

8.0 OTHER CONSIDERATIONS

**Insects that are indicators of excellent water quality
and provide nutrition for stream trout**

Caddisfly Larvae
Case-making Caddisfly Larva
Order Trichoptera, various families



- Up to one inch in length
- Build distinctive cases made of sticks, rocks, sand, plant material and/or other debris
- Three pairs of legs
- Antennae reduced and inconspicuous

Great Lakes Trivia Test (answers on back):

- 1) Is spring earlier or later along the shores of Lake Michigan, and what effect does this have on the fruit trees?
- 2) Name three benefits of Great Lakes wetlands.
- 3) How many species are there of Great Lakes fish?
(a) 65 (b) 145 (c) 180
- 4) What percentage of the U.S. population lives in the Great Lakes basin? Of the Canadian population?
- 5) Where do all the waters of the Great Lakes end up?

GUIDING PRINCIPLES

1. Plan projects. (All projects should be planned!)
2. Move water off road surfaces as soon as possible.
3. Direct runoff into vegetated filter areas or rock-lined turnouts.
4. Address road runoff from the top of both approaches.
5. Avoid directing runoff into surface waters.
6. Stabilize bare areas.
7. Keep runoff velocities low and avoid concentrating runoff.
- 8. Minimize areas of disturbance.**
- 9. Revegetate disturbed areas ASAP.**
- 10. Maintain and monitor all practices.**

Answers:

- 1) Spring is delayed several weeks making it a cooler spring which protects the fruit trees from being vulnerable to damaging frost. This improves Michigan's harvest of fruit.
- 2) They reduce flooding by storing water; provide habitat for plants, animals, and fish; improve water quality by filtering out sediments, nutrients, and contaminants; and reduce shoreline erosion by providing a buffer between the water and the shoreline.
- 3) (c) 180
- 4) U.S. is 20 percent, or 36 million people; Canadian is 60 percent or 6 million people
- 5) the Atlantic Ocean or through the Chicago diversion down the Mississippi River and into the Gulf of Mexico

8.0 OTHER CONSIDERATIONS

8.1 Aesthetics/Vegetative Management

Good maintenance and erosion control practices create more attractive backroads and make the public happy about the care their roads are receiving. This in turn improves public support for the needs of the road crew in maintaining roads properly. Tree canopies over backroads are one of the area's important scenic resources for residents and visitors alike; but there are times when aesthetics and good road maintenance and erosion control practices may seem to conflict, as in creating proper ditches. The road crew has the important job of balancing the need for the proper road maintenance and erosion control that will keep sedimentation from reaching surface waters with the need to maintain the wonderful aesthetic qualities of scenic backroads.

- Removal of large, healthy trees along the road should only be done when absolutely necessary.
- Grading too close to trees, closer to the trunk than the drip line of the leaf canopy, will harm the tree and may eventually kill the tree.
- Grading that exposes roots, especially on slopes or along deep ditches may cause a hazard by making trees more easily uprooted, as well as look unsightly.
- Cover exposed tree roots as quickly as possible to avoid damaging the tree.
- Prune any tree limbs broken during maintenance back close to the main trunk or branch.
- Replant areas where trees are removed for construction purposes to provide for a new canopy and revegetation.
- Rebuild any stonewalls that must be removed for road construction or ditching.
- Stone culvert headers are aesthetically pleasing and in keeping with the rural character of backroads.
- Use natural fieldstone for riprap as opposed to quarry limestone for a more aesthetic appearance.

8.2 Beavers

Cute as they are, beavers can create problems for road crews by building dams that block culverts and impounding water that can be released during a flood, washing out roads and bridges. Beavers, particularly, like to build dams at culverts because the stream flow is narrowed and the road makes up the rest of the dam. This creates a recurring problem for road crews since beavers have a tendency to keep rebuilding dam after dam in the same spot. However, beavers also create significant wildlife habitats and scenic areas. In recent years, many inventive people have developed methods to deal with the beavers other than constantly dismantling dams or extermination. Some of these ideas include:

