

The Need for Fish Habitat Enhancement

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Why do we need fish habitat?

Are fish a priority?



What are the Goals of Your Lake?

Do you want to make fish habitat a priority?



Why do we need fish habitat?

- To provide the **species-specific** needs to create, sustain, or improve a fishery.
- Each life stage should be considered when addressing habitat needs.



Why are there fish habitat issues?

- Water demands (fluctuating water levels)
- Aging reservoirs
- Declining water quality
- Sedimentation
- Shoreline alteration
- Shoreline erosion
- Urbanization
- Invasive species
- It was never there to begin with
- Add in your own here

Essential Fish Habitat

- Magnuson-Stevens Act – defined **Essential Fish Habitat** for marine fisheries.
- The term "essential fish habitat" means those waters and substrate necessary to fish for spawning, breeding, feeding or growth to maturity.

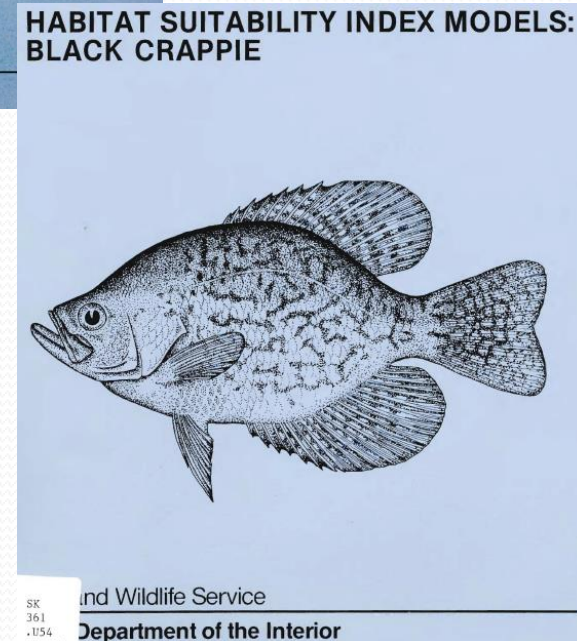
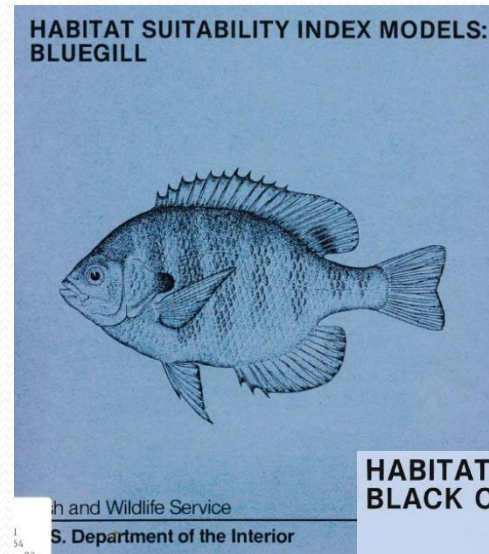


Magnuson-Stevens Fishery Conservation and Management Act



Habitat Suitability Index Models

- The US Fish and Wildlife Agency developed Habitat Suitability Index (HSI) models for many fish species.
- The models give species-habitat relationships but do not prove cause and effect.
- The models do give a basic understanding of habitat needs at different life stages for the specific species.
 - Like using a map to find the stadium – not enough detail to find your seat. You get close but you have some work left to do.



Components of Fish Habitat

- Essential Fish Habitat and the Habitat Suitability Index Models include physical and chemical components.
 - **Physical**
 - Water Depth
 - Substrate Type
 - % Cover and Cover Type
 - Clarity/Turbidity
 - **Chemical**
 - Temperature
 - Dissolved Oxygen
 - pH
 - Nutrient Levels
 - Conductivity

