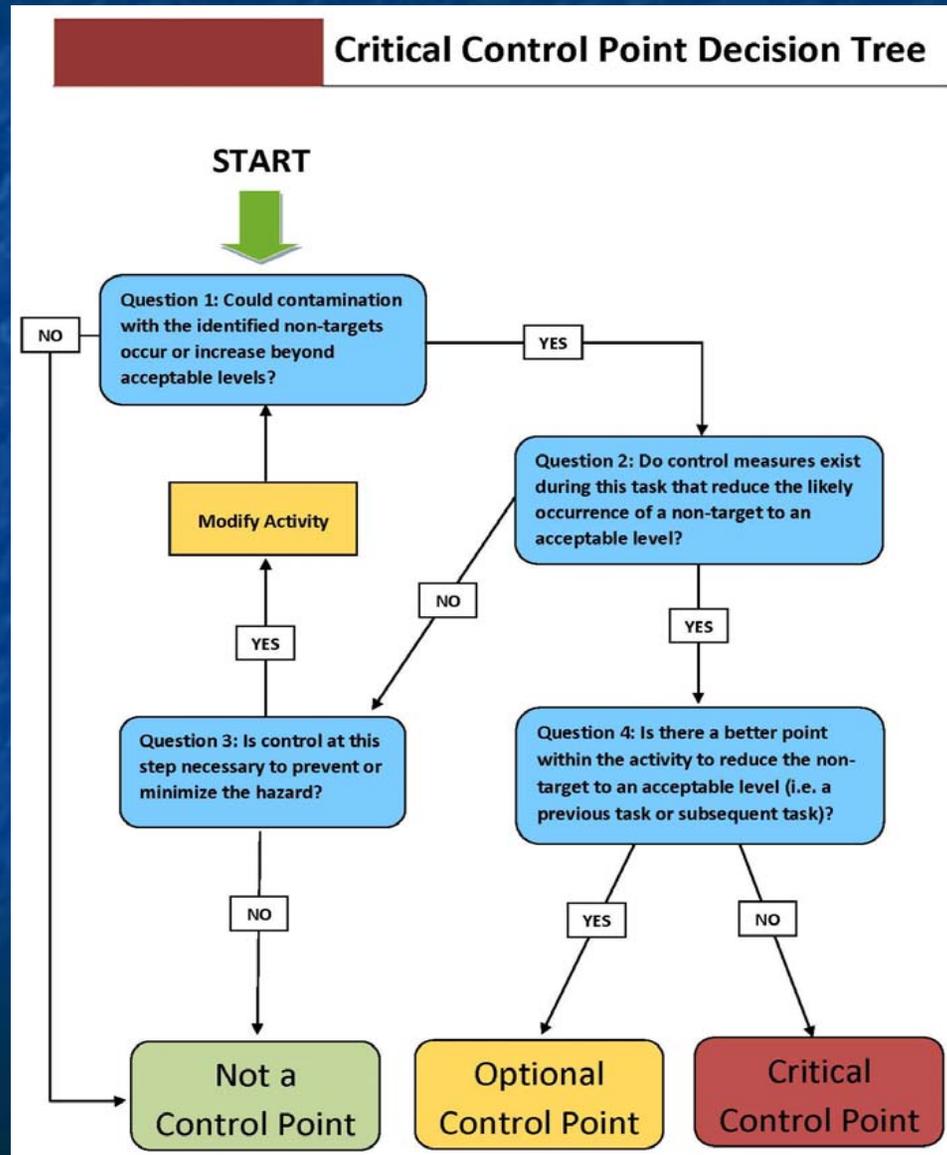
Critical control points are those in which control measures *are essential* for preventing the spread of non-target hazards.

