

# HACCP

Hazard Analysis and Critical Control Point

Planning to Prevent the Spread of  
Invasive Species

Jonathan Thompson

209-334-2968 x 315

[jonathan\\_thompson@fws.gov](mailto:jonathan_thompson@fws.gov)

[www.haccp-nrm.org](http://www.haccp-nrm.org)

# Invasive Species Impacts

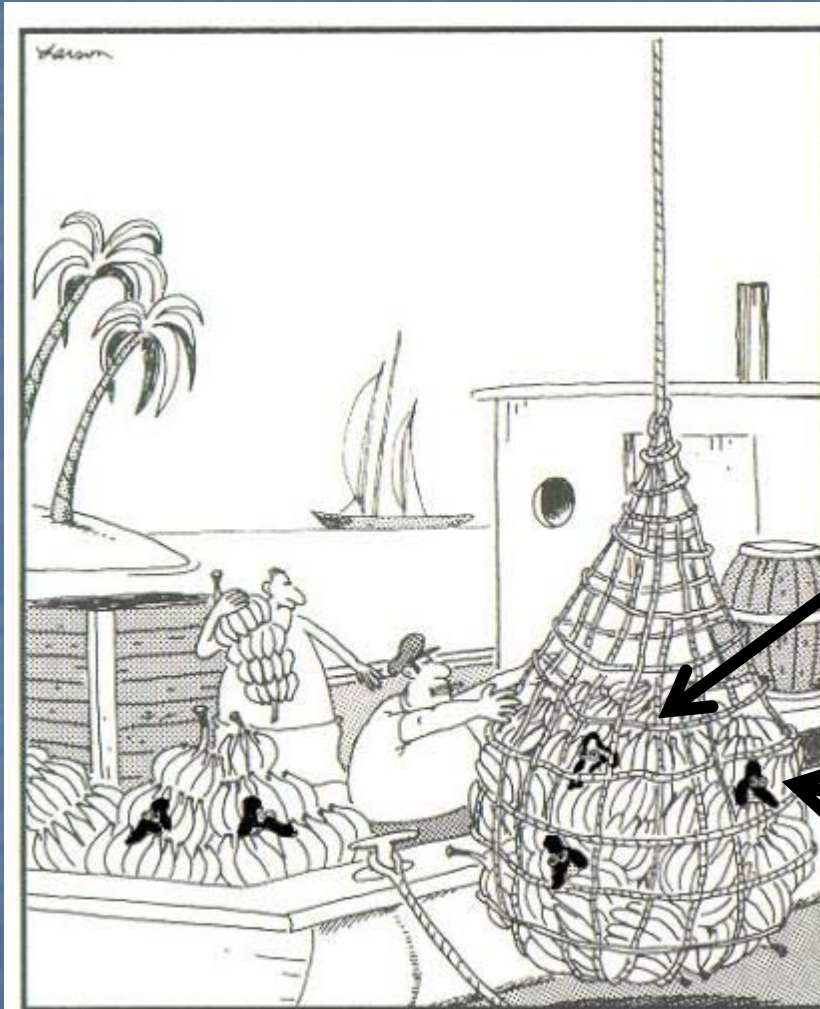
Define Terminology

**Non-indigenous**

**Invasive**



## Target versus Non-target



Target

Non-target

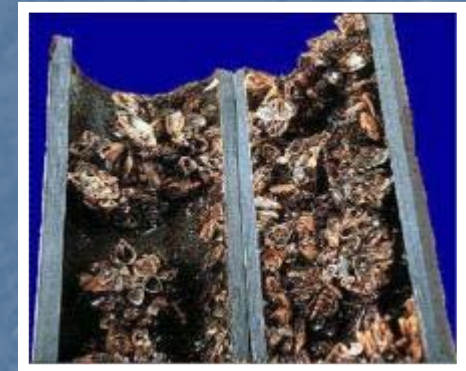
How Poodles Came to America

# The problem with non-native invasive species...

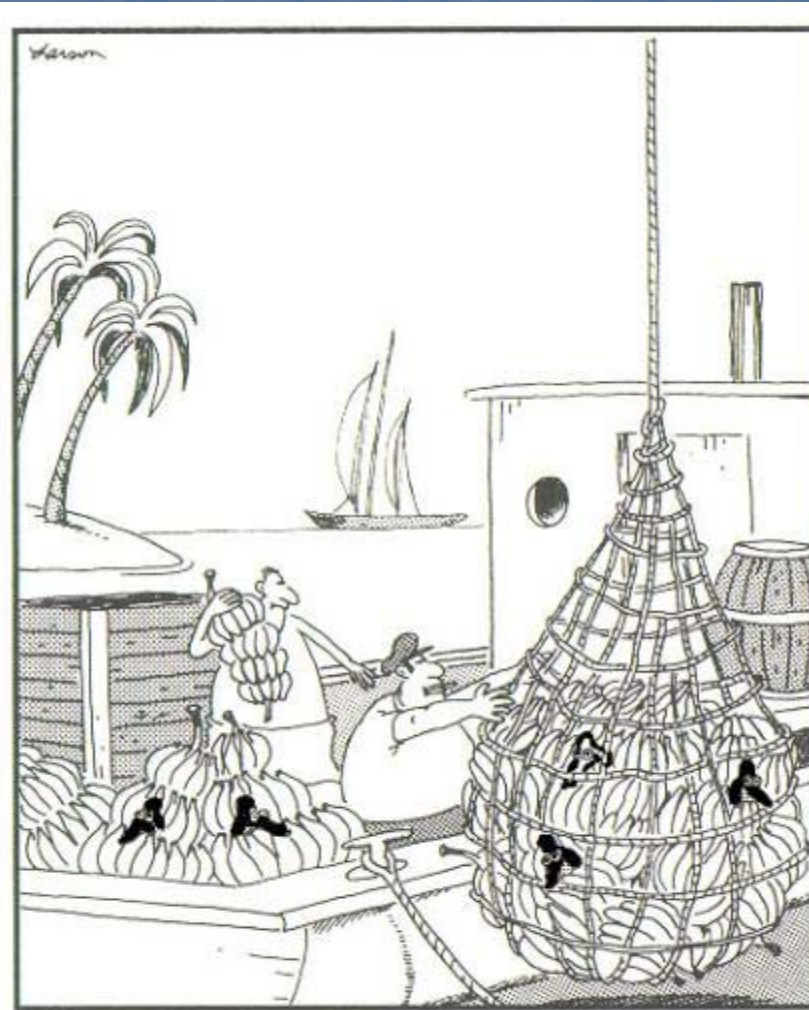
Sam Hamilton Invasive Species are “probably the single greatest threat in our country to our native wildlife”.

