



## CONSERVING VERNAL PONDS

### FOREST STEWARDSHIP MANAGEMENT NOTE #30

#### INTRODUCTION

Forested wetlands are important because they produce timber, harbor wildlife, influence water quality, intercept runoff, recharge groundwater, and provide open space and recreation opportunities (#5). Low-lying swamps are the most abundant and well-known type of forested wetland, but many types of upland and lowland forests contain temporary ponds that are much more important than their size indicates.

Michigan's Forest Stewardship Incentive Program (SIP) recognizes the value of wetlands and supports their conservation by providing cost-sharing for a variety of practices, including fencing, erosion control, tree planting, and restoration work.

This Note explains the nature and importance of vernal ponds, summarizes threats to them, and offers suggestions for their conservation.

#### THE NATURE AND IMPORTANCE OF VERNAL PONDS

1. **DEFINITION** - Vernal ponds are small ponds that result from spring rains and snowmelt and that dry up during the growing season. They can range in size from small puddles up to an acre or more. Some vernal ponds may hold surface water at other times of year, but it is the temporary occurrence of surface water in spring that gives vernal ponds much of their special value.
2. **LACK OF FISH** - Because of their temporary nature, vernal ponds cannot support fish, and the lack of fish as competitors and predators is a great opportunity for a host of organisms that can become dormant or move to land during dry periods. The life supported by vernal ponds varies widely with their size, depth, and water chemistry, but many of them flourish with productivity during their brief existence, providing habitat for a great variety of microbes, plants, invertebrates, amphibians, reptiles, birds, and mammals (#3). This intense biological activity is especially important in that it occurs early in the growing season when most other habitats are relatively quiet.
3. **AMPHIBIANS** - Amphibians are particularly dependent on vernal ponds, in that many species of frogs, toads, and salamanders must lay their eggs in the relatively safe waters of such pools if their young are to survive. As the water of vernal pools warms in spring, a succession of amphibian species arrive to breed in predictable order.

#### THREATS TO VERNAL PONDS

Because the wildlife value of vernal ponds is little recognized, these rich habitats are often seen as unproductive areas in which to dispose of brush and stumps or as convenient places to water and graze livestock (#3). Vernal ponds are also threatened with drainage by people who see them as problem areas and with attempts to convert them to permanent ponds by people who want to "improve" them. The latter often fails as vernal ponds are frequently above the normal water table.

The critical value of vernal ponds as breeding habitat for amphibians also appears to be threatened even where the vernal pond habitat per se is not being destroyed. Since the 1970's, scientists around the world have become increasingly alarmed at declining amphibian populations (#2,4). The causes of the decline are not fully known, but because of their permeable skin, amphibians are particularly susceptible to many forms of pollution. Pesticides and acid precipitation have been implicated in some areas and increased ultra-violet radiation due to thinning of the Earth's protective ozone layer appears to be another cause (#1).

## **SUGGESTIONS FOR CONSERVING VERNAL PONDS AND THEIR INHABITANTS**

1. **PRACTICES TO AVOID** - Like many resources, vernal ponds are valuable in proportion to their scarcity. The fewer vernal ponds there are in an area, the more critical they are to the maintenance of biodiversity (FSMN #37). And because many of the species that depend on vernal ponds are not very mobile, it is important that vernal ponds be well distributed across the landscape. Thus, unless other, similar, undisturbed vernal ponds are present nearby, avoid:
  - using them for grazing or watering livestock,
  - using them for disposal of woody debris or other wastes,
  - converting them to permanent ponds, or
  - draining them.
  
2. **RESTORATION PRACTICES** - Vernal ponds that have been degraded by the above activities can be at least partially restored by:
  - fencing out livestock (FSMN #3),
  - removing debris from them,
  - removing dams,
  - blocking drainage channels,
  - deepening (#3), and/or by
  - planting native vegetation.
  
3. **ENHANCEMENT PRACTICES** - The value of vernal ponds can be maintained or enhanced by:
  - leaving undisturbed buffer zones between them and roads, timber harvests, and plantations, installing nest boxes for wildlife (FSMN #24),
  - planting evergreen trees to shield amphibians from ultra-violet radiation (FSMN #12), and by providing connecting corridors between isolated vernal ponds and larger areas of native vegetation (#3, FSMN #39), use of rock piles, snags, down logs, and floating platforms for wildlife cover and resting sites.

## **REFERENCES**

FSMN #'s refer to other Forest Stewardship Management Notes in this series.

- #1 Mining Journal and Associated Press. 1994. Thinning ozone layer blamed for less frogs. Mining Journal (Marquette, MI), March 1, 1994.
- #2 Phillips, K. 1990. Frogs in trouble. International Wildlife, Nov.-Dec. 1990.
- #3 Premo, D. and E. Rogers. 1994. Vernal ponds. A brief for the "Biodiversity Management Opportunities on Small Landholdings" workshop sponsored by the Forest Management Division, Michigan Department of Natural Resources. White Water Associates, Inc., Box 27, Amasa, MI 49903.
- #4 Primack, R.B. 1993. Essentials of conservation biology. Sinauer Associates, Inc.
- #5 Society of American Foresters (SAF). 1993. Protection and management of forest wetlands. A position of the SAF. Journal of Forestry 91(5):9.

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