

# Wild Rice Vanishes as Resident Geese Multiply

By Elaine Friebele

In the last decade a disturbing trend has been taking place in the marshes of Jug Bay: a rapid decline in Wild Rice populations. Though Wild Rice stands in the Patuxent's tidal freshwater marshes have gradually decreased since the beginning of the last century, the sudden denuding of dense Wild Rice areas has resource managers concerned. A scarcity of the energy-rich rice could have serious consequences for migrating and resident waterbirds. What's at the bottom of this disappearance? Though patterns of Wild Rice growth and consumption weave a complicated picture, results of field studies point to an increasingly prevalent culprit: the resident Canada Goose.

Current stands of Wild Rice in Jug Bay marshes represent less than 10 percent of those existing 30 to 40 years ago, according to naturalist Greg Kearns of Patuxent River Park; the decline has been even more dramatic in the last decade. Kearns conducts long-term studies of Soras—shy, Robin-sized birds that stop at Jug Bay marshes in the fall to stock up on Wild Rice and Tear Thumb seeds on their southerly migration.

Wild Rice nearly dominated the marsh just south of the Railroad Bed in the early 1980s, says Kearns. "In the fall, there were dozens and dozens of Soras in the Wild Rice [near the Observation Blind]. Often 50 of them were calling at once. Now there's very little Wild Rice, and it's difficult to see or hear Soras there."

Wild Rice is one of the best seed sources for many migrating waterbirds because it has a very high carbohydrate content, which birds convert to fat and store as fuel for long migratory flights. In the fall of 1960, two million Red-winged Blackbirds and 10,000 Bobolinks (Reedbirds), as well as many Soras, fed on ripening Wild Rice and other seeds in Patuxent River marshes, wrote retired biologist Brooke Meanley in his

book, *The Patuxent River Wildrice Marsh*. Feeding by Redwings, Reedbirds and marsh ducks thinned the stands and prevented Wild Rice plants from getting so thick that they were choked out, Meanley said. Bobolinks fattened up even more than the Soras, eating only rice to prepare for their autumn flight to Argentina. (Hence their nickname "Butterball.")

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Only rarely do we see Bobolinks today. Redwing Blackbird flocks, however, are immense, and in August and September, they can darken the sky. As Redwings move from one Wild Rice plant to another, they shatter some of the seed, which is picked up from the mud by the Sora, Blue-winged Teal, Black Ducks, and

Wood Ducks. Later, when Wild Rice plants fall over, the Sora and teal can easily reach the grainheads.

## Wild Rice Growth Unpredictable

Wild Rice growth patterns in Patuxent River marshes have not been followed closely, but scattered observations provide historical snapshots. At the turn of the century, hunters set out in shallow draft boats each fall to hunt for the Soras gorging on Wild Rice in the marshes near Mataponi Creek. Abundant Wild Rice grew from Jug Bay to Nottingham (six miles south of Jug Bay), and stands extended downstream to Whites Landing (10 miles south of Jug Bay), according to a U.S. Department of Agriculture survey. In 1982, abundant Wild Rice grew between Route 4 and the southern end of Jug Bay, according to wetland inventory maps prepared for the Maryland Department of Natural Resources. The southern edge of Wild Rice stands had retreated upstream to Nottingham.

Apparently, Jug Bay is among only a few spots experiencing a serious Wild Rice decline. Wild Rice stands in other tidal areas of the Chesapeake Bay system and in the marshes of New Jersey show no signs of decreasing, according to wetland plant scientist Dennis Whigham of the Smithsonian Environmental Research Center. And Kearns recently heard many Soras calling from hundreds of acres of Wild Rice on the Chickahominy River in Virginia.

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Wetland plant studies at the Sanctuary reveal just how much Wild Rice growth varies from year to year. Wild Rice is often present, then absent in the same marsh transects during consecutive years. In 1988, no Wild Rice grew in plots located just off the middle section of the marsh boardwalk. By 1990, rice appeared and became abundant. It was sparse or missing in the plots in '92 through '94, present in '95 and '96, thinning in '97, and absent in 2000.

Wild Rice depends upon annual seed germination to reproduce, unlike the more prevalent perennial marsh plants, which propagate through extensive root systems. This member of the grass family grows in areas of the marsh where water depth varies between a few inches to several feet. Shoots emerge in May, growing rapidly and towering to ten feet by July and August. Between June and September, female flowers form on broomlike branches at the top, while the male flowers hang below. The wind or Red-winged Blackbirds moving through the stands carry pollen from nearby plants that fertilizes the female flowers. Seeds ripen from late August through mid-September. In contrast to

commercially harvested Wild Rice grown in northern Minnesota, the variety at Jug Bay drops its seeds so quickly that it has no commercial value.

Many conditions shape the roller coaster of Wild Rice growth, including water quality, weather, and predation. Sediment borne by the river may be one cause of the long-term decline in Wild Rice. Scientists believe that sedimentation has gradually raised the level of intertidal areas of Patuxent River marshes, creating more favorable growing spots for plants like *Phragmites* (the Common Reed). For example, in the 1930s, a pure stand of Wild Rice grew in the marsh on the north side of Hill's Bridge on Route 4, according to Meanley. The gradual accumulation of sediment from the river has created a habitat more suitable for shrubs.

