THE GREAT BLUE HERONS
OF NANJEMOY, MARYLAND

PREPARED BY: STEVE CARDANO
CALVERT R. POSEY, SR.
PRICILLA MINNICH
PAULA BATZER
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A PUBLICATION BY THE
NANJEMOY CREEK ENVIRONMENTAL EDUCATION CENTER
BOARD OF EDUCATION OF CHARLES COUNTY
LA PLATA, MARYLAND

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* The Nanjemoy Heron Rookery is located on property owned by The Nature Conservancy. Groups can not enter the Rookery at certain times during the year. All other times groups must make reservations by calling Reserve Manager Mr. Calvert R. Posey, Sr. (301) 743-5079.
ON A PLATFORM OF sticks high in the top of a spruce tree sat
a great blue heron. She was the color of the sea at dawn. Beneath
her breast lay five large eggs with shells of ancient blue-green, nearly
ready to hatch. She ruffled the feathers of her huge wings and drew
them closer about her. Spread, her wings spanned a full six feet. Her
powerful bill could crush almost any adversary, yet she was uneasy.

Two black forms had been stealthily slipping through the darkness
of the spruces, ever closer to the big shaggy nest. Although she kept
her eye on the pair of ravens hopping silently from branch to branch,
they did not really worry the heron. She could handle them if they
came too close. What bothered her was the boat that had crossed
the bay and circled her small island several times. A man had
beached the boat and was walking his way through the trees where
the heron nests were.

She could catch an occasional glimpse of the intruder. She was
familiar with the human form, but the alien silhouette of the knap-
sack on his back may have contributed further to the heron’s unease.
However, she had never had a direct interaction with man, so she
was able to sit tight. She held her head high, eyes glaring alertly,
head cocked tautly. The crack of dry branches on the ground told
her his footsteps were coming near. Carefully she shifted her weight
over the eggs. She raised the feathers of her crest, arched her neck,
stretched for one more look, and then drew her head and long neck
down flat against her back.

Below her the ground was carpeted with spruce needles stained
white with the droppings of all the herons which came to this island
in Penobscot Bay on the coast of Maine. Here the great blue herons
for miles around came to roost at night and to build their nests and
raise their young.

The man who was making his way in the shadows of the spruces
grimaced at the strong smell of the droppings which whitewashed
the rocks and trees. Then he smiled, for he could see the heron and
her nest silhouetted above him. He smiled, for he came in peace.

The man shifted the camera he was carrying to his shoulder and
began to climb the tree beside the heron’s nest. He chose this nest
from all the others because it stood at the outer edge of the group
of nests in the herony. He did not wish to disturb the birds.

Slowly, the man pulled himself up from branch to branch. He
proceeded cautiously, because many of the branches would not bear
his weight. The lower branches had died because the sunlight no
longer reached them; nearer the top of the tree the limbs had been
killed by heron guano. The spruce was treacherously slippery with
the wetness and the growth upon it. Nearly all the branches carried
old-man’s-beard, a greenish-gray lichen. It hung in wisps from the
damp dark limbs; rain that never fell, flourishing in the Maine
fogs.

Higher and higher climbed the man, smiling all the while at the
heron. He did not see the two black ravens, darker than the shadows
around them. He had eyes only for the heron on her nest.

She glared at him and flattened her body over her precious eggs
a bit more. Her heart pounded against the shells.

The man inched his way along the last limb that was big enough
to bear him and his camera. He sighted through his camera and
thought happily about the fine photographs he would have. He loved
the bay and admired the great herons he had so often watched
feeding in the coves. He was delighted to have discovered the island
nesting place of the great blue herons.

Awkwardly he groped behind him for the light meter he carried
in his knapsack. His arm brushed a dead branch, breaking it with a
loud snap.

The heron could remain frozen no longer. She exploded from the
nest and wheeled away into the air in alarm. As the two hungry
ravens flashed up to the unprotected nest the man watched in
helpless horror. Each raven gave an egg a quick blow with its power-
ful beak and carried away a dripping shell.

The air rang with the disconsolate-sounding cries of the heron
circling above. She could not master her fear to return to her nest.
GREAT BLUE

The photographer realized it was his doing that the coast would know fewer of the wonderful great blue herons this summer. He climbed down through the clawing spruce branches, made his way back to the boat on the beach, and headed out to sea with a heavy heart. The croaking cry of a raven came across the water to mock him.

