

# Infectious Diseases And Treatments

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# The Plan:

## 3 Lectures, with homework...

1. Introduction to Fish Health Management
  - Include Quarantine and Biosecurity
2. Water Quality and Non-Infectious Diseases
  - Nitrogen Cycle, Dissolved Gases
3. Infectious Diseases and Treatments
  - Common diseases and treatments
  - Regulatory concerns



# ***Introduction to Fish Health Management***

## **Developing a Fish Health Management Program:**

- 1. Water Quality/ Life Support**
- 2. Nutrition**
- 3. Sanitation**
- 4. Quarantine/ Biosecurity**

# What is *Disease*?

A condition regarded as harmful or abnormal

A pathological condition

- ✓ Can be pathology of an organ,  
a system or the entire organism
- ✓ Characterized by an identifiable  
group of signs or symptoms

Deviation or departure from **NORMAL**

*Dis - Ease*





# Fundamental Categories of Disease

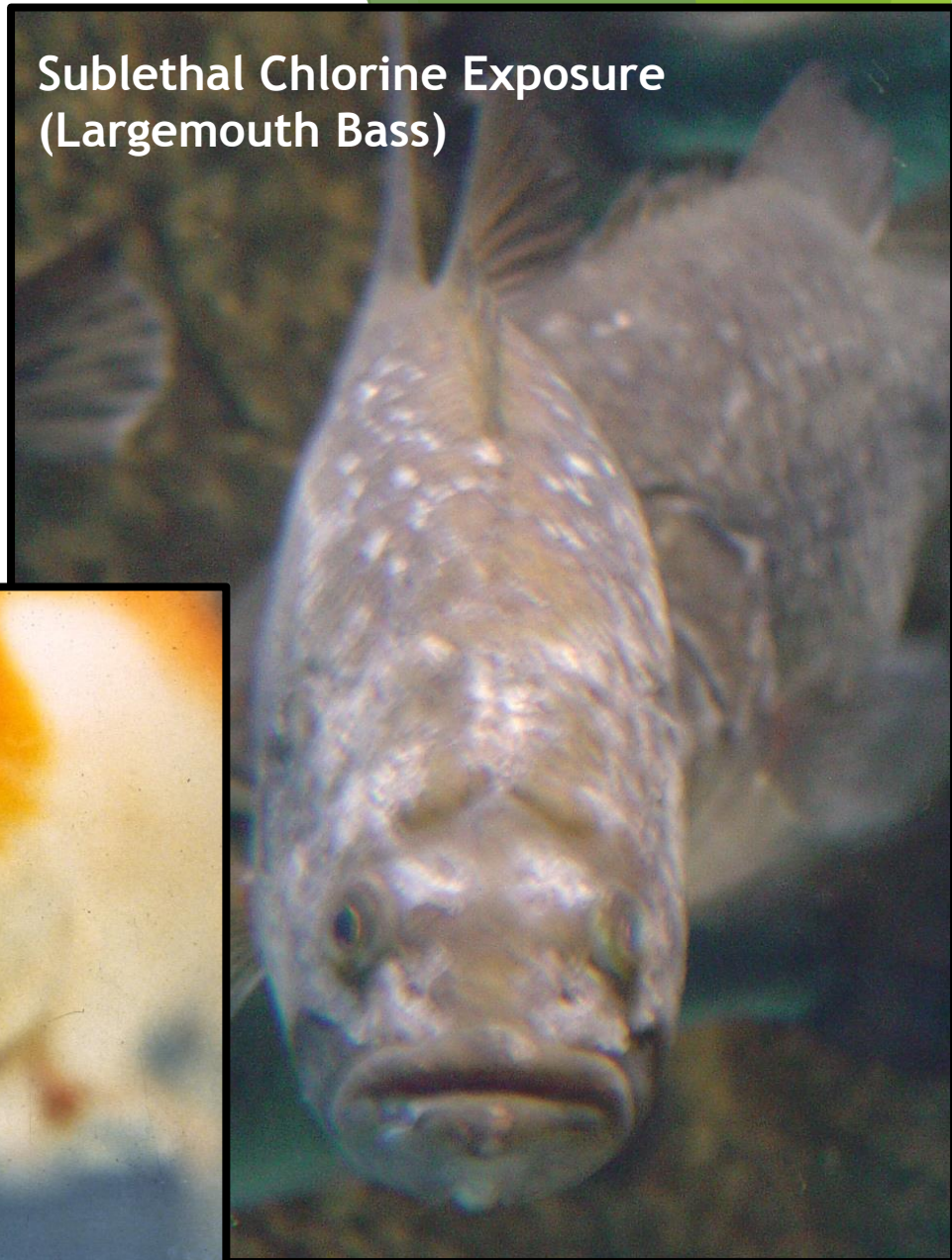
## ► *Non-infectious*

- Environmental
  - Water quality
  - Toxin
- Nutritional
- Genetic
- Traumatic
- Neoplastic

