MONMOUTH COUNTY PARK SYSTEM
GREEN HERITAGE
Now in its 50th Year...
The Newsletter of Monmouth County's Open Space, Parks & Recreation Agency
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THE STORY OF FISHERMAN'S COVE: How Locals Helped Create a Park

The very existence of this waterfront park along the Manasquan River shows how a group of determined residents, conservation groups and government agencies worked together to help save a one-of-a-kind parcel of land from development. It is a story unlike any other in the Park System's 50+ year history. Here's why…

Residents Rally to Preserve Waterfront

By the late 1970s, this marshy site was one of Manasquan's last remaining tracts of undeveloped land*. Some of it was owned by the town, while other parcels belonged to private owners, one of whom wanted to sell to developers. Many local residents saw value in protecting this land in its natural state, and hoped the town would preserve it instead.

This local interest spurred preliminary discussions for the town to purchase the land for open space. When these discussions eventually stalled, a group of very motivated residents from Manasquan and neighboring communities formed a citizen committee. Periodically working with environmental and conservation organizations, state and county governments and the mayor and council for the next 15 years, they ultimately prevailed against a formidable array of competing interests.

Instead of the proposed 200 or 400 unit housing developments, Fisherman's Cove is now a protected conservation area with marshes, beach dunes, and a maritime forest. It is home to many of the plants and animals that people associate with the shore; and for many species, it's a critical habitat for their survival. With 1,500 feet of riverfront beach, Fisherman's Cove is also an ideal place to sunbathe, fish, launch a kayak, or just walk along the water's edge and watch boats travelling to and from the inlet. It is also worth noting this is one of only remaining places along the shore where dogs (on a leash and within a restricted area) are allowed year-round.

*Portions were formerly used for dredge spoils (mud, soil and weeds that build up along the channel bottom over time). Channels were periodically cleared to keep the waterway flowing, and the "spoils" were dumped here, which affected the habitat.

Continued...

Aerial View of Fisherman's Cove (1982). Atlantic Ocean (top), Manasquan River inlet (top right), parking lot (upper left), Deep Creek roughly separates upland (upper right) from marsh (bottom).

Fisherman's Cove is a real cove—a small indentation or recess in the shoreline of the Manasquan River.

Note the classic saltmarsh grass species *(Spartina)*.

Dune grass *(Amophila brevigulata)* and seaside goldenrod *(Solidago sempervirens)* define the dunes along the river, before transitioning upland to thickets of woody shrubs and trees.

Upland areas have sandy trails that travel through juniper and cottonwood trees, bayberry and sumac shrubs, and some Queen Anne's lace.

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Bright colored beach rose (*Rosa rugosa*) can be found in marsh and dune grass at Fisherman's Cove.

Wetlands Worth Saving

How did this preservation effort finally succeed where so many others had failed? For one thing, there was an actual proposal on the table and the town was forced to make a decision one way or the other. Plus, after more than a decade of unrelenting pressure from local residents, strong and sustained support from environmental groups and land preservation agencies, identification by the state as an area of concern, and expressed interest by the county in purchasing this land (including formal leg work to appraise the site and secure funding), a very strong case had already been made for preservation.

Not only was this parcel one of Manasquan's last remaining open spaces, "the cove" (as residents called it) contained tidal wetlands. These wetlands are so critical to the local environment that they are protected from certain types of development because of their value as a flood/storm buffer and wildlife habitat.

- Wetland vegetation helps stabilize the shoreline from strong tidal surges and trap sediment and filter pollutants from the water.
- Wetlands serve as nurseries for shellfish and other marine species that impact the ecosystem all the way up the food chain to commercial and sport fish species of the Atlantic. Incoming/outgoing tides carry replenishing nutrients and organisms that make them an excellent feeding ground.
- Wetlands also serve as hatcheries for aquatic birds and this is one of the only protected coastal sites where they can feed and rest between Barnegat Bay and Sandy Hook (about 30 miles).

(top) The saltmarsh provides habitat for this oystercatcher pair, a snowy egret, a great egret and some humans. More than 70 bird species have been observed feeding, resting or nesting at Fisherman's Cove, one-third of which are species of special conservation concern. (bottom) Brants, a type of small goose, also enjoy the marshy waters.

