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FROM LOCAL TRAILS TO LEGENDARY PATHS: SPRING HIKING IN NEW JERSEY & BEYOND

Zack Karvelas, Assistant Public Information Officer

Spring signals a return to the outdoors. As temperatures moderate and trees begin to leaf out, trails across New Jersey and New York invite exploration once again. For many residents, hiking starts close to home on familiar paths in local parks. For others, it becomes a gateway to longer, steeper, and more demanding trails that stretch across regions and even states. From Monmouth County parks to the famed Appalachian Trail and the Adirondack High Peaks, spring offers an idyllic window to understand the many forms hiking can take.

HIKING CLOSE TO HOME

Monmouth County parks provide an accessible introduction to hiking for people of all ages and experience levels. The trails are well maintained, clearly marked, and designed for a broad range of ages and abilities. Elevation changes are modest, distances are manageable, and help is never far away. These settings allow hikers to focus on movement, observation, and enjoyment without needing specialized gear or advanced planning.

Local hikes also serve as valuable training grounds. These parks provide an opportunity to build endurance and confidence, learn pacing and trail etiquette, and enjoy nature without the pressure of technical terrain or long mileage. Even experienced hikers often return to local parks for regular outings, appreciating the balance of nature and convenience.

WHEN HIKING BECOMES MORE CHALLENGING

As hikers move beyond local parks, the identity of the trail changes. Longer distances, steeper climbs, and uneven or rocky terrain become more common. Trails in northern New Jersey and New York's mountain regions require greater preparation, including appropriate footwear, navigation awareness, and realistic time planning.

The Adirondack High Peaks represent one of the most challenging hiking destinations in the Northeast. With significant elevation gain, rugged trails, and rapidly changing weather, these hikes demand physical readiness and careful decision making. Spring conditions can add difficulty, with muddy trails, lingering snow at higher elevations, and fluctuating temperatures all common during the season.

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THE APPALACHIAN TRAIL IN NEW JERSEY AND ITS LEGACY

The Appalachian Trail stretches approximately 2,190 miles from Springer Mountain in Georgia to Mount Katahdin in Maine, passing through fourteen states along the way. First proposed in 1921 and completed in 1937, the trail was designed to connect people with nature while preserving a continuous passage of protected land.

Much of the trail runs through public lands, including national parks and forests, while other sections cross private property through conservation agreements. Each year, several thousand hikers attempt to walk the entire trail in a single season, though only a portion complete the journey due to physical strain, weather, injury, and time constraints.

The trail is currently protected along more than 99% of its path by federal or state land ownership or right-of-way. Annually, more than 4,000 volunteers contribute over 175,000 hours to maintain the trail, an effort coordinated largely by the Appalachian Trail Conservancy (ATC) and the NY/NJ Trail Conference, assisted by some 30 trail clubs and multiple partnerships.

Spanning 72.2 miles, the New Jersey section of the Appalachian Trail is the state's second-longest trail, traversing Warren, Sussex, and Passaic counties. Much of the route follows the Kittatinny Ridge, beginning at the Delaware Water Gap and passing through several Jersey landmarks, including:

- Worthington State Forest and Sunfish Pond,
- Stokes State Forest and High Point State Park (the state's highest elevation), and
- Wawayanda State Park and Abram S. Hewitt State Forest, featuring extensive boardwalks over marshlands near the New York border.

THRU-HIKING AND SECTION HIKING

Hikers experience the Appalachian Trail in different ways. A thru-hike involves completing the entire trail in one continuous journey, typically over several months. This approach requires significant planning, physical endurance, and the ability to adapt to changing conditions day after day.[2]

Section hiking offers a more flexible alternative. By completing the trail in smaller segments over time, hikers can experience the Appalachian Trail without the pressure of a lengthy single journey. This method allows people to balance their hiking goals with work, family, and other commitments while still experiencing the trail in a meaningful way.[4]

APPALACHIAN TRAIL AND PACIFIC CREST TRAIL

The Appalachian Trail is often associated with the Pacific Crest Trail, the AT's western counterpart, which runs from Mexico to Canada along the western United States. While both are iconic long-distance trails, they differ greatly in terrain and experience. The Appalachian Trail is known for dense forests, frequent elevation changes, and a humid climate, while the Pacific Crest Trail features higher elevations, longer stretches between towns, and more exposed landscapes.[5,6]

For hikers in New Jersey and New York, the Appalachian Trail reflects and embodies the landscapes and hiking conditions of the East Coast, offering a familiar yet physically demanding experience.