*Pharyngeal Mass in a Koi*



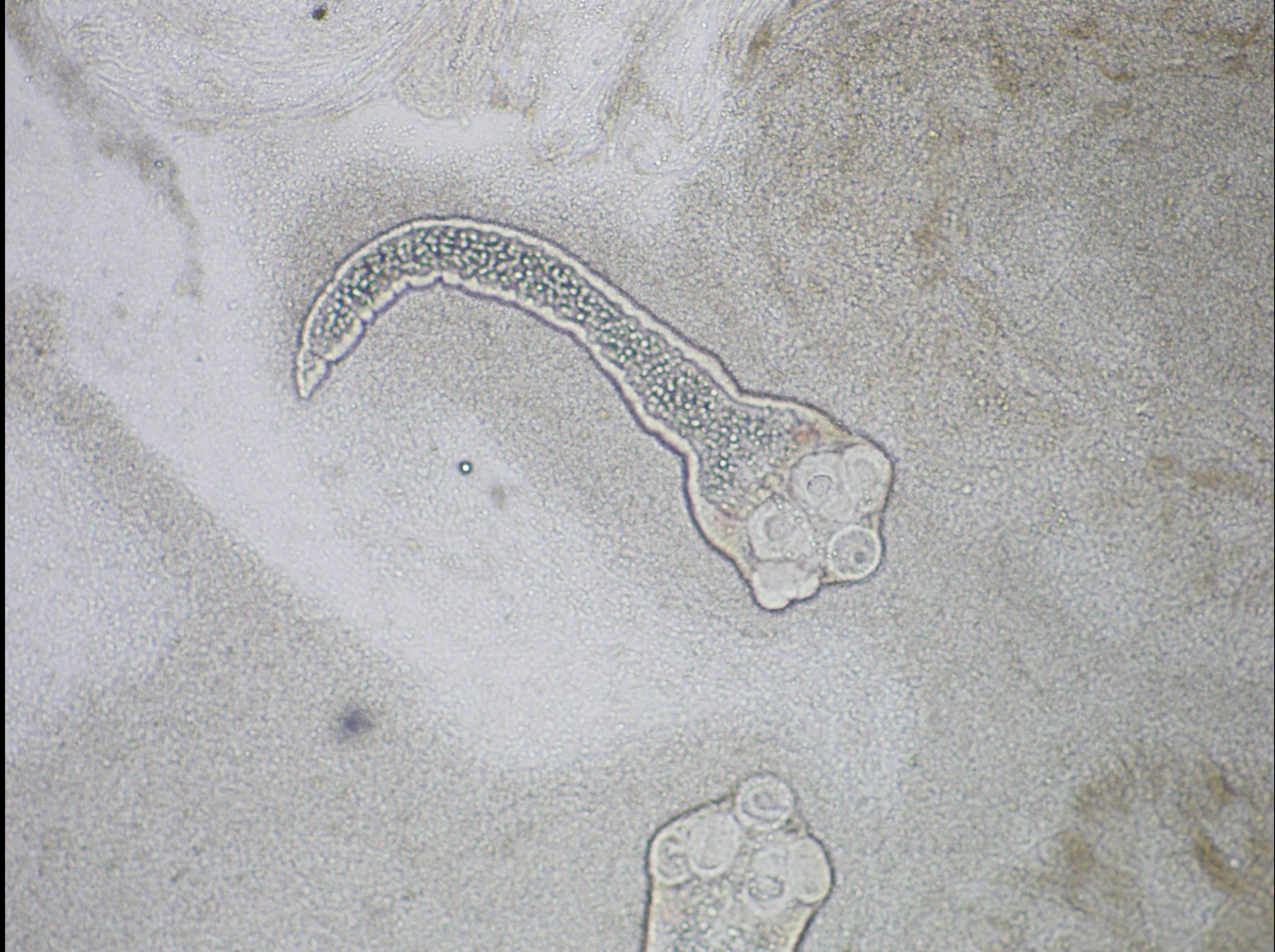
Sublethal Chlorine Exposure  
(Largemouth Bass)