Worldwide Cost = \$1.4 trillion U.S. = \$138 billion  
(International Congress on Bioinvasions 2009)

- Economic
- Ecological
- Human health
- Cultural



# Pathways and Vectors



How Poodles Came to America

# Pathways of Introduction

How do they get here:

Shipping



Captive and Cultured Organisms

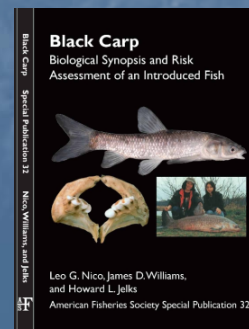


Recreation



Intentional Stocking

- Recreational
- Environmental
- Food (seafood)



# Pathways of Introduction/VECTORS

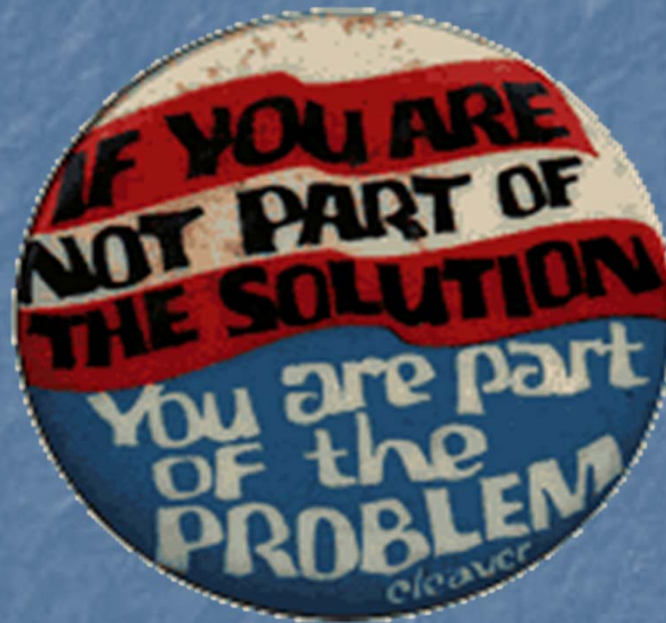
## How they are spread once there are here:

A single pathway may have many invasive vertebrates, plants, invertebrates, microbes, and others...