PREPARING FOR MORE DEMANDING HIKES

Transitioning from local trails to more challenging hikes requires preparation. Proper footwear, layered clothing, adequate food and water, and an understanding of trail conditions are essential. Gradually increasing distance and elevation helps build strength and confidence, especially for those new to longer hikes.[7]

Spring hiking presents unique considerations. Trails may be muddy, water crossings can be higher, and weather can shift quickly throughout the day. Checking conditions in advance and planning accordingly are key components of safe and enjoyable hiking, especially as we put winter in the rearview and usher in spring and all it has to offer.[1]

PROTECTING TRAILS FOR THE FUTURE

As interest in hiking continues to grow, popular trails face increasing pressure. Erosion, trail widening, and damage to sensitive ecosystems are ongoing concerns. Responsible hiking practices, including staying on marked trails, and following Leave No Trace principles (See our summer issue from 2024.) help protect these natural spaces for future visitors.[2]

A SEASON FOR NEW BEGINNINGS

Spring is a season of renewal, both for the landscape and for those who explore it. Whether hiking familiar paths in a local county park or setting goals that reach farther into the mountains, this time of year encourages movement, curiosity, and connection with the outdoors.

EVERY HIKE BEGINS SOMEWHERE. OFTEN, IT BEGINS CLOSE TO HOME.

References

1. Appalachian Mountain Club. Tips for Spring Hiking. https://www.outdoors.org/resources/amc-outdoors/outdoor-resources/tips-for-spring-hiking/
2. Appalachian Trail Conservancy. Thru-Hiking and Section Hiking the Appalachian Trail. https://appalachiantrail.org/experience/hike-the-trail/thru-section-hiking/
3. The Trek. East vs. West: Hiking Trails Comparison. https://thetrek.co/east-vs-west/
4. Jeff Ryan. How to Section Hike the Appalachian Trail. https://www.jeffryanauthor.com/how-to-section-hike-appalachian-trail/
5. The Trek. Four Major Differences Between the AT and PCT. https://thetrek.co/pacific-crest-trail/4-major-differences-pct/
6. Wayfarer. Appalachian Trail vs Pacific Crest Trail. https://wayfarer.me/at-vs-pct/
7. Hiking Guy. Hiking for Beginners: Essential Tips. https://hikingguy.com/how-to-hike/hiking-for-beginners-11-essential-tips/

MONMOUTHNJ250: Celebrating The County's Revolutionary History In The Parks

Kristen T. Hohn, MA RPA, Senior Historic Preservation Specialist

This July the United States will celebrate its semiquincentennial, or 250th anniversary of the signing of the Declaration of Independence and the official founding of our nation. Across the country, celebrations are being planned to commemorate this momentous occasion. In Monmouth County, the Park System and the MonmouthNJ250 Committee have been hard at work creating educational resources, videos, and a new GIS interactive map, in addition to organizing exciting events, programs, summer camps, and activities in our local communities and county parks.

From Historic Walnford in Upper Freehold to the Bayshore, the Monmouth County Park System maintains and interprets sites with deep ties to our region's revolutionary past. This year, during a Weekend in Old Monmouth, these stories will be shared at our seven participating National Register Listed historic sites, including the Seabrook Wilson House, Historic Longstreet Farm, the Holmes Hendrickson House, Historic Portland Place, Battery Lewis, the Historic Racing Stable at Thompson Park, and Historic Walnford. In addition, the Park System is creating a commemorative booklet that visitors can take home, detailing themes of the war in our county and about the sites' role in early American history.

The Monmouth Militia Secures Their Prize by Steven Schreiber.

Monmouth During the Revolution

In the late 1700s, about 15,000 people lived in Monmouth County. Most were of English, Dutch, or Scotch-Irish descent, and roughly 10% were free or enslaved Africans. Tax records reveal a diverse community of local craftsmen, lawyers, and doctors, with farmers and fishermen supporting the local economy through coastal trade with New York City.

As the Revolution approached, the threat of war brought constant disruption. Farms and homes were raided, property seized, and neighbors divided by their chosen loyalty. Caught between two major cities, daily life in Monmouth County was inescapably tangled in the turmoil of revolution.

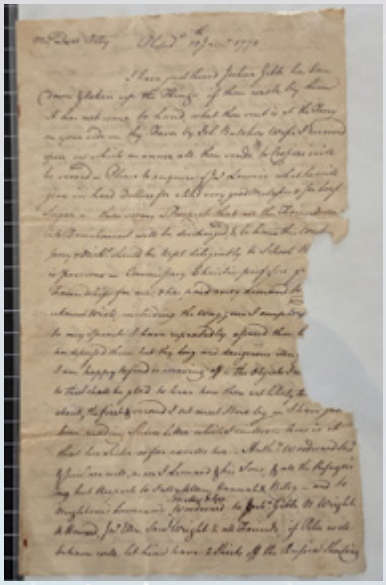
Washington Rallying the Troops at Monmouth by Emanuel Gottlieb Leutze.