The heron spread her dusky wings to brake her flight and landed her long legs onto the edge of the plundered nest. She studied the fragments of shell and the smear of albumen that was all that remained of two of her offspring. As she settled herself gently down on the remaining eggs, she heard the first faint peeps from within them. In these eggs still beat the hearts of herons to come, and perhaps she could raise three.

A few months ago, the cold winds of April had blown across the gray waters of the bay, and patches of snow still lay in the shade of the spruces when the herons had come back from the south. Sky-blue hepaticas were blooming promises of spring. Robins were back; noisy flocks of red-winged blackbirds filled bare treetops and boiled up from barren fields. Long lines of Canada geese came honking by in the night.

In the pearly light of dawn the herons had danced together on the mud flat of the cove across from the island. At least it looked like a dance. Groups of herons—loners for most of their lives—stood near one another on the icy flats. As birds approached each other they found themselves rebuffed by mildly hostile signals. A few days later male herons chose a nest site, usually an old nest which over the years may have become quite substantial. Some, chiefly younger birds, had to accept less desirable locations in the treetops on the edge of the circle to build their rickety platforms.

Each male defended his nest vigorously against all comers, even the females. Eventually these bachelors accepted a female, but at the first, theirs was a very tense relationship. Again and again the male would stab at the face of the female, who would draw back her head.
Herons land amid range controversy

By James Hetlinger
Staff Reporter

As they have every year since the mid-1940s, the great blue herons descended on Nanjemoy in February. An estimated 2,000 of the prehistoric-looking birds—with long, bony legs, small bodies and 6-foot wing spans—began swirling around Nanjemoy Bay to nesting sites near Nanjemoy Creek, home of one of the Atlantic Coast’s largest heron rookeries.

The birds, according to Nanjemoy resident and rookery manager Calvert Posey, have been going about business as usual for the last six weeks: fixing their treetop nests, fattening up to feed on “trash fish” from local waterways, and waiting for their young to hatch in April and begin flying in June.

But this year, when the herons came north to the area they call home from February to July, they landed unknowingly in the middle of a heated debate over a firing range proposed for a site near their rookery.

The St. Charles Sportsman’s Club wants to put a 151-shot shotgun, rifle and pistol range about one mile from the rookery, on a 114-acre, heavily wooded site adjacent to several houses in Nanjemoy.

Local residents object to the proposal, fearing it will create bothersome noise, endanger children and animals, and interfere with the heron’s nesting grounds. The heron’s possible reaction to purse noise both admit it is difficult thing to predict, and emphasize the need for caution.

Whether the firing range will disturb the birds “can’t be proved by either side,” said Mary Droge, land steward for the Nature Conservancy, a nonprofit environmental organization that owns the 200-acre preserve containing the rookery. “It’s ridiculous to us to say that the range shouldn’t be there,” Droge said, but “we just don’t want to take a chance. There’s a potential for it to be there.”

See Herons, A4

Four feet tall, with enormous wings, spindly legs, sharply curved necks and pointed bills, herons would not look out of place in a moat or a historic site. They are the official county bird.

The peristrodactyl-like creatures also feel right at home in a Charles County, where they nest on hundreds of acres each spring and summer. They are the official county bird.

The great blue heron rookery near Nanjemoy Creek—with 2,000 nests in the tops of trees and poplar trees, spread over a 3-acre area— attracts about 2,000 birds from February to July. It’s the largest heron rookery in Maryland, containing approximately 25 percent of the state’s breeding population, and is believed to be the East Coast’s largest such nesting ground north of Florida.

The birds have been nesting in Nanjemoy since the mid-1940s, according to rookery manager and longtime Nanjemoy resident Calvert Posey, who believes he was the first person to notice their presence. Over the years, the colony “has gotten bigger and spread out,” Posey said, estimating that the colony originally contained 150 to 200 nests.

The herons once nested along Mill溪 Creek, but were driven off by a combination of gleaning and hunting. They relocated to Nanjemoy, Posey said, because of the site’s isolated nature and proximity to feeding areas in the Patuxent River and several creeks. The Nanjemoy rookery was threatened by development in the late-1970s, but saved when the Nature Conservancy, a private environmental organization seeking to protect ecologically important areas, purchased the surrounding 200-acre preserve.

Though great blue herons are not particularly rare—and actually quite plentiful in the

Pterodactyl-like birds call Charles, County home

See Herons, A4
Herons

The sportsman’s club, meanwhile, doesn’t think its range will have “that much of a detrimental effect on the wildlife” or create “that much of a problem,” according to publicity director Danz Mitchell. Be noted, though, that the club will definitely be one of the environmental experts, and find another location if the Nanjemy site is judged unsuitable. “We’re conservationists first,” Mitchell said. “We definitely are not going to move down there and infringe on the birds in any way.”