- Natural Resource Management Activities
- Fire Management
- Restoration, Construction, Utilities, etc
- Outdoor Recreation (hiking, fishing...)
- Recreational Watercraft and Trailers



## Multiple Pathways require multiple solutions





# Invasive Species Legislation

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

# Invasive Species Toolbox

- Prevention
- Early Detection and Rapid Response
- Control
- Management or Eradication



# Preventing the Spread of Invasive Species

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



# What can you do!

Use Best Management Practices

- General BMP's
- HACCP



***“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**



# What is HACCP?

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





## The Origins 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)



# AIS-HACCP

Aquatic Invasive Species – Hazard Analysis and Critical Control Point



- USFWS modified HACCP (Inks Dam)



## 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 Analysis Worksheet (NTAW)

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

# Starting Out in the Right Direction

Management Commitment

HACCP Training

HACCP Team Assembly



# 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
- Likely from Morgan Lake population.
- Bad Press

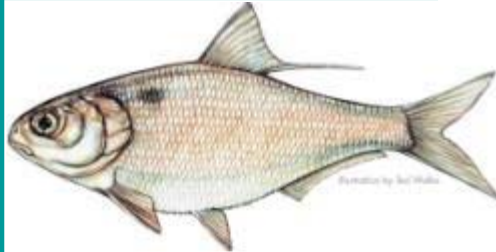
### **Fish and Wildlife Blunders in Lake Powell**

by Skip Knowles  
*The Salt Lake Tribune*

Tuesday,  
August 27, 2002

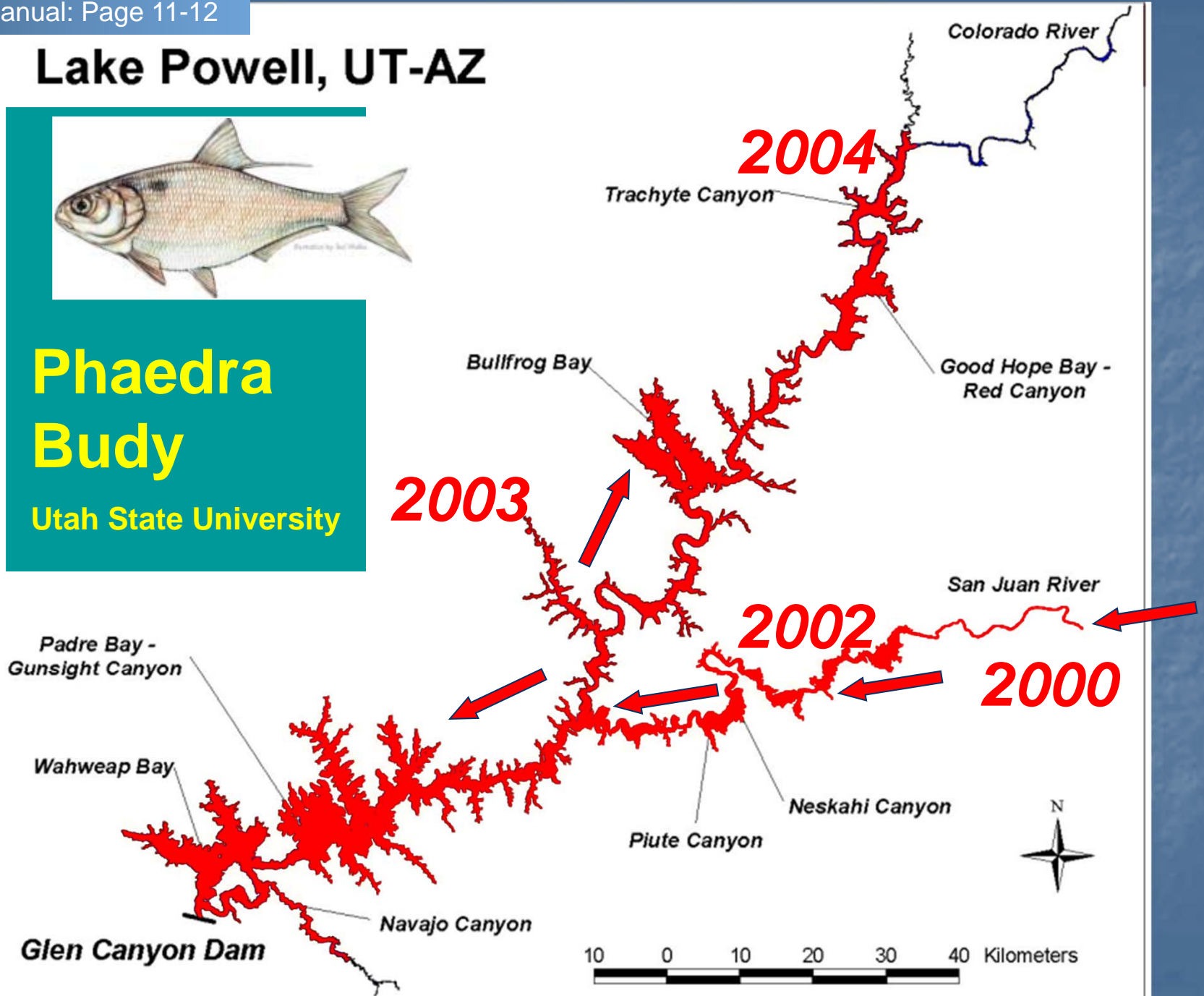
After years of telling Utah biologists to forget about stocking gizzard shad in Lake Powell because of concern for sensitive species, the U.S. Fish and Wildlife Service accidentally did just that.

