

Osprey observed when drowned by its prey

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Abstract. An Osprey *Pandion haliaetus* was observed by eight people as it was dragged under water by a fish and drowned. Several unsuccessful attempts to leave the water surface caused the Osprey gradually to sink in the water until it disappeared. The area was searched by boat, but the fish and Osprey were gone, and it was confirmed that there were no fishing nets in the area. This is a rare event, and sometimes rejected by scientists. The good view by eight persons, and detailed descriptions I received from two independent observers make the observation credible. The Osprey was an adult bird. In addition to traditional explanations that claws can become fastened to scales, bones or flesh of the fish, I propose that muscle spasm may be a reason why the osprey was not able to release its grip.

Keywords: feeding ecology, fish, muscle spasm, predator-prey interaction, raptor

INTRODUCTION

All raptors have to be extremely careful when attacking prey. If the prey can hurt the raptor and thereby reduce its ability to hunt in the future, the raptor will probably perish by starvation. If an Osprey *Pandion haliaetus* or other fish-catching birds try to catch a fish that is too heavy to be lifted from the water, the bird must release the fish or risk drowning. The Osprey almost exclusively eats fish, and selects a variety of different species (Hagen 1952, Cramp & Simmons 1980, Forsman 2010). With narrow chest, extremely strong and relatively long feet, long curved claws and wart-like projections with barbs on the underside of the toes (Cramp & Simmons 1980, Fowler et al. 2009), the Osprey is very well adapted for a tight grip on slippery fish (Figure 1). In addition the plumage is dense and heavily oiled to avoid becoming waterlogged (Cramp & Simmons 1980, Olsen 2007). Average prey size is 250–300 grams (Peterson 2002, Forsman 2010). The shape of the long and slim wings is an adaptation to bring fish away from the water surface, and it is claimed that they sometimes can lift fish weighing 2–3 kg out of the water (Collett 1921, Hagen 1952, Cramp & Simmons 1980). When Ospreys hunt on shoals of fish they sometimes pull more than one fish out of the water in a single dive (Mackrill 2019).

Drowning is rarely documented in wild birds, and if it happens it is in connection with flash flooding or strong winds combined with high waves (Craig & Powers 1972, Miller et al. 1986, Springer et al. 1989). A literature review made by Anderson found only one incidence of raptor drowning (Anderson 2008), and that was associated with a man-made trap in connection with a livestock watering tank (Craig & Powers 1972). One Osprey which nearly drowned was forced into the water by a second Osprey, and not by its prey (Anderson 2008). Dead wild birds diagnosed after being found in or near the water, have been shown to have died by poisoning, acute trauma (shot, hit by car, electrocution) and infections (Morishita et al. 1997). Recent surveys of morbidity and mortality of free ranging raptors do not mention drowning at all (Ellis et al. 2007).

It can, presumably, be problematic for an Osprey to always judge the size and strength of the prey in the water from many meters above the surface. If the fish is too big, the Osprey is usually able to release its grip, and such events are documented by photos (Olsen 2007). The old myth telling that the Ospreys lock their claws in their prey and are not able to release it, should be strongly counteracted by natural selection and is evidently not true. However, Ospreys have been seen paddling ashore using their wings with the fish in their claws instead of releasing it (Peterson 2002).

Published observations that large fish can drown the Osprey are very scarce. From North America there is, however, one description of an Osprey taking a big salmon. The Osprey was dragged nearly 50 m away, more or less submerged before the salmon dived and disappeared with the attached Osprey. A couple of days later the dead salmon with the attached drowned Osprey was found. The Osprey's claws were deeply embedded into the fish's back (Farley 1924). Also in European literature there are some incidents of newly dead Ospreys or their skeletons attached to 3,5–9 kg heavy fishes (Glutz von Blotzheim et al. 1971). From Scandinavia we have descriptions of pike *Esox lucius* observed with the feet or even the whole skeleton of Ospreys fastened on their back (Collett 1921, Hagen 1952, Peterson 2002). Some pikes have even been found alive, swimming around with remnants of a drowned Osprey like “willow bushes” on their backs. This phenomenon is not mentioned in three relatively new books about the Osprey (Poole 1989, Dennis 2009, Mackrill 2019). In fact, some authors believe that such stories refer to animals of fables (Österlöf 1961, Brown 1976). A supposed Osprey skeleton on the back of a large, dead carp *Cyprinus carpio* (Ferguson-Lees 1968) was later determined to be the skeleton of a buzzard *Buteo* sp. It further appeared that at least one foot of the raptor was implanted into the fish artificially after the latter's death (Cowles 1969). This incident has added increased disbelief to Ospreys being drowned by their prey.



Figure 1. The Osprey shows many characteristics which make it specialized for fishing, and normally it lifts the fish out of the water or release it if it is too heavy. Photo: Jørn Bøhmer Olsen.