A New Exhibit in Thompson Park

In March, the Park System, in coordination with the Monmouth County Clerk's Office opened A Revolutionary Timeline of Monmouth County, a new exhibition that presents a dramatic picture of the conflict as it moved throughout our region. The exhibition will be on display in the Walnut Room of the Thompson Park Visitor Center during open park hours, seven days a week from March through October. Admission is free.

Artifacts and archival documents will help visitors better understand how everyday people weathered a global war in their own backyard. Archaeological artifacts such as

musket balls, grape shot, and gun fragments found in Monmouth County's farm fields help paint a picture of just how harrowing forging a new nation against the largest army in the world would have been.



Letter from Richard Waln to his Elizabeth, while exiled in Philadelphia. As a pacifist Quaker, Waln refused to sign loyalty pledges to either side of the conflict and was exiled first in Philadelphia, then to New York for portions of the War. Today, the Waln family home, Walnford, is part of the Park System.

250 Monument Plaza Coming to Swimming River Park

Swimming River Park is a recent addition to the Park System, offering views of Red Bank and the Navesink River. In the summer of 2026, a Monmouth 250 Revolutionary War Memorial will be unveiled along the realigned perimeter path.

The memorial plaza will feature three groupings of bronze sculptures on granite bases featuring seven life size human bronze figures representing scenes of the Revolutionary War. The design will commemorate a milestone in our nation's history while offering views of the river and a patio area with benches for visitors to relax.

One of seven clay models to be cast in bronze as part of the Swimming River Monument.

The ParkStage Summer Concert Series at East Freehold Showgrounds

This summer, Monmouth County, in partnership with the Count Basie Center for the Arts will be hosting an all new, open-air music venue at the East Freehold Showgrounds (home to the Monmouth County Fair). The concert series was planned in coordination with MonmouthNJ250 to celebrate the semiquincentennial, but will feature contemporary artists and bands. The summer lineup is set to go public in early 2026.

A rendering of the planned ParkStage coming to East Freehold Showgrounds, part of the Monmouth County Park System, this summer of 2026.

There are many more exciting celebrations planned over the next two years, so stay tuned! Information on upcoming events can be found at MonmouthCountyParks.com and MonmouthNJ250.org/events.

A Sample of Upcoming Events and Highlights

March 2026 – A Revolutionary Timeline of Monmouth County Exhibit Opening, Thompson Park, Lincroft

- Saturday and Sunday, May 2-3, 2026 - Revolutionary Weekend in Old Monmouth
- Sunday, June 14, 2026 - Stars & Strides: Flag Day 5K, Bell Works
- Thursday, June 25, 2026 - MonmouthNJ250 Gala, Bell Works
- Sunday June 28, 2026 – America's Big Birthday Parade: Red, White, & You! Middletown, NJ
- July 3, 2026 - Sail 4th, Tall Ships Flotilla in Sandy Hook Bay
- August 29th 2026, Battle of the Navesink wayside panel Ribbon Cutting at Mt. Mitchill Scenic Overlook, in coordination with the Middletown Chapter of the Daughters of the American Revolution.

There will be several commemorative events, programs, and lectures taking place in the Park System throughout the year. Be sure to consult our Summer and Fall Parks and Programs Guides and website for updates.

Deep Cut Gardens
Home Gardener
152 Red Hill Road
Middletown, NJ 07748
GS Parkway Exit 114, to Red Hill Road
732-671-6050

THE DAWN REDWOOD: A Living Fossil

Stephanie Horton, Recreation Leader

When paleobotanists named the genus *Metasequo*ia in 1941, they were confident they were describing a tree that no longer existed. The only known remains of this genus were fossilized leaves scattered across the Northern Hemisphere. These were remnants of forests that once covered much of the planet millions of years ago. These fossils told a story of deep time, of landscapes very different from the ones humans know today. Then, fewer than ten years later, living trees matching those fossils were discovered growing quietly in central China. What scientists once believed to be extinct was suddenly, astonishingly, alive. Today, the dawn redwood (*Metasequoia glyptostroboides*) is considered one of the most remarkable botanical rediscoveries of the twentieth century, a tree that bridges deep time and the modern world[1].

The story of its rediscovery begins with Japanese paleobotanist Shigeru Miki, who first described *Metasequoia* from Mesozoic fossil material. Fossils of the genus were widespread and abundant, suggesting that these trees once dominated vast forests across Asia, Europe, and North America. Their presence across multiple continents made *Metasequoia* especially valuable to scientists studying ancient climates, as its distribution pointed to a time when global temperatures were warmer and more uniform than today. Because no living specimens were known, the genus was assumed to be long gone, another casualty of ecological change.

