

## Seasonal pond guidelines and RSTC recommendations

### Existing guidelines

- ✓ Identify resources, features and site conditions that may require special attention, such as perennial and intermittent streams, lakes, open water wetlands, non-open water wetlands and seasonal ponds
- ✓ Create a site map or conduct an on-site review with the operator to indicate the location of any special concern areas identify during the site survey. Be sure that maps are large enough to adequately depict sensitive areas. See Figure GG-3. The site map or on-site review should clearly identify the location of streams, lakes, wetlands and seasonal ponds (others listed in guidebook)
- ✓ Avoid rutting in non-open water wetlands and seasonal ponds. It is important that rutting not bisect wetlands.
- ✓ Apply filter strip guidelines to management activities adjacent to non-open water wetlands and seasonal ponds.
- ✓ Avoid disturbances such as ruts, soil compaction, excessive disturbance to litter layer, and addition of fill, which can interrupt or redirect the flow of water into or through a non-open water wetland or seasonal pond.
- ✓ Keep logging residue out of all streams, lakes and open water wetlands, except in cases where residue placement is specifically prescribed for fish or wildlife habitat. Make reasonable effort to keep logging residue out of all seasonal ponds and non-open water wetlands.
- ✓ [leave tree] clumps should center around or coincide with such features as:
  - \* Non-open water wetlands and seasonal ponds

### RSTC and seasonal pond recommendations

The RSTC report has been generally interpreted as concluding no consensus on the need for RMZ's adjacent to seasonal ponds, but several statements throughout the report are contradictory and it is unclear exactly what the RSTC concluded regarding buffers. However, they all agreed that seasonal ponds are important and require some level of protection.

“Waterbodies supported by the scientific literature as needing riparian management zones (RMZ) are streams, lakes, rivers, and open water wetlands (Cowardin types 3, 4, 5, and seasonal ponds).” – executive summary

“It was also agreed that the science does support an RMZ [around seasonal ponds] of at least 15 m (50 ft) wide and a residual BA of at least 75 ft<sup>2</sup>/ac.”

“Although there was a clear consensus that protection of seasonal ponds is critical, there was not universal agreement within the RSTC that seasonal ponds require the use of RMZs to provide that protection around some or all of the seasonal ponds.”

“Consensus among the RSTC was not reached regarding the need for application of RMZs adjacent to seasonal ponds. It was agreed, however, that there is uncertainty in the literature regarding potential recommendations for RMZ width and residual BA for seasonal ponds.”

“There is compelling scientific evidence that biological communities (e.g. invertebrates, amphibians) in Minnesota seasonal ponds experience short-term changes as a result of harvesting without RMZs. There is scant information about population changes over the long term but some evidence suggests that populations can recover. It is the professional judgment of some of the RSTC members that management could be improved adjacent to these sites. Discussed options ranged from providing leave tree patches around some seasonal ponds to RMZs around all ponds.”

The following memo provides some more context on the differing views among RSTC members on whether or not seasonal ponds should have buffer areas (from the RSTC report appendix).

**Seasonal Pond Guidelines**  
**RSTC Habitat Committee**  
**March 13, 2006**

**To: Riparian Science Technical Committee**  
**From: Mark Hanson, Lucinda Johnson, Brian Palik**  
**Re: Seasonal pond management guidelines**

The Minnesota Voluntary Site Level Management Guidelines address seasonal ponds in a limited way, specifically on pages 36-38 of the Wildlife Habitat subsection and on pages 72-73 of the General Guideline subsection. The former section defines seasonal ponds, provides some considerations relative to amphibians and waterfowl, but provides no guidelines. The latter section repeats some of the same definitional material as the Wildlife subsection and provides considerations and guidelines. We have reviewed the definition, considerations, and guidelines. We put forth the following suggested revisions to these guidelines. We suggest that any revision should be consistently made in both the Wildlife Habitat and General Guideline subsections.

