

These sites represent a large range extension from the south Yukon (Cody 1996, page 162) to the northern limit of the Boreal Forest. Harris (1998, page 269) previously listed it as being present at km 161.7, Robert Campbell Highway. It's rarity needs to be verified.

JUNCACEAE

Juncus stygius Linnaeus ssp. *americanus* (Buch.) Hultn – YUKON. Thermokarst Mounds, South Fork, Blackstone River, Dempster Highway at 138°22'W., 64°48'N., July 1987 (UAC 70257).

Cody (1996, page 190) previously reported it from the Keno Hill area, while Cody et al. (1998, page 305) found it at Coal River in the southeast Yukon.

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“Ashkui” Vernal Ice-cover Phenomena and Their Ecological Role in Southern Labrador

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This is the first documented incident of River Otter (*Lutra canadensis*) feeding on Common Goldeneye (*Bucephala clangula*) in a little studied region, southern Labrador. Our observations were made during spring staging when waterfowl aggregate at open water sites in frozen lakes and rivers, locally known as *ashkui*. We suggest that otters and raptors opportunistically forage on staging waterfowl at *ashkui*.

Key Words: River Otter, *Lutra canadensis*, Common Goldeneye, *Bucephala clangula*, Bald Eagle, *Haliaeetus leucocephalus*, predator-prey interactions, staging waterfowl, *ashkui*, Labrador.

Ashkui (singular and plural form) is the Innu name given to sites of open water in river and lake systems within the frozen spring landscape of Labrador (Fletcher and Breeze 2000*). Migratory waterfowl, including Common Goldeneye (*Bucephala clangula*), use *ashkui* as staging areas enroute to their breeding grounds. These birds arrive in groups of tens to hundreds to rest and rebuild energy reserves by feeding on

invertebrates, fish, seeds and other plant material at *ashkui* (Newbury 2002*). Beaver (*Castor canadensis*), River Otter (*Lutra canadensis*) and Muskrat (*Ondatra zibethicus*), have been observed at these sites. Osprey (*Pandion haliaetus*) and Bald Eagle (*Haliaeetus leucocephalus*) are known to fish at *ashkui* (Fletcher and Breeze 2000*). The temporal existence, number and distribution of *ashkui* sites are influenced by a high

degree of inter-annual variability in the onset of spring thaw. As the winter snows disintegrate and waterfowl await availability of breeding habitat, they may be susceptible to predation. In 2002, the opening of *ashkui* occurred two weeks later than in previous years (unpublished data, Environment Canada, St. John's, Newfoundland).

Our observations were made during a study examining the effects of military low level flying on the behaviour of staging waterfowl at Lac Fourmont in southern Labrador (52°00'N, 60°15'W; Newbury 2004*). While conducting waterfowl behavioural observations, we witnessed a River Otter feeding on a male Common Goldeneye. We also observed a Bald Eagle attack another goldeneye resting on the ice.

Study Area

Lac Fourmont is situated within the Boreal Forest Region of eastern Canada and is influenced by continental climatic regimes (Lopoukhine et al. 1977*). This region is covered with ice and snow until daily spring thaw temperatures rise to 5.1°C in May (30 year average for Goose Bay, Labrador; Environment Canada Meteorological Service, St. John's, Newfoundland). Daytime average temperatures were 4.1°C in May 2002 and ranged from 4.0 to 9.0°C for May during the years 1993 to 2002. River width at the observation location was approximately 1 km, and the *ashkui* site was 20 m in breadth. Ice breadth from *ashkui* to shoreline was approximately 50 m. Forest stands were composed of mainly Black Spruce (*Picea mariana*) and Balsam Fir (*Abies balsamea*) interspersed with approximately 10 % Paper Birch (*Betula papyrifera*), Balsam Poplar (*Populus balsamifera*), and Trembling Aspen (*Populus tremuloides*). Lake-edge shrubs consisted of willows (*Salix* spp.) and alders (*Alnus rugosa* and *A. crispa*). River and bank substrate was composed of coarse-grained sand and pebbles with exposed boulders and bedrock of gneiss and mafic intrusions. River basin and landscape were low gradient with shallow sloping banks, wide flood plain and low relief hills.

We conducted daily observations on waterfowl behaviour from blinds using a Swarovski 60× spotting scope from 9:00 to 12:00 and 13:00 to 16:00 between 26 April and 27 May 2002. Also, we conducted thirteen random 1.5 h watches during dawn and dusk.

