

Bull Trout, *Salvelinus confluentus*, and North American Porcupine, *Erethizon dorsatum*, Interaction in the Mackenzie Mountains, Northwest Territories

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Evidence of an interaction between a Bull Trout (*Salvelinus confluentus*) and a North American Porcupine (*Erethizon dorsatum*), was observed during a fisheries survey in the Mackenzie Mountains, Northwest Territories. A male Bull Trout with porcupine quills imbedded in its mouth was collected. It is speculated that this occurred when the trout was aggressively defending its territory from a perceived threat – a swimming porcupine. This is the first documented account of an interaction between a fish and a porcupine.

Key Words: Bull Trout, *Salvelinus confluentus*, North American Porcupine, *Erethizon dorsatum*, prey, interaction, diet, Northwest Territories, Mackenzie Mountains, Mackenzie Valley.

We report an interaction between a Bull Trout (*Salvelinus confluentus*) and a North American Porcupine (*Erethizon dorsatum*), two animals that, due to different life history requirements, would rarely be in contact.

The Bull Trout is a native salmonid (genus *Salvelinus*) occurring in streams, rivers and lakes across western North America. The species' range extends from northern California to the central Northwest Territories [NWT] (Haas and McPhail 1991; Reist et al. 2002; Mochnacz et al. 2004; Stewart et al. 2007a). Bull Trout are a top level predator consuming a variety of prey items ranging from insects to small mammals (Stewart et al. 2007b). North American Porcupines are large rodents, weighing up to 14 kg and are widely distributed from the Arctic Ocean to northern Mexico (Roze 1989). Porcupines occupy a variety of habitat types and are considered generalist herbivores (Roze 1989). Their dorsal surface is covered with modified guard hairs in the form of barbed quills, which serve as protection against predators. Predators include the Wolf (*Canis lupus*), Coyote (*Canis latrans*), Wolverine (*Gulo gulo*), Fisher (*Martes pennanti*), Cougar (*Puma concolor*), Canada Lynx (*Lynx canadensis*), Bobcat (*Lynx rufus*), and Great Horned Owl (*Bubo virginianus*) (Roze 1989). When a porcupine is attacked, the quills are driven into the assailant and released from the porcupine's skin, allowing the porcupine opportunity to escape (Roze 2002).

On 1 September 2007, during a field survey to delineate the distribution and assess habitat use of Bull



FIGURE 1. A Bull Trout (*Salvelinus confluentus*) collected from an unnamed stream in the Mackenzie Mountains, Northwest Territories, impaled by the quills of a North American Porcupine (*Erethizon dorsatum*).

Trout in the Mackenzie Mountains, NWT, two male Bull Trout were angled from a pool in an unnamed tributary of the Redstone River (63°39'001"N, 125° 23'414"W). The larger fish (fork length 583 mm, 2022 g) had four Porcupine quills embedded in its mouth. The quills were in the thin skin covering the upper mandible (Figure 1), with no quills in the esophagus or stomach, which suggested that the Bull Trout had bitten a porcupine, rather than scavenged off a carcass. Only fish remains were found in the trout's stomach. The size and colouration of the quills were consistent with those from the side of a porcu-

piners' tail, suggesting a defensive interaction (U. Roze, Queens College, Flushing, New York, personal communication 2007). For a Bull Trout to encounter a porcupine, the latter would either have to be wading or swimming across a stream, or less likely, floating dead down a stream. Porcupines are known to swim or otherwise traverse watercourses to access different parts of their range (Murie 1926; Roze 1989). When a porcupine swims, the majority of the body is below water, with the head and some of the back and tail visible above the surface, much like a Beaver (*Castor canadensis*) (U. Roze, personal communication 2007). Bull Trout often live in environments that have sparse food resources and are, therefore, opportunistic predators (Stewart et al. 2007b). However, given a porcupine's size it is unlikely that it was a potential food source. A more plausible explanation is that the Bull Trout was defending its territory against the porcupine which the fish interpreted as a threat. Bull Trout are very aggressive, particularly during spawning, and have attacked SCUBA divers during *in situ* spawning surveys (J. Stewart, Fisheries and Oceans Canada, Winnipeg, personal communication, 2007). The time frame of the survey and temperature observed (6.0°C) are both within the preferred ranges for spawning Bull Trout in the NWT (Mochnac et al. 2004) and further south (Baxter and McPhail 1996).

This is the first record of a Bull Trout, or perhaps any fish, attacking a North American Porcupine. Although an interaction between these two species is certainly a rare event, the fact that it occurred is evidence of the aggressive behavior of Bull Trout, and the unusual and unforeseen linkages that can occur within a given ecosystem.

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