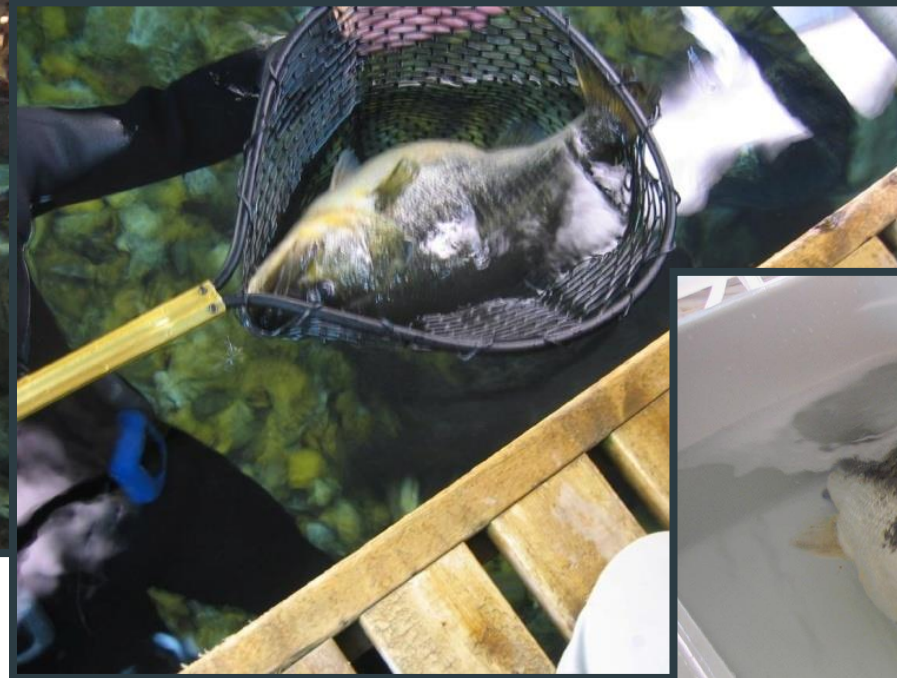
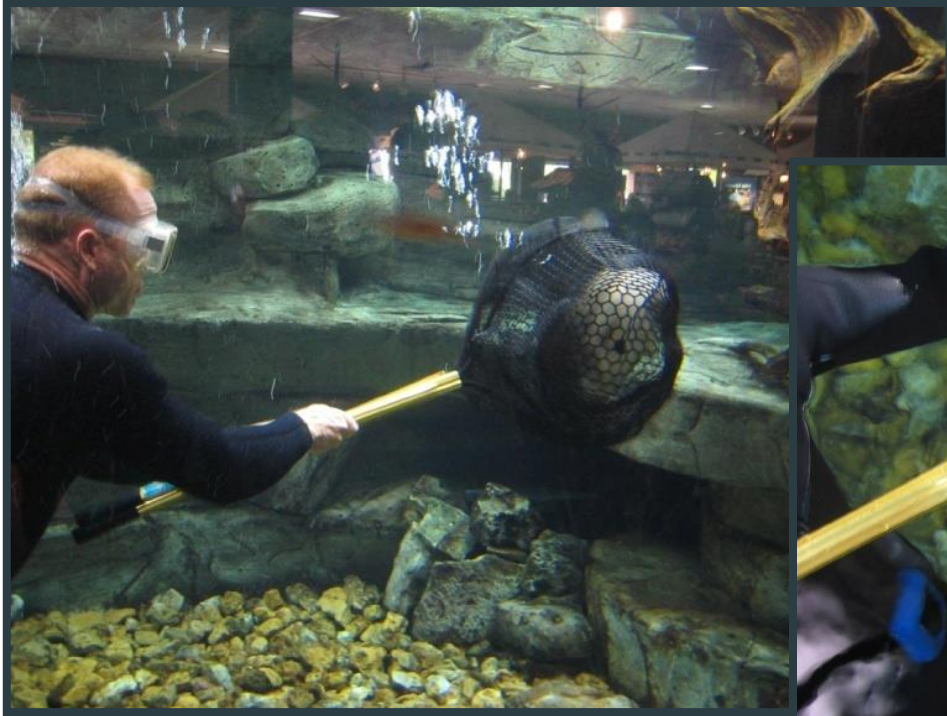
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► In