# Lake Powell, UT-AZ



**Phaedra  
Budy**

Utah State University



# Planning is Everything!

*Managing Natural Resource Pathways*

# HACCP

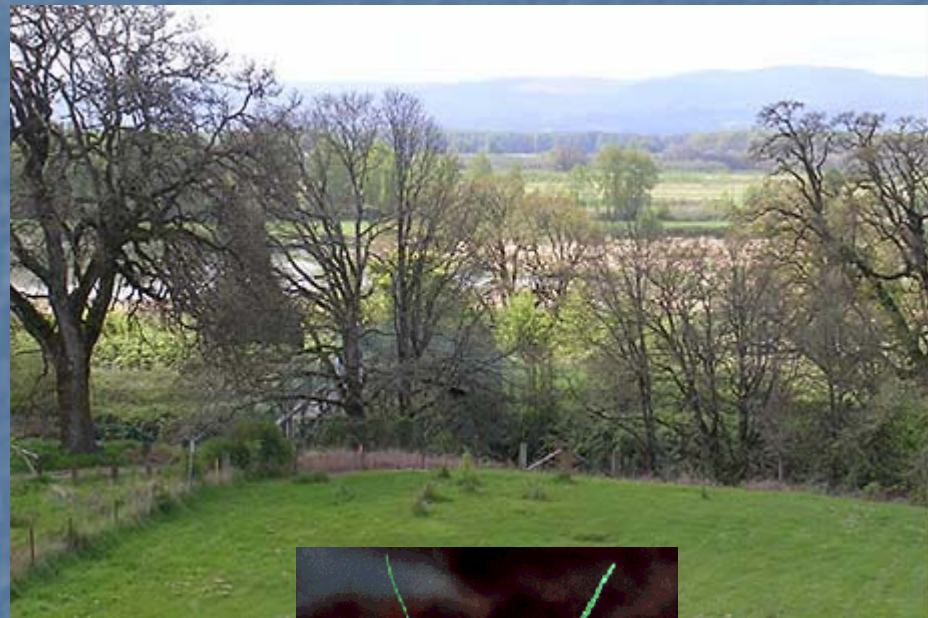
HACCP Could Have Prevented this  
"Hatchery Release"



# 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?



# Step 1 – Activity Description

<b>HACCP Step 1 – Activity Description</b>	
<b>Management Objective &amp; Contact Information</b>	
Management Objective:	Contact Person:
	Phone:
	Email:
<b>Activity Description</b>	
i.e. Who; What; Where; When; How; Why	

## Activity Description

Examples of activities include, but are not limited to...