- Use deep repellent to keep beavers away temporarily.
- Hang a 36-inch x 36-inch white flag attached to two poles when beavers start to construct a new dam - the color and motion causes the beaver to leave and not return.
- Weld an elbow that aims downward at a 90 degree angle onto the culvert, allowing water through the pipe and preventing the beavers from plugging the culvert.
- Install a perforated pipe that inserts into the larger culvert pipe and goes through the beaver dam extending into the pond about 15 feet - this drains the pond causing beavers to move to better accommodations.
- Install two small perforated pipes, each with an elbow extension creating 4 arms going into the pond, on the outside of the culvert. Known as a "beaver reliever", this device also drains the beaver pond.
- Install a beaver pipe and a metal fence around the culvert that prevents the beavers from blocking the culvert with debris - the two pipes going from the pond through the fence and beaver dam allow the water to flow into the culvert.
- In isolated instances, it may become necessary to control beavers by animal control means such as trapping and removal. Follow the applicable trapping regulations in your area. This method should only be used if all other methods fail.

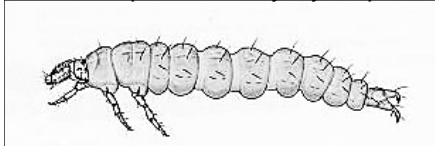
9.0 RESOURCE LIST

**Insects that are indicators of excellent water quality
and provide nutrition for stream trout**

Caddisfly Larvae

Free-living Caddis Larva

Order Trichoptera, Family Rhyacophilidae



- Measure up to 3/4 inch, occasionally 1 inch in length
- Abdomen usually has deep constrictions between segments
- Often whitish to green in color
- Found in cool, clean streams
- Most species are active predators.

Great Lakes Trivia Test (answers on back):

- 1) The Locks at Sault Ste. Marie are the first, third or eighth busiest in the world?
- 2) Which is the shortest shipping distance to Europe by freighter: Buffalo, New York, or Baltimore, Maryland?
- 3) What is the acronym most commonly used to remember the names of all of the Great Lakes?
- 4) What canal moved settlers from New York City and the Hudson River over to the Great Lakes?
- 5) Name the largest waterfall in the Great Lakes system.

Answers:

- 1) third
- 2) Buffalo, New York
- 3) HOMES (Huron, Ontario, Michigan, Erie, and Superior)
- 4) the Erie Barge Canal
- 5) the Niagara Falls

9.0 RESOURCE LIST

The following organizations, in Michigan, may be able to provide assistance with road maintenance, erosion control and sedimentation problems. For projects in other states, consult the appropriate agencies in those areas.

Michigan Department of Environmental Quality (517) 373-1170
Land and Water Management Division
PO Box 30458
Lansing, MI 48909

Michigan Department of Environmental Quality (517) 241-1300
Water Bureau
PO Box 30273
Lansing, MI 48909

Michigan Department of Transportation (517) 373-2090
State Transportation Building
425 W. Ottawa St.
PO Box 30050
Lansing, MI 48909

Michigan Department of Natural Resources (517) 373-1275
Forest, Mineral and Fire Management Division
PO Box 30452
Lansing, MI 48909

Michigan Department of Natural Resources (517) 373-1280
Fisheries Division
PO Box 30446
Lansing, MI 48909

USDA Natural Resources Conservation Service (517) 324-5270
Michigan State Office
3001 Coolidge Rd., Suite 250
East Lansing, MI 48823

U.S. Fish & Wildlife Service (517) 351-2555
Ecological Services Field Office
2651 Coolidge Rd., Suite 101
East Lansing, MI 48823

USDA Forest Service
Huron-Manistee National Forests
Supervisor's Office
1755 S. Mitchell St.
Cadillac, MI 49601

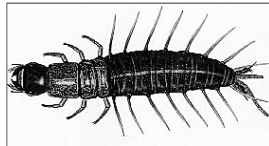
(231) 775-2421

10.0 PERMITS

**Insects that are indicators of excellent water quality
and provide nutrition for stream trout**

Dobsonfly

Order Megaloptera, Family Corydalidae



- Commonly called Hellgrammites.
- Measure 3/4—4 inches in length.
- Body is elongate and somewhat flattened.
- Large pinching jaws.
- Lateral appendages along the length of the abdomen.
- Cotton-like gill tufts on underside of abdomen.
- Abdomen terminates in two small prolegs, each bearing two claws.
- Short inconspicuous antennae.
- Feed on other aquatic insects.
- Hellgrammites are usually found on the underside of large rocks in cool, slow-moving streams.
- Handle hellgrammites, carefully, larger individuals may deliver a painful pinch!