During the 1940s, however, Chinese foresters working in remote valleys of Hubei and Sichuan encountered towering deciduous trees that looked suspiciously familiar. Their feathery foliage and growth form closely resembled the fossil descriptions. Botanists Hu Hsen-Hsu and W.C. Cheng formally described the living species in 1948, confirming that the "fossil" tree was very much alive and growing in the present day[1]. The discovery came at a moment of political uncertainty and limited scientific infrastructure, making its documentation and protection even more remarkable. That such a globally significant species had survived unnoticed for so long speaks both to the remoteness of its habitat and to how incomplete scientific knowledge of the natural world still was in the early twentieth century.

Although the dawn redwood is the only living species within the Metasequoia genus, there are three known fossil species like this Metasequoia occidentalis.

Once the importance of the dawn redwood was understood, action followed quickly. Seeds collected from wild trees were distributed internationally beginning in 1947 and 1948, with help from institutions such as the Arnold Arboretum at Harvard. Archival records show how eagerly botanical gardens responded, planting seeds across North America, Europe, and beyond[2]. Many of the dawn redwoods growing in parks, campuses, and arboreta today trace their lineage directly back to these early seed collections. This wave of planting created an accidental global refuge for the species, ensuring its survival even as pressures mounted in its native habitat.

Within a few decades, the dawn redwood went from scientific novelty to familiar ornamental, valued for its rapid growth, graceful form, and striking seasonal color. In fact, the dawn redwood was named "tree of the century" by the Arnold Arboretum who has used the tree's image in their logo since 1995. The tree's success outside China demonstrates the species' broad climatic tolerance, yet this adaptability can be misleading. A tree's ability to grow well in managed landscapes does not necessarily translate to resilience in complex natural ecosystems, where regeneration depends on specific hydrological patterns, soil conditions, and disturbance regimes.


A row of dawn redwoods at the Missouri Botanical Garden.


Since dawn redwoods are deciduous, they shed their soft, feathery needles in the fall.

[In the wild, the dawn redwood's story is still unfolding, and it appears far less secure. *Metasequoia glyptostroboides* persists only in a small number of riparian valleys in south-central China, primarily in parts of Hubei, Hunan, and Chongqing. These forests once formed extensive floodplain systems shaped by seasonal flooding and rich soils distributed by the plain's waterways. Periodic flooding likely played a role in reducing competition and creating open conditions for seedling establishment. Today, those landscapes are heavily fragmented by agriculture, infrastructure, and altered waterways. Flood control projects have stabilized rivers that were once dynamic, disrupting the ecological processes the species depends on.

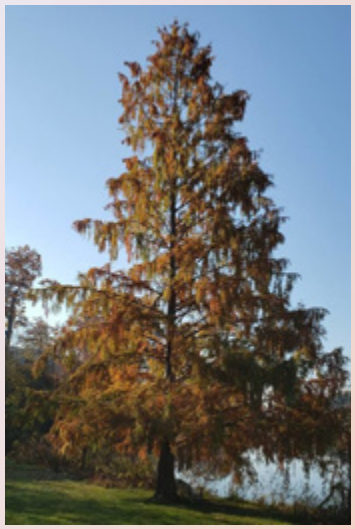
Field surveys estimate that only a few thousand mature individuals remain, many of them aging and producing little natural regeneration[3]. Young seedlings are rare, suggesting that the conditions required for successful establishment are increasingly uncommon. As a result of habitat loss, altered hydrology, and limited recruitment, wild populations of dawn redwood are classified as globally threatened, despite the species' widespread cultivation elsewhere[3]. The disconnect between abundance in cultivation and vulnerability in the wild highlights a recurring challenge in conservation: saving a species does not always mean saving its ecosystem.

Dawn redwoods are monoecious which means they produce both male and female cones. The female cones are pollinated by the wind, usually around March. Mature cones open and drop seeds in late fall.

Since pollination occurs in early spring, the male cones which contain pollen for wind pollination are vulnerable to late freezes and winter weather.

Genetic research adds an important layer to this conservation picture. Studies show that dawn redwood populations retain distinct genetic patterns from valley to valley, reflecting long-term isolation across rugged terrain and river systems[4]. This means that each population carries its own genetic history and adaptive potential, shaped by local conditions over thousands of years. Protecting only a handful of sites would risk losing this hidden diversity. Understanding these patterns allows conservationists to plan more effective restoration efforts, guiding seed collection and planting strategies that maintain genetic resilience rather than unintentionally narrowing it[4]. In this way, genetics helps translate the tree's deep evolutionary past into practical guidance for its future.

One of the dawn redwood's most striking features is its seasonal transformation. In autumn, its soft green needles turn warm shades of amber and copper before falling away, leaving the tree bare through winter. This often surprises people who expect conifers to remain evergreen. Yet *Metasequoia glyptostroboides* belongs to a small but fascinating group of deciduous conifers, including the bald cypress (*Taxodium distichum*) of the southeastern United States and the Chinese swamp cypress (*Glyptostrobus pensilis*). These trees challenge the simple idea that conifers must be evergreen and reveal how flexible conifer evolution has been in response to environmental conditions.