Control Points

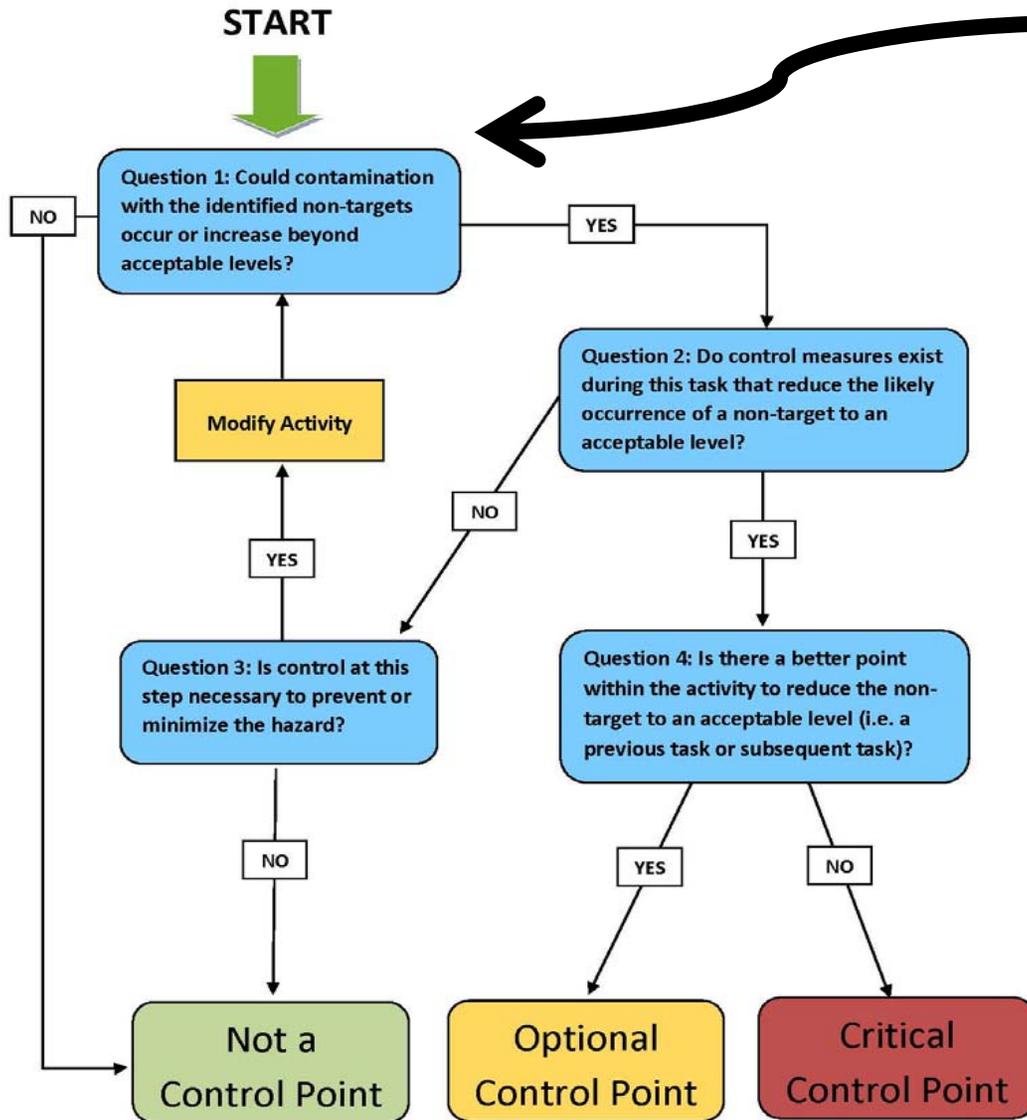
- CCPs and optional control points vary from activity to activity
- Often, the best place to control a non-target is at the point of contact
- How do we determine if a control point is optional or critical?



