Family Life at Salt Point

Candace E. Cornell

Contents

Arrival & Courtship

Mated ospreys stay together for life and return to the same nest year after year to rear their offspring. Each year osprey arrive in the Finger Lakes in March and April after flying up to four thousand miles from their wintering grounds in the Caribbean, and Central and South America. GPS tracking of these extraordinary journeys shows the exact paths taken by adult osprey returning north in Spring 2014. Males tend to arrive a few days ahead of females, to stake claim of suitable nesting sites. Older, experienced breeders are the first to reach the nesting grounds, followed a few weeks later by younger ones.

First-time nesting ospreys often get a late start breeding since they tend to arrive later than mature, established pairs, and must court and build a nest before they can lay eggs. Mated pairs tend to arrive from migration earlier than younger, inexperienced birds and usually have only a few repairs to make to the nest before courting and egg laying can begin. The earlier the pair start their families, the longer their chicks will have to develop into capable juveniles before leaving on their first fall migration.

Typically, established ospreys pairs return from migration and arrive at their nests at nearly the same time each year. In some places, ospreys are as regular as the famed cliff swallows of San Juan Capistrano that return to the mission on or around St. Joseph's Day, March 19. Like male cliff swallows, male ospreys typically arrive at the nest before their mates although mated pairs may also arrive on the same day.

On April 19, 2013, a young male osprey nicknamed Orpheus probably arrived at the nesting ground of his parents, assumed to be Portland Point, Lansing. Seeing his natal nest occupied, he continued his search for a suitable, unoccupied nest site, until he discovered the empty nest platform at Salt Point. This platform had been erected by NYSEG volunteers just a month earlier and was the scene of much interest from unmated ospreys. He laid his claimed on the Salt Point nest platform and began defending it from other marauding bachelors.

After two and a half days of contests, on April 22, 2013, Orpheus saw Ophelia near the platform for the first time, grabbed a stick, and did a sky dance over the platform with a stick for her benefit. He flew about 500 feet in the air while giving in a high pitched, continuous courtship cry and dangling his outstretched legs to proudly display the stick in his talons. He would suddenly helicopter his way down a hundred feet at a time with wings fluttering until finally placing the stick in the new nest with much fan fair. Ophelia flew over to inspect the stick, sat next to it. After sitting on the nest for nearly a half hour, she began to cry out, begging for food. Orpheus responded in short order with a small Lake Trout and by doing so, cemented their pair bond. Ophelia allowed Orpheus to court her and the rest, as they say, is history.

On the cold but sunny afternoon of April 5, 2014, Orpheus and Ophelia reunited after their first winter apart. They were seen courting with Orpheus parading fish and nesting materials around in the air and calling for Ophelia's attention. It is suspected that Orpheus arrived the day before as a male was seen putting a stick in the nest at sunset, but the sighting has yet to be confirmed. Since then, they have refurbished the nest with new twigs and grasses and have spent a great deal of time getting reacquainted. "Courtship feeding," where the male feeds his mate, helps solidify the couple's relationship each spring and assures the female that her mate is a good provider. On their second day together, April 6, 2014, Orpheus presented Ophelia with a large headless carp, weighing nearly two pounds and there were no longer doubts about his fishing prowess.

When it comes to courtship feeding, older, more experienced males are more generous at feeding their mates than younger males, which are usually reluctant to do so. Over time, successfully mated pairs learn to respond quickly to one another and continue to perform these courtship rituals each spring in order to strengthen their bonds. However, if a male is not a good provider, a female will "divorce" the mate and find another. They may also dissolve their union if the pair failed to breed the previous year.

Next year, we will expect Ophelia and Orpheus back at Salt Point sometime around April 5 , 2015. However, with the advent of nest cams, researchers are learning there are many exceptions to every rule. At the Hellgate Canyon nest in Missoula Montana, the female osprey nicknamed Iris has routinely arrived in early April since 2010. Her mate eventually arrives nearly two weeks later. Last year, a different male courted the not-so-faithful Iris when she first arrived and they produced three eggs. When Iris' mate Stan arrived on May 3rd, he chased the interloper away and destroyed the eggs.

