

Little known and little understood: Development of a small wetland assessment field card to identify potential breeding habitat for amphibians

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Abstract

The effect of timber harvesting on small wetland habitats and associated amphibians has not been studied in the Pacific Northwest. In 2004, we initiated a study of three forested sites containing 70+ small wetlands in the Nanaimo Lakes area on Vancouver Island to investigate the use of these sites by amphibians before and after harvesting. Before harvesting, the majority of these wetlands were used for breeding by at least one of four aquatic-breeding amphibian species. Use continued after harvesting, with some species apparently drawn to breed in the newly harvested sites in response to reduced canopy cover conditions, which increase water temperature and productivity. Variable retention harvesting methods often use small wetlands as anchor points for retention patches, which protect the integrity of the in-pond environment and provide cover for metamorphs emerging in mid-summer; however, often only the largest wetlands receive retention. Our results indicate that habitat factors beyond wetland size are also important. Based on our research, we developed and tested a wetland field card that forestry personnel in south coastal areas can use to identify small wetlands used by breeding amphibians.

KEYWORDS: *amphibians, breeding habitat, field card, retention patches, small wetlands, Vancouver Island, variable retention.*

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Introduction

Historically, small, unclassified wetlands (< 0.5 ha) have received little protection during forest harvesting operations. Small wetlands are important habitat features for amphibians:

- they are used for breeding, foraging, and hydration;
- they act as stepping stones across the landscape, maintaining connectivity among populations; and
- their short hydroperiod (which excludes predators such as fish), and their high productivity can result in large reproductive outputs.

The effect of timber harvesting on these habitats and associated amphibians has not been studied in the Pacific Northwest. We initiated a small wetland study in the Nanaimo Lakes area on Vancouver Island in 2004, investigating the use of these sites by amphibians for breeding before and after harvesting.

Study Sites and Methods

Three forested sites containing 20+ small wetlands each were selected for inclusion in the study in 2004. At each site, visual surveys were conducted for all species and life stages of amphibians, and maximum water depth was recorded every 2 weeks from spring until late summer. General habitat characteristics were also recorded pre- and post-harvest at each wetland. Harvesting occurred in fall 2004 at one site and fall 2005 at two sites—the former site had 1 year of pre-harvest data collection, while the remaining two had 2 years of pre-harvest data collection. To date, 3 and 2 years (respectively) of post-harvest data have been collected. Long-term monitoring is expected to continue at these sites to measure responses through green-up.

Results and Discussion

The majority of the 70+ small wetlands in our study area were used for breeding by at least one of four aquatic-breeding amphibian species before harvesting, and use has continued after harvesting. In addition, some species seem to have been drawn to breeding in small wetlands in the newly harvested sites in response to reduced canopy cover conditions, which increase water temperature and productivity (an increase of a only few degrees in early spring may result in a growth advantage for larva). In addition, the majority of the small wetlands experienced a longer hydroperiod after harvest due to a combination of deeper water and slower drying rates.

Although small, unclassified wetlands are important habitat features for amphibians, they have historically received little protection during forest harvesting operations.

Studies elsewhere have shown some amphibian species prefer mid-level canopy cover conditions. Although some amphibians on Vancouver Island may be attracted to harvested sites for breeding, it remains unclear whether reproductive output and survival are affected by timber harvesting. The survival of newly emerged metamorphosed young into cutblocks in mid-summer would likely benefit greatly from the increased cover and moist microsites provided by retention patches.

Management Application: Wetland Assessment Field Card

Variable retention harvesting methods often use small wetlands as anchor points for retention patches essentially providing riparian buffers that may be used by amphibians and other wildlife. However, the allocation of these retention patches is often based on wetland size, with only the largest wetlands receiving retention. Our results indicate that habitat factors beyond wetland size are also important.

Based on our research, we developed and tested a wetland field card that can be used by forestry personnel in south coastal areas of British Columbia to identify small wetlands that may be used by amphibians for breeding (Figure 1). Where options exist, this could help prioritize the wetlands that should receive retention. The results of the field testing were very positive and the card was well received by all forestry personnel who volunteered for the project. The most current version of the field card, including management guidelines, is being distributed among south coastal forestry companies, and is available by contacting Elke Wind at ewind@telus.net.

