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IMPORTANCE OF ISLAND BACK CHANNELS TO WILDLIFE ON THE OHIO RIVER

Background

The Ohio River has been dramatically changed over the past 200 years by many industrial and navigational projects including the building of dams (Fig. 1). These activities have essentially changed the river from a free-flowing river system to a series of connected lakes, likely negatively affecting wildlife species and eliminating or severely degrading many islands within the river. The back channels of islands (the area between an island and mainland not used for commercial barge traffic) on the Ohio River are assumed to provide habitat critical for several wildlife species.



Figure 1. A barge dredger operating on the main channel of the Ohio River.

However, quantitative information on the wildlife value of back channels is needed by natural resource managers for the conservation of these forested islands and embayments in the face of increasing shoreline development and recreational boating.

Currently, many islands and some mainland tracts are protected from development as part of the Ohio River Islands National Wildlife Refuge (ORINWR) (Fig. 2). However, most back channels and adjacent mainland shorelines remain under pressure of development for various uses. Riparian zones in river systems contain valuable wildlife communities, but specific information on wildlife use of back channels is needed by resource managers for conserving these areas.



Figure 2. Sign indicating this island is protected as part of the ORINWR.

We sampled back and main channels, and island and mainland shorelines, associated with islands in the Ohio River and quantified waterbirds, turtles (Fig. 3), frogs and toads, beavers, and muskrats.



Figure 3. Spiny softshell turtles are one of the more abundant turtle species on the Ohio River, West Virginia.

We hypothesized that back channels would have greater abundance of wildlife compared to main channels.

Study Goal

The goal of our study was to evaluate what species of wildlife use the back channels of islands (Fig. 4) compared to the main channels and what habitat characteristics contribute to use of these areas. Specifically we studied the relative abundance of waterbirds, turtles, frogs and toads, beavers, and muskrats between main and back channels of the Ohio River.



Figure 4. The back channel of Captina Island (left), Ohio River, West Virginia.

Study Area

We conducted this study on the back and main channels of 10 islands on the Ohio River, West Virginia (Fig. 5).

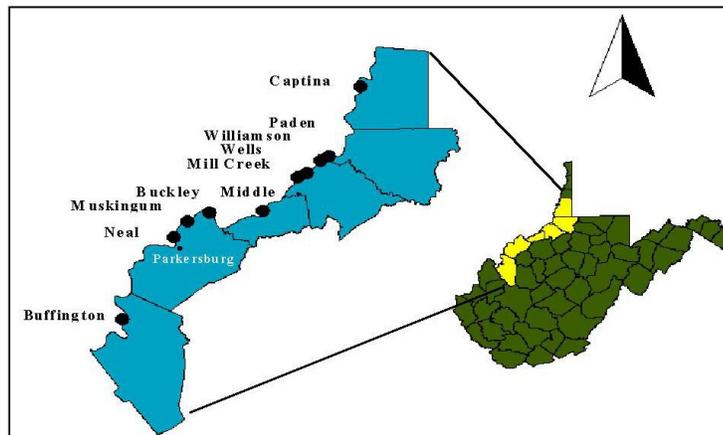


Figure 5. Locations of the 10 islands studied in West Virginia.

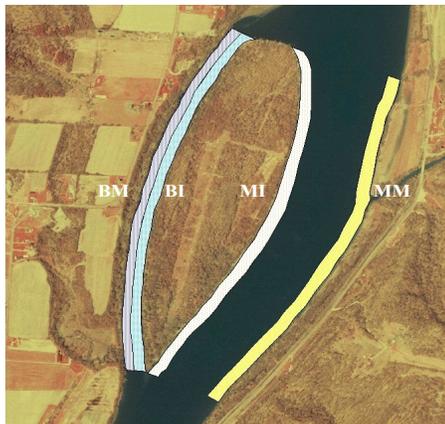
“WE SURVEYED FOR FROGS AND TOADS BETWEEN 1/2 HOUR AFTER SUNSET AND MIDNIGHT”

Back Channel Islands

We studied 10 tear-drop shaped islands that were part of the ORINWR and likely were formed by the accumulation of sand and gravel outwash during periods of extreme ice melt. We selected these islands because they had a true back channel area with no barge traffic. Back channels of these islands generally were much narrower than their main channels.

Island terrestrial cover types included bottomland hardwood forest, early and late old fields, thick patches of Japanese knotweed, agricultural areas, rocky or muddy shoreline, and urban or industrial areas. The wetland and river areas included rocky or muddy bottoms, emergent plants, shrub thickets, and forests.