***Before you hold 'em,  
you gotta be able to catch 'em!***



*Photos courtesy of Juan Sabalones*

# Aquatic Animal Health - Review



**Partnerships!!**

**Prevention is key!!**

- ✓ Quarantine New Stock
- ✓ Good Biosecurity

**Categories of Disease**

- ✓ Non-Infectious
  - ✓ WATER QUALITY!!!
  - ✓ Other...
- ✓ Infectious
  - ✓ Parasites
  - ✓ Bacteria
  - ✓ Virus
  - ✓ Fungus



# Examining a Fish



**Look in the Mouth!**

*(Debbie Crain)*



**Assess Body  
Condition**

*(Debbie Crain)*



**Assess  
Lesions**



*Photo courtesy of  
Eric Lambert*

**Don't forget to  
Weigh the fish!**



***Photo courtesy of Denise Petty***



# Biopsies First...

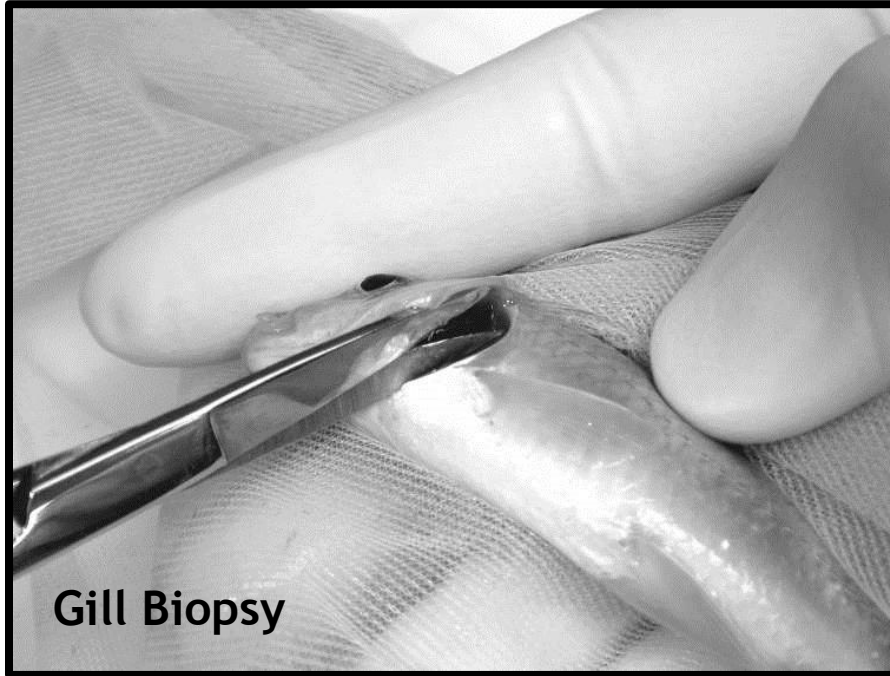


**Biopsy Gill,  
Skin, Fins  
Every Time!**