CCP Decision Tree



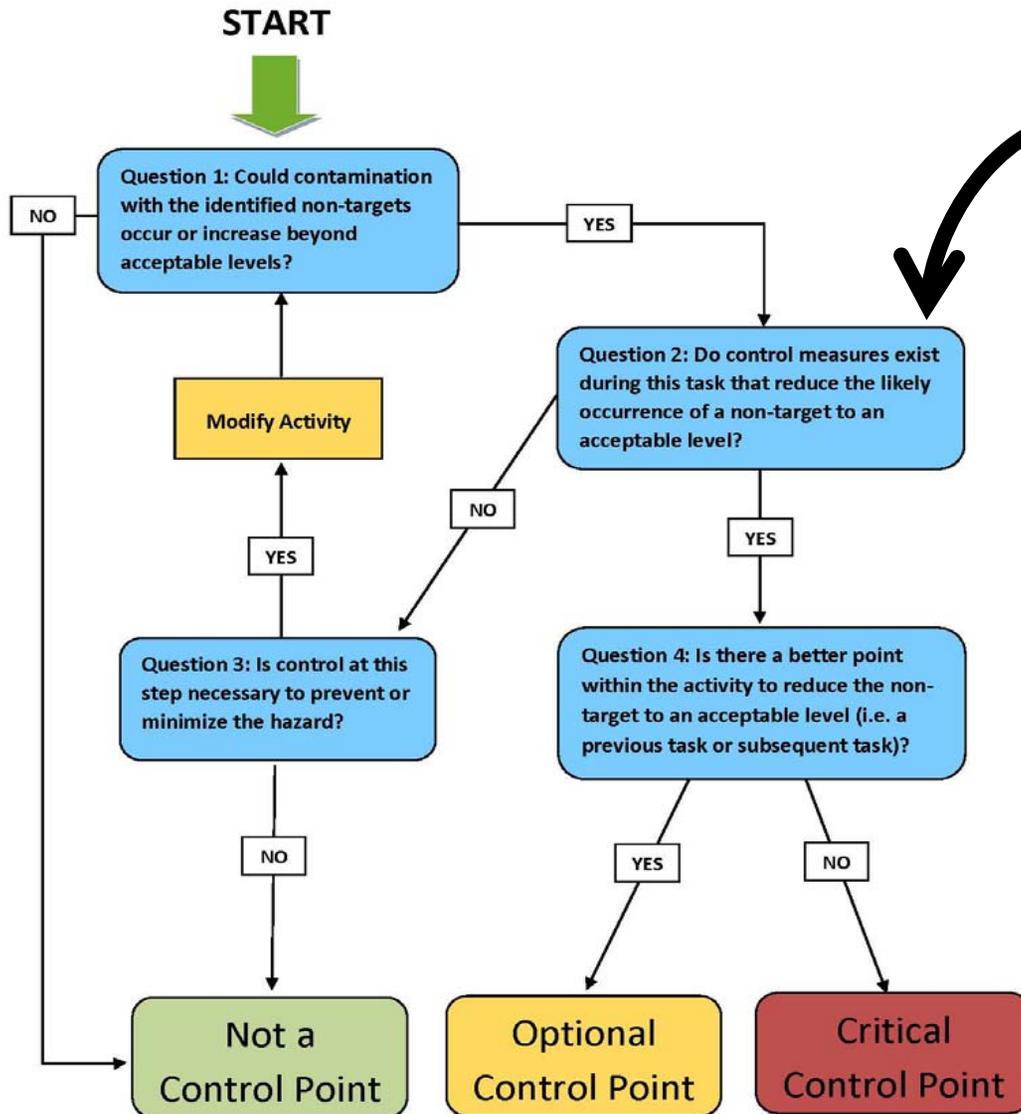
Critical Control Point Decision Tree



CCP Decision Tree

Could contamination with the identified non-targets occur or increase beyond acceptable levels?

Critical Control Point Decision Tree

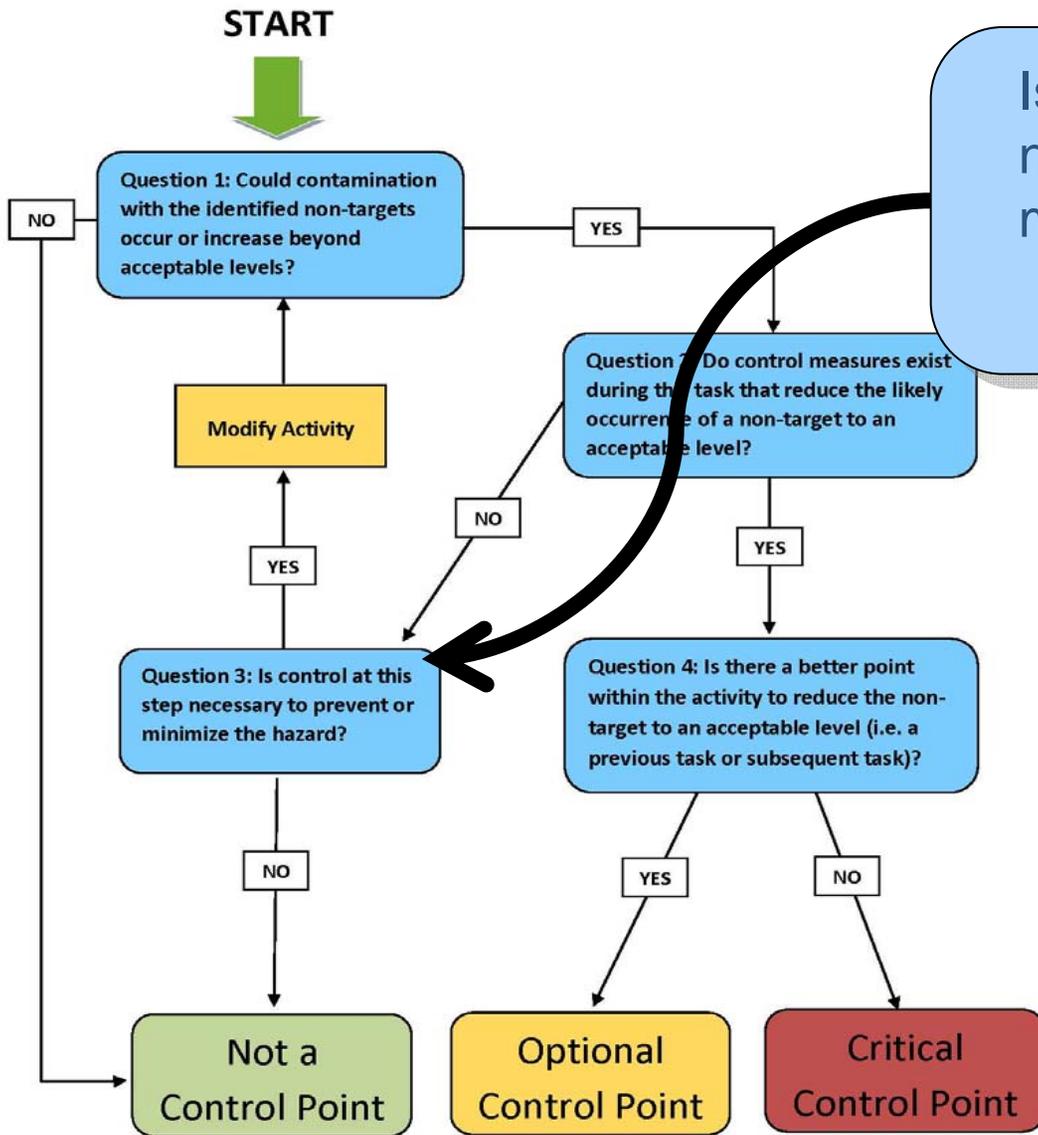


CCP Decision Tree

Do control measures exist during this task that reduce the likely occurrence of a non-target to an acceptable level?