Nest Building

Established pairs always return to their previous nesting sites, while the new arrivals or those that have lost their nests, may spend weeks searching for an adequate nesting site. The long narrow wings of an osprey make it hard to turn tight corners so they prefer nesting in the open where the nest is easy to reach and it must be within 1-3 miles of an abundant fish supply. Natural nesting sites are usually the tops of large, isolated, dead trees that are still sturdy enough to bear the weight of an osprey's heavy nest, but such trees are rare today.

In recent times, ospreys are substituting man-made structures such as power poles and light towers as nest supports although these can be fire hazards for both birds and humans. The local power company, NYSEG, is very proactive in trying to provide safe platforms on their utility poles for nesting osprey. The proliferation of these retrofitted platforms and the building of special osprey nesting towers is vital to the osprey's continued existence. An added benefit is that these artificial sites are mounted with predator guards and are difficult for nest robbers to climb.

Paired ospreys demonstrate division of labor in most aspects of their lives. This is evident when nest building, which begins soon after the partners first bond to each other and never really ends. Males collect the majority of twigs and sticks by snapping them off of trees and bushes and the female finds the bulk of the soft grassy materials to line the nest. When actively building a nest, a pair may make a hundred trips a day to gather nesting material. But fashioning these materials into a nest is the work of only the female and it is always her prerogative whether or not to include items in the nest. Small adornments and fresh twigs and nest lining continue to be added to the nest throughout the breeding season and every year hence.

Mated ospreys stay together for life and return to the same nest year after year to rear their offspring. Ospreys are loyal to one another, but it is their urge to protect the nest that is paramount in their relationship. If an osprey loses a mate over the winter, it will wait for a while, but eventually will take another mate. Stan, from the Hellgate nest, took a big chance of being usurped every year he arrived

home late. Perhaps Iris thought Stan had perished in 2013, causing her to fall for another's charms.

The act of building a nest is an integral part of the osprey courtship ritual and helps cement their bond as a mated pair. Orpheus and Ophelia began working on their nest on the day they met, April 22, 2013. Orpheus primarily gathered the large sticks used on the outside of the nest rim to protect the inner soft nest cup. He would present each stick to Ophelia and it was up to her to place it in the nest or reject it. She collected mainly soft grasses and algae to line the nest cup. A pair of House Sparrows nested below the nest, but left in early August after their second brood fledged. Throughout the rest of the season, Orpheus continued to supply Ophelia with nesting materials and she fashioned them into a sprawling yet functional nest.

On Aril 5, 2014, the pair began refurbishing the nest, repairing any winter damage and refreshing the nest lining with new soft grasses, and moss. Just as last year, Orpheus will continue bringing new nesting materials to Ophelia throughout the season.

Ospreys are famous for decorating their huge bulky nests with eclectic human debris. Dr. Alan Poole compares their taste in nest decorations over the centuries in Ospreys: A Natural and Unnatural History. Nineteenth century osprey nest contained rag dolls, doormats, a toy sailboat, a feather duster, barrel staves and hoops, a bootjack; remnants of an oilskin rain slicker, large bleached-out domestic animals bones probably from cattle and sheep, and 20 feet of hemp rope.

Fast-forward to this century and you find ospreys using all sorts of "nestorations" from the human flotsam and jetsam in our waters—just about anything that they can carry is fair game. Nestorations of the twenty-second century, seen through the prying eye of the osprey nest cams, have included rubber boots, bicycle tires, Hula Hoops, television antennas, Styrofoam cups, plastic hamburger containers, toothpaste containers, candy wrappers, adult magazines, bikini tops, fishing nets, cardboard, food wrappers, and other garbage.Unfortunately, some ospreys prefer nesting with hazardous debris like baling twine, fishing line, string, plastic fencing, and Mylar balloons and ribbons, which can strangle the chicks.

Other examples of the osprey's diverse tastes and sometimes-indelicate sensibilities are rather humorous. At one nest site made famous by David Gessner in Return of the Osprey, he found a naked Barbie doll with sunglasses frequently posed in compromising positions.