**Definition**

1. The opening statement should state explicitly that seasonal ponds often include a clearly defined dry period. The point we feel needs emphasis is that a site is not exempt from guideline application if/because standing water and/or wet soils are absent during part of the growing season, or when the site is visited for timber sale layout.
2. The seasonal pond size criterion should be increased to 1 ac (currently ½ ac). It is true that most seasonal ponds are likely to be less than ½ ac in size, however larger ones to exist and should be acknowledged.
3. The statement regarding identification of seasonal wetlands during dry periods by less forest litter in the depression compared to the upland is inaccurate and should be eliminated. In many cases, litter will decompose slower in the depression proper, than the upland, due to longer periods of inundation, increased moisture, and reduced aeration. However, decomposition rates are widely variable due to differences in nutrient levels, pH, water movement, inundation levels, and moisture, making identification of dry ponds using the litter criteria problematic.
4. Revise the statement about the presence of black ash to read "may include the presence of black ash". Black ash may be absent naturally, due to site characteristics, or may be absent due to disturbance history.
5. The comment about minor presence of shrubs (e.g., alder) along the pond margins should be reconsidered. Shrubs can range from minor to abundant depending on the type of pond, its disturbance history, etc.

**Considerations**

The current guidelines contain "considerations" relative to leaving residual vegetation around seasonal ponds. The user is asked to consider leaving residual trees around ponds to maintain shade, retain sufficient vegetation to prevent sedimentation, and to provide a source of coarse wood and leaf litter. Moreover, the user is asked to consider meeting site level leave tree and patch requirements (5% of harvest area retained) by targeting application around seasonal ponds. Emphasizing this consideration is especially important if there continues to be no RMZ requirement for seasonal ponds (as is the case currently, but see below). However, the

description of leave tree requirements in general in the guidelines is cryptic; consider revising for increased clarity.

### **Guidelines**

Currently, there are two specific guidelines for seasonal ponds: i) apply filter strips guidelines and ii) avoid disturbances such as ruts, compaction, excessive disturbance to litter layer, and addition of fill. These guidelines are appropriate and should be maintained. However, there are not sufficient for sustaining seasonal pond functionality. It is our collective belief that there should be an RMZ guideline added for seasonal ponds, specifically one that provides for a high level of residual tree basal area around the pond. The primary functional reason for the RMZ is to help maintain functional linkages between the pond and the adjacent forest by providing shade, maintaining UV light levels within acceptable limits for pond breeding organisms, ensuring a continued supply of organic matter to the pond, and maintaining habitat requirements for animals in the RMZ (e.g., appropriate forest floor and litter conditions). These functions are critical for sustaining the contributions of seasonal ponds to forest and landscape biodiversity, especially for pond breeding amphibians, such as wood frogs and spring peepers. It is unlikely that filter strips alone are sufficient to meet these requirements. Moreover, it is not clear to us that the 5% leave patch guideline for a harvest unit is or will be implemented in a way that protects seasonal ponds.

It has been argued that an RMZ around seasonal ponds may be warranted only if the majority of such wetlands in a landscape are treated similarly, i. e., adjacent forest around all or most ponds is harvested within a short time period (i.e., cumulative impacts). The reality is that the landscape size for pond breeding amphibians (a key biodiversity component of seasonal ponds), based on modal distances that individuals will migrate to find acceptable breeding habitat, will rarely exceed the size of typical timber sales (Semlitsch 1998, 2003). As such, there is a high probability that most seasonal ponds within the functional landscape of a pond breeding amphibian, will be treated similarly at the time of harvest, thus arguing for the inclusion of an RMZ guideline to protect continuity of function related to shading. We are uncertain about the exact recommendations for width and residual basal area in a seasonal pond RMZ. Our belief is that it should be at least 50 feet wide and contain at least 75 ft<sup>2</sup>/ac of preharvest basal area. Where they naturally occur, conifers should be retained, or their establishment encouraged, as they provide shade year round.

### **Literature Cited**

- Semlitsch, R.D., and J.R. Bodie. 1998. Are small, isolated wetlands expendable? *Conservation Biology* 12:1129-1133.
- Semlitsch, R.D., and J.R. Bodie. 2003. Biological criteria for buffer zones around wetlands and riparian habitats for amphibians and reptiles. *Conservation Biology* 17:1219-1228.

## **Summary of research related to forest harvesting and seasonal ponds in and around Minnesota.**

Batzer, D.P. and B.J. Palik. 2007. Variable response by aquatic invertebrates to experimental manipulations of leaf litter input into seasonal woodland ponds. *Fundamental and Applied Limnology* Vol.168/2:155–162.

**Location:** Chippewa NF, Minnesota

**Project focus:** determine influence of leaf litter (food source) on aquatic invertebrates in ponds

**Project design:** restricted litter inputs at 2 ponds for 4 years and then allowed inputs to proceed (mimic cutting)

**Results:** Reduction in litter reduced invertebrates at 1 pond, benefited invertebrates at the other pond

Freidenfelds, N.A., J.L. Purrenhage, and K.J.Babbitt. 2011. The effects of clearcuts and forest buffer size on post-breeding emigration of adult woodfrogs (*Lithobates sylvaticus*). *Forest Ecology and Management* 261:2115-2122.