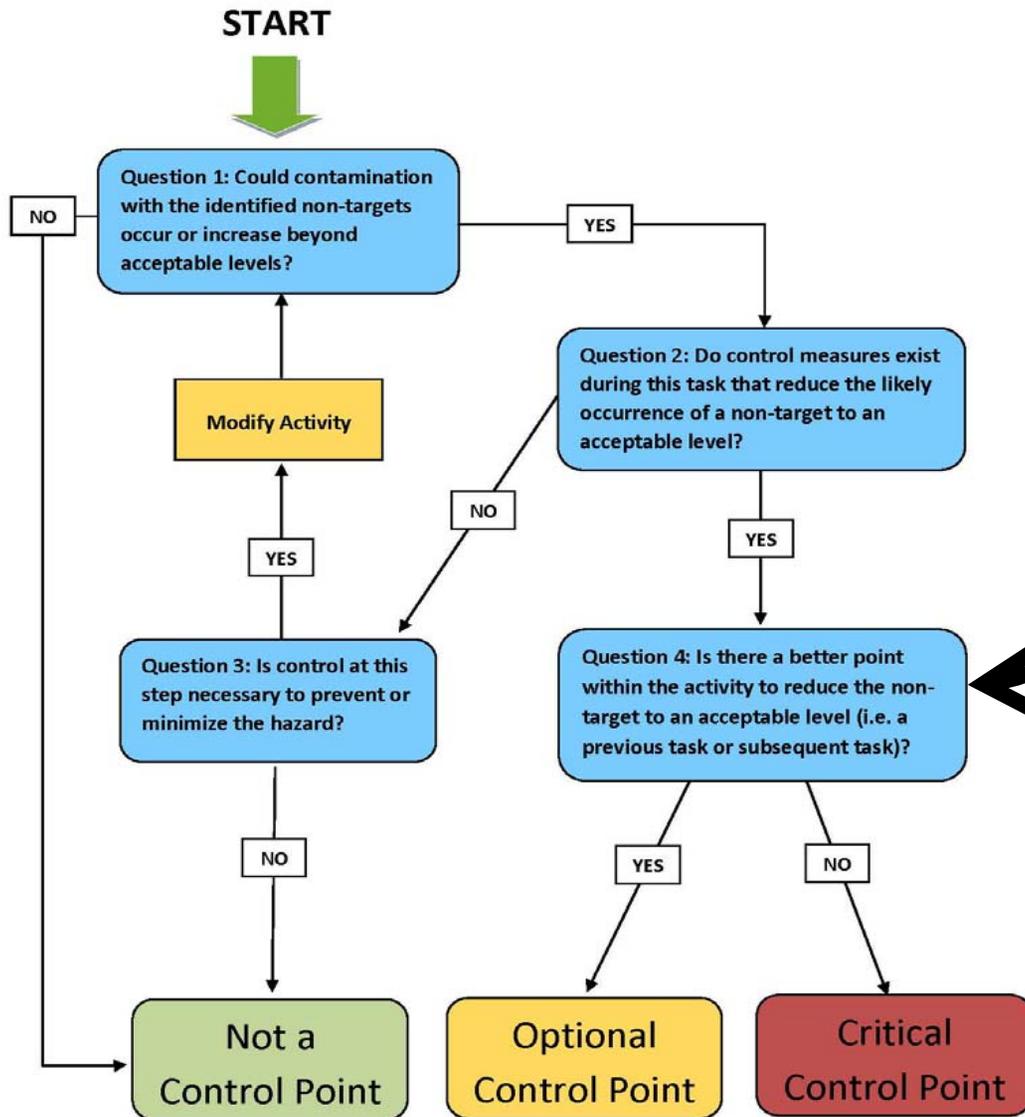
Critical Control Point Decision Tree

CCP Decision Tree



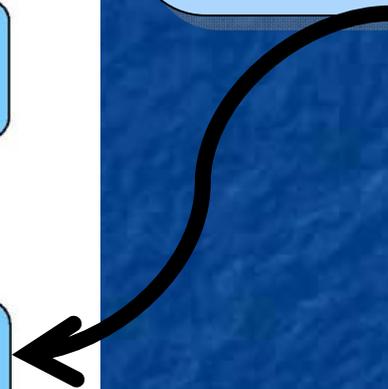
Is control during this task necessary to prevent or minimize the non-targets?