Dawn redwoods turn a golden brown-red color in the fall as they begin to shed their needles and prepare for dormancy.

Deciduous conifers tend to grow in wet, flood-prone environments where seasonal changes are pronounced. Their leaves are relatively inexpensive to produce and highly productive during the growing season. Before the leaves fall, trees reclaim valuable nutrients such as nitrogen, reducing losses and preparing for dormancy. Evergreen needles, by contrast, are built for longevity. They are thicker, denser, and chemically protected so they can survive for several years, spreading the cost of construction over time and allowing photosynthesis whenever conditions permit[4]. In nutrient-poor soils or climates with unpredictable growing seasons, this evergreen strategy can offer a significant advantage.

In dawn redwoods, leaf loss happens all at once through the formation of an abscission layer, much like in other deciduous trees like maples. Bald cypress follows a similar pattern, shedding its needles annually and standing bare in winter swamps across the southeastern United States. Both species are well adapted to saturated soils and fluctuating water levels, where rapid seasonal growth followed by dormancy helps avoid stress and damage[5]. Evergreen conifers, such as pines and spruces, lose their needles gradually over several years rather than all at once, maintaining some foliage year-round[6].

The bald cypress (Taxodium distichum) is also a deciduous conifer which changes colors before leaf shed in the fall.

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The dawn redwood is also part of an ancient lineage that includes some of the largest and most iconic trees on Earth. Alongside the coast redwood (*Sequoia sempervirens*) and the giant sequoia (*Sequoiadendron giganteum*), *Metasequoia* belongs to the redwood family, a group that once dominated forests across the Northern Hemisphere. Fossil evidence shows that these trees thrived during warmer, wetter periods before climatic cooling and drying restricted their ranges to narrow refuges[7]. Today, each surviving member of this lineage occupies a very specific ecological niche, shaped by climate, water, and geography.

Hikers on the Coastal Trail surrounded by coast redwoods (Sequoia sempervirens) in California. Coast redwoods are the tallest species of tree in the world – one in Redwood National Park is even taller than the Statue of Liberty.

Giant sequoias are celebrated as the largest trees by volume, while coast redwoods are known as the largest trees by height. The dawn redwood, by contrast, is a quieter symbol. It is a tree that was written off as extinct, only to reappear at a moment when humans were finally paying close enough attention to notice.

The journey of the dawn redwood, from fossils to living trees, from hidden valleys to city streets, highlights both the promise and the limits of conservation. Botanical gardens and arboreta have given the species a global safety net, but its future as a wild tree depends on protecting the rivers, soils, and forests that allowed it to persist for millions of years. It stands as living proof that the past is not as distant as it seems, and that the fate of even the most ancient species still rests, in part, in human hands.

References

1. Ma, J. S. (2003). The chronology of the "living fossil" Metasequoia glyptostroboides (1943–2003). Harvard Papers in Botany, 8(1), 9–18.
2. Arnold Arboretum. (n.d.). Metasequoia glyptostroboides: History of introduction and cultivation. Harvard University.
3. Tang, C. Q., Yang, Y., Ohsawa, M., Momohara, A., Mu, Y. M., Wang, H. F., Zhang, Z. Y., & Peng, M. C. (2011). Population structure of relict Metasequoia glyptostroboides and its habitat fragmentation and degradation in south-central China. Biological Conservation, 144(1), 279–289.
4. Li, Y. Y., Jian, S. G., Zhang, C., Cheng, S., & Xia, N. H. (2023). Genetic structure shows the presence of small-scale genetic differentiation in Metasequoia glyptostroboides. Frontiers in Genetics, 14, 1134231.
5. Burns, R. M., & Honkala, B. H. (1990). Silvics of North America: Volume 1, conifers (Agriculture Handbook 654). U.S. Forest Service.
6. Penn State Extension. (n.d.). Why some conifers are deciduous. Pennsylvania State University.
7. Farjon, A. (2005). A monograph of Cupressaceae and Sciadopitys. Royal Botanic Gardens, Kew.
8. Hikosaka, K. (2025). Leaf economics of deciduous and evergreen plants. Annual Review of Plant Biology, 76, 153–176.

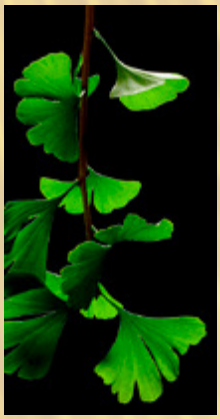
Another Living Relic - The Maidenhair Tree (Gingko Biloba)

Kate B. Lepis, Ph.D., Horticulturist

Maidenhair trees also represent living fossils. With dawn redwoods and other gymnosperms (Greek for "naked seed") their reproductive structures are organized into cones instead of flowers as in angiosperms (Greek for "hidden seed").

