



"National parks are the best idea we ever had. Absolutely American, absolutely democratic, they reflect us at our best rather than our worst."

—Wallace Stegner, American author

With all due respect to Ozzie Osbourne and other true rock stars, this issue's feature-article authors truly are "rock stars" of the conservation world.

Benjamin Franta, an outstanding speaker at the NAL 2024 Conference, writes that the American Petroleum Institute and major global oil companies knew about the harmful effects of fossil fuels on the earth's heat balance and the potential for climate change as early as 1959. His enlightening article is a must-read.

Banner photo: Delta Lake in Grand Teton National Park is situated in Glacier Gulch and is fed glacial silt from the Teton Glacier, which turns the water turquoise. Photo by Kimberly McMorrow, Woodside Atherton GC, Zone XII, Vice Chair, National Parks

On the cover: Prismatic Spring, Yellowstone National Park's largest hot spring, is 200 to 330 feet wide and more than 121 feet deep. This is just one small part of the Greater Yellowstone Ecosystem, which was the topic of this year's Conservation Study Conference. For a complete list of speakers and topics, see **page 24.** Photo by Janet Frantz, Mill Mountain GC, Zone VII, Vice Chair, Conservation Study Conference 2024

While his stardom may be a bit more localized to the Long Island area, Seatuck Senior Conservation Policy Advocate John Turner's article on water quality applies to any area of the country. He explains the importance of water-reuse projects, which use treated wastewater for beneficial purposes.

We are also fortunate to have updates from several vice chairs from the Conservation and NAL committees. They make it easier for us to stay informed on important issues.

ConWatch is produced three times a year by the Conservation Committee of The Garden Club of America. It is available online in July, November, and April. Submissions and comments are encouraged and welcome. Use this link to submit, or contact conwatch@gcamerica.org

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The purpose of The Garden Club of America is to stimulate the knowledge and love of gardening, to share the advantages of association by means of educational meetings, conferences, correspondence, and publications, and to restore, improve, and protect the quality of the environment through educational programs and actions in the fields of conservation and civic improvement.



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The Garden Club of America, 14 East 60th Street, New York, NY 10022, GCAmerica.org

FROM THE CONSERVATION AND NALCOMMETTES

or parts of the country, autumn is a crisp, colorful time of the year when the monarchs begin migrating to Mexico, and the lazy days of summer give way to the hustle and bustle of seasonal planting and holiday preparation.

This issue of *ConWatch* brings us closer to the final stage of GCA's Centennial Celebration of the Conservation Committee. The GCA has been advocating for the environment for over 100 years. We hope you have enjoyed the conservation recap by the decade that Anne Noyes (Green Tree GC, Zone XI, First Vice Chair, Conservation), has provided in each monthly *eNews* edition this year.

The 2024 virtual Conservation Study Conference, The Greater Yellowstone Ecosystem: Conservation and Connectivity, "promises to delight and challenge the NAL Committee Chair Carolyn Ross and Conservation Committee Chair Joy Flynn. Photo by Anne Louise Noyes

viewer," said Vice Chair Conservation Study Conference 2024 Janet

Frantz (Mill Mountain GC, Zone VII),

who, along with Vice Chair National Parks Kimberly McMorrow (Woodside Atherton GC, Zone XII), and Board of Associates Member Dale Naylor (The GC of Cleveland, Zone X), orchestrated this outstanding conference. And delight it did! We hope your club hosted a watch party to enjoy the conference with friends.

-Carolyn Ross, Chestnut Hill GC, Zone I, NAL Committee Chair, and Joy Flynn, Westhampton GC, Zone III, Conservation Committee Chair

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Banner photo: The Lamar River in Yellowstone National Park in all its autumn glory. Photo by Kimberly McMorrow.

SAVE THE DATES:

2025 NAL Virtual Advocacy Workshop, March 20, virtual.

2025 NAL Conference, March 23 to 26, in Washington, D.C., and virtual.



Updates and News from Conservation/NAL Committees Vice Chairs

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Restoring the Sagebrush Steppe

The sagebrush steppe, once abundant across the Intermountain West, is rapidly declining, threatening the diverse ecosystem it supports. This iconic habitat is vital to more than 350 species of conservation concern, including the greater sage grouse, which depends entirely on sagebrush for survival. The habitat also serves as crucial forage grounds for elk, bison, pronghorn, and moose.

Sagebrush steppe is disappearing at a rate of 1.3 million acres annually across 13 western states. In response, Grand Teton National Park has embarked on an ambitious restoration project to reclaim former agricultural lands and reestablish the native sagebrush plant community. The park's efforts focus on approximately 4,500 acres of sagebrush replaced with non-native pasture grasses by early settlers.

Park ecologists have been working since 2007 to restore this area, and face numerous challenges. One major hurdle is the lack of commercially available native seeds. The park's vegetation crew hand-collects seeds from local plants and subcontracts with a commercial grower, a time-consuming and expensive process. Additionally, the restoration team grapples with undesired, aggressive non-native plants in newly seeded areas. Despite these obstacles, the park has made progress, restoring about 1,400 acres over 16 years. The process is slow but crucial for reestablishing the natural ecosystem native wildlife depends on.

> —Kimberly McMorrow, Woodside-Atherton GC, Zone XII, Vice Chair, National Parks

Climate Tipping Points

It is easy to see the obvious signs of climate change. Catastrophic fires fueled by heat and drought, extreme heat causing deaths, and severe storms and flooding dominate headlines globally. Less obvious are effects on the systems that support our natural world.

