

Ogopogo Gait

proof: April 5, 2016

Alistair B. Fraser

I have seen Ogopogo - twice.

Ogopogo is the large serpentine monster that has been reported in many lakes in British Columbia. Sightings, which predate European settlement and continue to the present, are sufficiently rare that the animal has assumed the proportions of myth.

Myth is the appropriate word, for Ogopogo is a cryptid - an animal of dubious existence.

What then can it possibly mean for me to say that I have seen it twice? Simply, I have seen (and photographed) what most observers would have immediately identified as Ogopogo. Let me explain.

As Ogopogo is now the darling of tourism organizations, particularly in the Okanagan, a good start is to examine a statue of it in Kelowna, which seems to be an amalgam of descriptions from Okanagan Lake. While a tad stylized, it shows many of the features I have seen on its siblings in Kootenay Lake: a serpentine body with vertical undulations and fins along with a lighter underbelly (right).



Before showing what does look rather like the statue, I will explain why a genuine lake monster would not look this way. Observers agree that Ogopogo is serpentine, so it is reasonable to ask how such an animal would propel itself through the water. It is those vertical undulations extending its body into the air that are bothersome for they would not help Ogopogo to swim. Indeed, a swimming snake always employs horizontal undulations which allow the body to press

against the water along its length. If this lake monster existed, it would not look as Ogopogo is always illustrated, but would slither through the water using horizontal undulations.

But if I, and many others, were not seeing a lake monster, what were we seeing? Biologists and naturalists have claimed for decades that the answer to that question was a family of otters. However, they apparently neglected to explain why or when otters will occasionally appear this way, so I will. A couple of crucial ideas are hull speed and gait.

No one who has seen a typical family of otters romping along the shore, or hunting fish in a lake, would have mistaken it for Ogopogo. Yet, when it comes to moving around, animals can have multiple distinctive gaits. People walk, jog, and run. Some quadrupeds walk, trot, lope, gallop, and stot - each a different mode of moving. Otters have (at least) two distinctive swimming gaits.

When moving slowly across the water surface, otters use their paddling gait where they are propelled by their feet. While this makes them quite manoeuvrable, speed is capped by their hull speed of about 1 m/s — the speed at which the wavelength of the bow wave is equal to the body length. Travelling at its hull speed, the otter seems trapped between two wave crests. For it to swim faster would increase the wavelength causing it to endlessly swim uphill from wave trough to crest and this would take more power than it can exert. (This difficulty applies equally to everything from muskrats to kayaks.)

However, as this speed limit, the hull speed, is caused by surface waves, it is only applicable at the surface. It is not relevant when travelling underwater. To take advantage of this, the otter changes its swimming mode to one resembling porpoising where much time is spent below the surface. Now, propulsion is obtained by undulations of body and tail. An otter family reduces the underwater drag even further by playing follow-the-leader.

This swimming mode is the otter's ogopogo gait and it seems to not only increase speed by about a factor of three over that of its paddling gait, but also reduces the energy required to cover a particular distance. Otters use

their ogopogo gait on the few occasions that they wish to travel a great distance quickly, such as past poorer fishing areas.

Of course while in its ogopogo gait, each otter must keep returning to the surface where its nose pointing up gets interpreted by a distant observer as Ogopogo's fin. The otter then dives again presenting us with Ogopogo's vertical humps (right).



Occasionally the head of the lead otter must be extended to establish the travel direction. This enables us to see Ogopogo's head as well as its humps (right).



What about the Kelowna statue's other features? The lighter underbelly fits with otters. Occasionally observers report horns. These are probably just views of the otter's pinna (external ears). That the statue shows both pinna and horns is likely just an observational composite.

The rarity of sightings of Ogopogo depends partially on an otter family's uncommon need to use its ogopogo gait when bypassing poorer fishing areas. Possibly more important is that, before the family disperses, it travels together for only a few months out of a few years.

Ogopogo has over five-dozen serpentine but cryptid cousins in lakes around the world (one is even protected by law). Is each a result of the ogopogo gait of otters? I have seen none of the cousins and don't know. However when it comes to Ogopogo, it is apparent that humanity has created a whole new animal to account for a group of known animals which were merely using an uncommon gait.