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DEVELOPMENT OF A SMALL WETLAND ASSESSMENT FIELD CARD

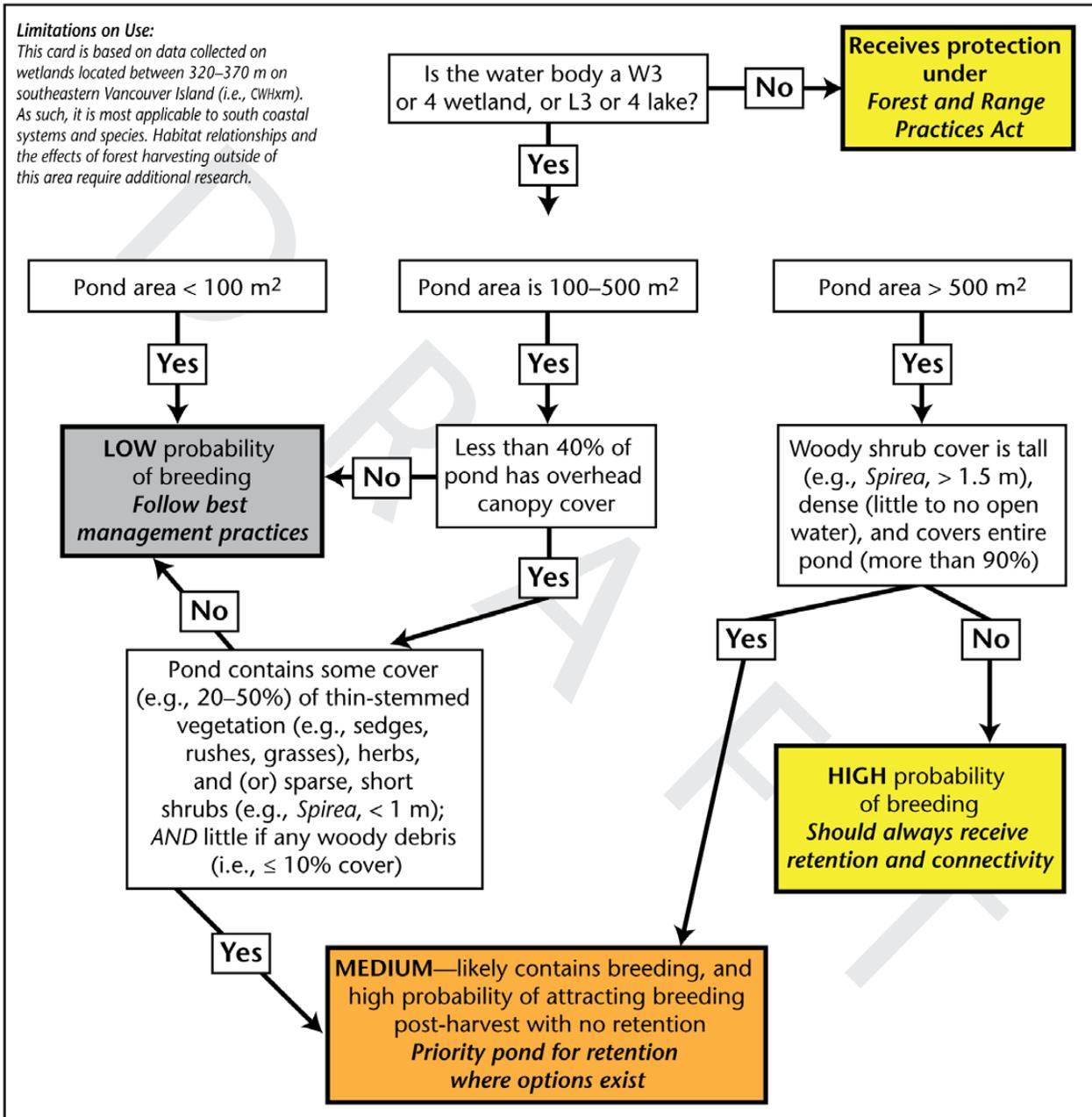


FIGURE 1. First draft of wetland assessment field card field tested in 2007.

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