These effects were addressed in a recent *New York Times* article by Raymond Zhong and Mira Rojanasakul, August 1, 2024, "**How Close Are the Planet's Climate Tipping Points?**" More than 70 percent of reef-building corals are likely to bleach in coming decades, even if global warming is slowed. Permafrost is thawing, releasing



About 25 percent of ocean fish depend on healthy coral reefs. Photo by Toby Hudson, Wikimedia Commons

Banner photo: The greater sage grouse depends entirely on sagebrush for survival. At the Conservation Study Conference on November 6, Laura Jones, Branch Chief of Vegetation Ecology and Management at Grand Teton National Park, addressed the challenges and successes of sagebrush restoration. Photo by Dominic Sherony, Wikimedia Commons

carbon and methane, worsening global heating. Melting permafrost also releases microbes that haven't been seen in ages and potentially dangerous chemicals.

The article addresses the breakup of the Greenland and West Antarctic ice sheets, which can affect rainfall, currents, storms, and flooding. The extreme destruction of the Amazon rainforest by agriculture results in carbon being added to the atmosphere, and the region will lose moisture as it loses vegetation. The Atlantic currents that determine seawater temperatures, which affect the moisture in the air and the ferocity of storms across the globe, are slowing down, but it's not known how fast this will progress. If this continues, heat exchange in the water will be reduced, causing hot areas to get hotter and cold areas to get colder. As these tipping points are reached, climate change accelerates. All these concerns should boost our efforts to decrease greenhouse gas emissions now. to preserve their eroding shorelines. She looks at resortowner behavior, which contributes to an unsustainable carbon footprint, citing the effect of air conditioning, water consumption, golf-course maintenance, and importation of food and drink to remote locations. Long-haul flights to many beach resorts make us all accessories to the growing carbon footprint. With the rise of sea levels predicted at 1½–3 three feet by the end of the 21st century, these resorts will become difficult to preserve, and many will disappear.

Stodola closes with suggestions for a better approach to beach resorts. Sourcing locally or regionally and building sensibly are high on her list. She suggests planting native plants and eliminating palm trees. Limiting development and the number of tourists are also offered. Saving coral reefs and replanting mangrove shrubs would be a line of defense against storm surges. When water fills resort lobbies, what will be our last resort?

-Diane Lewis, Bedford GC, Zone III, Vice Chair, Climate Change

-Jane Edwards, The GC of Norfolk, Zone VII, Vice Chair, Oceans

The Last Resort



Photo by Louis Neudorff

By Sarah Stodola *Harper Collins Publishers,* 2022, 319 pages Sarah Stodola subtitles her book A Chronicle of Paradise, Profit and Peril at the Beach and states in her prologue that the book is "meant as both corrective and a warning." The author traveled to more than 20 worldwide destinations from Monte Carlo, where the pursuit of beach

pleasure arrived early, to a village in Fiji, where a single resort changed life forever—to show the effects of beach tourism. Closer to home, she looks at how Miami Beach is taking extreme measures to prevent the barrier island from vanishing into the ocean.

Stodola explains the great lengths resorts undertake

The Value of Our Forests

America's mature and old-growth forests, key attributes in national forests and national parks, provide essential climate change mitigation. Old-growth, as well as matureand second-growth forests, provide significant benefits



A mature cedar forest in Glacier National Park. Two agencies control most federal lands for public use: the National Parks Service and the U.S. Forest Service. Both protect wilderness areas, wildlife, and waterways. While the national parks are managed primarily for public enjoyment of the outdoors and cultural enrichment, national forests are also used for extracting natural resources like forestry, mining, and grazing. Photo by Lynn Steiner

to people everywhere, as these trees play an outsized role by absorbing carbon dioxide at rates equivalent to more than 10 percent of U.S. annual greenhouse-gas emissions, filtering and shading waterways, sustaining the biodiversity of flora and fauna, and nurturing native plants.

Magnificent old-growth forests are also cultural icons, providing jaw-dropping recreational opportunities and economic boons for local communities. Reduced logging and sustained maintenance of our remaining ancient and maturing forests help reduce wildfire risk and promote long-term resilience against changing climate. And, old-growth forests are part of the fundamental cultural framework of Native American heritage.

-Shelley Rolfe, Seattle GC, Zone XII, Vice Chair, Forests/Redwoods

Oh, Deer!

In the Summer 2024 issue of *Audubon*, Ashley Stimpson reported on eastern U.S. forests in crisis due to surging deer populations. Extensive overfeeding, particularly by whitetails, reduces the forest's carbon-storage capacity, destroys the understory, and hinders seedling growth. The dramatic reduction in plant life compromises habitat and negatively impacts other animal populations dependent on the forest ecosystem, specifically those reliant on midstory vegetation. "The forests of the mid-Atlantic and



A Pennsylvania study concluded that areas overpopulated with deer saw a 37 percent reduction in bird species and a 27 percent decline in species diversity. Deer density of at least 20 animals per square mile led to the outright extirpation of five bird species. Photo by Lynn Steiner

Northeast are in imminent danger of collapse," says Cornell University ecologist Bernd Blossey, "and there is little hope that business as usual or incremental changes will suffice to address the serious issues we face."

Peter Smallidge, director of Cornell University's 4,200acre Arnot Teaching and Research Forest outside of Ithaca, New York, noticed that important tree species preferred by deer, such as white oak, never had a chance to mature. Smallidge and Forest Manager Bret Chedzov had an idea to use slash—leftover commercially unviable trunks and treetopsfrom logging—to create a deer barrier around 500 acres of the forest. After six years, this section of the Arnot Forest has become the most diverse forest and healthiest ecosystem Smallidge has ever overseen. The results prove that without deer pressure, the forest can recover.

Blossey believes that fencing partial forests with slash is not enough. He advocates an integrated approach to deer overpopulation, including systematic culling spearheaded by federal authorities responsible for wildlife, human health, transportation, and agriculture. "It was us who messed up this system," Blossey says. "It's our job to fix it."