Critical Control Point Decision Tree



CCP Decision Tree

Is there a better point within the activity to reduce the non-target to an acceptable level (i.e. a previous or subsequent task)?



Control Points

- Did you find any CCPs?
- Did you have too many CCPs?
- Are there instances where it is OK to have multiple CCPs?
 - Multiple targets with unique control needs vs single target with multiple controls

HACCP Manual: Page 41

HACCP Manual: Page 43

HACCP Manual: Page 43, 54

Task 1...

HACCP Step 4 – Non-target Analysis Worksheet

<p>1 Tasks (From Step 2)</p>	<p>2 Potential Non-Targets (From Step 3)</p>	<p>3 Risk Assessment Are any non-targets significant? Yes or No</p>	<p>4 Justification Justify your answer in Column 3</p>	<p>5 Control What Control Measures Can be applied during this task to reduce the risk of non- targets?</p>	<p>6 CCP Is this task a CCP? Yes or No</p>	<p>7 Justification Justify your answer in column 6</p>
<p>Task 1 Load Gear and Drive to Site</p>	<p>Vertebrates Amphibians, including bullfrogs</p>	<p>Yes</p>	<p>There is risk of moving the potential non- targets from the warehouse to the next site because equipment was used at a different site during a previous survey. Organisms could remain viable from this point until this day's survey site is reached.</p>	<p>Verify that equipment was stored properly</p>	<p>Yes</p>	<p>This is a critical control point because this is the point where the equipment would go out into the field.</p>
<p>Invertebrates NZMS</p>	<p>Yes</p>	<p>Yes</p>				
<p>Plants Eurasian milfoil Purple loosestrife</p>	<p>Yes</p>	<p>Yes</p>				
<p>Others Chytrid fungus Whirling disease</p>	<p>Yes</p>	<p>Yes</p>				

Task 2...

HACCP Step 4 – Non-target Analysis Worksheet

1 Tasks (From Step 2)	2 Potential Non-Targets (From Step 3)	3 Risk Assessment Are any non-targets significant? Yes or No	4 Justification Justify your answer in Column 3	5 Control What Control Measures Can be applied during this task to reduce the risk of non-targets?	6 CCP Is this task a CCP? Yes or No	7 Justification Justify your answer in column 6
Task 2 Unload gear and conduct sampling	Vertebrates Amphibians, including bullfrogs	No	Risk is low for moving potential non-targets because all sampling equipment was cleaned following last use and will remain at this site.	NA	No	There are no significant non-targets during this task
	Invertebrates NZMS	No		NA	No	
	Plants Eurasian milfoil Purple loosestrife	No		NA	No	
	Others Chytrid fungus Whirling disease	No		NA	No	

Task 3...

HACCP Step 4 – Non-target Analysis Worksheet

1 Tasks (From Step 2)	2 Potential Non-Targets (From Step 3)	3 Risk Assessment Are any non-targets significant? Yes or No	4 Justification Justify your answer in Column 3	5 Control What Control Measures Can be applied during this task to reduce the risk of non-targets?	6 CCP Is this task a CCP? Yes or No	7 Justification Justify your answer in column 6
---------------------------------	---	---	---	--	--	---

Task 3 Reload gear	Vertebrates Amphibians, including bullfrogs	Yes	High risk that bullfrog eggs or adults may be in gear after sampling and could be transported	Visually inspect all gear for non-targets and remove anything found by hand	No	Although there is a potential to encounter NTS during this task, effective controls are not as available in the field as they are at the station. Visual inspection and hand removal are not an effective method of reducing risk of invasive species spread. The subsequent task would better serve as the CCP.
	Invertebrates NZMS	Yes	High risk that invertebrates could be in gear after sampling and could be transported		No	
	Plants Eurasian milfoil Purple loosestrife	Yes	High risk that plants or seeds could be attached to gear after sampling and could be transported		No	
	Others Chytrid fungus Whirling disease	Yes	High risk that unwanted organisms could survive on gear and could be transported		No	

Task 4...

HACCP Step 4 – Non-target Analysis Worksheet

1 Tasks (From Step 2)	2 Potential Non-Targets (From Step 3)	3 Risk Assessment Are any non-targets significant? Yes or No	4 Justification Justify your answer in Column 3	5 Control What Control Measures Can be applied during this task to reduce the risk of non-targets?	6 CCP Is this task a CCP? Yes or No	7 Justification Justify your answer in column 6
---	---	---	---	--	--	---

Task 4 Return to warehouse and unload gear	Vertebrates Amphibians, including bullfrogs	Yes	There is risk of moving the potential non-targets from this site to the warehouse and then to a site during subsequent field work. Organisms could remain viable from this point until the next survey site is reached.	Clean and disinfect all equipment using approved disinfectant solution.	Yes	If the equipment is not decontaminated during this task, then it will not be clean for use next time it is needed.
	Invertebrates NZMS	Yes			Yes	
	Plants Eurasian milfoil Purple loosestrife	Yes			Yes	
	Others Chytrid fungus Whirling disease	Yes			Yes	