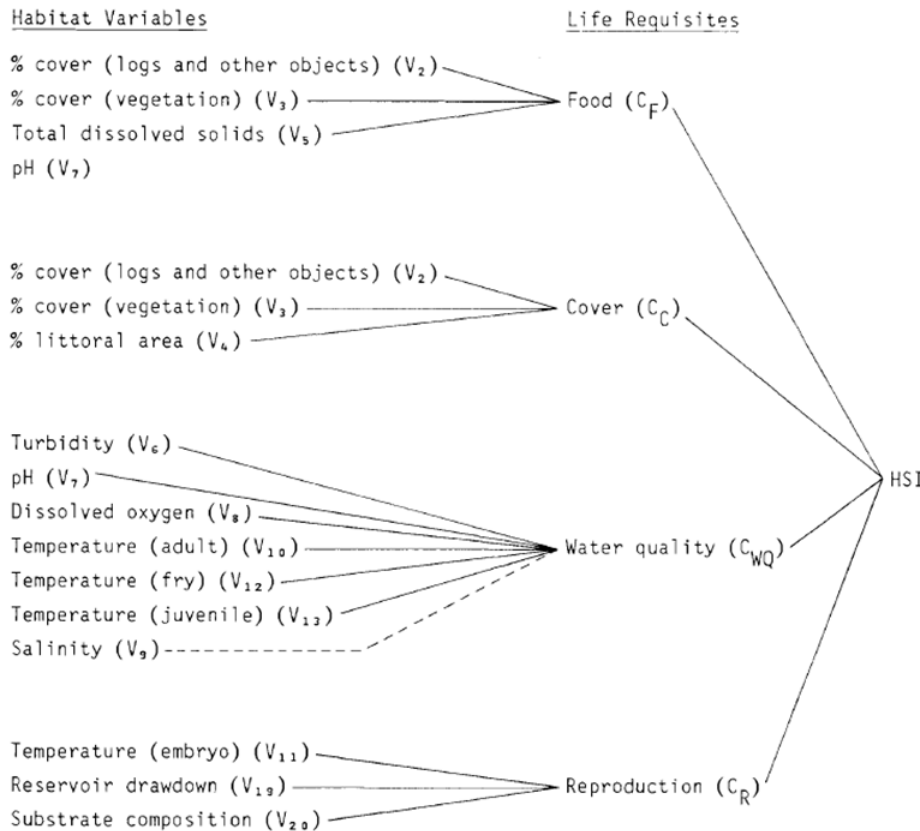
HSI Models as a Guide for Habitat Needs

- The HSI Models are divided into 4 categories:
 - Food
 - Cover
 - Water Quality
 - Reproduction
- Within each category, there are **measurable habitat variables**. Each habitat variable is assigned a suitability index from 0 to 1 that is used in the model calculation.

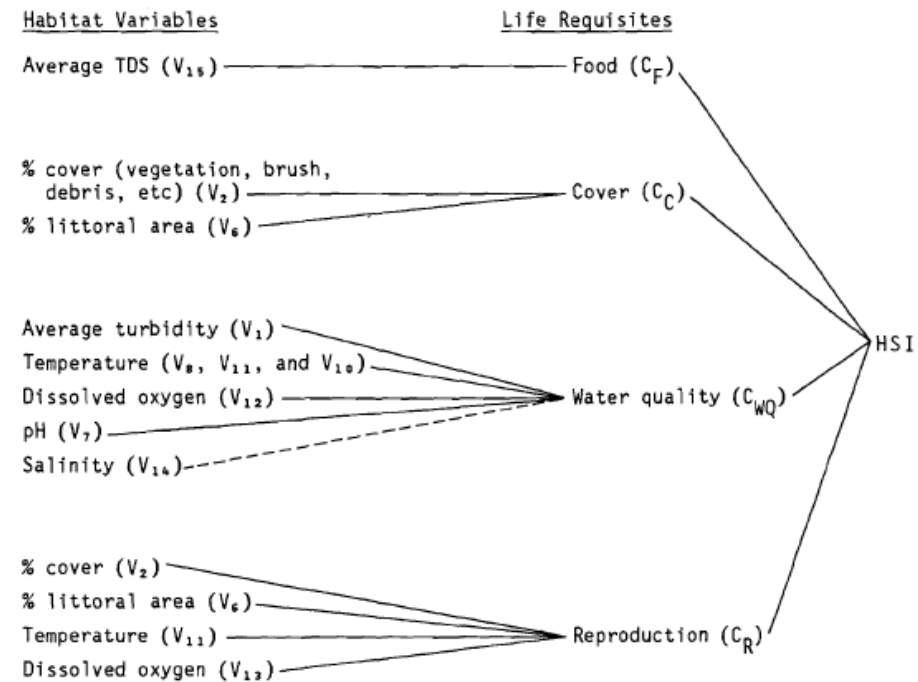
HSI Models

Bluegill and Black Crappie

Bluegill



Black Crappie



HSI Model for Bluegill - Food

● Food

- **% cover (logs and other objects)**
 - Promotes good habitat for foraging and food organisms
- 20% to 60%

- **% cover (vegetation)**
 - Vegetation density can influence both feeding ability and abundance of food.
 - The optimum level for the model is from 15% to 30%.