The vagaries of weather also affect Wild Rice growth patterns. Biologist Court Stevenson of Horn Point Environmental Laboratory noted a resurgence of Wild Rice last summer in tidal freshwater marshes of the upper Choptank and Nanticoke Rivers. He attributes the change to increased freshwater flow and higher water levels during last year's wet summer. Indeed, more rice appeared last year at Jug Bay than in previous dry summers. Higher water may create new primary nursery areas for Wild Rice seeds, Stevenson believes.

If seeds escape consumption and germinate successfully, the young Wild Rice plants can still be grazed. The bright green shoots are delectable morsels: tender, low in cellulose, highly digestible, and energy-packed. Since the mid-1990s, Sanctuary director Chris Swarth has observed resident Canada geese gorging voraciously on Wild Rice shoots in the spring, cropping and even plucking entire plants. (Migratory geese have returned to Canada by this time.) Experiments with wire exclosures placed in the marsh by Kearns as Wild Rice shoots emerge show striking results: thick stands of Wild Rice grow within the exclosures, surrounded by bare mud outside the wire boundaries. Though Kearns has not entirely ruled out grazing by carp, he believes that consumption by fish is limited to a few weeks following germination; resident geese continue grazing for longer periods until the plants have outgrown their reach.

## The Economics of Seed Production

A thick stand of Wild Rice at Jug Bay produces over 1,000 pounds of seeds per acre, according to Kearns. Three or more panicles (branched flower clusters) on each plant bear, like chandeliers, an average of 600 dangling seeds. Many plants grazed by geese produce only one panicle, says Kearns. As a result, seed production is reduced by about two-thirds. In the fall, before the ripening seeds have dropped, Red-winged Blackbirds descend to devour their pre-migration feast. As the remaining black seeds fall, needle-like tails guide their descent directly into the mud, where they are anchored by bristles on the hull. Many are consumed by Sora and ducks before they can germinate. Lowered seed production and consumption of most of the seeds by hungry birds leaves few seeds to germinate the following year. Though seeds

## Resident Geese Thrive

The honking of Canada Geese as they fly overhead in chilly winter air is a common and beautiful sight at Jug Bay. Most of the geese seen here in the winter migrate to Canada in the early spring, where they nest and raise their young. A population of resident Canada geese, however, stays year-round. Over the past two decades, the nonmigratory geese population has grown to over one million along the Atlantic Coast. In Maryland, resident Canada Geese originated from the release of decoy flocks and from government stocking programs during the 1930s. Gradually, these geese adapted to the excellent habitats provided by humans—including golf course, lawns, and sediment ponds. Because many resident geese inhabit areas removed from hunters and do not experience the hardships of long migrations, they have a higher survival rate and live longer than migratory geese. Resident geese also tend to breed earlier in life, lay larger clutches of eggs, and nest in more a hospitable environment than migrant geese do. Tolerant to human disturbance and

nesting near other geese, resident geese require less habitat for nesting. As a result, resident geese populations are currently growing at an average rate of 14 percent per year.



When protected from grazing by geese, Wild Rice flourishes in Jug Bay marsh.

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may be viable for two to three years, a pattern of heavy grazing and seed consumption over long periods can eliminate Wild Rice entirely from areas where it once grew.

How will the disappearance of this vast food source affect migrating birds? Kearns has followed a decline in Soras at Jug Bay that mirrors the Wild Rice decline of the last 20 years. Whether the Soras are going elsewhere to feed or perishing on the long flight to Venezuela because their bodies aren't properly fattened is uncertain.

## A Course of Action

The situation, local resource managers feel, is urgent. Recent aerial surveys indicate that the resident Canada Geese population at Jug Bay is 300 to 500, and growing. "We need to inform the public and get them to act on it," Kearns says. "If we want to save the Wild Rice, the numbers of geese need to be reduced by a third or a half very soon."

How can populations of these creatures—the invasive cousins of beautiful geese flocking through autumn skies—be limited effectively and humanely? A promising option is birth control. Aware of the problems created by resident geese, the U.S. Fish and



**Greg Kearns checks wire enclosures protecting Wild Rice plants.**

Wildlife Service (USFWS) has developed strict guidelines and a permitting process for "addling" eggs. Addling involves coating the goose egg with vegetable oil, which prevents exchange of gases through the shell and stops egg development. The eggs may be coated with oil within 14 days after incubation has begun.

Anne Arundel County has obtained a permit to addle eggs in order to limit resident geese populations in its parks. The directors of Jug Bay Wetlands Sanctuary, Patuxent River Park, and Merckle Wildlife Sanctuary have agreed to work together to addle eggs when resident geese nest this spring. Under permit regulations, they are required to keep accurate records and report the success rate of addling to USFWS.

"[Resident geese] are beautiful birds, and people have an aesthetic attraction to them," says Brian Woodward, Natural and Cultural Resources Division Chief at the Anne Arundel Recreation and Parks Department. "We're not advocating killing birds, but reducing their growth rates." If the parks are successful, maybe more Wild Rice plants can escape grazing at Jug Bay and produce their lode of nutritious seeds. Given a chance, maybe a few lush stands will come back, and with them, the Bobolinks and Soras.