-Eunice Burnett, Hortulus, Zone II, Vice Chair, Land Conservation

Initiative to Regulate PFAS in the Air and Pushback on EPA Clean Air Regulations

Environmental department heads in North Carolina, New Mexico, and New Jersey sent a petition to the EPA calling for regulation of forever chemicals in the air. They requested four PFAS (per- and polyfluoroalkyl substances PFOA, PFOs, GenX, and PFNA) to be added to the Clean Air Act's list of hazardous air pollutants. If approved, the EPA would be required to establish technology-based standards for major polluters to limit the concentrations of these PFAS in their emissions. Since the hazardous airpollutant list was created in 1990, EPA has only added one substance, 1-Bromopropane, to the roster. Under pressure from municipalities, the EPA finalized limits for the same four PFAS in drinking water earlier this year. Rep. Haley Stevens of Michigan introduced H.B. 6834 requiring the EPA to add PFAS as an entire class to its list of hazardous air pollutants. Introduced in December 2023, the bill still awaits subcommittee consideration.

The House and Commerce Committee approved three Congressional Review Act resolutions to overturn EPA regulations. These resolutions address the EPA's power plant, particulate matter, and heavy-duty vehicle tailpipe rules. The committee stated that these regulations are harmful and costly to the energy and auto industries. House Joint Resolution 117 rolls back EPA's tightening of particulate matter limits. House Joint Resolution 133 overturns the heavy-duty tailpipe rule that aims to set vehicle emissions caps so low that automakers could be forced to rely on increased electric vehicle production to comply. House Joint Resolution 163 rolls back stricter power-plant emissions. Members of the committee who opposed the resolutions stated that the EPA regulations are essential to the decarbonization of the American economy and will protect the public from the harmful effects of air pollution.

> ---Eva Clarke, James River GC, Zone VII, Vice Chair, Clean Air

New Standards for Air Pollution

The transportation sector is the largest U.S. source of greenhouse gas (GHG) emissions, representing 29 percent of total emissions in the U.S. Making cars and mediumduty vehicles like vans and light trucks cleaner is critical to addressing climate change and improving air quality, particularly in large cities. Low-income populations who live close to heavily trafficked roads are particularly vulnerable to transportation pollutants.

On March 20, 2024, the EPA released a tailpipe emissions rule that set more stringent emissions standards for GHG pollutants for light-duty and medium-duty vehicles for model years 2027–2032. The Multi-Pollutant Emissions rule begins with a slower ramp-up of stringency for reducing pollutants, but the EPA estimates that the standards will reduce over 7 billion tons of GHG emissions, along with significant amounts of other pollutants and air toxics resulting in "substantial improvements in public health."

In addition to the reduction in CO₂, the EPA estimates that these new standards will reduce air pollution and provide \$13 billion in annual health benefits. Other pollutants that will be reduced include particulate matter, nitrogen oxides, and volatile organic compounds mainly from reduced exhaust from internal combustion engines running on fossil fuels. The EPA also estimates that there are significant economic benefits to consumers from the new standards, coming not only from fuel savings for electric vehicles but also from the lower repair and maintenance costs for clean vehicles. Customers are expected to save an average of \$6,000 over the lifetime of a new vehicle once the standards are fully phased in.

> —Signe Ostby, Woodside-Atherton GC, Zone XII, Vice Chair, Transportation

(CO ₂ grams/mile)									
	2027	2028	2029	2030	2031	2032			
Cars	139	125	112	99	86	73			
Trucks	184	165	146	128	109	90			
Total Light- Duty Fleet	170	153	136	119	102	85			

Light-duty vehicle GHG standards: Projected targets, by regulatory class

Medium-duty vehicle GHG standards: Projected targets, by regulatory class $(CO_2 \text{ grams/mile})$

	2027	2028	2029	2030	2031	2032
Vans	392	391	355	317	281	245
Pickups	497	486	437	371	331	290
Total Medium- Duty Fleet	461	453	408	353	314	274

Greenhouse gas emissions for light-duty vehicles will be cut in half by 2032, while medium-duty vehicle emissions will be cut by about 40 percent. Source: EPA Multi-Pollutant Emissions standards for Model Years 2027–2032, March 2024.



Adopting Local Native Plant Ordinances

As states across the country pass Native Plant Month proclamations and laws, municipalities are increasingly adopting local native plant ordinances. These regulations promote using native plants to preserve local biodiversity and enhance ecosystem resilience.

In spring 2024, three municipalities in Morris County, New Jersey, passed similar ordinances requiring new plantings on municipal properties to be native species. Chatham Township's ordinance states that it "desires to support the use of native vegetation through leading by example," a motivation all three cities share. Using local-ecotype straight species (seed-grown wild type; not propagated by cloning) over cultivars is strongly encouraged. Chatham Township stipulates this "to ensure biodiversity and preserve a species' natural environmental benefits."

In the absence of statewide laws in New Jersey, these ordinances proactively prohibit the planting of any invasive species on municipal property. The Borough of Madison "strongly recommends that developers, private property owners, and landscapers of private property avoid species on the New Jersey Invasive Species Strike Team's *Do Not Plant* List." The ordinance explains that "Seeds from invasive plants on private property are spread by birds and damage the ecosystems of Borough woodlands and parks." Adding this requirement helps raise awareness about the ecological damage caused by invasive species. The Borough of Madison's ordinance was officially endorsed by **Garden Club of Madison, Zone IV,** when it was introduced at a borough council meeting.

Passing municipal native plant ordinances is another effective way to promote environmental conservation at the community level. Ultimately, such regulations will help restore local flora and fauna, increase native habitat connectivity, support biodiversity, and raise awareness about the importance of native plants to a healthy ecosystem. Why not give it a try as your state proclaims Native Plant Month for a third straight year!

> —Lydia Chambers, GC of Madison, Zone IV, Vice Chair, Native Plants

Saving Wetlands

Wetlands account for only 6 percent of the earth's surface, but 40 percent of all plant and animal species live or breed in wetlands. More than a third of federally endangered species live only in wetlands, and half use wetlands during their lifespan. Wetlands store and slowly release water downstream and underground, protecting communities from flooding, maintaining a constant water supply, reducing wildfire risk, and cleaning future drinking water before it reaches our taps. In 2023, the *Sackett v. EPA* Supreme Court ruling erased the Clean Water Act's protection of this critical resource.

