



State of Washington
Department of Fish and Wildlife

Mailing Address: 600 Capitol Way N, Olympia WA 98501-1091, (360) 902-2200, TDD (360) 902-2207
Main Office Location: Natural Resources Building, 1111 Washington Street SE, Olympia WA

18 February 2015

Mr. Jon McAninch
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Dear Mr. McAninch:

This letter is to provide you and Cedarville Farms with information on the biota observed during our August 2014 surveys of the two adjacent oxbows you have described as the Upper and Lower Ponds located largely on Cedarville Farm properties located off Bicknell Road, Centralia. It will also provide you with our assessment of your restoration efforts on these two units for the purposes of enhancement habitat for fish and wildlife that may be helpful in your future efforts. Our understanding is that Cedarville Farms shares ownership of the Upper Pond with Mr. Donald McCourt, but Cedarville has exclusive ownership of the Lower Pond.

We conducted surveys of these two oxbows over the four-day interval 18-21 August 2014. We surveyed the Lower and Upper Ponds, respectively, on first two and the latter two days during this interval. During these surveys, 10 transects were established in each Pond and at each transect, we place three collapsible minnow traps (for a total of 30 at the sampling of each Pond). Minnow traps were set of the first day for an overnight set and checked and taken down the following day for each Pond. Besides using collapsible minnow traps, we dipped netted shallows at 25 randomly selected locations around each Pond. Further, we set one fyke net with 6-foot hoops and two 25-foot wings overnight, and made one seine pass using a 50-foot by 4-foot seine; both the latter efforts were done at one well-chosen location in each Pond. The combination of sampling efforts was designed to maximize detection of the diversity of aquatic species present. For all these sampling efforts, we identified, measured and photographed most aquatic animals captured. Besides this sampling, we also recorded bird species either present or foraging in or over the Ponds or along the Pond banks.

This relatively brief survey effort revealed a moderately rich assemblage of aquatic species and birds. Specifically, we recorded nine species of fish and amphibians during our trapping and sampling effort in the two ponds (**Table 1**). The Lower Pond, the richer of the two, had all nine aquatic species we recorded, whereas we found only five aquatic species in the Upper Pond. We recorded three species, Three-spined Stickleback, Black Crappie and Northwestern Salamander, only in the Lower Pond. We emphasize, however, that if any species was in very low numbers, our relatively limited trapping and sampling may not have recorded them, and the numbers we provide are only estimates to



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give an idea of the relative difference between ponds; in brief, these numbers should not be viewed as absolute. It is interesting, however, to note that both ponds had a majority of exotic species (mostly fish), though more native species were present in the Lower Pond (**Table 2**). However, despite this dominance of the number of exotic species in both Ponds, the Lower Pond had a greater count of individuals of the native species than the exotic species (**Table 3**). It is worth noting, that, some native species, such as juvenile Coho salmon and other native amphibians, that may seasonally appear in these Ponds,

Table 1. Amphibian and fish species either trapped or sampled in the two Cedarville Ponds during the 18-21 August 2015 surveys.

Standard English Name	Scientific Name	Exotic or Native	Lower Pond	Upper Pond
Olympic mudminnow	<i>Novumbra hubbsi</i>	Native	41	1
Threespine stickleback	<i>Gasterosteus aculeatus</i>	Native	129	
Black Crappie	<i>Pomoxis nigromaculatus</i>	Exotic	1	
Bluegill	<i>Lepomis macrochirus</i>	Exotic	6	42
Pumpkinseed	<i>Lepomis gibbosus</i>	Exotic	14	3
Brown bullhead	<i>Ameiurus nebulosus</i>	Exotic	22	2
Largemouth bass	<i>Micropterus salmoides</i>	Exotic	22	5
American Bullfrog	<i>Lithobates catesbeianus</i>	Exotic	48	127
Northwestern salamander	<i>Ambystoma gracile</i>	Native	7	

Table 2. Aquatic species categories in the two Cedarville Ponds.