Droge suggested an “acceptable compromise” might be for the club to keep the range closed from February to May, the time the birds are “most vulnerable to noise” because of mating and early broodhood activities. Young birds, Droge noted in a Feb. 12 letter to the zoning board, “will jump out of their nest to their death if agitated or startled.”

The club has requested a seven-day-per-week, dawn-to-dusk operating schedule to accommodate members who work odd days and hours. Club attorney Stephen Braun told the zoning board Jan. 24 that the sportsman’s group has “limited resources” and “can’t compromise on days or hours.”

Mitchell expects the range to be used for the average of 6 to 10 hours a week, with most activity taking place on weekends, and the busiest times being several weekends of organized shoots and marksmanship programs. The club plans a maximum of 15 firing points, and anticipates no more than 30 people shooting throughout a weekend, Mitchell said.

Assuming that “wildlife are adaptable,” Mitchell said deer and possibly some small birds will wander along trails near the club’s proposed firing range on Pinney Church Road in Waldorf. Great blue herons are not an endangered species that has failed to adjust to human activity, and might be able to forge a similar coexistence with the Nanjemy firing range, he added.

“Posey is not so sure,” Mitchell said. “He knows how they’re going to react,” he asked, maintaining that the heron colony now in Nanjemy once nested near Maltawoman Swamp, but left after the area became popular with hunters. “Herons have ‘survived’ some instances of noise intrusion, but have been unable to adjust to others, according to Chandler Robb, a wildlife biologist with the U.S. Fish and Wildlife Service.”

Firing range supporters point out that the Nanjemy herons currently live with noise from the Indian Head, Dahlgren and Quantico military bases a few miles away, as well as a sportsman’s club that hunts on property adjacent to the rookery.

But the 25-member Buckhorn Bow and Gun Club that has leased property near the rookery since 1961, mainly for hunting and cookouts, does not shoot there from February to September, according to president Blake Yoder.

And though the noise generated by the military bases is “quite a boom,” it’s “a different kind of boom than you would get from firearms,” Posey said. The sharp crack of gunfire, he noted, might have a more detrimental effect on the herons.

Firing range detractors say the location of the range is optional, while the location of the rookery is not. Mitchell countered that the St. Charles Sportsman’s Club, which seems to have a Waldorf location it leases because of the coming expansion of St. Charles, has been actively searching for a new site for two years, and has discovered that affordable, remote locations are hard to come by. The club, he said, “is not basically a bottomless pit as far as money goes,” but is competing with wealthy developers in its search for land.

So the questions of how to satisfy both the sportsman’s club and local environmentalists, and how best to protect a unique nesting ground, remain unanswered, with some expert opinions expected to be voiced at the April 11 zoning board hearing.

The great blue heron rookery “is something special on the whole East Coast,” and “one of our prime nesting sites in Charles County,” said Posey. “I don’t want something to come in and destroy it.”

The sportsman’s club has no intention of doing that, Mitchell said, noting his organization wants to protect “the habitat” and shares the “same basic intention” as the environmentalists. “The two groups have no goal is sight, Mitchell added, and just have to get there together.”

Home

Chesapeake Bay region — the Nanjemy rookery is significant because it represents “such a concentration of nesting herons ... it’s so important to so many birds,” according to Maslow, a land steward with the Nature Conservancy.

Pairs of herons come north to mate, fittingly, around Valentine’s Day each year. Posey believes they determine the time of their arrival, and arrive so consistently within a few days of the swallows’ holiday, by observing the lengthening days rather than temperature changes.

Upon arrival, the herons fix their large treestop nests, which measure up to 3 feet in width, with new sticks and twigs. After a noisy mating period during which they puff their plume feathers and vibrate their wings, the birds begin to down to hatch three to five eggs each nest. Young birds begin appearing 9 to 12 weeks later, Posey said. Many young herons, he added, leave the nest too soon, and die as they attempt to reach a feeding area.

Herons “will nest close together, but they spread out over a large area to feed,” Posey said. It is not uncommon to see several heron nests packed within a single tree, but when it comes to feeding, each pair likes to have its own quarter mile of waterway, he explained.

Eating such non-commercial fish as white perch and young blue crabs, they catch by wading into streams and plucking from the water with their long beaks, herons feed over a 3-mile radius from the Nanjemy rookery, Posey said. Young birds, who must stay in the nest in order to receive food, are fed by their parents, who regurgitate directly into their mouths, Posey added.