A new partnership, America the Beautiful Freshwater

Banner photo: A native plant garden in Madison, New Jersey, managed by **GC** of Madison, Zone IV. Municipalities increasingly recognize that native plants provide essential food and habitat for local wildlife, including pollinators and beneficial insects, and thrive with less water and maintenance. Photo by Lydia Chambers



The U.S. has lost over half of its wetlands since Europeans first arrived, and between 2009 and 2019 wetlands loss increased a staggering 50 percent. Photo by Lynn Steiner

Challenge, calls for states, tribal governments, and entities to refocus on their own strategies to conserve and restore America's freshwater systems. This bipartisan organization was announced by The White House for Earth Day 2024 and is now supported by 160 partners, including states, municipalities, and organizations, all providing hope that our personal networks, like those of freshwater systems, can provide better ways to protect our planet's most precious resource: fresh water. As GCA club members, we can engage in our own communities and states to help enable better policies to address and halt this disturbing trend of our disappearing freshwater systems.

-Beth Alm, Vice Chair, Water, The Westport GC, Zone XI

Recycling Plastic

After the 2023 NAL Conference, Garden Club of New Haven, Zone II, took up the Trex challenge to recycle 500 pounds of plastic bags and film in six months. Trex is a



GC of New Haven members Joy Ford, Conservation Committee; Trish Helm, chair, Horticulture Committee, and Marilyn Ellsworth, chair, Visiting Gardens Committee, deliver a Trex bench to Quinnipiac Meadows, a restoration site in New Haven, CT. Photo by Pat Sabosik

leader in recycling plastic bags into decking and outdoor furniture. The campaign was a success, with the entire club getting involved, as well as a local elementary school where students collected plastic bags for recycling as part of their environmental curriculum. More than 560 pounds of plastic was collected and recycled into a Trex product. Trex donated a bench to the GC of New Haven, which they donated to a local nature preserve.

---Molly LeVan, Chair, Conservation Committee, and Pat Sabosik, Former Chair, Conservation Committee, GC of New Haven, Zone II

Planting Native Plants

Garden Club of New Haven, Zone II, is celebrating its centennial year in 2024–25. One of the club's

signature projects is selecting and donating native shrubs to various partners and civic organizations the club has worked with over past decades. The club is proud to say over 240 shrubs were planted this fall. Photo by Pat Sabosik

—Molly LeVan, Chair, Conservation Committee, and Pat Sabosik, Former Chair, Conservation Committee, GC of New Haven, Zone II

CONSERVATION COMMITTEE

19905 In the early 1990s discussions began about the possibility of the Conservation Committee publishing its own newsletter. *GCA Conservation Watch* (now *ConWatch*) contained condensed vice chairs' reports, news on legislative issues, and information to help understand those issues.

In 1991, club conservation chairs were invited to join the two committees for the first time at the NAL meeting.

Partners for Plants was launched in 1992 as a conservation project to pair local GCA clubs with managers of national parks and other federal lands to monitor endangered and rare plants.

In 1993, the fall meeting visited the redwoods in Eureka, California, where members participated in the



Study field trips became an important part of the Conservation and NAL schedule in the 1990s. In 1992, they traveled to the Pacific Northwest to examine controversial forestry issues. They viewed old-growth forests, second-growth, and clean cuts, leading to educated positions on the issue. In 2019, Conservation Study Trips were opened to 50 non-committee members. With excellent speakers and in-depth information, the trips offer unmatched educational opportunities. All photos by Lynn Steiner.

The GCA Conservation Committee celebrates its 100th anniversary in 2024. Each *ConWatch* issue this year highlights the GCA's achievements in conservation through the decades.

75th anniversary of the Save the Redwoods League and assisted in dedicating the new Elvira Broome Doolan Grove, adjacent to The Garden Club of America Grove.

In 1996, the Conservation Committee produced *The New American Lawn*, a guide on "how to have a healthy lawn friendly to people and the environment."

For years, the NAL chair worked with the GCA's Washington consultant preparing weekly communication to interested club members about legislative issues. Originally called the "Hotline," it became the "Legislative Update." In 1999, the NAL Committee completely took over the preparation and production of the update.

200005 By 2000, reports were emailed to committee members. Within a few years, all reports and publications were posted on the website and available to any GCA club member.

In the early 2000s, the NAL Committee opposed legislation that violated conservation principles the GCA supported. These proposed changes included the National Park Service favoring recreation and public use over conservation and preservation; continuing efforts to open the Arctic National Wildlife Refuge to drilling; selling public lands to mining companies; weakening the Endangered Species Act and the National Environmental Policy Act; weakening billboard regulations in 13 southern states; and, following the disastrous effects of Hurricane Katrina on Louisiana wetlands, allowing companies to harvest cypress trees in the damaged areas, further exposing sensitive wetlands to degradation.

The first decade of the 21st century saw the first Conservation and NAL committees' interest in the

threat of climate change. The Summer 2002 issue of *Conservation Watch* was titled "Is it Hot Enough for You?"

2010s The GCA celebrated 100 years as an organization in 2013. The Smithsonian Press released a history, *The Garden Club of America: 100 Years of a Growing Legacy*, with a lengthy chapter titled "The Conservationists," duly noting that conservation "had been important" to the GCA from the beginning and the "noisy voice of the GCA."