Species Category	Lower Pond	Upper Pond
Native fish species	2	1
Exotic fish species	5	4
Native amphibian species	1	
Exotic amphibian species	1	1
Total native species	3	1
Total exotic species	6	5

Table 3. Aquatic species count categories in the two Cedarville Ponds.

Aquatic Species Count Category	Lower Pond	Upper Pond
Native fish count	170	1
Exotic fish count	65	52
Native amphibian count	7	
Exotic amphibian count	48	127
Total native numbers count	177	1
Total exotic numbers count	113	179



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would have exited the Ponds prior to our sampling them in August. Hence, summer sampling may be biased for the exotic species that occupy these ponds; early season sampling would enable understanding whether such a bias exists.

A notable aspect of our aquatic sampling was the discovery of moderate numbers of the Olympic mudminnow, a small native fish found only in Washington State that is particularly well-adapted to densely aquatic habitats with floating or submergent vegetation. The state formally classifies this species as sensitive, the Chehalis system geographically captures a majority of its distribution (over 60%), and the species appears to have become less frequent in oxbows because these habitats are frequently rich in exotic fish species that can prey upon it. Hence, finding it fair numbers in the densely vegetation southwest arm of Lower Pond was encouraging.

Besides the aquatic species recorded, we recorded 19 bird species in and around the two Ponds (**Table 4**). More species ($n = 15$) were recorded in association with the Lower Pond than in association with the Upper Pond ($n = 13$). Nine of these species were recorded in association with both Ponds, but two of these (Red-tailed Hawk and Turkey Vulture) represent purely fly-overs that likely have little to do with these ponds. However, three of the four fish-consuming (or less often amphibian-consuming) species (Belted Kingfisher, Great Blue Heron, and American Bittern) were all recorded in the Lower Pond, but not the Upper Pond, which may reflect the greater fish and amphibian numbers recorded there. The fourth fish consumer, Osprey, was recorded over both Ponds. Further, though both swallows (Barn and Tree Swallows) were recorded over both Ponds, Tree Swallows were recorded more frequently over the Lower Pond. As swallows are insectivores that take insects on the wing and often focus their foraging over ponds because of their relatively greater insect production, this pattern may reflect greater insect production in the Lower Pond than in the Upper Pond. Other species with a clear aquatic association of some kind (nesting and/or foraging) included three additional species, the Marsh Wren, Wood Duck and Pied-billed Grebe. The latter two were observed in both Ponds, but the grebe was the only aquatic-associated species exclusively observed in the Upper Pond. Seven of the other bird species observed to not require aquatic habitats *per se*. These included Steller's Jay, Cooper's Hawk, Western Scrub Jay, Chestnut Backed Chickadee, Northern Flicker, Common Raven and Cedar Waxwing. However, they may find more favorable foraging opportunities along the margins of these ponds. For example, Cooper's Hawk, a bird predator, was recorded in association with the Lower Pond, perhaps because the Lower Pond was frequented by a greater number of birds. Why some species were recorded in association with the Lower Pond (Chestnut-backed Chickadee) and others were recorded in association with the Upper Pond (Northern Flicker and Common Raven) may reflect some real difference or simple chance effects due to the short duration of our sampling. Notably, all bird species observed regardless of pond, we native species.



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Table 4. Bird species observed in, above, and around the two Cedarville Ponds.