It Took 15 Years to Protect 55 Acres

Even though this land was recognized as critically important, the preservation effort experienced some dramatic set-backs along the way.

Timeline of Events

1979-1980

- **Manasquan** begins talks with the **Park System** about preserving Fisherman's Cove.
- Residents take action by forming the **Manasquan Preservation Association (MPA),** later submitting a petition with more than 1,200 signatures. Local supporters will also be known through the years as the "Fisherman's Cove" and "Save the Cove" committee.
- Park System completes a FEASIBILITY STUDY (February 1980) to assess the impact of proposed development in accordance with current zoning† and recommends preserving the site: taxes would not cover the cost of all the new residents (schools, water, sewer, etc.) and development would remove a valuable and limited local natural resource with scenic and environmental merit while also adding pollutants to the nearby waters.
- **Manasquan Environmental Commission** and **Monmouth County Environmental Council** go on record supporting acquisition/preservation.

†Over the years, this property's zoning changed from Marine/Commercial to Conservation Area to Planned Unit Development, or PUD. PUD requires careful balance of waterfront land use with preservation, and that land be developed with one comprehensive plan—necessitating that the borough (who owns part of the Cove) would participate in any plans.

1981-1982

- Public meetings continue. The following suggestions are presented: further talks with environmental organizations to educate the public; ballot referendum to let voters choose PUD (see footnote p.2) or preservation; re-zone as a conservation area (so no one can build on it); place a deed restriction on the site to prevent development, etc.
- Negotiations begin with private land-owners assisted by the **NJ** and **Monmouth Conservation Foundations**. Discovery begins to secure funding (e.g. **state Green Acres Program**, beach revenue, donations, municipal bonds, etc.).
- Landowner submits CAFRA§ inquiry to build 400 townhomes (with marina, clubhouse and parking lot) on 62-acre site. State responds that proposal does not comply with coastal regulations to build near wetlands, etc.
- Town planners meet with state and county officials and conservation organizations to discuss purchasing the private property. The Park System offers to acquire the property with state Green Acres funding and awaits go-ahead from the town…but the go-ahead never comes. Instead, the town sends the issue back to council to form a committee to further study the acquisition.

1983-1990

- Local and county preservation efforts continue…

1991-1992

- In October 1991, an ENVIRONMENTAL CONSTRAINTS REPORT concludes that private landowner can develop 20+ acres of their 35-acre tract.
- In April 1992, town receives NOTIFICATION OF INTENT TO BUILD. Landowner applies to the NJ Council of Affordable Housing (COAH#) to build low/moderate income housing on 20% or 46 of a proposed 228 units. They also file a lawsuit against Manasquan for zoning changes to fulfill Mt. Laurel** obligations. (Developers may seek higher density zoning to provide more units of affordable housing.)
- Park System affirms interest in acquiring Fisherman's Cove in its natural state as open space in June 1992 after meeting with state Green Acres Program and Monmouth Conservation Foundation.

§CAFRA: Coastal Area Facility Review Act, state legislation requiring review of development plans in sensitive coastal areas/waterways.
#COAH: NJ agency responsible for administering the Fair Housing Act.
**Mt Laurel is a town in NJ about which state Supreme Court decisions were made that required municipalities to have zoning regulations that ensure affordable housing.

In 1997, Manasquan conveyed an additional 17 acres to the county (a parking lot which they still use during the summer), and another 3 acres of marshland were added in 2007, bringing the current total to 55 acres.

- **"Save the Cove" Committee** gathers a petition with 2,310 signatures and sets up a rally to block development.
- In early July, Manasquan Environmental Commission, **Jersey Shore Audubon Society**, and Monmouth Conservation Foundation submit letters formally urging the Mayor and Council to take every step possible to preserve "the cove."
- On July 1992, a "Save the Cove" rally was held to block development. Over 1,000 people attend.

Unwavering support from local residents proved instrumental in preserving the last parcel of open space in Manasquan.