When the herons leave Nanjemy in July, they spread out over the whole East Coast, Posey said. Those that go north initially head south when the weather turns cold, before returning to Nanjemy the following February, he added.

The herons are notoriously skittish creatures who are particularly sensitive to people walking beneath their nests, Posey said. Access to the Nature Conservancy rookery is limited to field trips between mid-May and mid-June.

The birds, whose breeding dates are smaller than an average chicken’s, look awkward standing in their nests, but extremely graceful when flying. Their 6-foot wingspans enable them to climb through the air while moving their wings slowly, with little apparent effort.

Great blue herons are actually more gray than blue, while their blue European counterparts, for reasons unknown to Posey, have been labeled great gray herons.

Though the size of the rookery has increased each year, Posey expects it to begin slowing as a “saturation point for the feeding area” is reached. He noted the rookery local has a problem with bird droppings, causing as nitrogen from bird droppings kills tree housing heron nests.

— James Hettinger
Blue herons get winter home courtesy of commissioner

Reflections of yesteryear

by Ann Vazza
Community Editor

10 years ago

Blue herons get winter home courtesy of commissioner

The new building should be ready for occupancy by Christmas of 1984, the pastor, the Rev. William J. Michelman, S.J., reports.

Holiday babies born: A future member of the La Plata Volunteer Fire Department was born at 7:40 p.m. Dec. 25 to Chief and Mrs. John Matthews at Peacehaven Memorial Hospital.

The little girl, their first child, weighed 6 pounds 11 ounces and will be named Mary Agnes.

Christmas babies were born Christmas Day (Dec. 25) to Mr. and Mrs. Charles Nettles of Waldorf, a son, at the La Plata hospital that serves all of Charles County.

Dances benefit teens: Firemen of the Waldorf Volunteer Fire Department have taken on a project designed to give the youngsters of the Waldorf area a good time and earn some funds for the fire department by sponsoring a Teen Hop every other Friday evening in the Waldorf Firehouse.

Baltimore Sun

Maryland Independent
January 6, 1984
Page 3A

20 years ago

Two in inauguration ceremonies

Both Steve Poles and his brother Paul, will participate in the presidential inauguration ceremonies.

Steve, an Army OCS candidate at Ft. Belvoir, will be at the President's Honor Guard in the inaugurating ceremony which will be led by the president and also render the 21-gun salute as President Nixon enters the White House.

Paul, a member of Engineers Post 84, an Eagle Scout and a member of the Knights of Columbus, will be one of 400 Scouts who will form the President's Honor Guard around the president's box during the inauguration.

Only the eagle scouts participate in the ceremony. Following the inauguration, both will act as hosts of the inaugural ball.

Maryland Independent
January 20, 1964
Page 1A

10 years ago

Teacher group raises $12,000

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Co-chairmen for the successful program, which has drawn crowds averaging around 150 teenagers, are Joe Viering and Wayne Hamilton.

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GREAT BLUE HERONS: SURVIVING IN SPITE OF CIVILIZATION

By Amy Weather
Washington Post

T
city dwellers, who feast their eyes on plucky house sparrows and pigeons,
incept to think of a great blue heron taking flight on the Chesapeake Bay is a

They are arguably the most regal of

The great blue herons average

span is six feet and their compact bodies

size. Behind their eyes flash jet-black

plumes. No is the best time to see these birds in

flight, as thousands make their migratory

journey from wintering in the southern

states to the northern marshes of the

country.

Near the banks of Nantucket Creek, the young ones test their wings while balancing

on the edges of their mother's wings. After a few

weeks, the birds take off on their own,

flying gracefully. Occasionally, they make

low passes over the forest floor.

See BLUE HERON, Rb, Oct. 1,

Pickup Spot

In the Dr. Gridlock column June 24, a reader complained about the

danger caused by cars on 15th Street near the Washington Monument. The

penalty for speeding in these areas is $25. In response to the complaint, Chief

District Traffic Engineer George Schmeck and the city are considering

two alternative solutions: a second route on 14th and 15th Street between

Pensylvania Avenue and Constitution Avenue NW and a second route

in the 1400 block of Madison Drive.

Schmeck asked readers for

comments and suggestions. Some of these, which are not sent to

Dr. Gridlock, follow:

While I do not believe that the pickup area causes

anywhere near the

disturbance or danger caused by cars

blocking the

intersection of 14th Street

and Constitution

Avenue, or by moving the

lights, I'd concede

that traffic flow might be

improved by moving the pickup

area.