Great Lakes Trivia Test (answers on back):

- 1) What fish were introduced to the Great Lakes in the late 1960's and the 1970's that revitalized the sport fishing industry?
- 2) What is the name of the canal that allows ocean-going vessels to pass around the Niagara Falls?
- 3) What Lake is most susceptible to "seiches" or winds that pile water up as high as eight feet at one end?
- 4) Name four ways people play along the Great Lakes.

Answers:

- 1) Salmon (primarily Coho and King)
- 2) the Welland Canal (part of the St. Lawrence Seaway)
- 3) Lake Erie because it is shallow, long, and narrow
- 4) walking, swimming, boating, fishing, building sandcastles, collecting rocks, wading, windsurfing

10.0 PERMITS

The following permits are required under Michigan law. For projects in other states, contact your state resource agency responsible for permitting.

Inland Lakes and Stream - Part 301 of Act 451

A permit is required to dredge, fill, or place a structure below the ordinary high water mark of an inland lake or stream in Michigan. Common activities requiring a permit under this program are: seawalls or riprap, dredging or filling, and bridge or culvert placement.

Great Lakes - Part 325 Act 451

A permit is required for work or structures below the ordinary high water mark of the Great Lakes.

Also, a permit may be needed under Section 404 of the Federal Clean Water Act for Army Corps of Engineers jurisdictional waters (mostly Great Lakes).

Wetlands Protection Act, Part 303 of Act 451

A permit is required for dredging, draining, filing or maintained use of a wetland. The Act applies to wetlands that are connected to or are near a lake, pond, river, or stream. Isolated wetlands greater than five (5) acres are also protected in counties with populations greater than 100,000.

Flood Plain Control Act, Part 31 of Act 451

A permit is required for structures or to fill in the 100 year floodplain (0.1% chance of occurring each year). The purpose of this Act is to control encroachments into floodways for flows including a one percent probability. This would include bridges and culverts, fills and stream modifications for roads, etc.

For the above, contact:

Michigan Department of Environmental Quality (517) 373-1170
Land and Water Management Division
PO Box 30458
Lansing, MI 48909

Applications: www.mi.gov/jointpermit

Soil Erosion and Sedimentation Control Act, Part 91 of Act 451

This provides for the control of soil erosion and protects the waters of the state from sedimentation. The Act is applicable to all earth changes of one acre or greater or to any earth change within 500 feet of a lake or stream. Contact your county building and zoning department.

For the above, contact your county building and zoning department.

Natural Rivers Act, Part 305 of Act 451

This Act establishes a system of outstanding rivers in Michigan for the preservation, protection and enhancement of them. This Act applies to a selected list of Michigan's rivers and their tributaries.

For the above, contact:

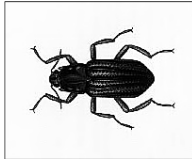
Michigan Department of Natural Resources (517) 373-1280
Fisheries Division
530 W. Allegan St.
PO Box 30046
Lansing, MI 48909

11.0 BIBLIOGRAPHY

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Riffle Beetle

Order Coleoptera, Family Elmidae



- Riffle beetles measure approximately 1/16 to 1/4 inch in length
- Body small, usually oval
- Legs are long
- Antennae are usually slender
- Riffle beetles walk slowly underwater, they do not swim on the surface.

Great Lakes Trivia Test (answers on back):

- 1) What historic and recreation resource is protected by Great Lakes Bottomland Preserves?
- 2) Great Lakes water levels fluctuate—go up and down—naturally. What is the most significant cause of these changes in water levels from year to year?
- 3) What is the percentage of Michigan's land area that drains into the Great Lakes? (a) 75 (b) 95 (c) 100

Answers:

- 1) shipwrecks
- 2) precipitation rates (rainfall)
- 3) (c) 100