Mating

Once a pair has established itself on the nest site, and the nest is complete, the female spends most of her time at the nest and must beg for food. Copulations are frequent during courtship and usually take place at the nest. Experienced females may solicit mating by tilting forward with raised tail and drooped wings, but usually males take the lead. A male mounts the female from the air, resting his leg along her back, and vigorously flapping to keep his balance. If the female is receptive, she tilts forward and raises her tail, allowing the male's tail to slide under hers. Cloacal contact, better know as the "cloacal kiss," is made and sperm is transferred. The female may remain in the posture for a few moments after the male dismounts.

Successful copulations depend on posture of the female. If she is unwilling or unreceptive, she will either maintain the horizontal posture or will tilt back on her tail, causing the male to slide off her back. Young pairs are less likely to copulate successfully than older, more experienced pairs. An inexperienced Orpheus in April, 2013, often attempted to mount Ophelia backwards or sideways, but his technique gradually improved. Researchers postulate that this low success rate might be a reflection of the young males reluctance to pass on food to their mates, since courtship feeding is a key stimulus in making the female receptive

By April, 2014, Orpheus no longer had orientation problems while consummating their bond, but he did have trouble staying atop Ophelia in the strong winds that started the month.

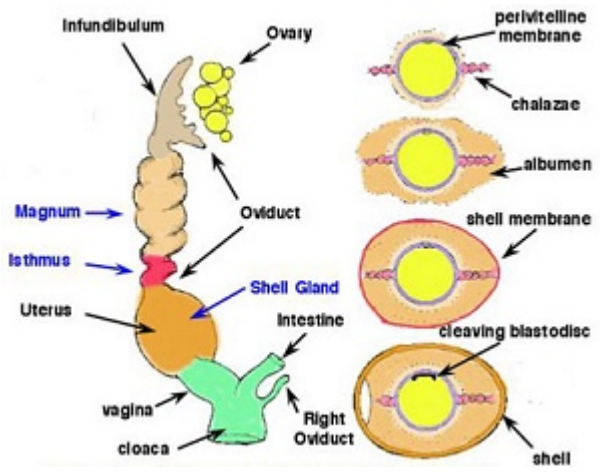
Early copulations during the courtship period do not fertilize eggs, since the female is not yet hormonally receptive. These frequent matings stimulate the growth of eggs within the female's ovary and serve to strengthen the pair bond. It is only the copulations completed a few days prior to laying that fertilize the eggs. Males guard their mates possessively during this brief period of peak of fertility and may even accompanying her during flight. After a few days of fertile copulation, the female lays her eggs.

Monogamy is typical in most ospreys. However, in large colonies where male mortality rate is high, polygyny or mating with multiple females occurs. Males that keep and defend two different females, either at the same nest or at two different nests, are usually unable to supply enough fish to raise two full broods.

Egg laying

Most birds have only one ovary and one oviduct. In early stages of embryonic development, each female bird has two ovaries, but only one develops into a functional organ. In hawks, the right ovary and oviduct usually develop. A mature ovary looks like a cluster of grapes and may contain up to 4,000 small ova, which can develop into mature eggs.

The ovary enlarges greatly during the breeding season. The oviduct opens medially to it in a funnel-shaped ostium. Ovulation results in the release of an egg from a mature follicle on the surface of the ovary. Upon fertilization, the ovum or egg becomes a developing embryo and for most birds passes through the oviduct to the ovary in about 24 hours. The egg, with extensive food reserves in the form of concentric layers of yolk, is picked up by the ostium and ciliary currents carry it into the magnum region. Over about three hours the egg receives a coating of albumen.



The egg then passes into the isthmus, where the shell membranes are deposited over the course of about one hour. The egg moves to the uterus, or shell gland, where the calcareous shell is added and, in some birds like ospreys, pigment is added in characteristic patterns. The completed egg passes into the vagina and cloaca for laying, which usually occurs in the morning.

Eggs consists of different components: yolk, albumen, shell membranes, and the shell. A yolk or energy-rich supply of food is 21 – 36% lipids, 16 – 22% proteins, with the rest water. The yolk is suspended in the center of the egg by twisted strands of protein fibers called chalazae. Albumen, consisting of 90% water and 10% protein, is the embryo's water supply and serves as a 'shock-absorber' to help protect the embryo. It also buffers the embryo from sudden changes in temperature. The inner and outer shell membranes are attached to the shell and protect the egg from bacterial invasion and help prevent rapid evaporation of moisture from the egg. The outer shell protects the embryo and contains thousands of pores that permit gas exchange.