In 2014, the billboard menace rose again in the form of flashing electronic billboards. The GCA signed on to an amicus brief in support of **Scenic America**. **The Sierra Club**, the **American Planning Association**,



Inspired by the climate-change speakers they heard at the 2013 NAL meeting, Kathleen Biggins and Katy Kinsolving of the Princeton and Stony Brook Garden clubs wanted to do something. The result was **C-Change Conversations**, a program exploring the topic in a nonpartisan way. Since then, C-Change Conversations has traveled to communities in all 12 GCA zones with presentations by entrepreneurs, scientists, public policy experts, business people, and others on the challenges and opportunities of climate change.

and the International Dark-Sky Association

agreed, joining the GCA in a filing challenging the **Highway Administration's** interpretation. Another environmental emergency reared its ugly head—the decline of pollinators. The Conservation, NAL, Horticulture, and Scholarship committees addressed the challenge, advocating ending the use of pesticides, planting milkweed and pollinator gardens, and undertaking public education and outreach.

The National Park Service marked its centennial in 2016—a natural time for the committees to launch a campaign called Park it!, calling on clubs across the country to visit national parks and to document their trips on the Conservation Committee's Conservation Showcase. The Open Space Institute, based in New York, awarded the GCA its

GCA POSITION PAPERS

Position papers were created in 1989 to support advocacy by providing a cohesive and consistent message that can be articulated by the member clubs and GCA national committees. Jointly produced by the GCA's **National Affairs & Legislation** and Conservation Committees, and approved by the GCA's **Executive Board, position papers** summarize issues that are priorities to the GCA. They are created with great care, updated every two years, and contain specific core provisions which the GCA wishes to see embodied in any piece of legislation. The nine current GCA Position Papers cover the following topics:

- Agriculture, Soil, Seed
 Diversity, and Food Security
- Clean Air
- Climate Change
- Land Conservation
- Native Plants
- Oceans
- Transportation & Infrastructure
- Waste Management
- Water

Check out the GCA's 10 Position Papers found on the *GCA website*.

national conservation prize in 2016, recognizing the GCA for a century of conservation leadership.

In the mid-2010s, **Partners for Plants** was opened to projects of all sizes, if they would have a significant impact on native plants. Among those projects is **Weed Wrangle**, a popular P4P program that debuted in Nashville.



In 2014, a GCA report, "Pollinators in Peril: The Challenge," called club members to action. "Bees and butterflies are making headlines these days and the news is not good," read the report. "Honeybees and native bees are both disappearing."

In 2016 and 2017, the Conservation and NAL committees faced growing concern over a lack of plant scientists in the federal workplace, resulting in The Botanical Sciences & Native Plant Materials Research, Restoration and Promotion Act.

In 2017, a changing climate and the increasing incidence of severe storms, forest fires, and natural

devastation, prompted the GCA to announce a groundbreaking new effort in 2017: the Restoration Initiative, offered as a grant program to clubs. Also, the GCA Executive Board, working with the Conservation, NAL, and Horticulture committees, sent letters to the Secretary of Agriculture and the EPA Administrator protesting the sale of neonicotinoid-treated plants. They also called on club members to speak with their feet and their wallets by asking home-improvement stores and garden centers not to sell such plants or, at a minimum, to label them.

In 2018, the Conservation Committee embraced the **Healthy Back Yard Pledge** as its year-long focus, calling on all 18,000 club members to take the pledge. The committees also adopted their 10th position paper, **Oceans**, noting that protecting coastal areas and the earth's largest ecosystem was vital to the planet's health. **The Center for Plant Conservation** dedicated the entire January 2018 issue of its newsletter, *Save Plants*, to the GCA, calling it "One of the most influential conservation organizations in the country."

In 2019, the GCA announced a new centennial fellowship dedicated to pollinators, and a return to a long-standing conservation concern, the redwoods. The GCA's Bridge the Gap campaign was formed to raise funds for major improvements and support of the GCA Redwood Grove.

20205 The first virtual NAL Conference was held in 2021. The position of Vice Chair of State and Local Affairs position was added to the committee. The National Native Plant Month initiative was launched in 2022.

-Excerpted from A History of Conservation and National Affairs & Legislation, a GCA publication.

Things They Knew What Big Oil Knew About Climate Change

Benjamin Franta, Climate Litigation Lab, University of Oxford

everal years ago, I traveled around America visiting historical archives. I was looking for documents that might reveal the hidden history of climate change and, in particular, when the major coal, oil, and gas companies became aware of the problem and what they knew about it.

From coast to coast and in between, I pored over boxes of papers, thousands of pages. I began to recognize typewriter fonts from the 1960s and 1970s and marvel at the legibility of past penmanship (and got used to squinting when it was not so clear). From sunup to sundown, I flipped through papers, scanning with my eyes, taking notes and sometimes photos, one stack, then another, and then another. I went home, reviewed my findings, made plans for the next day, slept a bit, and started again. It was a lot of work. But what those papers revealed is now changing our understanding of how we got into this climate-change mess and what we can do to get out.

Surprising Discoveries

At an old gunpowder factory in Delaware, I found a transcript of an oil-industry conference from 1959. As I flipped through it, I saw a speech from a famous scientist

WORTH REPEATING

"The warnings about global warming have been extremely clear for a long time. We are facing a global climate crisis. It is deepening. We are entering a period of consequences." —Al Gore, 2005

warning the company men assembled of you guessed it—global warming. "Whenever you burn conventional fuel," the scientist explained, "you create carbon dioxide. ... Its presence in the atmosphere causes a greenhouse effect." If the world kept using fossil fuels? Eventually, "all the coastal cities would be covered," he warned. The year 1959 was before

The oil industry was aware of the risks of climate change decades ago. Photo by Walter Siegmund, Wikimedia Commons



"There is still time to save the world's peoples from the catastrophic consequences of pollution, but time is running out."

> —American Petroleum Institute, 1965

the moon landing, before the Beatles' first single, before Martin Luther King's "I Have a Dream" speech, and before the first modern aluminum can was made. It was decades before I was born. What else was out there?