1993-1994

- In August 1994, the *General Board of Proprietors of Eastern Division of NJ* files a lawsuit against the landowner, claiming the land is held under different title per a historic survey from 1884-1885. After months of investigation, Monmouth County informs Manasquan that the existing landowners have a defendable title.
- While the title investigation is going on, Manasquan argues before the state COAH board that Fisherman's Cove was already slated for Open Space and is not available for affordable housing …and wins. COAH gives the town one year to purchase the private property.
- Monmouth County Board of Chosen Freeholders puts together financing to purchase the first 35 acres of land for $5.1 million in 1995 ($3 million in county bonds, $2 million from state Green Acres Trust Fund [loan and grant]).

Scenes from Fisherman's Cove today…

Archaeology in the Parks: LOOKING BENEATH THE SURFACE

Gail Hunton, Supervising Historic Preservation Specialist

Archaeology has long played an important role in the planning and management of some of our nation's premier open spaces and historic landscapes. Artifacts, structural remains, and refuse deposits help define early human settlements, and tell us how our forebears lived and worked.

Think of places like the cliff dwellings of Mesa Verde National Park in Colorado, where archaeology has expanded our knowledge of the Ancestral Pueblo people who lived there for over 700 years. Or, the excavations at Monticello in Charlottesville, Virginia, that helped us envision the 18th century plantation landscape created by Thomas Jefferson.

Likewise, the Monmouth County Park System has long viewed archaeology as a practical tool for planning improvements and protecting our cultural resources. We have hosted five archaeological field schools at our sites in conjunction with academic institutions. The most noteworthy have been excavations at Turkey Swamp Park.

John Cavallo of Monmouth University leads an archaeology program at Turkey Swamp Park in the late 1970s.

Early Excavations Lead to Significant Discoveries

The Turkey Swamp Archaeological Site, located in Turkey Swamp Park in Freehold Township, is one of New Jersey's preeminent prehistoric sites; it includes some of the oldest know artifacts in the state.

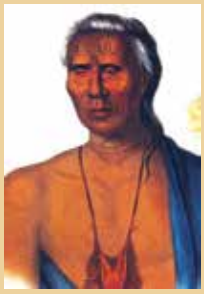
Early excavations (1974–1980) led by Professor John Cavallo and Sandra Bierbrauer of Monmouth University documented one of the first, and arguably one of the richest, prehistoric archaeological sites on the Outer Coastal Plain. The deposits they unearthed span almost the entire prehistory of New Jersey.

Archaeological Periods of North American History

Paleo-Indian (13,000 – 8,000 B.C.) – earliest known period of human occupation in North America; small, mobile bands of hunters lived alongside mammoth, mastodon, caribou, musk oxen, walrus, moose-elk, giant beaver, dire wolf and other large animals, now extinct or no longer found here. There's some evidence Paleo-Indians hunted smaller game (caribou, moose, elk and deer), while also foraging. Materials include "fluted" projectile points, most notably the Clovis point.

Archaic (8,000 – 1,000 B.C.) – seasonal exploitation of natural resources (hunting, fishing, gathering of wild vegetable foods) by small nomadic groups, and population expansion. Late Archaic characterized by specialized tools made with exotic materials, e.g. bannerstones (pictured), axes, adzes, stone knives, choppers, scrapers, drills, atlatl weights, etc.

Woodland (1,000 B.C. – 1,600 A.D.) – technological advances and development of a more sedentary lifestyle evidenced by large base camps and villages, perhaps occupied year round, and a mixed agrarian lifestyle. Materials include stemmed and notched biface projectile points, ceramics and other specialized tools.



Historic (500 years ago – Present) – includes first European contact (500-250 years ago) during which the Lenape occupied the region encompassing the Turkey Swamp site.

Portrait of Lappawinsoe,, a Lenape Delaware. Based on a 1735 oil painting by Gustavus Hesselius.

Discoveries include triangular **bifaces** (see Glossary) that helped transform ideas about the different types of projectile points (commonly know as "arrowheads") found in this region. Early research also pioneered the use of flotation (a soil technique that separates light and heavy materials, e.g. seeds and bone fragments), resulting in one of the most substantial macrobotanical collections taken from the Outer Coastal Plain. This early collection is also rich in Woodland Period pottery, which highlights the intensive occupation of the site.