Of the two, I think the

most logical and convenient

would be the 1400 block of Madison

Drive. This would allow

to continue to use the 15th Street

route and to take advantage of

the left turn allowed at 15th

Street. Traffic flow would be

lighter on Madison Drive and the
distance the

riders would have to walk

would be reduced.

The other location is far

more convenient because the

block is often filled with

metres and tonnes.

Regal Blue Heron Kingdom Manifests, Survives on Bay

BLUE HERON, From 81

The kingdom of the heron spans nearly the entire coastal United States, but the Chesapeake Bay region is home to a huge population; at last count, Maryland reported 27 colonies and Virginia, 34, for a total of more than 7,000 heron pairs.

New Jersey is considered the largest rookery, or breeding site, on the East Coast, north of Florida. Female herons choose mates each February and stay with them until the breeding season ends in July.

Because the herons are colonial birds that dwell in trees "apartment style," one catastrophe could cause extensive damage to the whole colony. "A single event, man-made or natural, in the New Jersey rookery would wipe out one-third of the [Maryland] population," said Glenn Thores of the Maryland Department of Natural Resources. "That's why we're starting to pay more attention to these critters."

The 286 acres that make up the New Jersey preserve were bought by the Nature Conservancy, a private conservation group, 10 years ago after the area was threatened by logging interests. As the first project of its kind, the conservancy drummed up area support through the "Save a Nest Program," which became the "spark that got the conservancy going in the state," said Wayne Klockner, assistant director for the Maryland/Delaware Field Office.

Years ago, heron plumes were high-priced crosses for ladies' hats. After heron hunting was outlawed in the United States in 1918, the depleted population quickly rebounded.

Still, there are modern-day threats to the nesting environment such as logging, development and pollution, as well as nature's own logger, the beaver.

Nowhere near endangered, in fact, downright common, the great blue heron can be spotted on virtually any shoreline of the bay and its waters.

Erika Wilson, a biologist at Audubon Society nationalist, cites the size and productivity of the bay as reasons behind this population boom.

The Chesapeake Bay is one of the largest estuaries in North America. And the general improvement in air and water quality has helped the food supply," she said.

Since heron hunting was outlawed, the biggest problem confronting the creatures is the loss of nesting habitat, Thores says. "The nature of their breeding habits is that they concentrate in small areas, versus robins or robins, he said.

Maryland is doing more than paying po- lice attention to the birds. This summer, the Chesapeake Bay Critical Areas Law takes effect. The statute will provide protection for the herons and Maryland's endangered habitats. The state is exploring possible expansion and development in the bay region.

In July, the rookery is nearly abandoned. Empty nests and skeletal of ill-fated baby birds that toppled from their nests mark the breeding site.

There are a few latecomers though, pairs of birds who arrived after the great influx of mid-February and are still raising their young. And there is Cal Posey.

It was Posey who made sure that the herons would have a place to which return. He approached the Nature Conservancy with the idea that New Jersey was an ecologically valuable site worth preserving. Now he's the site manager for the rookery.

"I keep watch," he said, "and see that the herons aren't disturbed.

Posey, 61, has been watching the New Jersey herons since the mid-1940s after a nearby swamp where they nested became a pig farm and the birds moved en masse to the site at New Jersey. Every year since then, the herons have returned.

When exactly they appear is still a mystery. Although Posey can predict almost to the day when the herons will arrive, he has never actually seen them fly in. It's usually around Valentine's Day. One day nothing's there, and then they're everywhere. It's an explosion of birds.

"Since 1950, the population has doubled," he said. "This year there are 1,400 nests."

Posey is a firm believer in the conservancy's philosophy of hands-off preservation. Often this means ignoring hundreds of baby herons that, after falling from their nests, are abandoned by their parents and face certain death. Posey recognizes this as "part of the natural order.

One time, however, a member of a group field trip he was leading persuaded upon him to save a crippled heron. So he fed it and nursed it through the winter.

"This bird used to sit on the porch steps and wait for me to come home," Posey said.

Normally herons are feared by humans because they are generally not approachable, but Posey said he was able to approach the bird.

"Every now and then there's a familiar bird on the road," he said. "I think it's the rookery coming by to say hello."

Favorite Pickup Spot for Va.-Bourgeois

GRIDLOCK, From 81

access to the express lane would be the Ninth State Street and that is farther out than the drivers, as is 10th Street.

