

# Pond Fisheries Management During and Following Extreme Weather



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# Extreme Weather Affects Fish Population Dynamics

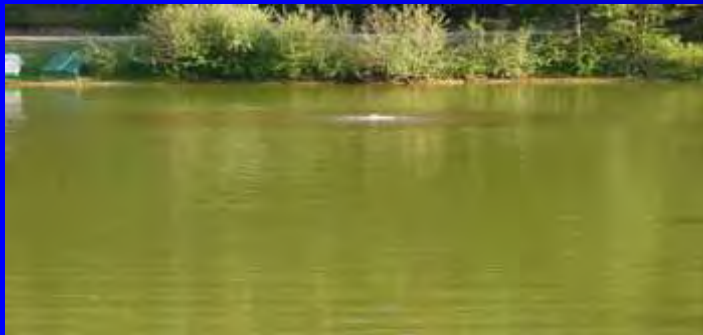
Extreme dry



Extreme wet



Extreme hot



Extreme cold



# Extreme Dry Weather Fishery Management for Ponds

- Low pond water levels crowd fish and reduce cover
  - Forage fish are vulnerable to predation and populations may become limited
  - Predator fish may grow unusually fast and develop more eggs



# Extreme Dry Weather Fishery Management for Ponds

- More pond bottom is exposed to sunlight
  - Aquatic vegetation may increase to nuisance levels
  - Exposed bottom may allow excess terrestrial vegetation



# Extreme Wet Weather Fishery Management for Ponds

- Fish may escape
- Fish from surrounding surface water may enter pond
- Excess nutrients in runoff may encourage nuisance vegetation
- Excess debris (dead leaves, mulch, etc.) may decay and consume dissolved oxygen
- Excess turbidity can reduce plankton growth



# Extreme Hot Weather Fishery Management for Ponds

- Metabolism is higher for fish and everything else living in the pond
- Therefore everything requires more dissolved oxygen
- Warm water cannot absorb as much dissolved oxygen
- Stratification of water layers reduces the volume of water available to fish
- Nutrients recycle in deep water contributing to nuisance aquatic vegetation
- Fish kills are not uncommon



# Extreme Cold Weather Fishery Management for Ponds

- Fish immune systems are not as active
- Ice and snow can prevent light penetration, reducing dissolved oxygen production
- Feeding is slow or non-existent
- Snow can increase nitrogen inputs contributing to nuisance vegetation after thaw



# Extreme Weather Impacts on Ponds

- Certain species and sizes of fish may be impacted more than others



# Not All Fish are Affected Equally

## Temperature

### Sensitive

Rainbow trout

Tilapia

Hybrid striped bass

Shad

## Dissolved Oxygen

### Sensitive

Large fish

Fed fish

Cool water fish

# Extreme Weather Impacts on Ponds

- Predator – prey fish population relationships may get out of balance



# Extreme Weather Impacts on Ponds

- Fish may be stressed and weakened



# Extreme Weather Impacts on Ponds

- Growth and reproduction may be reduced



# Extreme Weather Fishery Management Techniques for Ponds



- Frequent inspections and monitoring during extreme weather helps identify consequences
- Water quality must be allowed to improve or be corrected
- Fish population sampling is necessary after conditions improve
- Restocking recommendations should be based on objectives and sampling results
- We recommend gradual, methodical population imbalance corrections
- Fertilization and fish feeding will speed growth
- Habitat improvement can increase fish populations

# Inspect and Observe



# Water Quality Improvement Techniques

- Add agricultural lime to reduce turbidity
- Provide aeration to improve circulation and increase dissolved oxygen
- Encourage desirable plant growth



# Suitable Sampling Techniques

- Shoreline observations
- Observations while feeding pellets to fish
- Angling
- Electro – fishing
- Quadrant seine sampling
- Cast net throws
- The more methods  
the better



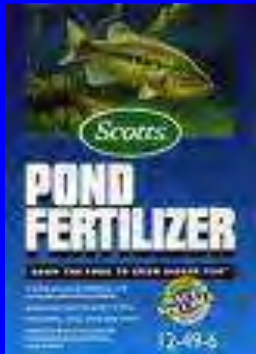


# Restocking

- We usually recommend waiting a year before radical stocking so the current population can be assessed
- Are existing populations out of balance or proportionately smaller
- Do undesirable species exist
- Is starting over necessary
- Have management objectives changed

# Feeding Fish or Fertilization Helps Recovery

- Feeding is more direct and “fool proof”
- Fertilizing requires sufficient alkalinity
- Fertilizing produces plankton bloom



# Recovery May Benefit from Habitat Improvement



# Recovery is Possible



# QUESTIONS?



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