Gingko tree behind Tatum Mansion.

Gymnosperms and angiosperms package and disperse their embryos within seeds, with gymnosperms evolving this trait first. Gingko is an older gymnosperm than the conifers of which redwoods are a part and represent an evolutionary link between ferns and conifers[1] (to review plant evolution look to the Summer 2024 issue, available on our website.



Like dawn redwoods, Gingko leaves are deciduous but are uniquely broad-leaved (instead of needle-like) and fan-shaped.

The species is described as dioecious with either male or female trees. Each spring small pollen producing cones emerge from male trees.

Females lack cones altogether producing stalks tipped with a pair of ovules (structures containing an egg) that clearly demonstrate the "naked" character of this gymnosperm. If this were an angiosperm those ovules would have developed deep within the ovary of a flower.

If the ovules are successfully pollinated and fertilized, a fleshy seed will develop. They look like fruit but, by definition a fruit is a swollen ripened ovary with seed(s) inside. For Gingko the seed coat is the tissue that transforms into the fleshy outer covering. In autumn, when the plump seed coat starts to decompose, it emits an unpleasant vomit-like odor.

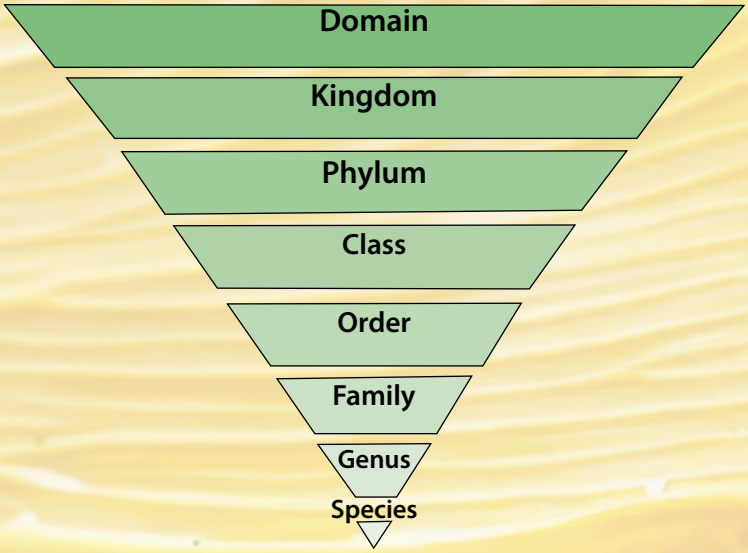
Peanuts provide a well-known example of a seed coat in angiosperms. The fibrous shell is the fruit or ripened ovary. The brown papery covering of each "nut" is the seed coat.

Gingko emerged in the Permian Period – a time when the Appalachian Mountains were a young uplifting range[2]. They diversified into a widespread group, reaching their peak with the dinosaurs during the Mesozoic Era[4]. They began to decline in the mid-Cretaceous Period (c. 100 mya) presumably due to competition with flowering plants[4], but remained widespread across the globe as recently as seven mya5. Gingko biloba is the sole survivor of a group that withstood two mass extinction events (Permian c. 250 mya and Cretaceous c. 65 mya)[5]. Sadly, this species has no close living relatives[1]:

- It is the only living species in the genus Gingko,
- The only genus in the family Gingkoaceae, and
- The only family in the order Gingkoales.

To put this into perspective, dawn redwood is also the only living species in the genus Metasequoia[6], but that genus is a member of the Cypress Family (Cupressaceae) including 27 cousin genera[7]. The family is part of the order Cupressales including five closely related families of 57 general and 383 living species[7].

The hierarchical system for organizing life.



Gingko has been used by people in the east for thousands of years. The roasted seeds (flesh removed) have culinary uses in Asian cuisine and are said to have medicinal traits that help with memory. Some toxicity has been documented so caution should be used in limiting intake[8].

This species was unknown to the western world prior to the late 1600s but has since gained popularity as an urban street tree with its high tolerance to air pollution and compact soils[8]. Due to the smelly fruit seeds, male trees are favored in U.S. cities. Dawn redwood and Gingko biloba represent species pulled from the brink of extinction by human use.