In Wyoming, I found a speech, this one from an oil executive himself in 1965. That year, the American Petroleum Institute, the main organization for the U.S. oil industry, held its annual meeting in Chicago, and the group's president addressed the crowd. "As always, it is good to see so many in attendance," he opened, before mentioning a report on the environment published just a few days before by President Johnson's scientific advisors. "The substance of the report," the oil head said, "is that there is still time to save the world's peoples from the catastrophic consequences of pollution, but time is running out." He continued, "One of the most important predictions of the report is that carbon dioxide is being added to the earth's atmosphere by the burning of coal, oil, and natural gas at such a rate that by the year 2000 the heat balance will be so modified as possibly to cause marked changes in climate," and noted that a "nonpolluting means of powering automobiles, buses, and trucks is likely to become a national necessity."

As I reviewed my findings back in Stanford, California, where I was a PhD student in history, I realized that before San Francisco's Summer of Love, before Woodstock and the peak of the 1960s counterculture and the start of the "war on drugs" and all that stuff that seemed ancient history to me, the heads of the oil industry had been privately informed by their leaders that their products would eventually alter the climate of the entire planet, with dangerous consequences.



Transportation is the leading source of carbon dioxide emissions in the U.S., followed by electricity. Photo by Oran Viriyincy, Wikimedia Commons



Secret Research

While I traveled the country, others were also hard at work. And the documents they found were in some ways even more shocking. By the late 1970s, the American Petroleum Institute had formed a secret task force, which included representatives from many major oil companies, to privately monitor and discuss climate science. In 1980, the task force invited a scientist from Stanford University to brief them on the state of climate science. Today, we have a copy of his presentation, which warned that if fossil fuels continued to be used, global warming would be "barely noticeable" by 2005 but by the 2060s would have "globally catastrophic effects." But that same year, the American Petroleum Institute called on governments to triple coal production worldwide, despite the consequences for humanity.

Exxon had a secret research program, too. In 1981, one of its research directors sent an internal memo observing that the company's long-term business plans could "produce effects which will indeed be catastrophic (at least for a substantial fraction of the earth's population). "The next year, Exxon completed a comprehensive, 40-page, internal report on climate change, which predicted almost exactly the global warming we have seen and many of its damaging, costly effects. According to the front page of the report, it was "given wide circulation to Exxon management" but was "not to

Climate change is evident in rapidly melting glaciers, such as Angel Glacier, which flows down the north face of Mount Edith Cavell in Jasper National Park, Canada. Photo by Lynn Steiner

COMING TO TERMS Greenhouse Effect

The greenhouse effect is the process through which heat is trapped near earth's surface by substances known as greenhouse gases. Imagine these gases as a cozy blanket enveloping our planet, helping to maintain a warmer temperature than it would have otherwise. Greenhouse gases consist of carbon dioxide, methane, ozone, nitrous oxide, chlorofluorocarbons, and water vapor. Water vapor, which reacts to temperature changes, is referred to as "feedback," because it amplifies the effect of forces that initially caused the warming.

The greenhouse effect is a good thing. Without it, the world would be more like Mars: a frozen, uninhabitable place. The problem is, voracious burning of fossil fuels for energy is artificially amping up the natural greenhouse effect. The result? An increase in global warming altering the planet's climate system.

Facing page: As early as the 1970s, big oil companies knew that if the industry moved away from fossil fuels and instead focused on renewable energy, fossil-fuel pollution could start to decline in the 1990s, and a major climate crisis could be avoided. Photo by Matthew T. Rader, Wikimedia Commons be distributed externally." And Exxon did keep it secret: we only know of the report's existence because journalists uncovered it in recent years.

Other oil companies knew what they were doing to the planet too. In 1986, Dutch oil company Shell finished an internal report predicting that global warming from fossil fuels would cause changes "the greatest in recorded history," including "destructive floods," abandonment of entire countries, and even forced migration around the world.

All this is even worse when one learns that these companies had a choice. Back in 1979, Exxon privately studied options for avoiding global warming. It found that with immediate action—if the industry moved away from fossil fuels and instead focused on renewable energy—fossil-fuel pollution could start to decline in the 1990s, and a major climate crisis could be avoided. But the industry did not pursue that path.

Our Job

According to the oil industry's internal documents, it could have begun addressing global warming in the early 1980s. Instead, Exxon and other companies coordinated a global campaign to dispute climate science, block fossil-fuel controls, and keep their products on top. We know about this international conspiracy through internal documents and the words of industry insiders, who are now beginning to share what they saw with the public. Likely, much more remains to be learned.

Decades to act have now been lost. And today many of us are noticing global warming with our own eyes: weird weather, shifting seasons, and fires and storms like we have never seen before. It is as true in the cities as it is where I grew up in farm-town lowa. Will the world experience the global catastrophe oil companies predicted years before I was born? That, of course, is up to us. That is our slice of history.

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This article was first published in **The Conversation**, October 28, 2021, and updated October 29, 2021.

"...heads of the oil industry had been privately informed by their own leaders that their products would eventually alter the climate of the entire planet, with dangerous consequences."

Twice is Nice: The Value of Water Recycling

John L. Turner, Senior Conservation Policy Advocate, Seatuck Environmental Association

ooking at an aerial photograph of eastern Long Island, New York, where the North and South forks of the East End begin their divergence from the main body of the island, you will see a widening Peconic River emptying into Peconic Bay. This 158,000acre body of water is an "estuary of national significance." Flanking the north side of the river mouth is the 18-hole Indian Island Golf Course, owned and operated by Suffolk County. Adjacent to the northwest corner of the golf course is what appears to be a small industrial facility. A closer look reveals half a dozen circular pools of water and twice that number of rectangularly shaped ones. This facility is the Riverhead Wastewater Treatment Plant, and these pools are treatment tanks that transform muddycolored sewage water into a clear and clean liquid. This water runs through a long pipe, ultimately discharging treated wastewater into the river and by extension the bay—except when it doesn't.