- Forest thinning operations
- Raising and/or stocking of fish and other organisms
- Wildland fire fighting
- Field surveys (aquatic and terrestrial)
- Habitat restoration projects
- Research field work
- Road construction and maintenance
- Trail building and maintenance
- Introducing an organism for biological control
- Landscaping
- Invasive plant removal projects



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organisms



## HACCP Step 1 – Activity Description

Management Objective & Contact Information	
<b>Title:</b>	
<b>Management Objective:</b> Habitat Survey for the recovery of cutthroat trout (CT)	<b>Contact Person:</b> Thompson
	<b>Phone:</b> (800) LUV-FISH
	<b>Email:</b> jonathan_thompson@fws.gov
Activity Description i.e. Who; What; Where; When; How; Why	
<b>Who:</b> Cutthroat National Fish Hatchery personnel.	
<b>What:</b> Measurement of Riparian Vegetation Density	
<b>Where:</b> Thompson Basin	
<b>When:</b> Year round, once a month.	
<b>How:</b> Retrieve the appropriate gear from the warehouse at the beginning of the day. Travel to the sampling site and conduct the sampling activity. Return to warehouse.	
<b>Why:</b> To gather data and information on riparian habitat to guide CT recovery actions in the two different basins.	

# Step 2 – Activity Flow Chart

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

<b>Task 1</b>	<b>Title:</b>
	<b>Description:</b>



<b>Task 2</b>	<b>Title:</b>
	<b>Description:</b>



<b>Task 3</b>	<b>Title:</b>
	<b>Description:</b>



<b>Task 4</b>	<b>Title:</b>
	<b>Description:</b>

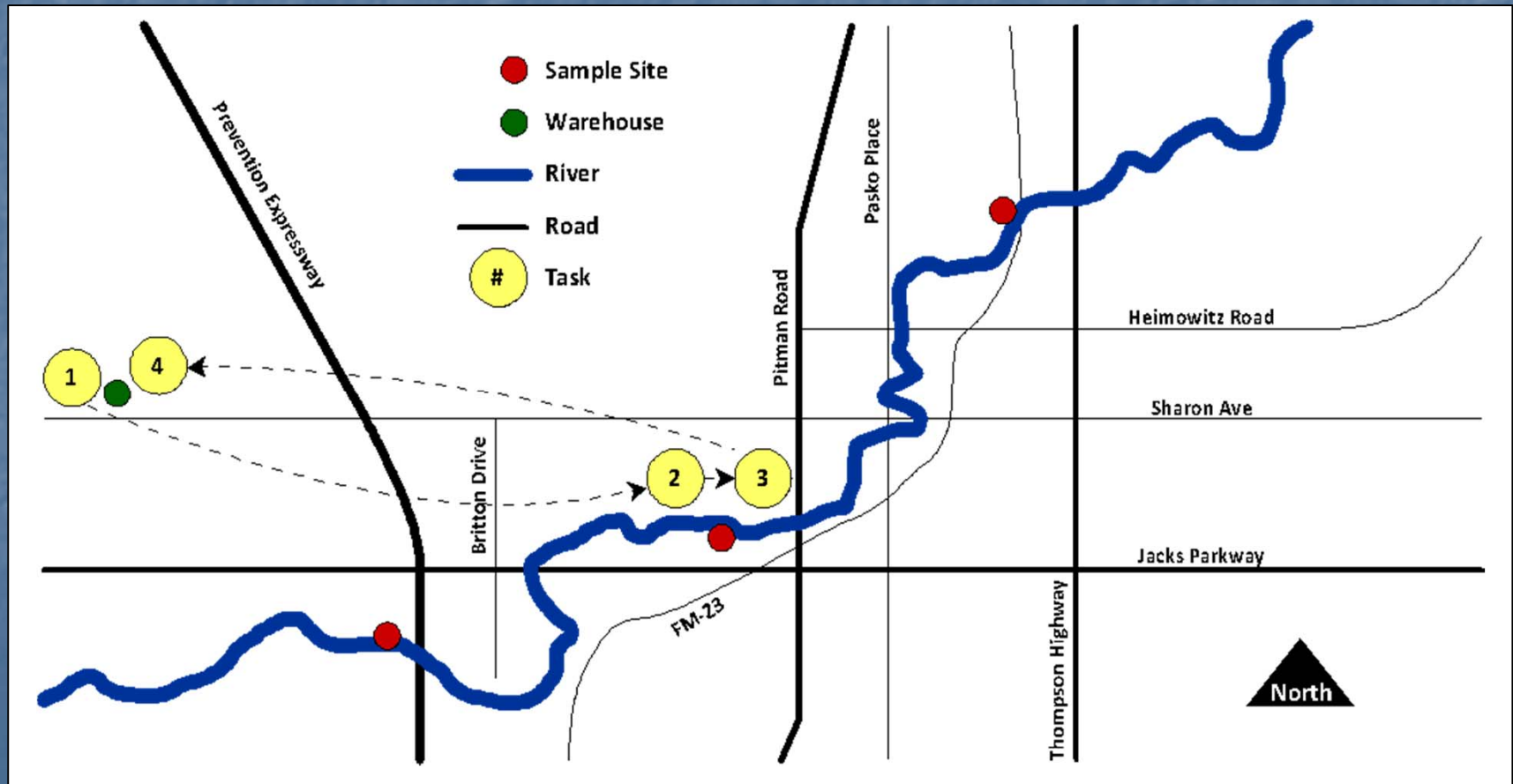
## What is a Flow Chart?