Recent Excavations at Turkey Swamp Site

During the summer of 2015 we again hosted an archaeological field school at Turkey Swamp Park with Monmouth University. It was carried out over the course of five weekends by 16 undergraduate and graduate students and ten volunteers led by Professors Richard Veit and Sean McHugh.

The goals of this project were (1) to identify cultural resources in areas of the park under consideration for future improvements; (2) to identify the boundaries of the original Turkey Swamp site so as to better protect the site; and (3) to test a predictive model for locating prehistoric sites developed for the park by Monmouth University.

Monmouth University students beginning their day's work at the field school, 2015.

Evan Mydlowski, a graduate student at Monmouth University, excavating at the Turkey Swamp site.

Shovel testing in progress.

There were five study areas: four previously unexamined areas plus the original Turkey Swamp site that was first identified by Park Ranger and Naturalist Douglas Egeland in the 1960s and studied by John Cavallo in the 1970s.

- The five study areas measured 15.44 acres (within the larger 2,261 acre park).
- Prior to starting fieldwork, shovel test grids were laid out within the four testing areas and across the original Turkey Swamp site. Given the time allotted for the field school, a staggered 100-foot interval grid was utilized.
- The overall excavation consisted of 130 shovel tests and eight excavation units. All tests were hand excavated with shovel and trowel to sterile subsoil, with all soils screened through 1/4" mesh screen.
- A total of 1,477 artifacts were recovered and will be transferred to the Park System's archaeological collection.
- Monmouth University prepared a comprehensive report summarizing the fieldwork and findings, and cataloging all the recovered artifacts.

Two of the areas tested plus the original Turkey Swamp site contained intact archaeological deposits. One area contained small quantities of prehistoric artifacts, including a possible Jack's Reef biface from the early-middle Woodland Period. Another area contained extensive rich Late Archaic deposits, including diagnostic bifaces and a **bannerstone** fragment. Intact cultural features, including a large hearth, were present.

*Testing in one of the study areas revealed rich Late Archaic artifacts deposits, including this projectile point (**argillite** broadspear).*

*Professor Sean McHugh displays the fragmentary **bannerstone** suggestive of the Archaic Period.*

Testing of the original Turkey Swamp site revealed intact prehistoric deposits outside of the original excavation. Artifacts uncovered include flakes, thermally altered rock, projectile points, and pottery that dates from the Late Archaic through Late Woodland periods.

Archaeological resources in the parks are protected features. Unauthorized excavation and artifact collecting is strictly prohibited by Park System policy.

The Turkey Swamp site has the potential to continue providing new information about the prehistoric people who lived in the area before European contact. This is especially true in regards to technology, trade networks, and settlement patterns. The Park System looks forward to continued work with Monmouth University to analyze the artifacts and findings. We hope to install an exhibit about the Turkey Swamp archaeological site in the future.

Glossary of Terms

Argillite – A fine-grained sedimentary rock composed primarily of clay particles.

Biface – A type of prehistoric stone tool flaked (or chipped) on both faces or sides, suitable for cutting, sawing, piercing, drilling and chopping. **Broadspear** – type of broad-bladed biface that appears very late in the Archaic Period.

Bannerstone – Drilled stone objects that were probably used as weights on spear and dart throwers, known by their Aztec name as atlatls. They are believed to have helped increase accuracy and impact. They are often made with colorful and attractive stones and may also have had symbolic value.

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GARDENS & THE GREAT OUTDOORS

Interactions with nature don't always have to be well-planned, organized events. This is especially true when children are involved. Their innate sense of curiosity and energy are perfect partners for a spontaneous outdoor experience. Scrambling up rocks, touching a flower, or finding a hidden nook in the forest–these moments are the "stuff" of childhood—full of wonder, magic and imagination. Yet as simple as it may seem, many parents, educators and communities are finding it increasingly hard to connect children with nature. Why is this?

Deep Cut offers Volunteer "Drop-in" Days spring through fall, for when people feel an urge to get their hands in the dirt.