And it doesn't for over half the year, April through October, when the highly treated water is redirected for irrigating the golf course's fairways and greens. This redirection prevents approximately 1.2 tons of



The Riverhead Wastewater Treatment Plant, located near Indian Island Golf Course on Long Island, where sewage water is transformed into a clean liquid used for irrigation. All photos by Joy Flynn

nitrogen from entering the river and bay and keeps about 63 million gallons of groundwater in the ground annually. The nitrogen is in the form of nitrate-nitrogen, and its presence in low concentrations in wastewater helps fertilize the golf course grass, a process called "fertigation." These quality and quantity benefits are typical of water-reuse projects, reducing nutrient loads entering receiving waterbodies while eliminating the need to pump ambient water from aquifers or surfacewater reservoirs.

Water-reuse projects involve using treated wastewater again for a desirable or beneficial purpose. In addition to the typical steps of treating wastewater filtration, nitrifying, and denitrifying bacteria to clean the water—reused water is subject to additional purifying steps. The Riverhead plant employs UV-emitting lights, which kill 99 percent of water-borne pathogens, most "Today's technology allows us to take any source of water, from wastewater to stormwater, and clean it to a level appropriate for any end use."

—Patricia Sinicropi



An excellent example of water reuse: For over half the year, Indian Island Golf Course, located along the mouth of the Peconic River on Long Island, uses treated wastewater to irrigate greens and fairways. Nitrogen present in wastewater also helps fertilize the grass.

Almost all estuaries in the United States—critically important places where the salt water of the ocean mingles with freshwater inputs from rivers, creating ideal conditions for the growth of numerous shellfish and finfish species have too much nitrogen.

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notably viruses. The casing for the lights and the pipes carrying the soon-to-be-reused wastewater are light purple, the universal color for water-reuse infrastructure.

"It just makes sense," notes Michael Reichel, Superintendent of the Riverhead Sewer District, which operates the wastewater plant. "We have water already out of the ground, and next to us is a golf course that needs water. Using the water at the course reduces nitrogen loading to the estuary." The common-sense dimension of the water recycling project was obvious to all involved. Reichel served as the main catalyst behind the project, working with others to secure funding and the approvals needed to see the project to fruition. "Clean water is personal. I like to go crabbing and swimming, and the same with my kids," he emphasizes, noting, "All district employees enjoy the bay and are fully invested in wanting to protect it."

Over the past decade, the adverse environmental impacts from excess nitrogen have come into focus, not only on eastern Long Island but throughout the United States. Almost all U.S. estuaries—those critically important places where the ocean salt water mingles with freshwater inputs from rivers, creating ideal conditions for the growth of numerous shellfish and finfish species—have too much nitrogen. It's the same for innumerable freshwater systems, including the Great Lakes. This excess is fueling a variety of negative impacts on these valuable ecosystems. Excessive nitrogen, which acts as plant fertilizer, catalyzes a predictable chain of events starting with the excessive growth of algae. Being short-lived, the algae die and sink to the bottom of the wetland. Significant amounts of dissolved oxygen are used to decompose the algae, creating hypoxic or lowdissolved oxygen levels. These low levels stress and kill marine animals and are especially hard on benthic or ground-dwelling animals like lobsters and crabs, which cannot flee the lethal conditions.

In some cases, dissolved oxygen levels can get close to or reach zero, creating anoxic conditions scientists call "dead zones." The National Oceanic and Atmospheric Administration (NOAA), in a 2019 assessment, documented a dead zone in the Gulf of Mexico covering nearly 7,000 square miles. Caused by excess nutrients washing into the gulf from the Mississippi River, this dead zone picks up nutrients from farms and other land surfaces in a watershed that encompasses nearly half the country. In the northeast, Long Island Sound has been afflicted with excess nitrogen problems, with the western reaches of the sound having worse water-quality conditions due to wastewater inputs of several large treatment plants serving New York City.

Water reuse has long been recognized as a valuable water-management tool in safeguarding water quality and preserving and extending water supplies. Waterscarce Israel, the world's water-recycling leader, reuses about 90 percent of its wastewater, mostly for agricultural applications. In the U.S., approximately 10 percent of wastewater generated daily is reused, with California, Florida, and arid southwestern states reusing the most. There is a decent likelihood the orange juice you enjoyed this morning came from oranges grown on an orange tree irrigated with highly treated wastewater. "Although arid and coastal regions have historically been the biggest adopters of water reuse, we have seen significant growth in water recycling in new regions

"In total, approximately 10 percent of wastewater generated daily in the United States is reused."

—John Turner

over the past decade, including the Pacific Northwest, Mid-Atlantic, and Midwest," notes Patricia Sinicropi, executive director of the WateReuse Association, a national organization promoting reuse.

Given the low percentage of water reused in the U.S., there's room for progress. Water is and can be reused in many ways. After all, nature endlessly reuses water every day

WORTH REPEATING "Water should never be treated as a nonrenewable resource; it should always be treated with the respect it deserves as the foundation of life on the planet." -David Brown, Photographer/Videographer

Colorado have adopted regulations governing direct reuse, and Florida and Arizona are in the process of doing so.

The water-quantity benefits of water recycling are the other side of the water-management coin and cannot be understated. Many of the nation's large groundwater aquifers, like the Ogallala Aquifer in the Great Plains, are being depleted. Water levels

as part of the global water cycle. Golf course and crop-field irrigation lead the way, but new uses for reclaimed water continue to grow. Sinicropi states, "Thirty years ago, landscape and agricultural irrigation were the primary-use applications; but today, fit-for-purpose water recycling produces water for any designated freshwater purpose, including drinking, industrial processes, surface or groundwater replenishment, and environmental restoration.

Water can be reused at the treatment plant itself, an application known as internal water reuse. Treatment plants consume a lot of water for cleaning belt presses and floors and, resultantly, plant operators have looked at ways to be more efficient, such as tapping into their end product—highly treated wastewater—for cleaning. One large wastewater plant on Long Island's south shore modified its system for internal reuse, saving more than 300 million gallons a year. This initiative made fiscal sense too, saving plant operators considerable funds through significantly reduced water-acquisition costs paid to the local water supplier. It saved so much that it paid for itself in a few years.