Ospreys lay chicken-sized, cream colored eggs with deep cinnamon-brown and chocolate streaks and blotches. These beautiful patterns vary from egg to egg, but are unique to Ophelia. In years to come, each of her clutches will look differently, and yet it would be possible to distinguish any of her clutches from that of other ospreys. Besides being recognizable, the eggs are perfectly camouflaged in the nest when seen from above, protecting them from marauding aerial egg thieves like gulls and crows.

The eggs weigh 2.1-2.6 ounces each, with the first egg being the largest and the later ones subsequently slightly smaller. This means that the embryo in the first egg gets a developmental head

start on any other eggs in the clutch and will hatch before any others do. It will take, on average, 37-43 days in the Northeast for an osprey egg to hatch and they do so asynchrony, in the order they were laid.

Incubation

From the moment the 5-6 weeks of incubation starts, there is a change in the ospreys' behavior. Instead of spending most of their time perched on the edges of the nest and platform, from now on, one of the pair will almost always be sitting in the center of the nest, covering the eggs, which are nestled in the shallow depression below. Unlike many species of birds, both male and female ospreys incubate the eggs and are equipped with brood patches. These heavily vascularized areas of skin lose their down feathers during the breeding season to allow the bird's body heat to transfer to the eggs.

During the long period of incubation the pair develops a daily routine: Ophelia is the homebody while Orpheus is the breadwinner. Orpheus brings his mate fish in the morning, afternoon, and at the dinner hour and she does the majority of incubation and guarding the nest. However, this amount of inactivity is stressful for Ophelia. Even though Orpheus feeds her and gives her many breaks, the primary responsibility of incubation—keeping the eggs around 99 °F and protecting them from solar radiation and predators—is still hers. She sits low and tight in the nest, shielding the precious nest with her body and gently turning the egg every few hours to maintain a constant temperature. She will have to endure the erratic spring weather—from freezing nights and snow showers to scorching days and thunderstorms—out in the open, without seeking shelter in the trees, as does Orpheus. All she can do is to hunker down on the nest and eggs and hold tight.

While males usually spell their mates during mealtime and exercise breaks, the frequency and duration of these periods vary among individual males. Some males hesitate before incubation and others are quick to incubate. Many males will leave the nest the moment the female returns, while other partners remain on the eggs and have to be evicted by the female. Some males will pend up to three hours a day or more on the nest each day, while others spend appreciably less.

Orpheus adjusted quickly to his new situation last year and has continued to be an attentive mate this season. He has never shown any hesitation to share in the incubation whenever he feeds Ophelia although he only occasionally offers her relief at other times. He also does not linger on the eggs and leaves the nest quickly upon Ophelia's return or sits and preens on the diagonal perch. On several occasions he stays on the eggs upon her arrival, allowing her to preen. But her hiatuses are short, and her hours incubating long. Osprey cam footage reveals that females do all the incubating at night, catching only catnaps as they constantly remain vigilant on guard and twitch from biting insects or falling rain.

Hatching

The eggs hatch about five to six weeks after being laid and in the same sequence as they were laid. If the first clutch is stolen or destroyed, a second clutch of eggs is laid about three weeks after the failure of the first one.

One or two days prior to hatching, the developing chick starts tapping the eggshell with its beak. A small outgrowth on the tip of the upper mandible, called the ***egg tooth*** helps the chick break free of the shell; at this stage, faint peeping calls of the chick can also be heard. The neck is the strongest part of a newly hatched chick's body, which drives its beak to break through the shell.

Courtesy of University of Toronto <http://individual.utoronto.ca/ali_naqvi/osprey.htm>.

Nestlings

The osprey chicks are halfway between altricial and precocial, a state described as ***semi-precocial*** by Cornell's biologist Alan Poole***.*** Their eyes open just hours after hatching, their body is covered with

down feathers; and they can actively pick chunks of food from their parent's bill, rather than fed bill to bill by the parent. The chicks however, are not mobile at birth. They start begging for food at any movement on the nest's edge, standing weakly with shaking heads, open bills and necks extended high.