Finding Time to Get Outside

When Richard Louv's groundbreaking book, *Last Child in the Woods*, was published in 2005, he made the case that parent fears and the growth of technology (such as cell phones, tablets and gaming systems) have led to "nature deficit disorder." Children are increasingly spending time indoors, disconnected from nature. According to a 2010 Kaiser Family Foundation study, 8-18 year-olds devote an average of 7 hours and 38 minutes to entertainment media during a typical day (> 53 hours a week). Further, the rate of obesity in children aged 6–11 has grown from 7% in 1980 to nearly 18% in 2012, according to the CDC. Clearly, society can do better.

Knowing this, many responsible, well-meaning parents can easily fall into the trap of "forcing" nature experiences by cutting off electronics or telling kids to go outside and play. It sounds beneficial, but to a child it may have other meanings. In an interview with *Greater Good Science Center at Berkeley*, Louv says "parents can sometimes push too hard. Nature time should never be seen by kids as a punishment for, say, spending too much time in the electronic world."

Take a spontaneous stroll on the beautiful paths at Deep Cut Gardens.

Louv suggests that parents and educators look to themselves first. "When parents rediscover their sense of wonder, so do most kids," he says. Yet this sense of wonder doesn't necessarily spring from the intellect; it springs from our sensory experiences: touching a lamb's ear plant, smelling a handful of mint, watching baby birds in a nest. 'Felt moments' pave the way for true teaching and education that can make a real impact with children.

'Felt moments' pave the way for true teaching that can make a real impact with children.

Sensory input: Children stop to smell the flowers.

It Starts in the Garden

Louv says, "The quality of the nature experience depends on how direct the experience with nature is. Are kids getting their hands wet and their feet muddy?" Perhaps this explains why there is such a trend today connecting kids not just with nature, but with gardening specifically—digging in the dirt, planting seeds. At home, there are easy ways to foster your own sense of wonder, and help instill an appreciation and budding love of nature for children.

1. Make a fairy house at a moment's notice using only natural materials: sticks, bark, dry grasses, pebbles, shells, feathers, seaweed, moss, sand or pinecones.

Building a fairy house can be a crafty outdoor adventure.

2. Plan, then plant a garden with a theme, such as "rainbows" (*Planting a Rainbow* by Lois Ehlert) or "pizza" (plant a circle of oregano, basil, parsley, tomato and peppers).

3. Plant giant sunflowers. These large, showy blooms (12-16' tall) are easy to grow in full sun with well drained soil. Fertilize regularly: for a large flowerhead, start with high nitrogen, but switch to a high phosphorous formula as the plant reaches its full height, says the Garden's Network.

4. Plant shrubs and flowers that attract birds, butterflies, bees, and more: butterfly weed, paintbrush zinnia, verbena, cosmos and marigold.

There is nothing like the thrill of planting butterfly weed (the native, ORANGE species only–Aesclepias tuberosa), and later seeing a butterfly land on it to feed.

5. Read books about nature and gardening. Visit the library inside the Deep Cut Horticultural Center for some expert recommendations.

6. Plant fragrant species such as lavender and spearmint; learn to make beauty products from the essential oils.

7. Deep Cut is dedicated to the home gardener and there are many ways to learn from the staff. Take your family to one of our free garden events for a tour or demonstration, talk with our staff on your next visit, or take a class.

Tour the gardens at Deep Cut for ideas or take a class with us.

New! Garden Programs for Schools & Scouts

If you want a more structured experiences, Deep Cut Gardens is expanding its group garden programs for children. A long-time destination for Master Gardeners and horticulturalists, staff realized there was a need for more hands-on experiences for children. "There is a very strong interest in having gardens in schools these days," says Joan Capriotti, Park System Naturalist. So, these programs have been designed to complement classroom science lessons, essentially bridging the gap between positive nature encounters and education.

As an added benefit, many of the new children's programs are in keeping with core curriculum standards, as well as badge requirements for scouts. Younger participants can enjoy ***Garden Story Hour*** or a sensory filled ***Scavenger Hunt***, while those in second or third grade to sixth grade delve into richer subjects such as ***Beneficial Bugs, The Science of Dirt,*** *and* ***Winter Seed Sowing***.

For each program, kids are working with their hands either digging and planting or making such things as worm composting boxes, terrariums, and mini-greenhouses. "The Park System connects kids with nature all the time, but these programs address specific needs we anticipated," says Capriotti.