Whichever location is chosen, I would hope for fair warning. Having the D.C. police ticket drivers now with no alternative, is prohibitive and unfair.

DAVID G. PAYNTER

Springfield

Dear Mr. Schoene:

I urge you to help caution like myself keep the streets that serve us and the city so well. At present, I can get home in 35 minutes. Should the car pool be abolished, I would have to take a bus and the Metro at a cost of about $1,000 a year ($4.20 per day; $21 per week).

For a single parent like myself, this represents a considerable saving of time and money.

I would prefer the new location at 10th and Pennsylvania. However, I would also like to go on the record as saying I would go almost anywhere in the 14th Street area to pick up the car pool.

I hope you will be able to help hundreds of people like myself who rely on this fast, convenient and cheap transportation daily.

DONA DE SANCTIS

Springfield

Dear Mr. Schoene:

I have been a rider and a driver for the past five years and in fact, the situation has been thoroughly researched by an independent individual or team, it would be immediately clear that the brief stops [to pick up riders] don't begin to compare to the length of time the Metrobuses stop.

Isn't that what really the problem here? It isn't that Metro is complaining about all that lost revenue. Why does everyone in Washington refuse to see the benefit to the District, in terms of thousands of fewest auto emissions into the already nightmarish road system? A drive anywhere from the 14th Street bridge to K Street, the Capitol to the River, is nothing but one big obstacle course of blocked lanes and bashed asphalt.

But back to the 14th Street/Constitution Avenue pickup spot . . . . The alternates suggested will not work because the drivers will have to go through so many more turns and hassles to get to them and back [to] the express lanes that they won't have saved themselves any time. Who is this supposed to help?

All it would take is a change in the sign at that particular spot to read Car-Pool Pickup, One Minute [or 30-second] Limit.

As long as right turns are allowed onto Constitution Avenue at 14th Street, the present pickup spot doesn't hurt anyone but it helps thousands.

ALICE M. TAYLOR

Springfield
THE FIRST EDEN

The Mediterranean World and Man

Program 1

Student Handout 5


Birds are some of the most beautiful and entrancing creatures to study. The Mediterranean is a rich laboratory where it is easy to study the relationships between birds and weather, soil, water, insects, mammals and humans. Birds are a class of vertebrates called Aves, which are believed to have evolved from small dinosaur-like reptiles.

The characteristic that separates birds from all other animals is feathers. Both our fingernails and birds' feathers are made of keratin. This hard, lightweight material forms two kinds of feathers: the down feathers, which insulate the animal, and the stiff but flexible contour feathers, which are necessary for flight.

Many birds, like the bee-eater, grow a magnificent display of colorful feathers. To fly efficiently a bird should have bones that are strong yet light. Most bird bones are hollow or partially hollow, with braces of thin bone for support and strength. A sturdy, lightweight frame is strong enough to support large flight muscles and yet light enough for the bird to get off the ground.

Birds' large eyes help give them the best vision in the animal world (in some instances up to ten times better than human eyes). Some can see color and focus on objects near and far; others concentrate low levels of light for night vision. Since their eyes are almost fixed in their sockets, birds must turn or twist their heads to see in different directions. To judge the distance of a fleeing mouse, some birds—owls and hawks, for example—have eyes in the front of their heads, giving them stereoscopic vision.

Birds have special balloon-like structures called air sacs attached to their lungs. These store additional air to help burn food for energy. Birds require lots of energy for flight, and, being warm-blooded, for keeping their body temperature constant. Air sacs aid thermoregulation (body temperature control) and, in swimming birds, help the bird float.

But it is a bird's beak, wings and feet that tell us the most about its environment. In their varied shapes and sizes, beaks tell us what a bird eats and how it gets its food. Thick, heavy beaks are adapted to crunching seeds, while thin, narrow beaks are designed to snap up insects or puncture fruit. Eagles' hooked beaks are designed to tear the flesh of small animals, while flamingos' beaks are curved and contain filter plates through which they strain mud for food.

A bird's wings indicate the type of flight to which it is adapted. The bee-eater has short wings to make the quick turns needed to capture bees, while the stork has long, broad wings for soaring long distances. Fast flyers have long or narrow wings.

Even birds' toes are specially shaped and arranged to do different tasks. Eagles have strong, grasping toes for catching and holding small animals. A warbler's toes help it grip a perch. Birds can be classified into climbers, grappers, perchers, runners, scratchers, and swimmers by their toes.

BUILD A BIRD

Hypothesis: If a bird is living and flying in a certain environment, then it will be physically adapted to be successful in that environment.