References

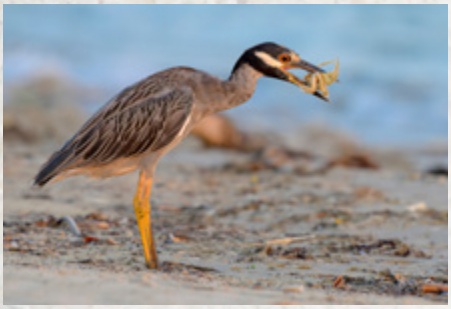
1. Avis-Riordan, K. 2020 Ginkgo biloba: The tree that outlived the dinosaurs. Royal Botanic Gardens Kew https://www.kew.org/read-and-watch/ginkgo-biloba-maidenhair-tree-kew-gardens
2. Wikimedia Commons. Creative Commons 3.0, 4.0
3. https://creativecommons.org/licenses/by-sa/3.0/; https://creativecommons.org/licenses/by-sa/4.0/deed.en
4. Raven, P. et al., 1992. Biology of Plants, 6th ed. W.H. Freeman & Company. New York, NY.
5. Crane, P. An Evolutionary and Cultural Biography of Ginkgo. 2019. Plants, People, Planet. 1:32-37. https://members.publicgardens.org/wp-content/uploads/2018/12/crane-2019-plants2cpeople2cplanet.pdf
6. Boyer, J. 2021. Great Moments in Plant Evolution, Part 3: Extinction of Ginko. Garden Stories, Brooklyn Botanic Garden. https://www.bbg.org/article/great_moments_in_plant_evolution_part_3_extinction_to_ginkgo
7. The Gymnosperm Database. https://www.conifers.org/cu/Cupressaceae.php
8. Missouri Botanical Garden. https://www.mobot.org/mobot/research/apweb/orders/cupressalesweb.html
9. Roger Cohn. May 1, 2013. YaleEnvironment360. Yale School of the Environment. https://e360.yale.edu/digest/interview_telling_the_life_story_of_ginkgo_the_oldest_tree_on_earth?id=3831&title=interview_telling_the_life_story_of_ginkgo_the_oldest_tree_on_earth

Jenna Reynolds, Principal Park Naturalist

Juvenile Ghost Crab

It was the Sunday before Memorial Day weekend, and I was at Seven Presidents Oceanfront Park in Long Branch. A beautifully warm, humid, partly sunny day was making it feel like summer on a spring day.

Along the edge of the Atlantic Ocean, I was conducting a low tide beach walk with about two-dozen people. We were walking along the sandy shores of the ocean looking for shells and other interesting beach finds. All around us there was evidence of life. Forked-tailed least terns were flying above the ocean looking for small fish to feed their young. A pair of distinctive black and white American oystercatchers were foraging nearby on newly washed-up blue mussels with their long, bright orange beaks, and a few lucky fishermen were catching striped bass and bluefish in the surf. Everything seemed to be alive and in-motion.



Yellow crowned night heron eating ghost crab.

Suddenly someone shouted at me to look over by the edge of the sand dunes. At first, I couldn't see what the person was pointing at. Was it a strange shell or maybe an unfamiliar bird? Then as I got a little closer, I could see the outline of a sand-colored crustacean with six yellowish legs and a square shaped body. With binoculars, I quickly recognized this pale yellowish-white crab as an Atlantic ghost crab (*Ocypode quadrata*).

Ghost crabs are mysterious and unusual sand crabs. They are also not always easy to see by a causal beach walker. The crabs are renowned as one of the fastest land crabs, capable of reaching speeds up to 10 mph, earning them the nickname "swift-footed" (*Ocypode*) for their rapid scurrying on sandy beaches to escape predators like gulls, owls, and herons. A remarkable activity I think for an animal that walks sideways.

Atlantic ghost crabs are named for both the ability to blend in with their seashore surroundings and for their mostly nocturnal behaviors. They become active at night to hunt for food on a sandy beach including insects, small clams, mole crabs and even dead fish. Their pale color helps them blend in with the sand, making them seem to "disappear" or move like ghosts.

Adult ghost crab

As a child growing up along the Jersey Shore during the 1970s, I never encountered ghost crabs. Though on the Outer Banks of North Carolina, I found plenty of them when my parents took me on vacation. With a flashlight in hand, my mom would take me down to the edge of the ocean at night where I would see the crabs quickly scurrying. I was startled to see them as I am sure they were equally surprised to see me and my flashlight. The crabs, as large as three inches wide, would disappear, seemingly vanishing into the sand, only to sneak past me a few moments later in an unforgettable nocturnal adventure.

The range for Atlantic ghost crabs was typically from the mid-Atlantic and subtropical areas of the United States, from about Atlantic City, NJ, to Florida.

Today, the crabs are expanding their range and population into previously unoccupied northern latitudes from the northern Jersey Shore and up to New England. The expansion is likely due to warming ocean temperatures caused by climate change.