Because Ospreys drowned by their prey are so rarely observed and described, I here report one such credible episode from the central part of Norway in 2008.

DESCRIPTION OF THE OSPREY DROWNING

The Osprey attack on a fish and subsequent drowning was observed by eight people under good light conditions and with overview over the lake Holderen in the east of Trøndelag county in Norway. Holderen, lying on the border between Norway and Sweden, is about 7.5 km long and nearly 2 km at its widest. The lake has brown trout *Salmo trutta* (mean weight 400 g), Arctic char *Salvelinus alpinus* (300 g), grayling *Thymallus thymallus* (300 g) and burbot *Lota lota* (not uncommonly around 2–3 kg). Individuals weighing more than 1 kg have been recorded for all four species in the lake, however Arctic char and grayling rarely reach such weights. The heaviest brown trout documented in the lake weighed 7.2 kg.

The Osprey attack started 17:24 on 24 July 2008. I was informed by phone immediately afterwards, and I contacted two persons who independently gave me a detailed description of the event. The descriptions coincided very well and only one version is given here.

Eight persons observed the Osprey when it tried to

lift from the water with the fish. The distance to the observed bird was about 300 m. First the Osprey was struggling very hard with its wings so the water was splashing high up into the air for 2–3 min. After 5 s of resting a new similar struggling started followed by a 30 s resting period. The Osprey lay now deep in the water, and tried with vigorous wing beats to lift from the water with the fish but relaxed after about 1 minute with struggling. After another resting period the Osprey tried again very vigorously and managed to move about 5 metres along the surface of the water before the next resting period. Only the head of the Osprey was now above the water. After a while, the Osprey disappeared totally under the water for about 30 seconds before it was visible on the surface again. Shortly afterwards, the Osprey disappeared and was not seen again. The event was followed through binoculars by some (about three) of the observers, and two persons rowed a boat to the place where the Osprey struggled with the fish. The water surface was calm and nothing could be seen.

People who stayed in the area searched for dead Osprey and/or dead fish in the lake the following days, but they were unable to find either the Osprey or the fish. The lake is quite large and it requires a lot of work to patrol the shore.

DISCUSSION

In spite of huge amount of time spent by photographers, researchers and others observing hunting Ospreys, this observation of an Osprey drowned by its prey is one of a very few such incidents published. I judge this observation credible. The good weather and light conditions, the observers' use of binoculars, and the prolonged struggle by the Osprey trying to lift from the water with the fish, all reduce the probability of any misinterpretation of the observation. An Osprey can lie on the water surface for some time after an attack (Olsen 2007), because they are buoyant and also have long wings which serve as floats when they lie in the water. I therefore conclude that the Osprey was drowned by the fish. The two persons who checked the area by boat did not find any Osprey or fishing nets nearby.

Fish might heal from injuries of the epithelium (scars), and even deeper subdermal wounds caused by the bill tip pervading muscle tissue. After healing, necrosis might represent up to 10% of the total body surface (Adamek et al. 2007). That fish can survive with multiple injuries from bird attacks has also been observed and reported to me by two physiologists (Tor Atle Mo and Trygve Poppe). It seems therefore reasonable to believe that fish can heal and survive after Osprey attacks.

It is known that Ospreys can attack and release a fish that is too heavy (Olsen 2007), but in some rare cases they may be unable to release the fish. As the Osprey's claws may penetrate deep into the flesh of a big fish, it is possible that they sometimes can fasten between the bones or scales of the prey so the birds are not able to release themselves (Hagen 1952, Cramp & Simmons 1980, Peterson 2002). Morphological adaptations to avoid losing the fish, such as feet covered with sharp barb-like scales, and the very long and curved talons with a semi-circular hook shape typical for raptors to immobilize large and strong prey (Fowler et al. 2009, Tsang et al. 2019), may perhaps in rare situations make it difficult to release a too big fish. Naturally, the extensor tubercle, where muscles to withdraw the talons from the prey are attached, are very small compared to flexor tubercles that are attached to strong muscles made to squeeze the talons into the flesh (Tsang et al. 2019). It is possible that the small muscles are not able to withdraw the talons in some rare situations.

Perhaps muscle spasms might cause that ospreys are not always able to release their prey? Some Ospreys may struggle for a long time with their prey before they release it. This intensive use of muscles could maybe in rare situations cause spasms in their feet that could make it hard to stretch their toes and release the fish. Such spasms are normal in humans, and muscles in birds are constructed and controlled by the nerve system in the same way as in mammals (Schmidt-Nielsen 1997).