Materials: colored pens or crayons, pencil, paper, scissors, tape or paste.

Procedure:
1. Read the fictional descriptions below. Choose one of them to build.
2. Cut out the beaks, feet, bodies and wings on the worksheet and tape or paste them onto a blank sheet of paper to form what you think the imaginary bird would look like. Or you may choose to trace bird parts from the worksheet onto a blank sheet of paper, fitting the parts together into a composite.
3. Color your bird to be consistent with the environment described. Keep in mind that male birds are generally more brightly colored than female birds.
4. After building your bird, share the results with a partner. Explain why you selected the beak, feet and wings you did. Base your explanation on the feeding and flying needs of your bird.

DESCRIPTIONS OF BIRDS TO BE BUILT:
1. The Leathertongued Aphvore: A compact bird that flies long distances from its breeding ground in Germany to feed on insects on Mediterranean shores. Perching on tree limbs, it waits for African killer bees to fly by.
2. The Great Spotted Moonling: This aquatic bird strains tiny shrimp from the sand along the edge of the Mediterranean. This long-legged bird spends most of its time flying to and from its other home in South Africa.
3. The Lesser Roderian: This carnivorous bird lives in the stubby trees on western Mediterranean shores. Feeding on mice, rats and frogs, this large bird soars in the thermals rising from the baking summer hillsides.
4. The Spanish Rockwren: This small, seed-eating bird, commonly known as the "nolli," runs across flat rocks and over the ground unless forced to fly. Its body is capable of flying only short distances. Its heavy leg muscles make good eating for its enemies.
5. The Norway Rapdlo: This small bird can fly at speeds of over 100 mph. Maneuverable enough to catch insects at high speeds, it feeds year-round at the western edge of the Mediterranean Sea. As it perches on the high cliffs, its keen eyes can detect insects in flight.
6. Your original creation: Use what you learned in this handout to write a bird description from your own imagination. Keep food and flight requirements in mind while writing your description. Examples of imaginary birds might include The Lunchbox Horrifico or The Spitting Wormicide. Or think of your own bird name and Build a Bird!
Title—Fill the Bill
Adapted from "Birds, Birds, Birds",
p.29 + 37

Name ____________________________
Grade/Period ____________________

Date ____________________________

Purpose—To investigate the advantages/disadvantages of bird bill shape for gathering a variety of bird food.

Materials—3 eyedroppers 3 fish nets rice stemmed cherries 4 pairs of chopsticks 3 tweezers puffed rice test tube 3 pliers 3 tongs 2 lg. containers, culture dish 2 lg. spoons small log grapes (or fake worms) walnuts 3 strainers popcorn oatmeal styrofoam chunks 1 fill the bill worksheet real bird heads string

Procedure—1. Rotate through the 8 stations and attempt to "feed" at each bird food station and record your success in the chart below.

2. Look at the real bird beaks and hypothesize their possible food and their adaptation to get that food.

Data/Observations—

<table>
<thead>
<tr>
<th>Station#</th>
<th>Food Type</th>
<th>&quot;Best Beak&quot;</th>
<th>Why it is the best</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
<td></td>
<td></td>
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<td>3</td>
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<tr>
<td>8</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

2. List the bird beaks, their possible food and the adaptation to its function.

1. 

2. 

3. 

3. Complete the attached fill the bill worksheet.

Summary—How are bird's beaks adapted to specific food types?
<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>NECTAR</td>
<td>WORMS IN THE MUD</td>
<td>SEEDS</td>
<td>FISH AND OTHER WATER ANIMALS</td>
</tr>
<tr>
<td>5</td>
<td>TINY WATER PLANTS AND WATER ANIMALS</td>
<td>FLYING INSECTS</td>
<td>CATERPILLARS AND OTHER INSECTS</td>
<td>FRUIT</td>
</tr>
</tbody>
</table>

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**Copycat Page**

**Fill the Bill**

- WHIPPOORWILL
- SNIPE
- TOUCAN
- WARBLER
- PELICAN
- HUMMINGBIRD
- GROSBEAK
- FLAMINGO
**ADAPT-A-BIRD**

- Cut and tape a bird into each habitat.
- Cut out body parts that will help each bird survive in its environment.
- Explain why you choose certain body parts.