In the ***Good Bugs*** *program, Daisy Scouts (age 5-7) learn how beneficial bugs can help control bad bugs in the garden (without using pesticides). The hula hoops help focus the search and magnifying boxes assist with identification. Naturalists in green (Lizzie Ferrari, pictured) helped the group identify beetles, pill bugs, earwigs, caterpillars, sow bugs, ants, centipedes, millipedes and, of course, worms.*

Continued next page...

Gardens & the Great Outdoors (cont.)

To help faciliate the new programs, six versatile garden "trugs" were installed to raise the garden bed several feet in wooden V-shaped containers. Not only are the trugs portable for flexibility, but they provide kids with an eye level view of the garden. It's a unique perspective that allows them to "spy" on the living creatures and plants. "Kids love to play in the dirt," says Capriotti. "If they're exposed early enough, they will fall in love with it."

*During the **Inch by Inch** program (after the song...inch by inch, row by row, gonna make the garden grow…) Naturalists Ilana Feitlowitz (cap) and Kathy Quintana teach a group of pre-K and Kindergarten students how to add compost to the soil, dig compost into the soil, plant bean seeds (following neat rows guided by string), and water the seeds.*

***Garden Together** is a 'mommy and me' series offered in the spring (pictured) and fall. This group grew nasturtiums, lettuce and tomatoes (fall plants include kale, mums and spinach). Participants also read stories together, made crafts, played games, and took walks through the gardens.*

Of course, all this is enjoyed in Deep Cut's aura as a peaceful oasis of horticultural specimens and natural beauty. As society's reliance on technology grows, having a place that allows for tranquility, mindfulness, and the meditative quality of connecting with the earth bears crucial importance for all ages. As Louv comments, "people seldom look back on their childhoods and recall the best day they ever spent watching TV."

To learn more about Deep Cut's children's group garden programs, call 732-671-6050 (or 732-872-7369). For 500 ways to build a nature–rich life, check out Louv's latest book, Vitamin N, which was released this past April.

Photographing the pergola when the sun is overhead creates a dimensional shadow inside.

DEEP CUT WINTER EVENTS

Photography Exhibit – A Different Perspective

Take a fresh look at the features of Deep Cut Gardens.

Opening Reception - Saturday, January 7, 2017: 1-3 p.m.

Meet and speak with the photographers. Light, warming refreshments will be served.

Exhibition - Daily from January 8-31, 2017: 10 a.m.-4 p.m.

Enjoy the beauty of Deep Cut Gardens as captured by some of our many visiting photographers. Weather permitting, take a stroll through the gardens and admire the winter landscape.

No registration or fee is required for the Opening Reception or Exhibition, but please call the park at 732-671-6050 to RSVP for the reception, or for any further information.

IT'S TIME TO...

January ✓

Shake it Off: Snow can weigh down evergreen branches

- Throughout winter, check for winter mulches and plants displaced by the weather and replace as necessary. Gently remove snow from evergreens to prevent damage.
- Remember the birds; fresh water is essential. Seeds and suet will provide nourishment as natural food supplies dwindle.
- Increase humidity around houseplants by grouping them together or setting them on pebble trays.
- Plan for next season: browse the catalogs, narrow your wishlist, sketch plans, make your seed list.
- Test leftover seeds for viability by placing several between moist paper towels or coffee filters, keep warm and moist.
- Get ready for spring: check your garden shelves and properly dispose of any old chemicals, get rid of junk. Clean and oil your garden tools now to add years to their life; take your mower for service before the rush.

February ✓

The greenhouse is a floral Sanctuary in the depths of winter.

- Filled with orchids, succulents and houseplants, the greenhouse at Deep Cut is open year round. Peak orchid flowering season is mid February-March.
- Turn the soil in your vegetable and annual beds now to expose insect eggs to foraging birds and the ravages of winter. Next month, add well-rotted manure or compost if not done in the fall.
- Dust the foliage on your houseplants and stay on the lookout for insects. Feed any plants that are actively blooming or showing new growth.
- For a taste of spring, force branches of flowering trees or shrubs like forsythia, cherry, apple or quince.
- Insect and disease control is important for fruit trees – pesticide recommendations and spray schedules are available from the Rutgers Cooperative Extension Service (732-303-7614 or online at www.njaes.rutgers.edu/garden).
- Pick up any twigs and other debris from winter storms; watch for and pull any early weeds like henbit, chickweed and shepherd's purse.
- On a mild day, begin pruning branches from trees and shrubs that have been damaged during winter.
- When the snow has melted, sow an early crop of spinach.

