

Osprey Nest Fish Delivery During the 2025 Breeding Season In the Severn River Watershed

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Linking Regional Recovery to Local Conditions: Focus on the Severn River

The Chesapeake Bay supports one of the world's largest Osprey breeding populations. Like many Osprey populations elsewhere, Chesapeake Bay Osprey experienced sharp declines in the decades following World War II driven by reproductive failure caused by environmental contaminants that interfered with successful nesting and chick survival.

While the Chesapeake Bay Osprey population has recovered at the regional scale, uneven recovery across the Bay underscores the importance of local conditions in shaping Osprey foraging success and reproductive outcomes. Differences in salinity, water quality, habitat structure, and prey availability among tributaries can influence where Osprey forage and how efficiently they provision their young. This note focuses on the Severn River, a small but ecologically complex tributary of the Chesapeake Bay that provides an ideal setting for examining links between Osprey behavior and fish availability. A central question guides our work: if Osprey routinely travel miles from their nests to forage, where do they go, and what fish do they capture?

Osprey Movement Patterns in the Severn River

Satellite tracking data collected through the Rob Bierregaard-led OspreyTrax project (2010 - 2016) provides a detailed view of how individual Osprey move across the Severn River watershed. Data from three tracked individuals—Woody and Hackett (males) and Molly (female)—show contrasting but repeatable foraging strategies, ranging from localized use of small embayments to longer-distance flights up-and-down the Severn River and into the mainstem of the Bay. Collectively, these data indicate that Osprey often travel well beyond the immediate vicinity of their nests, making repeated, purposeful trips to specific foraging locations rather than feeding opportunistically near nest sites.

Atlantic Menhaden: Life History, Ecological Role, and Relevance to Osprey

Atlantic menhaden are small schooling fish that play a central role in the Chesapeake Bay and along the U.S. East Coast. They are best known as forage fish, meaning they serve as a primary food source for many predators, including Osprey, striped bass, bluefish, marine mammals, and seabirds. Because so many species depend on them, menhaden occupy a critical position in the Bay's food web.

Menhaden play an especially important role in the ecosystem because of their feeding behavior. They filter-feed on tiny plants and animals in the water, on things too small for most fish to eat. Menhaden serve as a bridge between the smallest aquatic life and larger predators such as Osprey, striped bass, and other fish. When menhaden are plentiful, this natural food pathway works well: energy moves efficiently from plankton to fish to birds and other wildlife. When menhaden are scarce, that pathway weakens, and animals that depend on them may struggle to find enough food.

Taken together, the life history of Atlantic menhaden, their ecological importance, and their intensive human harvesting raise an essential question: could localized declines in menhaden in the saltier regions of the Chesapeake Bay influence Osprey foraging behavior and reproductive rates? Addressing this question is central to understanding how changes at the base of the food web may affect top predators in the Bay ecosystem



Above. Kintgen Nest Camera, (left), Female feeding fledgling (middle) and the fledgling able to feed in the nest on its own (right)

Kintgen Nest Camera and Data Collection

A Eufy 4G LTE Cam S330 camera system was mounted on the nest to address one of the central questions of this study - which fish species are delivered to Osprey nests within the Severn River. From May through August 2025, 190 minutes of video footage were recorded and analyzed, yielding 152 identifiable fish deliveries. Although brief, these recordings provide a focused, informative snapshot of prey-delivery patterns at a Severn River Osprey nest.

Among species-identified fish, Atlantic menhaden were the most common prey, accounting for 25% of deliveries, followed by gizzard shad at 13%. Other fish species, including Atlantic croaker, spot, American eel, and black crappie, were delivered infrequently and collectively accounted for a small portion of overall provisioning.



Above. Croaker (left), gizzard shad (middle and right), American Eel (bottom right)

Provisioning rates were highest in early June, when nestlings grew rapidly, and energy demands were highest. Delivery rates declined steadily through July and August, with several late-season days showing only one or two fish delivered. Lower late season delivery rates may reflect reduced prey availability, longer foraging trips, or changes in demand as young Osprey approach fledgling. These seasonal trends are consistent with patterns observed in other Chesapeake Bay Osprey populations.

Breeding Season Foraging Roles

During the Osprey breeding season, males conduct most of the foraging, particularly from egg-laying through the early nestling period. Their smaller size and lighter body mass make them well-suited to repeated fishing flights. This division of labor allows females to remain at the nest to incubate eggs, protect young nestlings from predators, and shield them from the weather. Because prey is located visually from the air, time spent foraging is closely tied to time spent flying.

Key Insights and Results: Prey Composition and Nest Observations

Nest camera observations at the Kintgen nest provide direct evidence linking Osprey foraging behavior in the Severn River to prey availability. By linking prey deliveries to season, size, and timing, nest cameras help clarify how local fish availability shapes Osprey foraging behavior and reproductive success within a Chesapeake Bay tributary. Fish deliveries during the 2025 breeding season were dominated by Atlantic menhaden with gizzard shad as secondary prey. Although Osprey occasionally delivered other fish species, these contributed little to overall provisioning and reflected opportunistic foraging rather than consistent prey use. Small fish accounted for most deliveries. They were evident in days with higher provisioning rates, indicating that frequent capture of small, surface-feeding prey was essential to meeting daily minimum energetic demands.

Nest observations also documented important reproductive outcomes. Of the three nestlings present, only one successfully fledged. The youngest nestling died on June 11, followed by the second nestling on June 26, leaving a single surviving fledgling. Seasonal declines in fish delivery rates later in the breeding season, combined with reduced daily provisioning on several days, and small fish sizes, suggest that prey availability may be limited during critical developmental periods. Together, these observations highlight the close connection between prey composition, delivery frequency, and reproductive success, underscoring the importance of localized availability of forage fish in shaping Osprey outcomes within the Severn River.

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