



Common Gartersnake Using Artificial Nest Platforms for Black Tern as Basking and Feeding Sites in British Columbia

R. Wayne Campbell

2511 Kilgary Place, Victoria, British Columbia, Canada V8N 1J6

In 2007, the Biodiversity Centre for Wildlife Studies initiated a research and conservation program to enhance breeding success of the Black Tern throughout its summer range in British Columbia. Hundreds of artificial floating nest platforms were placed in a variety of wetlands, especially where water levels fluctuated annually due to control by flood gates maintained by humans. The nest platforms, 25.4 cm² (10 in square) (Figure 1) were designed to float about 2.5 to 5 cm (1 in to 2

in) above the water and were anchored so they could be located and checked for occupancy in subsequent years. As fluctuating water levels and wind and wave action from storms are primary threats to the success of nesting terns in British Columbia (Mosher 1986), platforms were frequently anchored in protected, but semi-open sites in cattails (*Typha latifolia*), bulrushes (*Scirpus* spp.), or sedges (*Carex* spp.) (Figure 2).



Figure 1. The artificial floating nest designed for Black Terns is a small, square platform constructed of hollow, plastic, acrylonitrile butadiene styrene (ABS) pipe with a small galvanized wire mesh across the top to hold nesting material. The anchored nest platform, once set out, is loosely covered with nearby wetland vegetation. *Photo by R. Wayne Campbell, 31 May 2007.*



Figure 2. Nesting platforms (bottom centre) were placed among emergent vegetation that provided some protection from wind and waves but allowed open flight access to nesting Black Terns. Common Gartersnakes frequently basked on the platforms as well as on fallen bulrushes in these semi-open areas. *Photo by R. Wayne Campbell, near Douglas Lake, BC, 29 May 2009.*

Frequently, while checking nest platforms, I saw alarmed pairs, or flocks, of agitated Black Terns hovering and diving over specific locations in a wetland. In most instances, the cause of the commotion was never determined because the source of the birds' attention disappeared before the site was reached. My first impression was that the disturbance was probably caused by swimming mammals such as American Mink (*Neovison vison*), Muskrat (*Ondatra zibethicus*), or Beaver (*Castor canadensis*), all species that are widely distributed in British Columbia and inhabit wetlands within the breeding range of Black Terns in the province (Campbell et al. 1990).

On nine occasions, however, I was able to attribute the disturbance directly to Common Gartersnakes (*Thamnophis sirtalis*). This species (Figure 3) is wide-ranging in British Columbia and is most abundant near marshes, small lakes, ponds, and rivers where it feeds principally on amphibians and earthworms (Gregory and Campbell 1984, Matsuda et al. 2006). The floating tern nest platforms, usually anchored in mid-marsh, are used by snakes to bask, and to feed.



Figure 3. The Common Gartersnake in the interior of the province, known as the Valley Gartersnake (*T. s. fitchi*), is characterized by a broad dorsal stripe with black on top of the head. *Photo by R. Wayne Campbell, near Summit Lake, BC., 30 June 2002.*

Basking Common Gartersnakes were observed on nest platforms in June and July at three different locations between 2007 and 2010. These included, from south to north, near Douglas Lake in the south-central interior, west of Big Creek in the Cariboo, and near Summit Lake north of Prince George. Each of the snakes was adult size and estimated between 76 and 91 cm (30 and 36 inches) in total length. Eight snakes were coiled up on empty nest platforms, all being mobbed by adult Black Terns, and one snake was basking on a platform containing two tern eggs. At the latter site, terns dived and screamed over the nest continuously for about 12 minutes before I checked the site and the snake swam away.

On 29 June 2010, while checking tern platforms near Douglas Lake, in south-central British Columbia, I watched a flock of about 30 Black Terns frantically calling, flying, and diving over an open spot in a dense patch of bulrushes. Soon the

flock grew to about 45 birds and the alarmed birds seemed desperate in their behavior. I approached the site and peered through the reeds to see a Common Gartersnake on a tern nesting platform taking a newly hatched Black Tern chick with its mouth. I startled the snake and it swam off quickly towards shore with the chick and disappeared. It was brightly patterned, adult size and estimated about 86 cm (34 inches) in total length. The remaining nestling (Figure 4) remained huddled on the platform and as I started to leave the site both adults quickly returned to their nest. The chick, at hatching, would have weighed about 7.3 grams with a skull length (rear to bill tip) of about 26 mm (Dunn 1979).



Figure 4. A newly hatched Black Tern chick on an artificial floating nest platform set among a semi-open area among a dense stand of bulrushes. The chick's sibling was seized by a Common Gartersnake moments before this photograph was taken. *Photo by R. Wayne Campbell, near Douglas Lake, BC, 29 June 2010.*

The nest site was 32 m from shore and in 1.1 m of water. Elevation was 944 m.

A variety of avian and mammalian species has been recorded preying directly on the eggs, nestlings, and chicks of Black Terns in North America. These include Great Blue Heron (*Ardea herodias*; Chapman and Forbes 1984), Black-crowned Night-Heron (*Nycticorax nycticorax*; Bailey 1977), Northern Harrier (*Circus cyaneus*; Heath and Servello 2008), Great Horned Owl (*Bubo virginianus*; Bailey 1977, Einsweiler 1988), Common Raven (*Corvus corax*; Heath and Servello 2008), Norway Rat (*Rattus norvegicus*; Lee 1977),

Northern Raccoon (*Procyon lotor*; Heath et al. 2009), and American Mink (Dunn 1979, Hickey 1997, Heath and Servello 2008). Although other nest predators have been suspected, no authors specifically considered gartersnakes (Novak 1992).

The feeding habits and diet of Common Gartersnake have been reported in British Columbia, mostly from studies on Vancouver Island (Gregory 1978, 1984), which is outside the breeding range of Black Tern in the province (Cooper and Campbell 1997). The Common Gartersnake, however, is a generalized feeder and selects prey in both aquatic and terrestrial habitats. Major prey items include fishes, amphibians, and earthworms (Gregory 1991). Avian prey has also been reported, notably nestlings, and in one case was specifically identified as nestlings of American Robin (*Turdus migratorius*) observed near Comox, on Vancouver Island (Martin 1979). There are no similar diet studies for Common Gartersnake for interior British Columbia but it is probably similar to the coast (P.T. Gregory pers. comm.).

Although Common Gartersnake has been reported taking chicks of Common Tern (*Sterna hirundo*) at terrestrial colonies in Ontario (Lazell and Nisbet 1972), predation on Black Tern chicks, and perhaps other wetland-nesting species, may be more common than reported, at least in British Columbia. The event is rarely observed because it happens in a habitat that few biologists visit and where emergent vegetation obscures the incident. †

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About the Author



Since the late 1960s, Wayne has had a passion for marsh-nesting birds, first as an egg collector and later as an ornithologist. Over the past five decades, he has surveyed over 680 wetlands throughout British Columbia and is currently preparing a catalogue of colonial-nesting, fresh water species in the province.