AVOID THE EXTREMES



HSI Model – Food

- **Bluegill**

- **Total dissolved solids**

- A general measure of productivity
- 100 – 350 ppm

- **Black Crappie**

- **Total dissolved solids**

- 100 – 350 ppm
- The only variable listed for crappie.

There should enough productivity to provide an adequate food chain but not high enough to impact water quality.

HSI Model - Cover

- **Bluegill**

- **% cover (logs and other objects)**
 - 20 to 60%
- **% cover (vegetation)**
 - Too little or too much vegetation indicates poor habitat
 - 15 to 30%

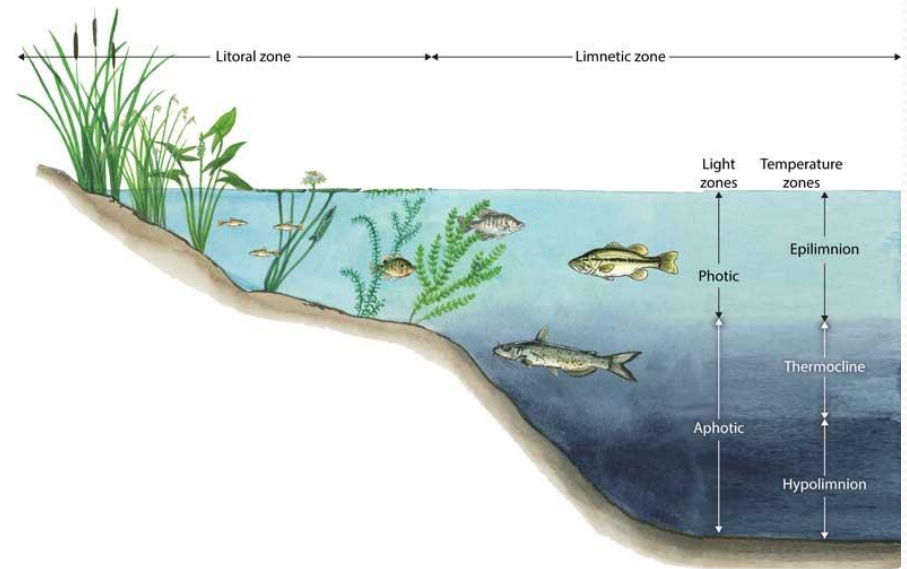
- **Black Crappie**

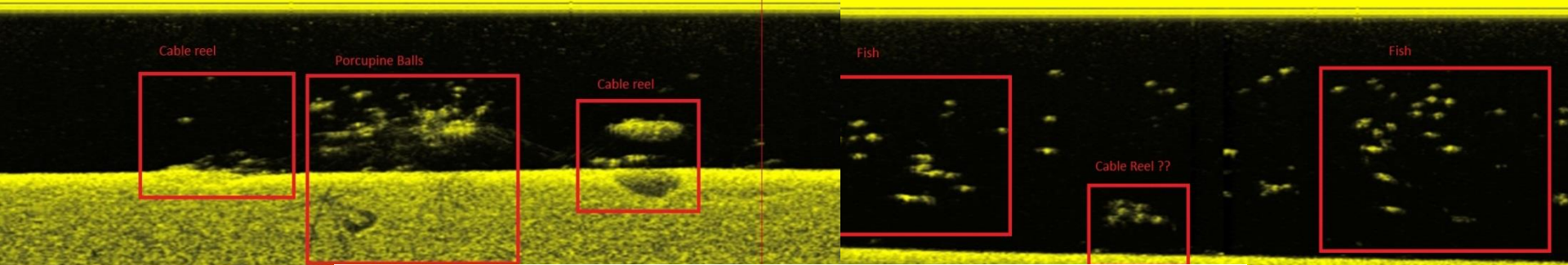
- **% Cover (logs, brush, timber, vegetation, etc.)**
- 25 to 90%