Step 4 – NTAW Skill Check

- ✓ Identify critical control points versus optional control points
- ✓ Understand how to use CCP decision tree (tool) to determine if control measure action is critical or optional
- ✓ Complete non-target analysis worksheet

Step 4 – NTAW Group Exercise

- Read through the Hypothetical Activity Narrative
- Using information provided, complete the NTAW .
- 10 minutes to complete



Step 5: Non-Target Risk Action Plan (NTRAP)

HACCP Step 5 – Non-Target Risk Action Plan (NTRAP)			
(Use this form for any "Yes" from Column 6 of HACCP Step 4 - Non-Target Analysis Worksheet) One page for each Critical Control Point			
Mangement Objective From Step 1			
Critical Control Point: Task #	4	Title:	
Significant Non-Target(s) (Step 4, Column 3)			
Control Measure(s) (Step 4, Column 5)			
Precribed ranges, limits, or citeria for control measure(s): (PRCL)			
Monitoring the Control Measure(s)	Who?		
	How?		
	Where?		
	How often?		
Corrective Action(s) if Control Measures Fail (or PRLC cannot be met)			
Supporting Documents (For example, Management Plan, Checklist, Decontamination Techniques, SOPs, Scientific Journal Articles, etc.)			
Development Team Members			
Date Developed:		Date(s) Reviewed:	

** all gray fields are required*

Step 5 – NTRAP

Learning Objectives

- Explain how Steps 1, 2, 3 and 4 of the HACCP Planning process apply to NTRAP.
- Define the prescribed limit, range, or criterion for control measures.
- Describe the process for monitoring and evaluating control measures and establish corrective actions if needed.
- Describe the importance and use of supporting documentation.
- Complete a Step 5 NTRAP form.

Non-Target Risk Action Plan (NTRAP)

HACCP Step 5 – Non-Target Risk Action Plan (NTRAP)			
(Use this form for any "Yes" from Column 6 of HACCP Step 4 - Non-Target Analysis Worksheet) One page for each Critical Control Point			
Mangement Objective From Step 1			
Critical Control Point: Task #	4	Title:	
Significant Non-Target(s) (Step 4, Column 3)			
Control Measure(s) (Step 4, Column 5)			
Precribed ranges, limits, or citeria for control measure(s): (PRCL)			
Monitoring the Control Measure(s)	Who?		
	How?		
	Where?		
	How often?		
Corrective Action(s) if Control Measures Fail (or PRLC cannot be met)			
Supporting Documents (For example, Management Plan, Checklist, Decontamination Techniques, SOPs, Scientific Journal Articles, etc.)			
Development Team Members			
Date Developed:		Date(s) Reviewed:	

** all gray fields are required*

HACCP Step 5 – Non-Target Risk Action Plan (NTRAP)

Management Objective From Step 1		Habitat Survey for the Recovery of Cutthroat Trout (CT)		
Critical Control Point: Task #	1	Title:	Load gear and drive to site	
Significant Non-Target(s) (Step 4, Column 3)		Vertebrates, Invertebrates, Plants, and Other Organisms (All listed in step 3)		
Control Measure(s) (Step 4, Column 5)		Verify that equipment was stored properly		
Prescribed ranges, limits, or criteria for control measure(s) (PRLC):		Verify that control measure checklist is signed after cleaning following last use.		
Monitoring the Control Measure(s)	Who?	Field crew		
	How?	Verify the date and signature, verify that the equipment is in its proper storage location		
	Where?	At the warehouse		
	How often?	Prior to loading the equipment		
Corrective Action(s) if Control Measures Fail (or PRLC cannot be met)		Complete all control measures from task 4: Remove all visible dirt material organisms. Rinse undercarriage of vehicles with high-pressure water spray. Use disinfectant solution that contains quaternary ammonium mixed at a concentration of at least 1% but no more than 3%. Contact time with gear must be at least 10 minutes Verification sheet must be signed to show that the control measure was executed		
Supporting Documents (For example, Management Plan, Checklist, Decontamination Techniques, SOPs, Scientific Journal Articles, etc.)				
Thompson Basin Sampling Protocol, Quaternary Ammonium Disinfectant Information Sheet, Nevada Noxious Weed List, California Noxious Weed List, Verification sheet/checklist, and Diagram of Activity				
Development Team Members			Jonathan Thompson, David Britton, Susan Pasko	
Date Developed:	9/13/2012	Date(s) Reviewed:	9/13/2013	

HACCP Step 5 – Non-Target Risk Action Plan (NTRAP)