*Photos courtesy of  
Juan Sabalones*



# Wet mounts-External

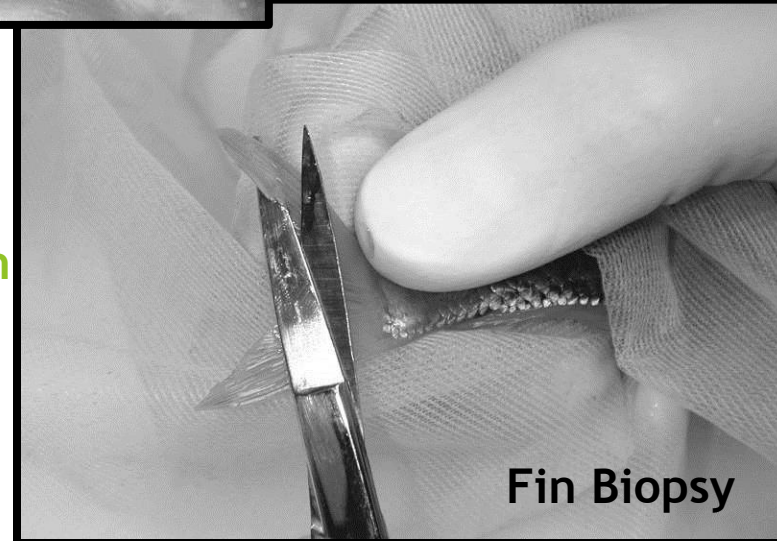


Gill Biopsy



Skin Scrape

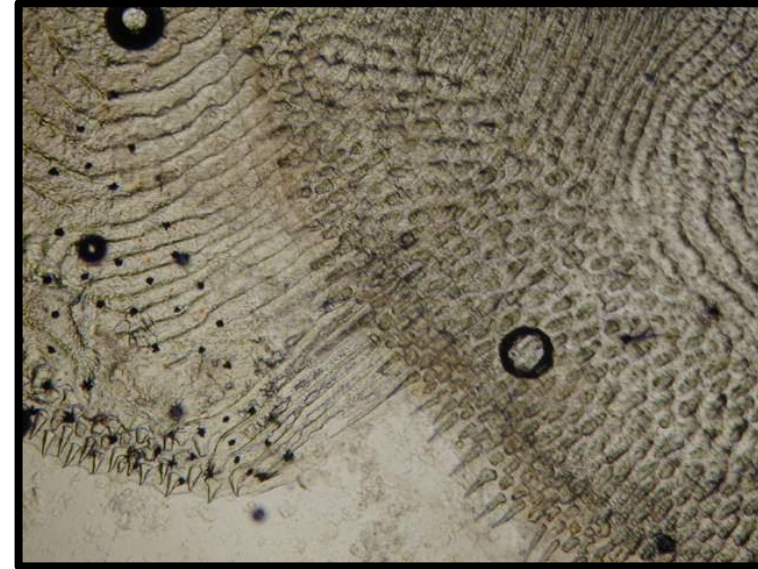
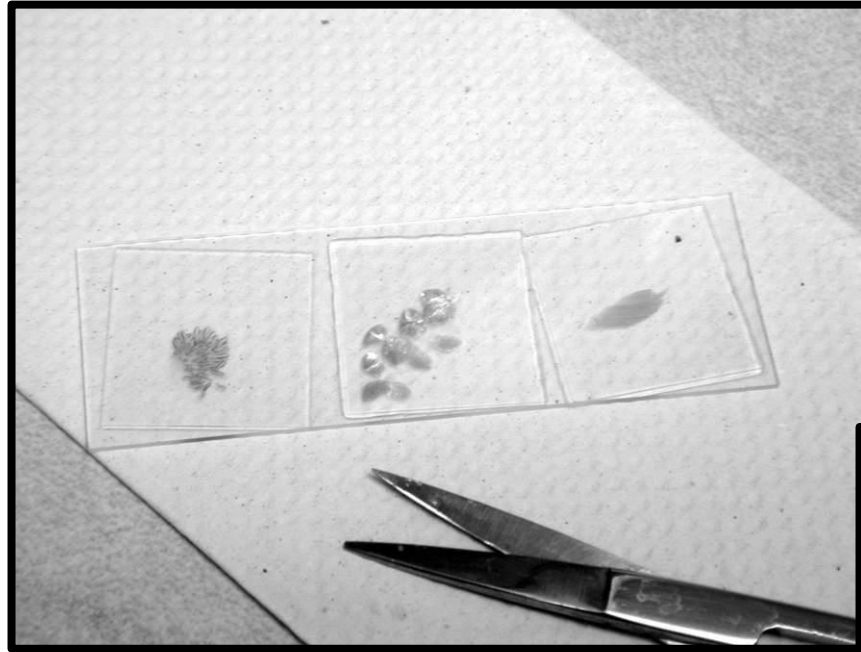
- Biopsy Protocols:
- Use tank water if possible
  - Try not to anesthetize fish



Fin Biopsy



# Wet mounts-External



# Parasites are Opportunists

- ▶ **PREVENTION IS KEY**
- ▶ Often present in small numbers
- ▶ No problem if fish is immunocompetent
- ▶ Problems: stressors or overwhelming load





# “*ICH*” (*Ichthyophthirius multifiliis*)

- ▶ Very common
- ▶ Wild and cultured FW species
- ▶ Wide host range
- ▶ Ability to replicate very rapidly in culture systems!!
- ▶ Very damaging to fish
- ▶ Without treatment, most fish will die