The same percentages as in the Food Category

HSI Model - Cover

- **Bluegill**
 - % Littoral Area
 - 20 to 60%
- **Black Crappie**
 - % Littoral Area
 - 20 to 80%
- Need to provide large areas of shallow water, but both species need deeper water





Habitat Projects



HSI Model – Water Quality

• Bluegill

- **Turbidity**
 - Higher levels impact growth and development
- **pH**
 - 6.5 to 8.5 is optimum
 - Levels that promote good production and maximum survival rates.
- **Dissolved Oxygen**
 - Minimum range during summer
 - Seldom below 5 mg/l

• Black Crappie

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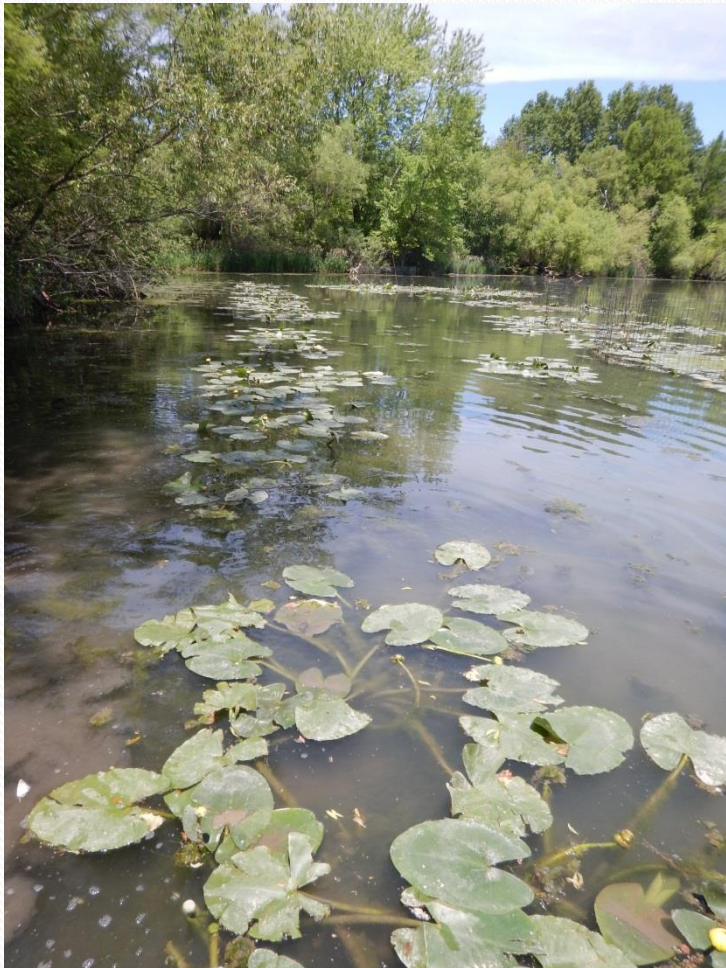
• Bluegill

- **Temperature (Fry)**
 - Maximum early summer temperature
 - Optimal temperatures are 77 - 89° F.
- **Temperature (Juvenile)**
 - Maximum midsummer temperature
 - Optimal growth occurs at 86° F
- **Temperature (Adult)**
 - Maximum midsummer temperature
 - Optimal growth occurs near 81° F
 - No growth occurs below 50° F or above 86° F.

• Black Crappie

- **Temperature (Fry)**
 - Most suitable summer temperature
 - Optimal temperature is 68 - 82° F
- **Temperature (Juvenile)**
 - Most suitable summer temperature
 - Optimal temperature is 75 - 82° F.
- **Temperature (Adult)**
 - Suitable Temperature in summer
 - Growth between 73 to 89° F

HSI Model – Bluegill Reproduction



- **Water drawdown during spawning**
 - Stable water levels are optimum.
 - This seems pretty obvious!



HSI Model - Reproduction

- **Bluegill**

- **Reproduction**

- **Substrate Composition**

- Fine gravel and sand are the optimum substrate types
 - Spawning occurs over almost any substrate.