Management Objective From Step 1		Habitat Survey for the Recovery of Cutthroat Trout (CT)	
Critical Control Point: Task #	1	Title:	Load gear and drive to site
Significant Non-Target(s) (Step 4, Column 3)		Vertebrates, Invertebrates, Plants, and Other Organisms (All listed in step 3)	
Control Measure(s) (Step 4, Column 5)		Verify that equipment was stored properly	
Prescribed ranges, limits, or criteria for control measure(s) (PRLC):		Verify that control measure checklist is signed after cleaning following last use.	
Monitoring the Control Measure(s)	Who?	Field crew	
	How?	Verify the date and signature, verify that the equipment is in its proper storage location	
	Where?	At the warehouse	
	How often?	Prior to loading the equipment	
Corrective Action(s) if Control Measures Fail (or PRLC cannot be met)		<p>Complete all control measures from task 4: Remove all visible dirt material organisms. Rinse undercarriage of vehicles with high-pressure water spray. Use disinfectant solution that contains quaternary ammonium mixed at a concentration of at least 1% but no more than 3%. Contact time with gear must be at least 10 minutes Verification sheet must be signed to show that the control measure was executed</p>	
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Prescribed Ranges, Limits, or Criteria

- A specific measureable attribute that can be used to determine if control measures are effectively minimizing the risk
- Needed to make sure control measure is working



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Monitoring the control measures

Control measure monitoring is the process that managers rely upon to maintain control at a CCP



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Example Checklist

Survey Equipment Inspection and Decontamination Checklist		
Item Description	Date/ID	
	First Check	Second Check
Equipment		
Nets		
Waders		
Seines		
Backpacks		
Gear Containers		
Vehicles, Boat, and Trailers		
Truck		
Trailer		
Boat		
Decontamination Equipment		
Disinfectant; ADBAC, Benzalkonium Chloride	Quaternary Ammonia Test Kit	
Buckets	Hoses	
Brushes		
Decontamination Procedure Conducted By:	Date:	
Reviewed By:	Date:	

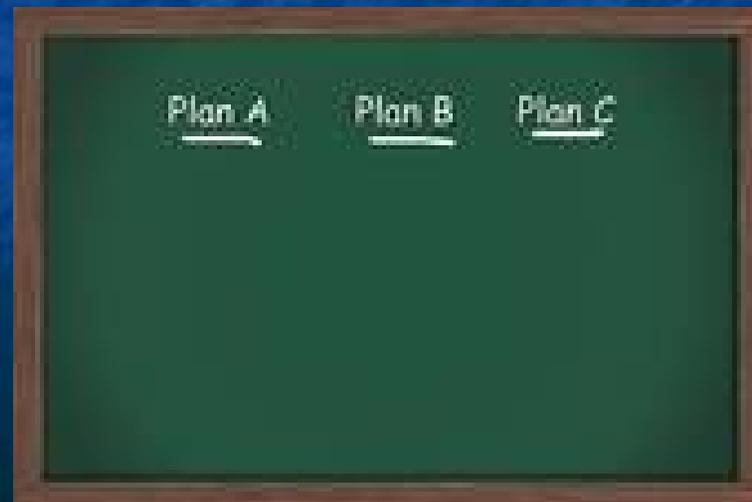
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Corrective Actions

The Back-up Plan

- A corrective action is only necessary if a control measure failed.
- When control measures fail corrective actions should be instituted immediately.
- Corrective actions must bring the CCP back under control



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Task 4...

HACCP Step 5 – Non-Target Risk Action Plan (NTRAP)

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Monitoring the Control Measure(s)	Who?	Field crew	
	How?	<p>Vehicles: Use gauge on powerwasher to ensure minimum of 90 psi is maintained throughout cleaning.</p> <p>Gear: Check immersion time with timer. Ensure concentration is correct with AQA1507 Quaternary Ammonium Test Kit (or similar)</p>	
	Where?	Decontamination station at the warehouse	
	How often?	Every time that gear is unloaded and stored	
Corrective Action(s) if Control Measures Fail (or PRLC cannot be met)		<p>Vehicles: Re-rinse with powerwash spray until non-target organisms are no longer detected.</p> <p>Gear: Mix new (fresh) dosage of disinfectant solution and repeat the cleaning/disinfectant procedure from the beginning. If gear cannot be disinfected, it must be clearly tagged as "contaminated" and isolated until it can be disinfected before being allowed back in the field.</p>	
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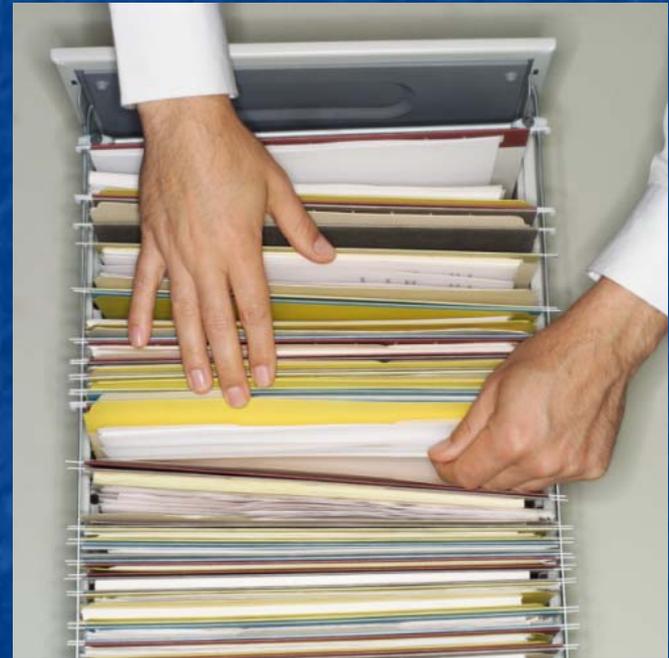
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Supporting Documents

Information and data used to develop the HACCP plan:

- Provide objective evidence that all essential elements of the plan have a scientific basis
- Represent a valid approach to controlling the pathway hazards.