<table>
<thead>
<tr>
<th>OPEN SPACES</th>
<th>DENSE FOREST</th>
<th>WATER ENVIRONMENT</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
ADAPT-A-BIRD BODY PARTS

BODIES:

NECKS:

HEADS & BEAKS:

LEGES: (Don't cut apart)

FEET:

TAILS:

Choose 1 body part from each box to make each bird.
Nest Count Methods

Each fall after the leaves have fallen, a nest count of the Nanjemoy Creek Great Blue Heron Rookery is conducted to determine the status of the Colony. This is usually between November 15th and December 15th, with a minimum of three persons in each party.

The rookery is divided into three or four sections that are naturally separated by stream valleys or other natural features. The group begins at a corner of their assigned section and moves across their area, methodically recording each tree in which nest are observed as to species of tree, number of nest, and the condition of each nest. Nest under a tree are also noted in remarks, but not counted for the given tree. Also, the health of the tree is noted if it appears unhealthy or is now dead. (See attached data sheet.)

The nest are given a numerical rating of from one to five as to size and condition. This may vary slightly due to the observer's interpretation. A map is also made to show where each tree is located in relationship to the entire rookery. A number is assigned to each tree for the purpose of identifying the position of each tree.
Suggestions For Field Trip Activities.

1. Reconstruct a fallen nest- Nests that fallen may be collected in large lawn and leaf bags and reconstructed back at the classroom by students.

2. Identify fish remains- with the help of a "Field Guide to the Atlantic Coast Fishes" a Peterson Field Guide Series, fish remains or whole fish may be identified during spring trips when parents are actively feeding young herons.

3. Heron behavior- can be recorded through observations of individuals at anytime when herons are present.

4. Tape recordings- a PARABOLIC microphone may be borrowed from the Nanjemoy Creek Environmental Education Center for voice recording of herons.
NANJEMOY HERON ROOKERY
GRAYTON, MARYLAND

(Hand-drawn map showing locations labeled 'Nest Area,' 'Hancock Run,' 'Hancock Run Road,' and directions to North.)
<table>
<thead>
<tr>
<th>Tree #</th>
<th>Species</th>
<th>Size DBH</th>
<th>Relative Size of Nest #1</th>
<th>Relative Size of Nest #2</th>
<th>Total #4 Nests</th>
<th>Remarks</th>
</tr>
</thead>
</table>
Nanjemoy Creek Heron Rookery

**EGG SHELL DATA**

<table>
<thead>
<tr>
<th>Shell No.</th>
<th>Equipment: Micrometer</th>
<th>Hatched</th>
<th>Predation</th>
<th>Shell Thickness</th>
</tr>
</thead>
</table>


Soil Test
Data Sheet

Equipment: Soil Science Outfit Model AM-31

<table>
<thead>
<tr>
<th>Station #</th>
<th>pH</th>
<th>NO3</th>
<th>PO4</th>
<th>K</th>
<th>Texture</th>
<th>Remarks</th>
</tr>
</thead>
</table>


SLIDE INDEX FOR GREAT BLUE HERON LESSON PLAN

35. American Robin’s Nest with eggs
36. Killdeer Bird at nest - ground nester
37. Bobwhite - male
38. Quail’s nest with eggs
39. Close-up of a Broadwinged Hawk
40. Yellow Billed Cuckoo Bird - front view
41. Great Horned Owl
42. Great Blue Heron’s at nest
43. Great Blue Heron
44. Great Blue Heron in foliage
45. Great Blue Heron in tree top
46. Great Blue Heron at nest
47. Great Blue Herons sitting and flying
48. Great Blue Heron sitting in tree
49. Young Great Blue Heron in nest
50. Camouflaged Great Blue Heron - close-up
51. Great Blue Heron at fishing area
52. Work of a Palliated Woodpecker
53. Mountain Laurel - close-up of blooms
54. Swamp Azalea - close-up of blooms
55. Scaly Blazing Star in bloom
56. Rattlesnake Weed - close-up of bloom
57. Downy Rattlesnake Plantain - orchard
58. Pickerelweed
59. White Footed Mouse
60. Burrow of a Groundhog
61. Groundhog or Woodchuck
62. Mink
63. Red Fox
64. Skunk
65. Shed Deer antler
66. Beaver
67. Beaver dam
SLIDE INDEX FOR GREAT BLUE HERON LESSON PLAN

68. Beaver pond
69. Tree felled by a Beaver
70. Beaver lodge
71. Beaver cutting on base of a tree
72. Larva of the Polyphemus Moth
73. American Holly with fruit
74. Winterberry
75. Running Pine (cedar) - common to Rookery
76. Tree Club Moss
77. White Perch - diet of Great Blue Heron
78. White Perch - diet of Great Blue Heron
79. Winter returns