- Break activity into tasks
- It is an outline of the activity
- Records what should happen
- List the most basic steps
- Each task is given a number, simple title, and brief description



## What is a Flow Diagram?

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




## HACCP Step 2 – Activity Flow Chart

### Outline Sequential Tasks of Activity


<b>Task 1</b>	<b>Title: Load gear and drive to site</b>
	<b>Description: Drive to warehouse and load appropriate gear for sampling activity. Drive to sampling site.</b>



<b>Task 2</b>	<b>Title: Unload gear and conduct survey</b>
	<b>Description: Unload gear from vehicle. Prepare gear to conduct sampling. Conduct survey.</b>



<b>Task 3</b>	<b>Title: Reload gear</b>
	<b>Description: After returning to the vehicle, the crew will pack up the gear.</b>



<b>Task 4</b>	<b>Title: Return to warehouse and unload gear</b>
	<b>Description: Return to the warehouse in vehicle with gear. Return to warehouse. Put equipment away.</b>

## Step 3 – Identify Potential Non-targets

### HACCP Step 3 – Identify Potential Non-Targets

**Non-Targets That May Potentially Be Moved/Introduced**

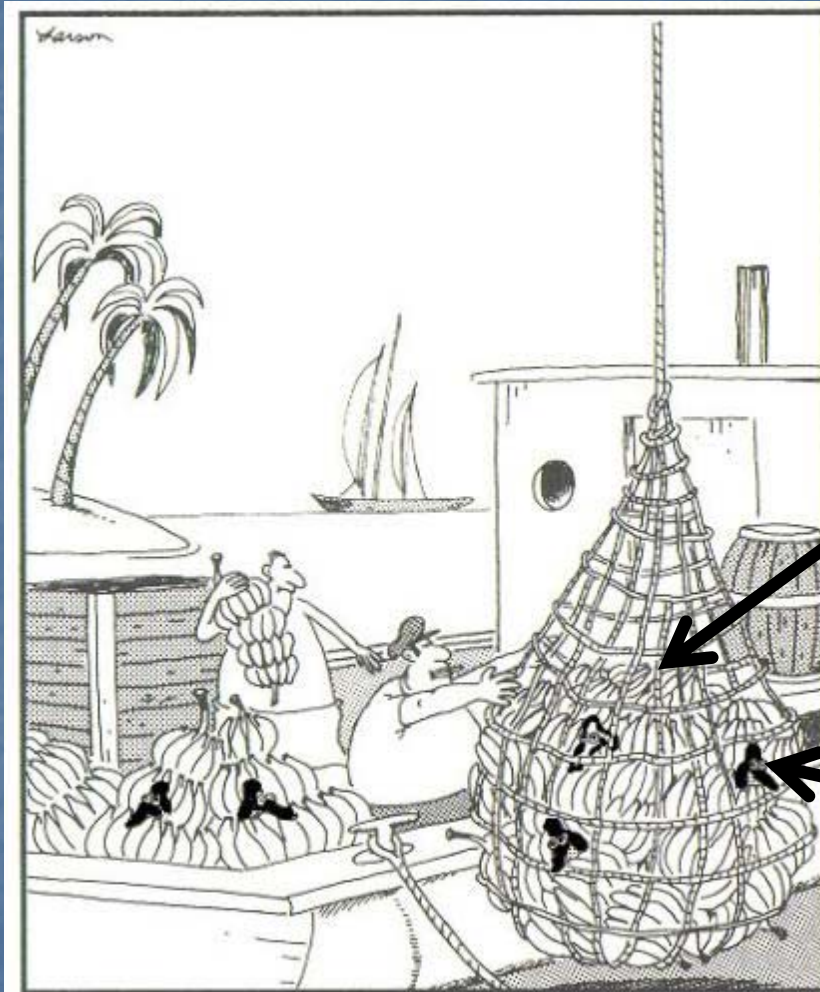
**Vertebrates:**

**Invertebrates:**

**Plants:**

**Other Organisms (pathogens, parasites, etc.):**

## Target versus Non-target



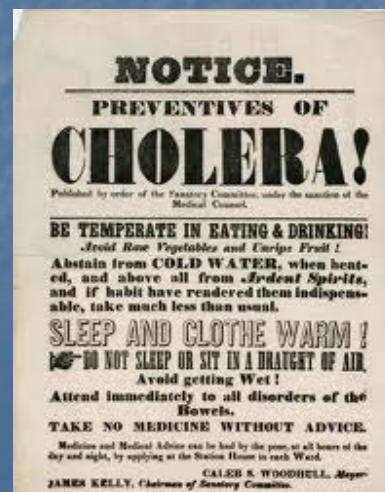
Bananas are a  
Target

Poodles are a  
Non-target

How Poodles Came to America

# Non-Targets

- Vertebrates
- Invertebrates
- Plants
- Other Organisms



## Developing Potential Non-target List:

- Regional and local experts