March ✓

By late March, the dogwoods bloom.

- Repot and fertilize your houseplants as needed.
- Indoors, start seeds for broccoli, cabbage, cauliflower, eggplant, lettuce, parsley, peppers and tomatoes.
- Fertilize trees and shrubs, if not already done, after soil temperatures have reached 40˚ F, but before new growth begins. Apply dormant oil spray on a calm day above 40˚.
- Weather is uncertain, so be cautious about uncovering beds. Proceed gradually, removing leaves and winter mulch in layers rather than all at once.
- Don't work the soil until it will form a ball that crumbles when pressed with your thumb.
- If not done in the fall, get a pH test and apply lime if needed.
- Divide and transplant perennials as needed, fertilize established ones when new growth appears. Pot up extras to bring to the Deep Cut Spring Perennial Plant Swap.
- Outdoors, direct-sow seeds for cool crops like peas, beets, Swiss chard, lettuce and seeds of cold-tolerant annuals.
- Pull out and clean pots and bird baths: scrub with a brush then soak in a 10% bleach solution for 15 minutes, then rinse thoroughly.
- Consider making or purchasing a rain barrel to catch those "April Showers."

NATURE CORNER

Amazing Survival Strategies Of Insects In Winter

By Susan Harasty, Park Naturalist

Insects comprise 80% of all the known species on Earth. They occupy possibly the greatest combined biomass of any terrestrial animal. It is estimated that for every one pound of human there are 300 pounds of insects. Yet, with their impressive numbers, they seem to all but disappear in winter. Where do they go and how do they survive?

Common insect characteristics include small size, relatively short life span, and the lack of internal temperature control (they are exothermic). Since they are found on every continent, they must encounter cold conditions. Each species approaches winter survival in their unique way.

Some insects migrate to warmer climates. Others stay in place and enter a type of dormancy.

Some migrate long distances to warmer climates, while others travel shorter distances to a warmer micro-environment. Almost all enter a type of dormancy (diapause) where metabolic functions barely keep them alive. Depending on the species, diapause occurs in different life stages: adult, pupa, larvae or nymph, and egg. Some insects actually require a winter dormancy to complete their life cycle.

Our migrating dragonflies: Common green darner (Anax junius) and black saddlebag Photo:Wikicommons Jerry Friedman.

Dragonfly-ing to a Warmer Climate

While monarch butterflies are possibly the most famous migrating insect, travelling up to 3,000 miles from Canada to Mexico during their fall journey, they do not have the longest journey. The longest recorded insect migration in the world is held by a dragonfly called the wandering glider which flies twice the distance of the monarch, across the Indian Ocean.

Like the monarch, the painted lady migrates before winter.

Of the 326 dragonfly species in North America, 16 are considered migrants. The most well-known dragonflies migrating on the east coast can travel from Canada to Mexico and the West Indies. These include the common green darner, spotted-winged darner, black saddlebag, and variegated meadowhawk. Other migratory insects include the painted lady and red admiral butterflies and some milkweed beetles.

Dragonfly migration mimics that of birds and follows similar seasonal, weather and topographic patterns. They are often observed migrating with birds, which provides the birds with a food source. They also may fatten up for the journey, travel during daylight, and make course corrections. Insects that return in spring are the offspring of the fall migrating population.

In September-October, dragonflies have been observed moving southward en masse along typical migration routes, but their return migration has been harder to document. We know it occurs however, because adult dragonflies reappear in March-June at ponds and wetlands well before resident nymphs (juveniles) can emerge as fully formed in later summer.

Nymph of the common green darner, seen in August.

Nymphs of insects such as mayflies and stoneflies continue to actively feed and grow all winter in their freshwater environments. They will "micro" migrate to warmer locations within their aquatic habitat.