Direct reuse, in which highly treated wastewater is injected directly into potable water supplies, is becoming more commonplace. Public support for direct reuse is growing. In a May 2024 European Union poll, 65 percent of respondents were prepared to drink beverages using recycled water. Six North American breweries now use recycled water in their brewing process. California and in this aquifer declined as much as 44 feet in Texas over the past several decades. This basic and critical concern having enough water to meet all a community's needs is a major motivating force in advancing reuse. Adding to the concern is the layer of uncertainty caused by the ultimate disruptor of the water cycle: climate change. Globally, droughts are becoming more frequent, are lasting longer, and are more severe.

Long Island is a good example of this vulnerability, since the 2.6 million residents cannot turn elsewhere to meet their water-supply needs. They completely depend on the groundwater supply—a system of tiered aguifers—to meet all water needs. In recognition of this vulnerability, Long Island was the first location in the United States to be declared a "Sole Source Aquifer" by the federal Environmental Protection Agency. But because of overpumping and contamination, the island's water-supply system is showing significant signs of stress, with saltwater intrusion occurring in a few places and overall water-quality decline in much of the aquifer system, especially in the upper glacial aquifer, the one closest to the land surface. This is especially acute in Nassau County, next to New York City. The county has been "mining" its water supply for many decades; watertable elevations have dropped throughout the county, causing the loss or reduction of surface-water wetlands such as streams and ponds. A recently released report from the United States Geological Survey indicates the



The Peconic River on Long Island empties into Peconic Bay, a 158,000-acre waterbody that is an "estuary of national significance."

extent of saltwater intrusion in southern Nassau County and the two northern "necks" has increased over the past several decades and threatens several public wells.

In response to these concerns, the Seatuck Environmental Association, with funding from the Greentree Foundation and technical assistance from Cameron Engineering, prepared a "Long Island Water Reuse Roadmap and Action Plan." The plan identifies 93 reuse opportunities involving golf courses, farms, nurseries, and athletic fields. This roadmap will have the opportunity to be implemented this fall in Suffolk County when voters decide on a water-quality referendum. If approved, \$4.2 billion will be available, some of which will be directed to fund water-recycling projects throughout the county.

The future for expanded use of recycled water is promising. "All water issues are local and water reuse

looks different in many places," Sinicropi explains. "Today's technology allows us to take any water source, from wastewater to stormwater, and clean it to a level appropriate for any end use. Sometimes these are centralized systems operated by a local utility or sometimes onsite systems for one or multiple buildings. The drivers for investment in water reuse are also equally diverse. Water reuse can be an effective solution when you do not have enough water, when you have too much water, or when you have the wrong quality of water." That pretty much covers it.

John Turner is senior conservation policy advocate at Islip, New York-based Seatuck Environmental Association. He was cofounder of the Long Island Pine Barrens Society, whose mission is to promote education, to advocate for the protection of Long Island's drinking water, and to preserve open spaces, especially in the Pine Barrens.

CONSERVATION STUDY CONFERENCE



The Greater Yellowstone Ecosystem: Conservation and Connectivity

The 2024 Conservation Study Conference was held virtually on November 6, with hundreds of GCA conservationists, naturalists, travelers, and outdoor enthusiasts logging in for exciting and informative sessions exploring Conservation and Connectivity

in the Greater Yellowstone Ecosystem. This ecosystem, one of the earth's largest remaining nearly intact temperatezone ecosystems in the world, spans 22 million acres, covers parts of Wyoming, Montana, and Idaho, and incorporates two national parks, six national forests, and tribal, state, and private lands. The conference included immersive presentations and vibrant conversations from the Yellowstone and Grand Teton National Park staff, researchers, biologists, conservation artists, and experts in bear, bison, pronghorn, and wolves.

> —Janet Frantz, Mill Mountain GC, Zone VII, Vice Chair, Conservation Study Conference 2024

Program

The Greater Yellowstone Ecosystem and Why It Is Important to All of Us, Cam Sholly, Superintendent, Yellowstone National Park

The Ecological, Cultural, and Spiritual Importance of the Buffalo, Jason Baldes, Eastern Shoshone Tribe, Tribal Buffalo Program Director, Tribal Partnerships Program, National Wildlife Federation Sagebrush in Peril: Restoring a Vital Habitat in Grand Teton National Park and Impacts of Climate Change on Phenology in the Greater Yellowstone Ecosystem, Laura Jones, Grand Teton National Park, Branch Chief Vegetation, and Charlotte Cadow, Wyoming Community Science Specialist, The Nature Conservancy

The Greater Yellowstone Ecosystem Through an Artist's Eye, James Prosek, Artist, Writer, Naturalist

Grizzly Bear Recovery and What the Future Holds, Chris Servheen, PhD, International Union for Conservation of Nature, Cochair, Bear Specialist Group, North American Bears Team

Pack Power: The Social Life of Wolves and Their Role in the Greater Yellowstone, Kira Cassidy, Research Associate, Yellowstone Forever

The How and Why of Ungulate Migrations, Bill Rudd, Project Manager and Cofounder, Wyoming Migration Initiative, and Matt Kauffman, Lead Scientist, Wyoming Migration Initiative

Fireside Chat with Chip Jenkins: Resiliency in Grand Teton National Park, Chip Jenkins, Superintendent, Grand Teton National Park, and Elizabeth Waddill, Magnolia GC, Zone IX, Board of Associates Members, Civic Improvement & Grants; Board Chair, National Parks Conservation Association

If you missed the conference and want to watch the informative presentations, visit the Conservation Committee page on the GCA website.

Banner photo: Grand Teton National Park. Photo by Kimberly McMorrow