**Location:** Penobscot and Washington Counties, Maine

**Project focus:** assess effect of forest buffers on wood frog emigration / dispersal

**Project design:** 2 buffer sizes (100, 320 feet) surrounded by clearcuts; recorded wood frogs movement with radio collars for 2 years post cutting

**Results:** some frogs stayed in both buffer sizes, others (primarily females) traveled through clearcut areas to get to intact forest especially in the 100 foot buffer treatment. Males more likely to stay in buffer than females. Authors concluded 100 ft buffers may be inadequate to provide wood frog habitat.

Homan,R.N., B.S. Windmiller, and J.M. Reed. 2004. Critical thresholds associated with habitat loss for two vernal pool-breeding amphibians. *Ecological Applications* 14(5): 1547–1553.

**Location:** Concord, Massachusetts

**Project focus:** determine critical threshold of habitat loss where impacts to pond-dependent orgs. occurs

**Project design:** probability-based approach to assess if the amount of forest cover at various scales (30-1000 meters) influences pond occupancy.

**Results:** wood frogs appear to be more susceptible to habitat loss near the pond than salamanders, but both species appear to be influenced by habitat loss at greater distances (up to 1000m). Significant thresholds varied between 10-30% forest cover.

Palik, B.J. and D. Kastendick. 2010. Response of seasonal pond plant communities to upland forest harvest in northern Minnesota forests,USA. *Forest Ecology and Management* 260:628-637.

**Location:** Chippewa NF, Minnesota

**Project focus:** determine effect of clearcut and pond buffers on vegetative communities in seasonal ponds

**Project design:** replicated design with 3 treatments: no buffer, 50 ft partial cut buffer, and 50 ft. no-cut buffer. Assessed response for 5 years post-harvest.

**Results:** Harvesting altered vegetative community regardless of treatment, with effects most pronounced in the no buffer treatment. Harvesting increased sedge/grass cover, and willow/alder/aspen cover. No cut buffer mitigated alteration to some extent.

Batzer, D.P., B.J. Palik, and R. Buech. 2004. Relationships between environmental characteristics and macroinvertebrate communities in seasonal woodland ponds of Minnesota. *Journal of the North American Benthological Society* 23(1):50–68.

**Location:** Chippewa NF, Minnesota

**Project focus:** assess influence of environmental variables on macroinvertebrates

**Project design:** Surveyed 66 ponds for macroinvertebrates and environmental variables. And related them with regression and other multivariate statistical techniques.

**Results:** Species richness increased as hydroperiods lengthened, tree canopies opened, water pH declined, and litter input decreased. Little relationship between macroinvertebrates and environmental variables. Authors conclude that the species are habitat generalists accustomed to environmental change and relatively resilient.

Palik, B.J., Batzer, D.P., R. Buech, D Nichols, K. Cease, L. Egeland and D.E. Streblov. 2001. Seasonal pond characteristics across a chronosequence of adjacent forest ages in northern Minnesota, USA. Wetlands 21:532-542.

**Location:** Chippewa NF, Minnesota

**Project focus:** assess influence of time since cutting on seasonal pond characteristics

**Project design:** Chronosequence approach with 4 age classes, and 4-5 ponds in each age class. Time since harvest ranged from 7-100 years.

**Results:** canopy openness and coarse particulate Om influenced by stand age, but no detectable effect of time since harvest on hydroperiod, water chemistry, water depth, overall macroinvertebrate abundance and diversity, macroinvertebrate population sizes, calling of breeding anurans, or abundance of amphibian larvae. Authors speculated that influence of harvest on pond characteristics may be influenced only in early years after cutting (< 15 years).

Semlitsch, R.D. and J.R. Bodie. 2003. Biological Criteria for Buffer Zones around Wetlands and Riparian Habitats for Amphibians and Reptiles. Conservation Biology 17:1219-1228.

**Location:** national review

**Project focus:** determine core habitat requirements (distance from pond) for amphibians and reptiles

**Project design:** review of existing literature related to most wetland types (not just seasonal ponds)

**Results:** mean core habitat requirements ranged from 160-290 m for amphibians and 1