Standard English Name	Scientific Name	Lower Pond	Upper Pond
Wood Duck	<i>Aix sponsa</i>	1	1
Red-tailed Hawk	<i>Buteo jamaicensis</i>	1	1
Belted Kingfisher	<i>Megaceryle alcyon</i>	1	
Barn Swallow	<i>Hirundo rustica</i>	1	1
Great Blue Heron	<i>Ardea herodia</i>	1	
Steller's Jay	<i>Cyanositta stelleri</i>	1	1
American Bittern	<i>Botaurus lentiginosus</i>	2	
Coopers Hawk	<i>Accipter cooperi</i>	1	
Tree Swallow	<i>Tachycineta bicolor</i>	6+	1
Western Scrub jay	<i>Aphelocoma californica</i>	1	1
Marsh Wren	<i>Cistothorus palustris</i>	1	1
Chestnut-backed Chickadee	<i>Poecile rufescens</i>	2	
Turkey Vulture	<i>Cathartes aura</i>	1	1
Killdeer	<i>Charadrius vociferus</i>	1	
Osprey	<i>Pandion haliaetus</i>	1	1
Northern Flicker	<i>Colaptes auratus</i>		1
Common Raven	<i>Corvus corax</i>		1
Cedar Waxwing	<i>Bombycilla cedrorum</i>		10
Pied-billed Grebe	<i>Podilymbus podiceps</i>		1

We caution against dramatic conclusions because more extensive sampling that captures some seasonal changes would be needed to arrive at definitive answers, but it seems that conditions in the Lower Pond are promoting greater diversity. This may reflect greater fish and insect abundance in Lower Pond in contrast to the Upper Pond, at least during late summer. Though the basis of such a difference is unclear, we speculate that it may reflect greater hydrological variation (perhaps in water level) in the Lower Pond, which both promotes production and better limits the exotic species assemblage.

It is our understanding that Cedarville Farms has been engaged in restorations efforts in these ponds and surrounding terrestrial habitats with some level of emphasis on promoting waterfowl production. It is our further understanding that special efforts have been made to reduced woody shrub-scrub vegetation, especially in the form of removing Hardhack (*Spirea douglasii*), shrubby Willows (*Salix* spp.) and perhaps other shrubby vegetation. We note that removal of Hardhack and shrubby Willows is an excellent



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means of setting back succession in aquatic and adjacent habitats, where it is desired that these habitats remain open. Further, this type of setting back succession, when coupled with the plant of aquatic native, such as Wapato (*Sagittaria latifolia*), is a useful way to increase aquatic production that will promote not only a food base for waterfowl, but also primary production for aquatic insects and sheltering and reproductive habitat for native fishes and amphibians.

It is our further understanding that Cedarville Farms has engaged in mowing and/or grazing the surrounding uplands. Because the terrestrial habitat from which woody or shrubby species have been removed tends to be dominated by the tenacious invasive exotic, Reed Canarygrass (*Phalaris arundinacea*), this mode of control keeps production of this invasive at a minimum by minimizing the production of seed heads. It has the positive effect of creating relative safe (= open) foraging habitat for Canadian Geese of several varieties as well as creating open terrestrial habitat for Killdeer, a ground-nesting plover, and minimizing the impacts of garter snake predation in the aquatic habitat on native amphibians and fishes, which tends to be greater where snakes have extensive terrestrial cover along aquatic habitat margins.

Overall, we view of Cedarville's restoration efforts as positive from a current restoration science perspective. We note that this system may be limited from the impacted of warmwater exotic fish and bullfrogs. We suspect, however, that based on the differences we observed between the Lower and Upper Ponds, that the impact of exotics could be reduced and native aquatic species production improved by enabling greater seasonal fluctuation in water levels, where this is possible and practical. Because some uncertainty exists as to the basis of this idea, we suggest that if an attempt at such an improvement is untaken, it be approached as an experimental program in which manipulation of water levels is done in one of these Ponds at time. Should this prove successful, one could then engage in an alternating pattern of manipulating water levels between ponds between years. The only other area where we might suggest improvement would an attempt to progressively eliminate Reed Canarygrass with a more favorable forage grass species. We expect that such an effort would be difficult and would require a number of years to reach a satisfactory end point that could be effectively maintained over time, but might be considered if a good forage substitute can be found.

We thank Cedarville Farms for their generous permission to survey their Ponds and look forward to potential future collaborative efforts.

Sincerely,

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