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Development Team Members		Jonathan Thompson, David Britton, Susan Pasko	
Date Developed:	9/13/2012	Date(s) Reviewed:	9/13/2013

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Step 5 – NTRAP Skill Check

- ✓ Explain how Steps 1, 2, 3 and 4 of the HACCP Planning process apply to NTRAP.
- ✓ Define the prescribed limit, range, or criterion for control measures.
- ✓ Describe the process for monitoring and evaluating control measures and establish corrective actions if needed.
- ✓ Describe the importance and use of supporting documentation.
- ✓ Complete a Step 5 NTRAP form.

Step 5 – NTRAP Group Exercise

- Read through the Hypothetical Activity Narrative
- Using information provided, complete the NTAW .
- 15 minutes to complete



Stump The Class

10 minutes to come up with 5 review questions

- 5 points for each correct answer
- 10 points if the group stumps the class
- 15 points if the group stumps the instructors

Chapter 5: Implementing HACCP

Living Document

HACCP Manual: Page 55

- Periodically re-evaluate actions to ensure that precautions are still valid

Sharing Plans

HACCP Manual: Page 56

- Reduce risk through communication and feedback

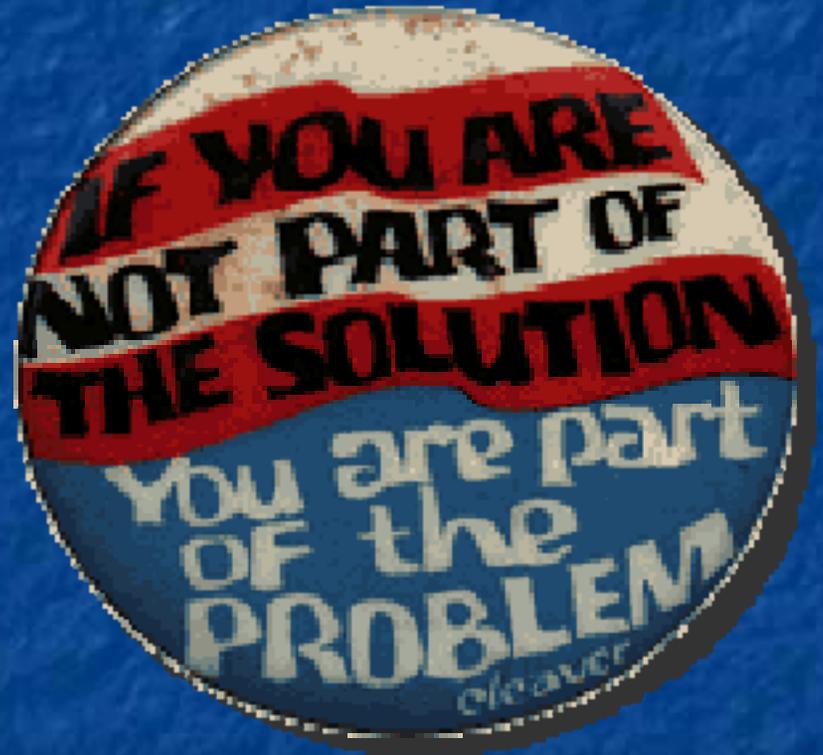
Website and Resources

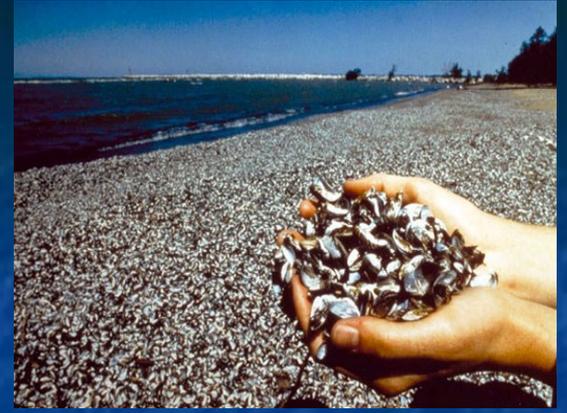
- Chapter 7 - References

HACCP Manual: Chapter 7

HACCP and Stewardship

- It is our responsibility to “Do No Harm”
- Conservation must be properly planned.
- A good steward should look at the larger picture and evaluate the consequences of his or her own actions





The End...

Questions?