- **Black Crappie**

- **Reproduction**

- **% Cover**
 - **% Littoral Area**
 - **Temperature**
 - **Dissolved Oxygen**

Different fish might have different habitat needs

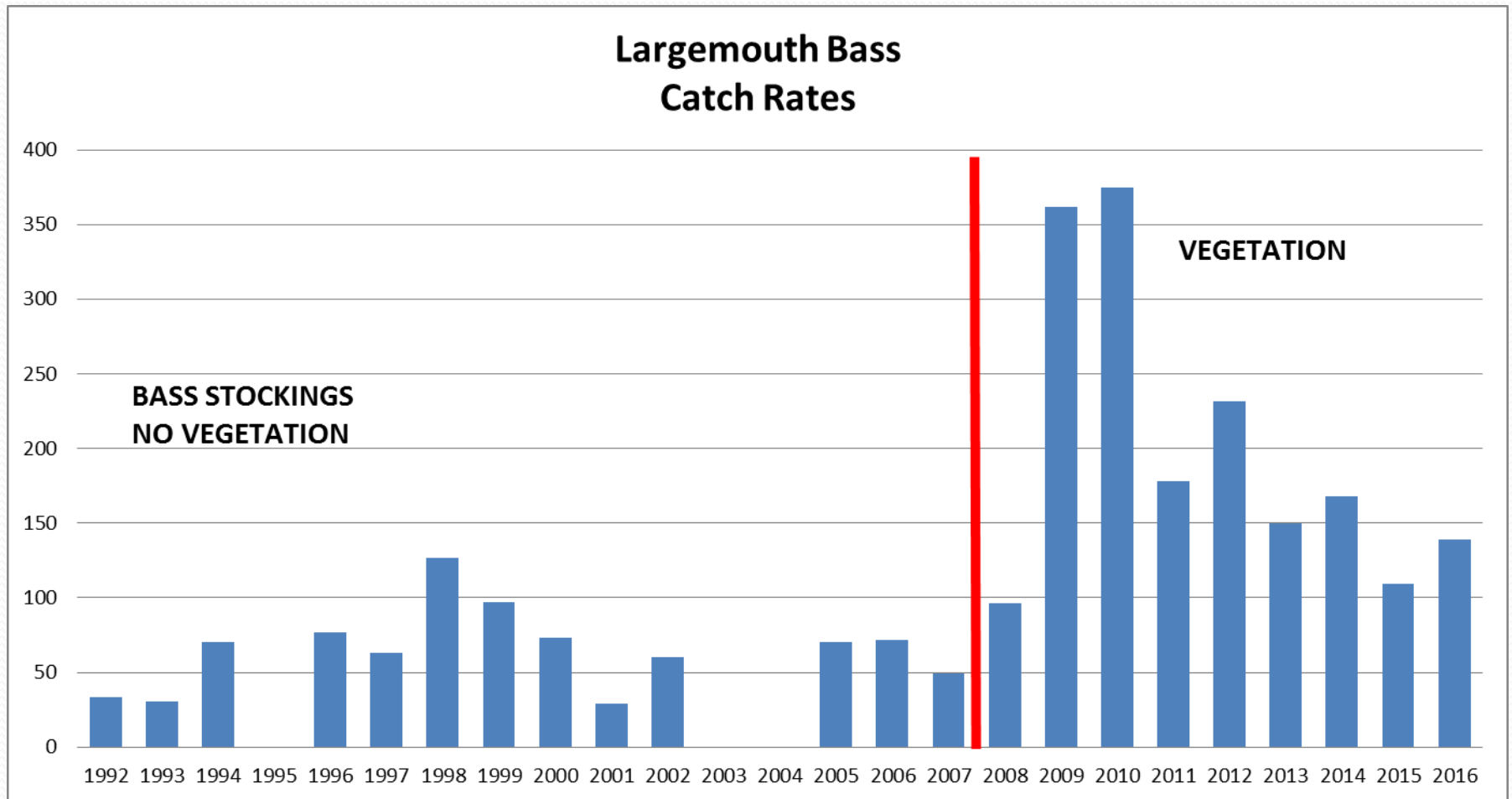


How do you address habitat (lake restoration) issues?

- On an individual basis, prioritize your perceived problems with the lake
- As a group, combine the individual prioritized list into one list for the group
- The next step is to collect materials and data to answer questions related to the problems
- Determine what projects will be needed to address the issues.
- Keep fish habitat needs in mind when addressing general lake restoration problems.

Evergreen Lake

Changes in a bass fishery



Importance of Fish Habitat



- You only need to know one thing.....
- If you want better fishing, it is important to have big structures!
- Just Kidding!!