- Inclusiveness
  - ★ If you're HACCP team is on the fence whether something should or should not be listed as a potential target, it probably should be listed

## HACCP Step 3 – Identify Potential Non-Targets

### Non-Targets That May Potentially Be Moved/Introduced

**Vertebrates:**

**Amphibians**

**Bullfrog (*Rana catesbeiana*)**

**Invertebrates:**

**New Zealand mudsnail (*Potamopyrgus antipodarum*)**

**Plants:**

**Eurasian milfoil (*Myriophyllum spicatum*)**

**Purple loosestrife (*Lythrum salicaria*)**

**Other Organisms (pathogens, parasites, etc.):**

**Chytrid fungus**

**Whirling disease (*Myxobolus cerebralis*)**

# Step 4: Non-Target Analysis Worksheet

## HACCP Step 4 – Non-Target Analysis Worksheet

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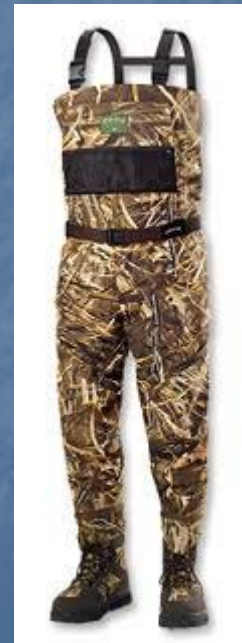
<b>Task #1</b>  <b>Title:</b>	<b>Vertebrates</b>					
	<b>Invertebrates</b>					
	<b>Plants</b>					
	<b>Others</b>					



# Control Measures

## Methods:

- Chemical
- Drying
- Freezing
- Manual Removal
- Water
- Heat Treatment
- Dedicated Equipment
- Managing Field Operations



Prevention:

<http://www.youtube.com/cleanwaterteamvideos>

# 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 criteria 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*

# Chapter 5: Implementing HACCP

**Living Document**

HACCP Manual: Page 52

**Supporting Documents**

HACCP Manual: Page 52

**Sharing Plans**

HACCP Manual: Page 53

**Website and Resources**

HACCP Manual: Chapter 7

**Stewardship**

HACCP Manual: Page 53