Common Snapping Turtle Preys on an Adult Western Grebe

LAWRENCE D. IGL* AND STEPHEN L. PETERSON[1]

Northern Prairie Wildlife Research Center, U.S. Geological Survey, 8711 37th Street SE, Jamestown, ND, 58401, USA

[1]Utah State University, College of Natural Resources (Wildland Resources Department), 5200 Old Main Hill, Logan, UT, 84322, USA

*Corresponding author; E-mail: ligl@usgs.gov

Abstract.—The identification of predators of aquatic birds can be difficult. The Common Snapping Turtle (*Chelydra serpentine*) is considered a major predator of waterfowl and other aquatic birds, but the evidence for this reputation is based largely on circumstantial or indirect evidence rather than direct observations. Herein, the first documented observations of a snapping turtle attacking and killing an adult Western Grebe (*Aechmophorus occidentalis*) are described. *Received 21 January 2009, accepted 2 March 2009.*

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The flight muscles of adult Western Grebes (*Aechmophorus occidentalis*) atrophy soon after the birds arrive on their breeding grounds, making them potentially incapable of flight and vulnerable to predation during the breeding season (Nuechterlein 1981; Piersma 1988; Storer and Nuechterlein 1992). Nuechterlein (1981) suggested that Western Grebes may reduce their vulnerability to predation by nesting in mixed colonies with gulls or terns whose distress calls and antipredator behaviors serve to alert other colony members of approaching predators. Information on specific predators of adult Western Grebes is limited, however, and based largely on indirect or circumstantial evidence (Munro 1938; Nuechterlein 1975; VanWagenen *et al.* 1981; Storer and Nuechterlein 1992; Clowater 1998; Grubb and Lopez 2000). Nuechterlein (1975), for example, concluded that the American mink (*Mustela vison*) was a predator of adult Western Grebes based on the presence of decapitated grebe carcasses, although other nocturnal predators also are known to decapitate birds (e.g. Great Horned Owl [*Bubo virginianus*]; Olmsted 1950). Munro (1938) found remains of adult Western Grebes below Bald Eagle (*Haliaeetus leucocephalus*) perches and suggested that eagles might prey on weak or emaciated adults, but this conclusion does not consider that the Bald Eagle is a well-known scavenger (Buehler 2000). Storer and Nuechterlein (1992) reported that adult Western Grebes frequently peer into the water with their eyes below the surface, presumably to search for food (e.g. fish) or potential underwater predators, but to our knowledge, an underwater predator taking an adult Western Grebe (or their young) has never been reported. In this paper, we describe an observation of an underwater predator, a Common Snapping Turtle (*Chelydra serpentine*), attacking and killing an adult Western Grebe

OBSERVATION

On 18 June 2007, while driving along the auto tour route at Sand Lake National Wildlife Refuge in Brown County in northeastern South Dakota, we stopped on a narrow bridge near Houghton Dam to photograph some adult Western Grebes that were feeding on both sides of the road. At 10:38 CDT, we noticed an adult Western Grebe flapping its wings in the water about 3 m south of the vehicle. Upon closer examination, we observed the head of a large Common Snapping Turtle below the surface of the water holding onto the right leg of the grebe. We had not noted any injured or distressed grebes before this time and thus assumed that this predation event had just started and that the victim was presumably a healthy adult.

The predation event was recorded with a handheld digital camcorder (Canon MiniDV ZR600 with a 25× optical zoom and 800x digital zoom) and later reviewed. All video was taken from the shore, at distances of 2-4 m from the predation event. At the onset of recording (10:39:02), the grebe was vigorously flapping its wings on the surface of the water but the bird was unable to move from the location, presumably because it was anchored by the weight of the grasping turtle. At 10:39:15, the grebe was pulled below the surface of the water by the snapping turtle for 3 sec. The turtle pulled the grebe under the water two more times, first for 2 sec and then for 9 sec. After each return to the surface, the grebe struggled and flailed its wings. At 10:40:30, the grebe was pulled below the water surface for a fourth time, where it remained for nearly a minute as the snapping turtle pulled the grebe toward shallower water near the rocky shoreline. At 10:41:35, the belly and legs of the grebe were visible above the water and a cloud of blood formed in the water around the grebe. At 10:41:37, the legs of the grebe flailed above the water surface for approximately 10 sec and then went limp as the blood in the water increased. At 10:42:12, the snapping turtle's head and part of its carapace surfaced near the shoreline while it was grasping the dead Western Grebe at the base of its neck (Fig. 1). We estimated the carapace length of the turtle to be over 40 cm. During the entire observation, a second Western Grebe (presumably the victim's mate) remained in the open water within 2-5 m of the predation event but made no defensive or distraction maneuvers, except for occasional alarm vocalizations. At 10:43:07, the snapping turtle pulled the grebe under the water and moved about 3 m from the rocky shoreline toward a stand of emergent bulrush (*Schoenoplectus* spp.). The grebe was visible just below the water surface, and the jerking motions of the grebe suggested that the turtle was attempting to tear feathers or flesh from the carcass.

Figure 1. Common Snapping Turtle grasping a recently killed adult Western Grebe at Sand Lake National Wildlife Refuge, South Dakota, 18 June 2007 (10:42:12 CDT). Videograb by Stephen L. Peterson.

DISCUSSION

The identification of predators of wild birds can be difficult, especially in aquatic environments. Our observation represents the first report of a Common Snapping Turtle depredating an adult Western Grebe. The predation event—from the time of capture to the time of the grebe's death—presumably took less than 5 min. The timing of such events is rarely reported in the literature or is confounded by an observer interrupting the predation event in an attempt to rescue the victim or to identify the underwater predator (e.g. Kirk 1981; Abel 1992). Lumsden (1986) observed a snapping turtle capture and kill a 15-day-old Trumpeter Swan (*Cygnus buccinator*) cygnet in 5 min, and Hunter (1986) observed a Purple Gallinule (*Porphyrula martinica*) struggle for over an hour in the grasp of a snapping turtle.