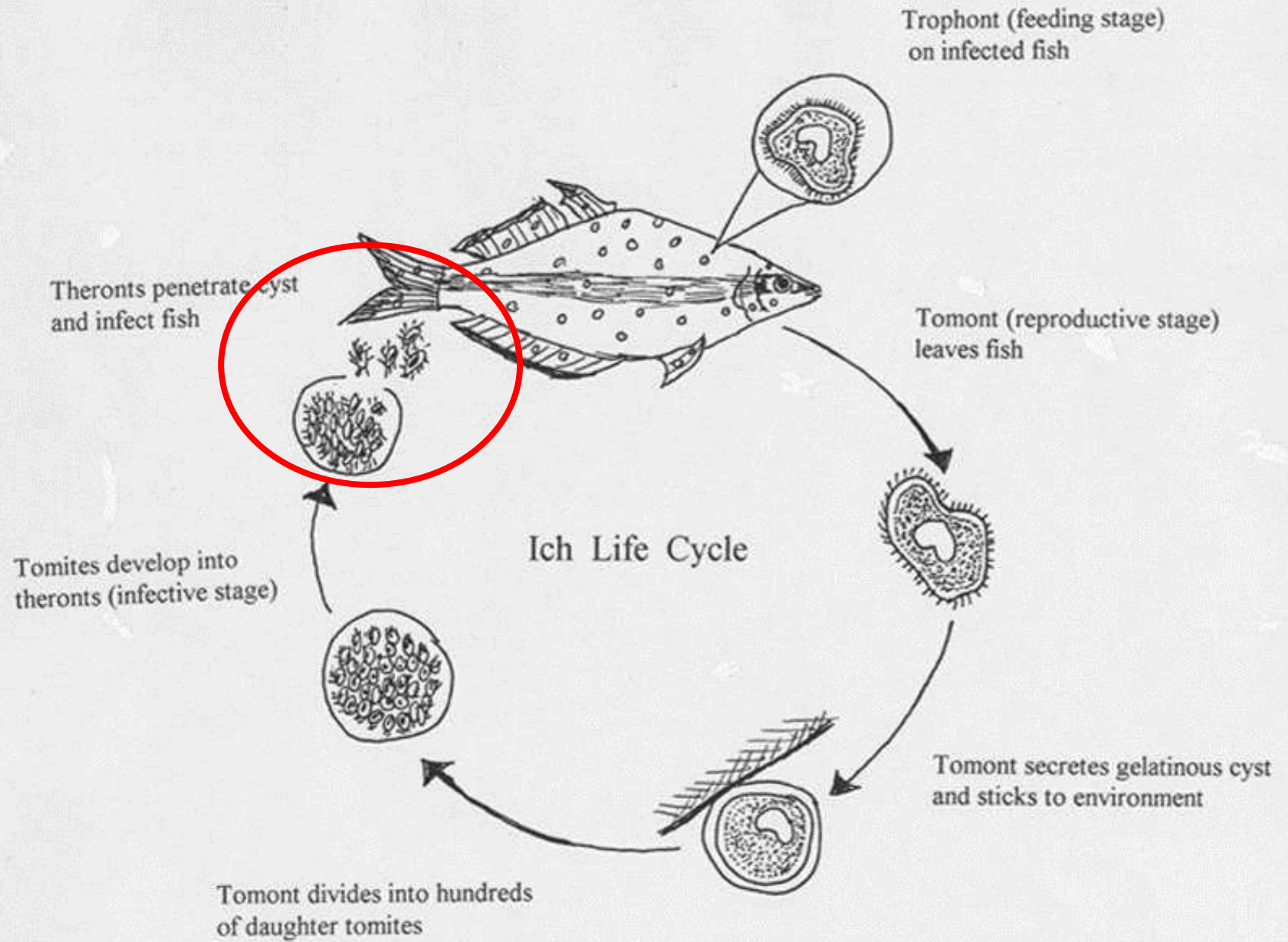


# “White Spot Disease”...



**Remember:  
Must biopsy to confirm!!!**

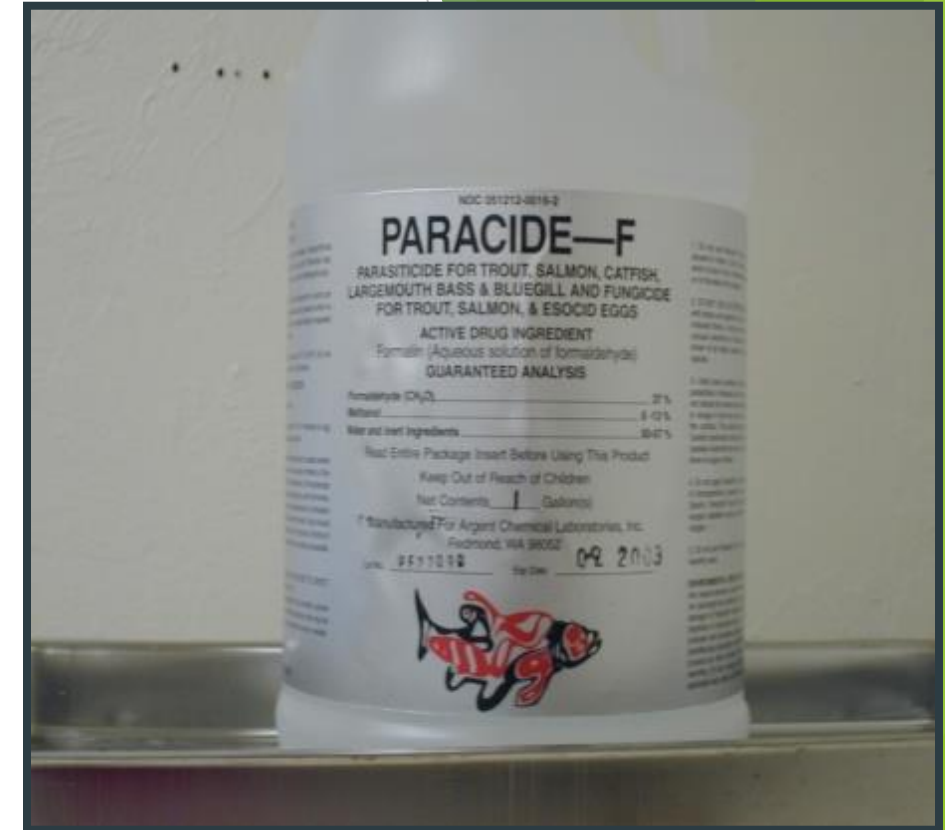




# Common Parasite Treatments

## Copper Sulfate

## Potassium Permanganate



## Formalin

➤ **FDA Approved**  
For ALL Fin Fish

**FDA** = Food and Drug Administration



# Using Copper Sulfate

- Often Treatment of Choice for Ich
- Cheap for use in ponds
- **Kills algae...**
  - Legal algacide
  - Can cause Oxygen problems
- **MUST KNOW ALKALINITY**
  - For freshwater use



*Photo Credit: wikipedia*

# Bacterial Disease Clinical Signs

- ▶ Not Feeding
- ▶ Change in behavior (hanging, lethargy, abnormal swimming, spinning)
- ▶ Hemorrhages, ulcers
- ▶ Popeye
- ▶ Don't guess, culture!





# Culture and Sensitivity

- ▶ Sterile technique
- ▶ Culture different organs
  - ▶ Blood agar most common
- ▶ Usually requires outside lab



# Culture and Sensitivity

- ▶ Primary isolation
  - ▶ Isolate individual colony
- ▶ Sensitivity
  - ▶ Tests different antibiotics
  - ▶ Clear zone means bacterial cannot grow near that antibiotic





# VIRAL DISEASES



**Lymphocystis**



**Koi Herpes Virus**

# Viral Diseases are **NOT** Treated with Medication

Seek Assistance  
from  
a specialist!!





# Sample Submission: Live Sick Fish are Best!!

- ▶ Sturdy plastic bag
- ▶ Water from pond
  - ▶ Enough to cover fish
  - ▶ No more than 1/3 of bag
- ▶ Fill with pure oxygen or room air
  - ▶ Do not exhale into the bag!



# Preparing Dead Fish for Shipment

- ▶ Choose a fish that is in good condition, with clear eyes
- ▶ Wrap the fish loosely in a paper towel moistened with water from the pond
- ▶ Place wrapped fish into sturdy plastic bag that can be securely closed
- ▶ Put bagged fish into shipping container on ice or ice packs.





# Poor Specimen Packaging



# Proper Shipping Containers





# Improper Shipping Containers