Observations

Fourteen species of waterfowl occupied the Lac Fourmont *ashkui*. Daily waterfowl numbers at the *ashkui* ranged from 34 to 376 during this study. A single River Otter was noted at the *ashkui* during at least five observation days. The number of sightings of mature and immature Bald Eagles, Osprey and Rough-legged Hawk (*Buteo lagopus*) totaled 7, 2, 1 and 1, respectively, over 8 non-consecutive study days.

On 6 May 2002 at 11:35, we observed a River Otter grasping a male Common Goldeneye on the ice, ap-

proximately 70 m from our observation blind on the south side of the *ashkui*. Although the capture was not observed, the goldeneye was alive and struggling when the otter was initially observed. The otter sat on its rear haunches with the goldeneye braced in its fore-paws and consumed the head of the duck first before eating the breast muscles and abdominal viscera. After approximately 10 minutes of feeding, the otter slipped into the water and swam downstream without the carcass remains. We did not observe the fate of the duck carcass, as it was no longer visible on the ice when the otter left the feeding site. The bird flock, during this observation period, comprised mainly 65 Common Goldeneyes, 27 Black Ducks, 113 Canada Geese (*Branta canadensis*).

On 18 May 2002 at 16:03, we observed a Bald Eagle circle the *ashkui* and plunge downward toward a small group of Common Goldeneyes resting and sleeping on the ice, approximately 150 m from our position. Upon impact, the eagle initially captured a goldeneye. The eagle then struggled with the goldeneye while standing on the ice edge but was unable to maintain its grasp. The goldeneye fell from the ice to the water then became inter-mixed with the flock. This interaction lasted approximately one minute and, we were unable to identify the attacked goldeneye after its escape. The eagle then flew to the other side of the *ashkui* and rested on the ice. The bird flock, during this observation, comprised mainly 7 Common Goldeneyes, 29 Black Ducks (*Anas rubripes*), 67 Canada Geese (*Branta canadensis*), 11 Greater Scaup (*Aythya marila*) and 20 Ring-necked Ducks (*Aythya collaris*).

Discussion

Fish are often the main prey of River Otter and rap-torial predators (Chubbs and Trimmer 1998; Larivière and Walton 1998; Fletcher and Breeze 2000*; Heath et al. 2001; Jedrzejewska et al. 2001). Studies in the Great Lakes and North American boreal ecosystems have shown that the diet of River Otter comprises mostly fish (Larivière and Walton 1998). However, otters have been known to feed opportunistically on small mammals, molluscs, reptiles, birds and fruits (Larivière and Walton 1998). In west-central Idaho, otters supplemented their fish diet with invertebrates and reptiles (Melquist and Hornocker 1983). In Great Britain and Ireland, otters consume primarily fish, and lesser amounts of small mammals, medium-sized mammals, birds, herpetofauna, earthworms, other invertebrates and carrion of large mammals (McDonald 2002). Jedrzejewska et al. (2001) showed that otters specialize on prey taken from water. It is plausible that an otter fishing for fish under water may opportunistically capture diving goldeneyes. Although River Otters were known to occasionally feed on birds (Larivière and Walton 1998), we believe that this was the first documented case of an otter feeding on a Common Goldeneye.

Instances of Bald Eagles preying on duck species are not rare (Jackman et al. 1999; Heath et al. 2001). Although fish dominate their diet, Bald Eagles have been reported to modify foraging behaviour and may forage opportunistically on staging waterfowl in situations where return on such effort makes them economical (Brown et al. 1998; Jackman et al. 1999).

The temporal existence, number and distribution of *ashkui*, in southern Labrador during spring, may influence the spatial and temporal distribution of piscivorous predators and migratory waterfowl by limiting the availability of open-water feeding and resting areas. Migratory waterfowl arriving from southern destinations must accumulate in greater concentrations when *ashkui* openings are limited. Though the behaviour and distribution of River Otter were not documented for Labrador, Larivière and Walton (1998) stated that otters made heavy use of *ashkui* in winter and "almost exclusively" used open water for locomotion and foraging (Madsen and Prang 2001; Ruiz-Olmo et al. 2001). Piscivorous raptors returning to breeding areas must travel to and congregate at available *ashkui* to fish. It was likely that spatial and temporal distribution of *ashkui* also affected predator-prey interactions.

Our observations are examples of opportunistic foraging events on waterfowl by predators that appear to use *ashkui* regardless of the presence of waterfowl. Further investigations in Labrador are needed to understand better the ecological importance of the temporal and spatial distribution of *ashkui* to mammalian and raptorial predators.

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