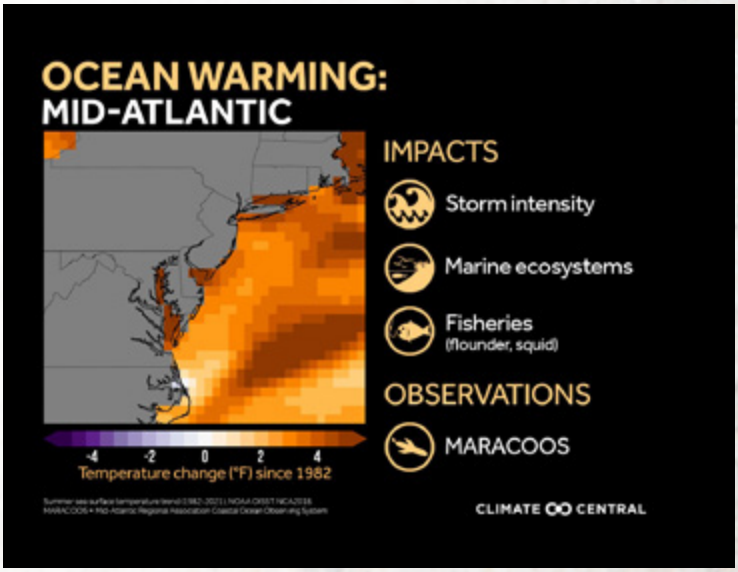
A 2024 scientific study written by Mikayka N. Call and others from the Virgina Department of Fish and Wildlife tell us that the Atlantic ghost crab population is increasing along the East Coast "due to rapid, climate-driven change within coastal ecosystems." The northern expansion for adult populations is generally to Rhode Island, but ghost crab larvae have been found as far north as Woods Hole, MA. While no adults have been found at this latitude, most likely due to cooler air temperatures that are unfavorable for growth, it is only a matter of time before adult crabs appear scurrying on Cape Cod beaches. Ghost crabs prefer air temperatures generally higher than 56°F.

Crab coming out of burrow.

How did the expansion of ghost crabs happen? It all has to do with biology and breeding. Ghost crabs begin their life cycle in the ocean. Adult females will scurry to the water's edge at night and let waves wash over them to release their eggs into the surf zone where tides and currents then carry the eggs farther out into the ocean.

The larvae develop in ocean waters for about six weeks, though the exact timing depends heavily on water temperatures. They drift with currents to generally different beaches from where they were originally released before the larvae develop enough to wash ashore as tiny crabs. With warming ocean temperatures, characteristic southern species including ghost crabs are expanding into previously cooler northern waters and beaches.

"The Atlantic Ocean in the northeast has warmed by about two degrees Fahrenheit over the last 15 years, much faster than the global average," stated Malin Pinsky, a professor in the Department of Ecology, Evolution, and Natural Resources at Rutgers University in an August 12, 2024, article at NJ.com. The entire East Coast is seeing temperatures rise roughly 3.5°F in 30 years, causing fish and other aquatic species to move north. The expansion of ghost crabs, however, is more noteworthy than a typical fish I think because these crabs are ordinarily terrestrial and the expansion is due to floating larvae.



During the day, ghost crabs will spend most of their time living in deep burrows, often reaching three to four feet and extending down to the water table for moisture and refuge from heat, with angled entrances for ventilation according to sources from the South Carolina Department of Natural Resources. The crabs typically remain hidden in their burrows to avoid predators, like gulls, and the midday heat that can dry out their gills.

Scientifically, ghost crabs are considered semi-terrestrial though, because they must periodically return to the edge of the ocean to keep their gills wet and for females to release eggs. It's a balancing act. Ghost crabs need to keep their gills wet but can't stay in the water too long, as they can drown. In response, the crabs have adapted to also use fine hairs (setae) at the base of their walking legs that act like tiny straws to draw water up from damp sand through capillary action. All this activity makes them masters of the intertidal zone, well-adapted to land but still dependent on the ocean.

Have you seen a ghost crab lately? If not, see if you can find one of these mysterious ghost crabs as they show up on an intertidal beach in Monmouth County this spring or summer.

Ghost crab footprints in the sand around its burrow.

Sources:

1. Atlantic Ghost Crab: Ocypode quadrata, by David Knott and edited by Peter Kingsley, South Carolina Department of Natural Resources, 2013.
2. Biotic and abiotic factors affecting Atlantic ghost crab (Ocypode quadrata) spatiotemporal activity at an important shorebird nesting site in Virginia, by Mikayla N. Call and others, Department of Fish and Wildlife Conservation, Virginia Tech, Blacksburg, Virginia, United States of America. Published August 2024.
3. Crabs: A Natural History by Peter J.F. Davie, Princeton University Press 2021
4. Jersey Shore is seeing a rapid rise in ocean temps: Scientists say we should all be alarmed.
5. By Steven Rodas, NJ Advance Media for NJ.com. Published July 23, 2024.
6. The Ghost Crab by Lorus J. Milne. Published in The Atlantic magazine, July 1946 issue

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"OF ALL THE PATHS YOU TAKE IN LIFE, MAKE SURE A FEW OF THEM ARE DIRT."

– JOHN MUIR

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