The Common Snapping Turtle is omnivore and an opportunistic forager (Ernst *et al.* 1994; Spotilla and Bell 2008). Although the diet of snapping turtles is variable, the literature emphasizes prey sizes that are much smaller than an adult Western Grebe. The average weight of an adult Western Grebe ranges from 800 to 1800 g (Storer and Nuechterlein 1992; Dunning 2008). Direct observations of Common Snapping Turtle predation on other large birds include an adult Laughing Gull (*Larus atricilla*; Alexander 1921), a hen Ring-necked Pheasant (*Phasianus colchicus*; Edminster 1953), and a drake Lesser Scaup (*Aythya affinis*; Kirk 1981). Abel (1992) reported snapping turtle attacks on Trumpeter Swan cygnets that

weighed as much as 3500 g, and Moriarty (1990) described a snapping turtle drowning a one-year-old, 14,500 g Trumpeter Swan.

We did not collect or examine the carcass to determine the ultimate cause of the grebe's death. The grebe likely died as a result of drowning or from injury associated with the attack. Large snapping turtles are assumed to lie in ambush below the water surface and then to seize their prey with their mouth (Ernst *et al.* 1994). To kill large prey, a snapping turtle may drag the victim beneath the water surface until it drowns or tear into the victim's flesh with the aid of its strong foreclaws (Alexander 1921; Lagler 1943; Abel 1992; Ernst *et al.* 1994).

Ratz *et al.* (1999) cautioned against using indirect evidence (e.g. characteristic sign, droppings, cache location, predator guild present) to identify potential predators. For instance, sign often overlaps between different predator species and the instigator of the sign may not have been the predator (see also Sargeant *et al.* 1998; Pietz and Granfors 2000). Ratz *et al.* (1999) listed two primary ways to positively identify a predator of a bird or its eggs and young: 1) direct observation (via watching or filming) of a predation event or 2) analyzing gut contents of a known predator. Although direct observations of predation events are uncommon and largely depend on a chance encounter, such as that reported herein, they provide unambiguous identification of the predator responsible. Analyses of gut contents of known predators can reveal feathers, bones, and other tissues of birds as proof of depredation, but a predator cannot be distinguished from a scavenger (Ratz *et al.* 1999).

The literature on the predatory habits of the Common Snapping Turtle underscores the challenges in identifying predators of aquatic birds. Although these turtles are considered regular predators of waterfowl and other aquatic birds and their young (Alexander 1943), the evidence for this reputation is based largely on analyses of stomach contents (e.g. Pell 1940; Alexander 1943; Lagler 1943; Coulter 1957; Hammer 1969, 1972) rather than direct observations of predation events. The frequency of bird remains in snapping turtle gastrointestinal tracts differs widely among studies (e.g. 1% of 157 turtles in Alexander 1943, 27% of 470 turtles in Coulter 1957), but interpreting predatory habits from these analyses can be confounded by the turtle's propensity to consume carrion (Lagler 1943; Ernst 1965; Ernst *et al.* 1994).

Indirect or circumstantial evidence also has been commonly used to classify snapping turtles as predators of birds (e.g. Laskey 1947; Kirby 1990; Korschgen *et al.*1996; Johnsgard 2001). For example, Korschgan *et al.* (1996) identified snapping turtles as a predator of radio-marked Canvasback duclings (*Aythya valisineria*) by using the location and condition of either the carcass or the radio-transmitter. Hatt (1932) and Trautman (1940) observed snapping turtles eating small herons (Green Heron [*Butorides virescens*] and Least Bittern [*Ixobrychus exilis*], respectively), but neither could determine conclusively if the birds had been captured alive or scavenged. Other studies have considered missing appendages (toes, webs, feet, legs, bills) on live birds as evidence of failed predation attempts by snapping turtles (e.g. Howe 1920; Willey 1968; Abel 1992; Johnsgard 2001). For example, Johnsgard (2001) reported an injured adult Western Grebe with a freshly severed foot, and Howe (1920) captured a Great Egret (*Ardea alba*) with a nearly severed foot. Both authors surmised that the injuries resulted from Common Snapping Turtles. Although such injuries may be consistent with those resulting from an attack by an underwater predator, such as snapping turtle, the authors did not provide evidence to support their assertion or to rule out other underwater predators (e.g. Northern Pike [*Esox lucius*]: Solman 1945) or human-related injuries (e.g. trapping: Gashwiler 1949; banding: Reed and Oring 1993). There are some reports of birds escaping from Common Snapping Turtles. Hunter (1986) observed snapping turtles capturing Purple Gallinules on eight occasions; half of these cases ended with the victims freeing themselves and escaping. Pryor (1996) interrupted two

predation events involving snapping turtles and shorebirds by nudging the carapace of the turtle; in both cases, the turtles released the victims.

In summary, field observations described herein represent the first direct observations of a snapping turtle killing an adult Western Grebe. Determining if snapping turtles are common predators of Western Grebes is difficult because predation has not been the focus of long-term studies of Western Grebes. Fraser (1994) speculated that individual snapping turtles could become seasonal specialists on vulnerable colonial waterbirds. Although there is no information in the literature to support this assertion, some observers have reported multiple predation events by one or more snapping turtles in the same location in the same year (Hunter 1986; Abel 1992; Pryor 1996).

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