The fatal hunting attempt described here must have

been made by an adult bird. Investigations of nesting Ospreys in the area show that they have nestlings at the time when the drowning was observed (Østnes et al. 2019). Two Ospreys from this area equipped with GPS-based satellite-transmitters as nestlings, started to move northwards from their wintering areas in tropical Africa for the first time in their third calendar year, one to Tunis and one to southern Sweden (Østnes et al. 2019).

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REFERENCES

- Adamek, Z., Kortan, J. & Flajshans, M. 2007. Computer-assisted image analysis in the evaluation of fish wounding by cormorant *Phalacrocorax carbo sinensis* (L.) attacks. *Aquaculture International* 15: 211–216.
- Anderson, N. L. 2008. Late-Stage Granulomatous Interstitial Pneumonia Secondary to Near-drowning in an Osprey (*Pandion haliaetus*). *Journal of Wildlife Rehabilitation* 29: 10–21.
- Brown, L. 1976. *Birds of Prey: Their Biology and Ecology*. Hamlyn, London.
- Collett, R. 1921. Norges fugle. Aschehoug & Co. (W. Nygaard), Kristiania. (In Norwegian)
- Cowles, G. S. 1969. Alleged skeleton of Osprey attached to Carp. *British birds* 62: 542–543.
- Craig, T. H. & Powers, L. R. 1972. Raptor mortality due to drowning in a livestock watering tank. *Condor* 78: 412.
- Cramp, S. & Simmons, K. E. L. 1980. *The birds of the Western Palearctic*. Vol. 2: Hawks to Bustards. Oxford University Press, Oxford.
- Dennis, R. 2009. *Life of ospreys*. Whittles Publishing, Scotland.
- Ellis, A. E., Mead, D. G., Allison, A. B., Stallknecht, D. E. & Howerth, E. W. 2007. Pathology and epidemiology of natural West Nile viral infection of raptors in Georgia. *Journal of Wildlife Diseases* 43: 214–223.
- Farley, J. A. 1924. Habits of the osprey. *Auk* 41: 154–155.
- Ferguson-Lees, I. J. 1968. Skeleton of osprey attached to carp. *British birds* 61: 465.
- Forsman, D. 2010. *The raptors of Europe and the Middle East*. Helm, London.
- Fowler, D. W., Freedman, E. A. & Scannella, J. B. 2009. *Predatory Functional Morphology in Raptors: Interdigital*

- Variation in Talon Size Is Related to Prey Restraint and Immobilisation Technique. *Plos One* 4: 9.
- Glutz von Blotzheim, U. N., Bauer, K. M. & Bezzel, E. 1971. *Handbuch der Vögel Mitteleuropas*, Band 4. Aula Verlag, Wiesbaden. (In German)
- Hagen, Y. 1952. *Rovfuglene og viltpleien*. Universitetsforlaget, Oslo. (In Norwegian)
- Mackrill, T. 2019. *Ospreys, Great Britain*: Bloomsbury Wildlife, London.
- Miller, S. L., Gregg, M. A., Murdock, M. K., Keritsubo, A. R., Combs, S. M., Nilsson, J. A. & Botzler, R. G. 1986. Probable drowning of tundra swans on the northern coast of California. *Journal of Wildlife Diseases* 22: 137–140.
- Morishita, T. Y., Aye, P. P. & Brooks, D. L. 1997. A survey of diseases of raptorial birds. *Journal of Avian Medicine and Surgery* 11: 77–92.
- Olsen, S. F. 2007. *Rovfugler og ugler i Nord-Europa*. Wigestrands forlag, Stavanger. (In Norwegian)
- Peterson, D. 2002. *Rovfugler og ugler i Norden*. Landbruksforlaget, Oslo. (In Norwegian)
- Poole, A. F. 1989. *Ospreys. A natural and unnatural history*. Cambridge University Press, Cambridge.
- Schmidt-Nielsen, K. 1997. *Animal physiology. Adaptation and environment*. Cambridge University Press, Cambridge.
- Springer, P. F., Lowe, R. W., Stroud, R. K. & Gullett, P. A. 1989. Presumed drowning of Aleutian Canada geese on the Pacific coast of California and Oregon. *Journal of Wildlife Diseases* 25: 276–279.
- Tsang, L. R., Wilson, L. A. B., Ledogar, J., Wroe, S., Attard, M. & Sansalone, G. 2019. Raptor talon shape and biomechanical performance are controlled by relative prey size but not by allometry. *Scientific Reports* 9: 10.
- Österlöf, S. 1961. *Fiskeørn*. In Blædel, N.: *Nordens fugle i farve. Fra rovfugle til andefugle*. Ejnar Munksgaard Skandinavisk Bogforlag, København. (In Danish)
- Østnes, J. E., Kroglund, R. T., Kleven, O. & Nygård, T. 2019. Migratory patterns of Ospreys (*Pandion haliaetus*) from central Norway. *Ornis Fennica* 96: 101–111.

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