The chicks are kept warm by their buff colored plumage of down feathers called the ***first down.*** The crop, which stores food so that the chicks don't need to be fed very frequently, develops within the first week of their life. They usually double their weight in the first week of their lives.

At ten days of age, the chicks become fairly mobile, quickly approaching the female when she feeds them, fighting with their siblings when food is scarce and backing up to eject feces over the rim of the nest. It is around this time that their first down is replaced by a dense, wooly, dark colored, ***second down***, which lasts another 10 to 15 days. A conspicuous light brown streak runs along their spine, the feet turn bluish-grey and the beak and claws turn black.

At two weeks of age, rusty golden feathers start replacing the down on the head and neck. Darker feathers appear on the rest of the body slightly later, while the primaries, secondaries and the rectrices appear at the age of 20 to 25 days.

By the age of 30 days, the chicks have already gained 75% of their adult body weight; the growth of the body slows down at this stage, while the feathers are growing rapidly.

Studies have shown that the culmen of a chick grows at a steady rate, therefore its length may be helpful in determining the chick's age. At the age of 20 to 35 days, the females, which are heavier as adults, start gaining weight much faster than the males. Thus body weight is a reliable criterion for sexing the chicks more than 30 days old. Young ospreys in the regions with good food supply grow faster than those in the regions with poor food supply.

When food is scarce, the siblings fight for access to the mother when she is distributing food. It is usually the oldest chick that dominates the feedings and is the first to feed. The smaller, younger siblings don't get a chance to feed until the dominant chick is satiated. If a subordinate chick tries to snatch food from the parent before the dominant chick has had its fill; the dominant chick pecks the subordinate viciously until it crouches submissively at the edge of the nest.

In times of scarcity, the subordinate chicks do not get enough to eat and slowly starve to death. Parents don't interfere in such squabbles, because it is easier to raise one or two well-fed and healthy chicks than three or four weak and undernourished chicks.

As the chicks grow, the quantity of food delivered to them slowly increases, but becomes constant when they are 30 days of age. This quantity drops just prior to fledging at 40 to 55 days of age. This decrease in the food supply by the adults is possibly meant to encourage the chicks to leave the nest, after which, the amount of food rises again.

Courtesy of University of Toronto <http://individual.utoronto.ca/ali_naqvi/osprey.htm>.

Fledglings

During the last 10 to 15 days prior to fledging, the young regularly exercise their wings to develop their flight muscles. Finally, when the young are about 50 to 55 days of age, they leave the nest. A fledgling might take its first flight by catching the wind, while exercising its wings. The first flight is brief and awkward and ends soon with the fledgling landing on a nearby perch.

In the nesting colonies where nests are close to each other, the fledglings might switch nests during their preliminary flights. The adults either tolerate these young intruders, or are unable to distinguish their own young from the others, which is unlikely. They even feed these intruding chicks, over-run by

their parental instincts. Subordinate chicks, which do not get enough food to satisfy them, at their parents' nests, are more likely to switch nests, seeking a nest with younger chicks, where they can dominate at feedings.

Even after leaving the nest, fledglings continue to depend on their parents for food, for about 10 to 20 days after leaving the nest. This period between fledging and becoming independent is critical for the survival of the individual, which depends on whether or not it learns to hunt for itself. During the time, a fledgling is acquiring and perfecting its hunting skills, food from the parents acts as a vital back up. However, it must soon learn to live on its own.

It was at first believed that youngsters acquire hunting skills from their parents, since parents often encourage them to hunt by dropping fish in mid-air for them to dive for and snatch. However, experiments have shown that hand-raised young, if released into the wild, can also hunt successfully, after 3 days to 3 weeks of their release.

After becoming independent, some youngsters stay at their nests, for a week or two after their parents' departure and some migrate immediately. In other instances, the father stays around until just before or until after some or all of the juveniles leave. It seems like every combination is possible, depending on the level of development and the dedication of the adult. By mid-September in the Finger Lakes, most of the adults and young have deserted the nesting grounds for their wintering habitats, not to return until next spring.

Modified from original, courtesy of University of Toronto <http://individual.utoronto.ca/ali_naqvi/osprey.htm>.

Upcoming Sections

Migration

Wintering