Good Fishing Needs Good Habitat

Good habitat provides good fishing. When water, food and shelter are present in proper amounts, fish populations provide good fishing. When one or more of these things are not available in proper amounts, populations are limited. Biologists call these things limiting factors. Limiting factors may keep certain fish species out of a habitat.

**Vocabulary** (Watch for these words!)
- **hydrology:** study of water movement and distribution
- **limiting factors:** factors that control a population's growth, such as organism growth or species population, size or distribution
- **riparian:** the area of land or banks next to a stream or river
- **riparian buffer:** streamside vegetation that protects banks in high water
- **stabilization:** efforts to reduce erosion of stream banks or lake shoreline
- **shelf:** a projecting layer of rock on land
- **grading:** to level or smooth to a desired slope

**Before Habitat Improvement**

**After Habitat Improvement**

**During Habitat Improvement**

Big Spring Creek, Cumberland County
Runaway Stream

Steep, eroded banks are one sign that the stream is out of its natural state. These streams have little or no vegetation on the banks or riparian buffer. The stream may also be very wide and shallow with the water moving slowly. Silt often covers the bottom of these streams.

These streams can be great candidates for habitat improvement. Biologists sample the stream at different places. They collect data on fish, bugs and water quality. Analysis of the stream hydrology occurs. Biologists and other technical staff review the data and develop habitat improvement plans.

Most projects work to stabilize banks and create diverse instream habitat. Narrowing the channel increases the water speed. Fast water keeps the bottom clean and creates places for fish to hide.

PFBC and Greater Latrobe High School students build multi-log deflectors.

like logs, root wads, rocks and native plants are used to provide places to hide.

It may take many years to see the full benefit of stream improvements. Trout are stocked when natural reproduction doesn’t support fishing.
**Stream Improvement Toolbox**

**Bank Grading and Riparian Shelf**
- Reduces erosion
- Narrows the channel
- Replaces steep banks with a gradual slope or shelf
- Restores native vegetation

**Multi-log Deflectors**
- Installed on outside bend of streams
- Built with rocks and logs, triangle-shaped structure
- Installed in an alternating pattern on straight channels
- Used to direct flow away from the bank
- Spaced 30 feet apart

**Cross Vanes**
- Deflects current from the bank towards the middle of the channel
- Creates plunge pools
- Constructed as single or double vanes
- Made with logs or stones
- Resembles a “V” pointing upstream
- Spaced 50 feet apart
- Protects eroded banks
- Narrows stream channel

**Partners**
Trout Unlimited, local conservation districts, watershed groups and other similar organizations are important partners in habitat improvement.
Lake Improvement Toolbox

The Pennsylvania Fish & Boat Commission also provides habitat help for lake fish. Only a few lakes in Pennsylvania are natural. Others were constructed many years ago to provide flood control or recreation. Vegetation and woody debris were often removed during construction. Habitat improvement projects work to create a more diverse fish habitat.

**Porcupine Crib**

- Built on land and sunk to the bottom
- Uses rough-cut hemlock lumber
- Placed in water 10- to 15-feet deep and parallel to the shoreline
- Placed 20 structures per acre
- Creates a microhabitat for aquatic invertebrates
- Provides a deep-water refuge for young fish

![Porcupine crib](image)

**Meet the Fleet**

The Commission uses a specialized fleet of boats for lake habitat improvement.

![The rollers on crib boats make it easier to install porcupine cribs.](image)

![Rocks and gravel are loaded and then discharged from dump boats.](image)
Post Cluster Structures
- Sunk in the lake bottom to provide vertical post structure
- Establishes 4 clusters per acre (each cluster has 25 posts)
- Placed in water 3- to 4-feet deep and at slight angles to the water surface
- Creates a microhabitat for aquatic invertebrates, and baitfish eat the invertebrates

Heavy construction equipment is used to build these structures.

Rock Rubble Humps
- Made with 1 to 2 tons of stone
- Constructed 1- to 3-foot high
- Built on flat or gradual slopes
- Establishes 20 rock rubble humps per acre
- Creates microhabitat for aquatic invertebrates
- Provides refuge for baitfish and young gamefish

Shoreline Stabilization
- Steep banks are regraded and planted
- Stone deflectors are built
Help this Habitat

Below are some characteristics of stream and lake habitats in need of improvement. Develop a habitat improvement plan for both a lake and a stream. Answer the questions in the boxes. Using the icons in the Habitat Legend, draw the structures on the map below.

Lake
- Lake is approximately 40 acres
  - 20 acres of the lake is shallow, 7 feet or less
  - 20 acres of the lake is 7 feet or deeper
- Largemouth bass population is low and limited to small fish
- Baitfish populations are very low

Lake Habitat Plan
Goal: Create refuge areas for young bass and baitfish.

1. What type of fish habitat and how many should be placed in the 3- to 4-feet water of the lake?

Type: __________________________

How many? __________________________
(20 acres x clusters per acre)

2. What type of fish habitat and how many should be placed in the 10- to 15-feet water of the lake?

Type: __________________________

How many? __________________________
(20 acres x structures per acre)

See "Lake Improvement Toolbox."

HABITAT LEGEND

- 20 Clusters
- 50 Cribs
- Multi-log Deflector
- Cross Vane

7 plus feet (20 acres)
0-7 feet (20 acres)

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Stream
- Eroded banks are near the lakeshore and carries silt into the lake
- Wide channel in straight sections
- Bottom covered with silt
- Stocked with trout but many leave the area shortly after stocking

Stream Habitat Plan
Goal: Stabilize banks to reduce erosion and sedimentation. Narrow the stream channel.

1. What type and how many habitat structures would you need to narrow and center water flow in the impaired stream?
   Type: __________________
   How many: ________________
   (spaced 50 feet apart)

2. What type and how many habitat structures would you need to protect the eroded outside bank and provide cover for trout?
   Type: ________________
   How many: ________________
   (spaced 30 feet apart)

See "Stream Improvement Toolbox."
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