Silver maple, box elder, sycamore, paw paw, black walnut, and black locust were common trees on the islands. Back channels generally had more forests on the shores and downed trees in the water while main channels had more barren land, pasture/grasslands, and wetlands than back channels. Both sides of most islands had tall, steep banks, but back channel island shorelines were generally vegetated.



300 0 300 600 Meters N

Figure 6. BM=back channel mainland, BI=back channel island side, MI=main channel island side, MM=main channel mainland.

Back channels were 0.02 to 0.14 miles wide and main channels were 0.15 to 0.22 miles wide. Islands were 13 to 236 acres in size.

Methods

We sampled 4 plots per island for a variety of wildlife species (Fig. 6). We counted waterbirds (loons, grebes, cormorants, ducks, geese, herons, coots, gulls, terns, shorebirds, and belted kingfishers) in each plot during daylight hours from a motorboat traveling just above idle speed parallel to each shoreline. Waterbird surveys were completed during spring and autumn migrations, the breeding season, and winter.

To sample toads and frogs (anurans), we conducted surveys by counting calls between 1/2 hour after sunset and midnight. We sampled from a stationary boat at 2 to 5 survey stations within a 820-foot radius of each station thus incorporating open water and terrestrial areas at each station. We trapped turtles using nylon hoop nets in autumn and summer (Figs. 7 & 8).



Figure 7. We trapped turtles using nylon hoop nets.



Figure 8. Removing turtles from the hoop trap was not always an easy task.

For beaver and muskrat, we searched for each species or their sign (tracks, scat, cuttings, burrows, lodges, food caches) (Fig. 9) along 100 foot long transects (50 feet in the water and 50 feet on land) spaced across each island. This provided an index of relative abundance for each species.



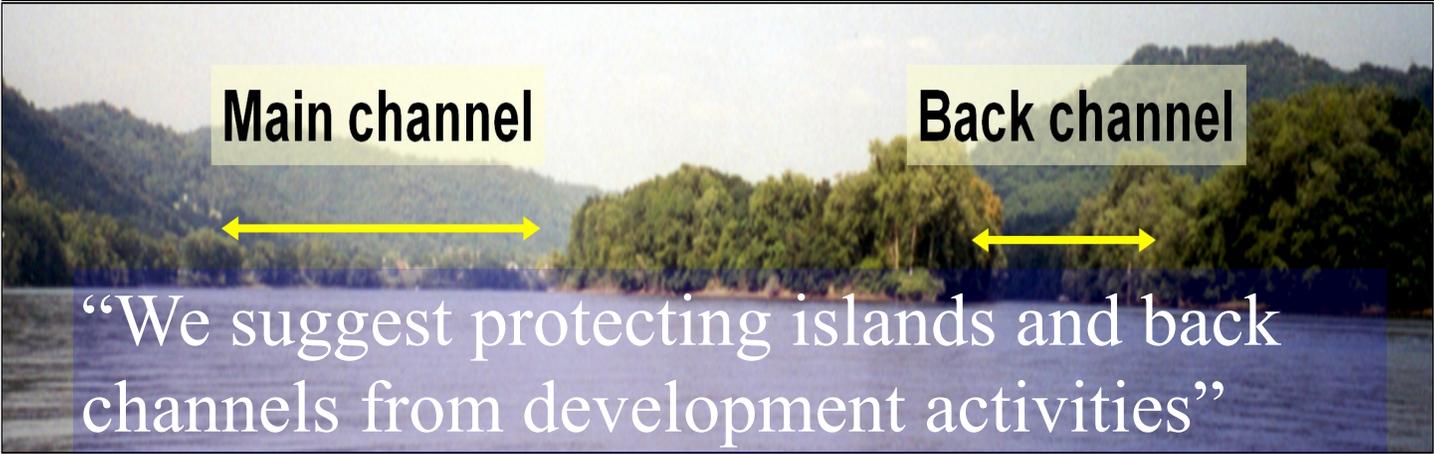
Figure 9. Beaver bank den in a back channel.

Findings

During the 2 years of this study, 27 species of waterbirds were detected. We counted 2,367 individuals of 22 species on back channel plots and 1,771 individuals of 22 species on main channel plots. Belted kingfisher, Canada goose, great blue heron, mallard, and wood duck were most abundant (Fig 10). We hypothesized that the greater waterfowl abundance observed on back channels, particularly for wood ducks and mallards, was influenced by low boat and barge traffic and by more forested landscape, overhead cover, herbaceous vegetation, and woody debris obstructions in the back channels.