Surviving Winter with Antifereeze

Have you ever seen one of these fuzzy orange and black insects on a tree branch during fall (photo next page, top)? They are known as banded woolly bears, the caterpillar form of the Isabella tiger moth. Folklore says the color of the woolly bear can predict the severity of winter: the more black, the harsher the winter. But this insect's real talent is the ability to survive temperatures down to -90° F.

During autumn, you will see these caterpillars on the move searching for a place to wait out the winter, usually under bark, a rock or log. While hiding, woolly bears will actually freeze, or more accurately, the water around their living cells will freeze. Tissue damage is prevented by controlling the rate at which the water freezes outside their cells. Their coat, which is made up of hair-like bristles called setae, also helps them freeze more controllably. When spring returns they "thaw" and spin a cocoon to finish maturing.

In fall, this banded wooly bear gets ready to freeze over winter, seen at the Manasquan Reservoir last October. During spring, it thaws and matures into the Isabella tiger moth (Pyrrharctia isabella). Photo:Wikicommons:Andy Reago & Chrissy McClarren.

The goldenrod gall fly freezes as winter survival strategy but also uses a plant for cover. The adult fly deposits its egg on the tip of fresh goldenrod stem. After hatching, the tiny fly larva bores into the stem and essentially irritates the plant, causing it to form a gall, or growth. The immature fly will live inside the gall throughout winter (easily spotted among dried fields). In spring, the larvae will develop into a fly and emerge from a tiny hole.

Goldenrod gall made by the fly species Eurosta solidaginis Photo: somethingscrawlinginmyhair.com/2011/07/16/goldenrod-gall-flies/

Chemicals called cryoprotectants can act like a kind of 'antifreeze' in the blood of certain insects. The mourning cloak butterfly for instance, can survive over winter in dormancy as an adult. The presence of glycerol (a cryoprotectant) will prevent it from freezing. It will shelter under loose tree bark or wood piles for additional protection.

Mourning cloak butterflies (Nymphalis antiopa) employ antifreeze to overwinter in cold climates.

Because they are one of the first butterflies seen on a late winter or early spring day, mourning cloaks are known as the "harbinger of spring." They emerge in spring to mate and lay eggs. They are one of the most long lived butterflies, able to survive up to a year.

Growth-Stages for Surviving Winter

This praying mantis egg case (ootheca) protects eggs over winter.

Non-feeding insects (and those in non-feeding growth stages such as eggs and pupae) have a lower freezing point. This is because no food in the gut means less water in its system. Some insects take advantage of this fact to protect their eggs over winter. The praying mantis lays hundreds of eggs in a froth which hardens into an egg case (called an ootheca) often found attached to a twig. Adult crickets deposit each egg individually deep in the soil before dying.

The spicebush swallowtail (Papilio troilus) overwinters as a chrysalid (pictured).

Butterflies and moths may spend their winters in a variety of growth stages. Hairstreak butterflies lay eggs, Eastern-tailed blues and red spotted purples stay over as caterpillars, and swallowtails overwinter as chrysalids.

The extreme looking hickory horned devil caterpillar overwinters underground in a silk cocoon. Photo: Wikicommons Bob Warrick.

Moths can pupate in the winter underground in cocoons spun from silk. Many form an additional protective case over the cocoon which will further insulate the pupa. Among these are caterpillars of the regal moth, called hickory horned devils. They are worth noting here because of their extreme appearance when they emerge. They are six inches long with horns on their head, and turn from bright green to turquoise when ready to pupate. They are increasingly rare due to habitat loss and while frightening to look at, are harmless to people.

Huddling & Burrowing

Honey bees work together to maintain the warmth of the hive. As hive temperatures drop, they gather and form a huddle. Inner bees vibrate their wings to generate heat, while the outer bees hold still and cluster around. The queen stays in the center, the warmest part. The outer most bees rotate with the inner most bees in order to share the heat generated. Their stored food, honey, gets them through until spring.

Ants and termites extend their tunnels below the frost line. The steady temperatures underground, combined with food stock piled in the late summer, extend their lives until the weather improves.

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The View From Underground: *What cultural treasures are buried under Turkey Swamp Park?*

A Child's View (pictured): *Tap into our newest garden programs for children (and parents) at Deep Cut Gardens.*

A View You May Not Have Considered: *Where do insects go when it gets cold?*