Figure 10. Mallards were one of the more abundant species observed in the back channels.



Main channel

Back channel

“We suggest protecting islands and back channels from development activities”

Boat traffic was over 9 times heavier on the main than back channel and all barge activity occurred on the main channel. The narrowness of most of the back channels limited use of these areas by boaters navigating large craft or pulling water-skiers.

The abundance of downed woody debris provides areas that harbor small fish and lower boat traffic in the back channel also likely increased great blue heron occurrence along island shorelines of back channels. In contrast, belted kingfishers were more common on the main channel where the high, steep soil banks devoid of vegetation provided nesting habitat and the large amount of open water provided increased foraging opportunities.

We detected 5 species of anurans: spring peeper, American toad, Fowler’s toad, Cope’s gray treefrog, and mountain chorus frog. Back channel areas supported a greater distribution of anurans than the main channel (Fig. 11).

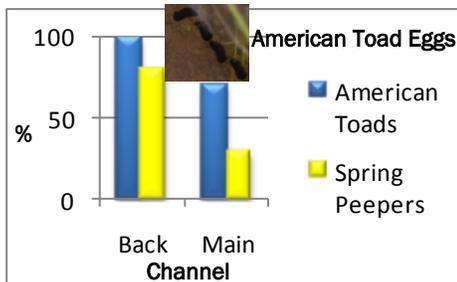


Figure 11. Spring peepers and American toads occurred more often in back channels, due to more vegetation, surface obstructions, and a slower current compared to the main channel.

We captured 84 turtles including painted turtles, smooth softshells, snapping turtles, spiny softshells, and stinkpots. The higher amounts of silt, basking areas, and woody debris found in back channels are important habitat features for turtles and likely contributed to higher total turtle abundance and abundance of snapping turtles in the back channels. Back channels were more conducive as overwintering sites for turtles who often escape harsh winter conditions by burying in substrate on the river bottom, or hiding under overhanging banks or submerged woody debris (Fig. 12).

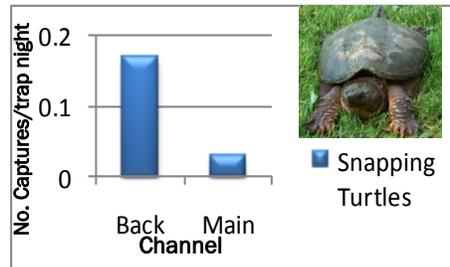


Figure 12. Snapping Turtles were more abundant on back than main channels.

Relative abundance of beaver and muskrat was greater on back than main channels. Both species benefited from the slower current, greater canopy cover, and denser herbaceous vegetation along the shorelines of the back channels.

Significance

The narrowness of the back channels, the protection they provide from the main current of the river, the reduced boat traffic and lack of barges, and presence of vegetated shorelines and woody debris (Fig. 13), are characteristics that appear to bene-

Canada geese are a familiar sight along the Ohio River.



fit several waterbirds, turtles, anurans, and furbearing mammals. As a conservation measure for important riparian wildlife habitat, and to maintain overall habitat complexity and species diversity on the Ohio River, we suggest protecting islands and back channels from development activities that may degrade these areas. In particular, we suggest prohibiting clearing of shoreline vegetation and removal of floating or submerged woody debris. We also suggest limiting building of piers and development of the shoreline in back channel areas. We recommend “no-wake zones” to minimize disturbance to wildlife and to help decrease shoreline erosion and minimize direct disturbance to wildlife caused by boating activities.



Figure 13. Woody debris in the back channels contributed to higher bird use.

Additional Information

Zadnik, A.K., J.T. Anderson, P.B. Wood, and K. Bledsoe. 2009. Wildlife use of back channels associated with islands on the Ohio River, West Virginia. *Wetlands* 29:543-551.

<http://www.bioone.org/doi/abs/10.1672/08-46.1>

Additional Reading:

Sacilotto, K. A., and J. T. Anderson. 2005. Avian nest box use on islands in the Ohio River. *Northeastern Naturalist* 12:403-410.

Zadnik, A. K. 2003. Wildlife use and habitat quality of back channel areas associated with islands on the Ohio River, West Virginia. MS Thesis, West Virginia University, Morgantown, WV, USA.

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