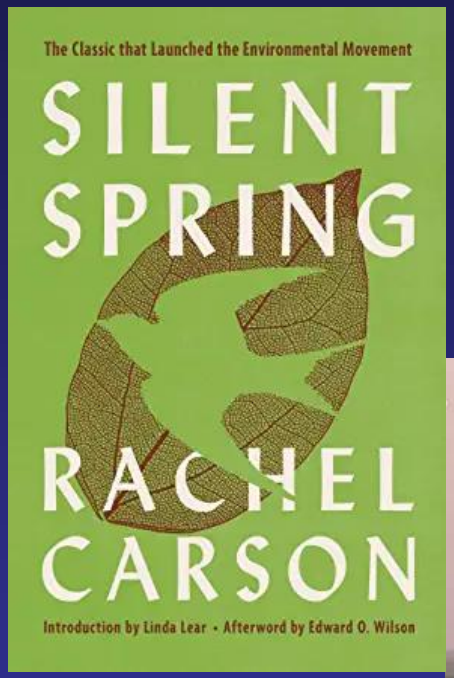
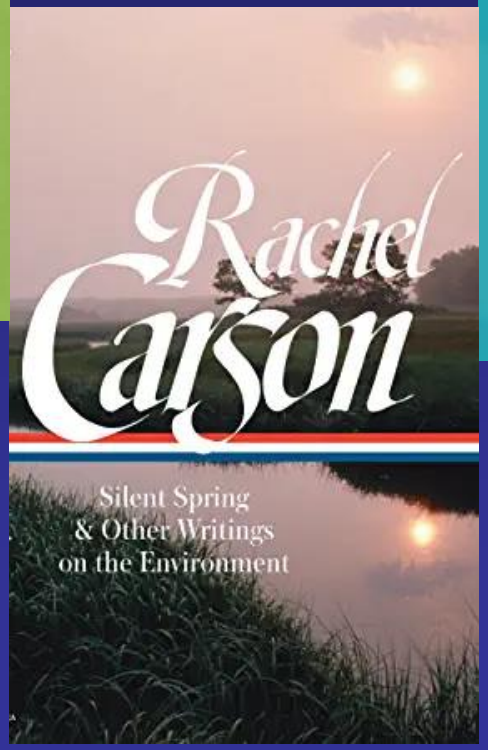

SILENT SPRING
RACHEL CARSON

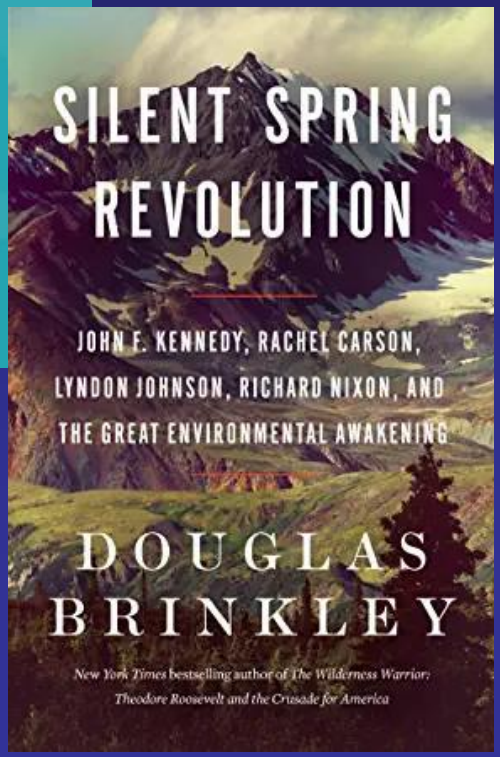
Silent Spring (1962) considered a "classic" of modern environmentalism

- Serialized in New Yorker, *Silent Spring* became best-seller
- Carson became one of the most admired women in USA
- Credited with "launching the [modern] environmental movement"— by calling attention to risks of chemicals in environment
- Providing major impetus for establishment of US EPA

Remains one of best-selling environmental books of all time







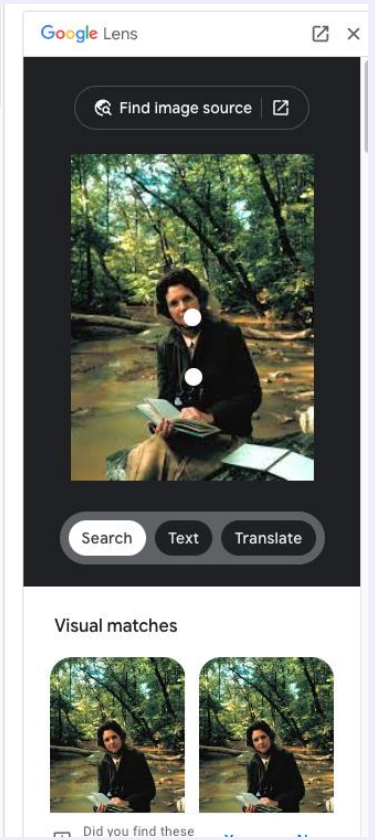
Carson's work had lasting impact

- Led to PSAC review of DDT and other persistent pesticides.
- Led in turn to decision to ban DDT use in USA
- Recovery of American eagle, the California condor, and other birds who existence was threatened.

Where are we today?

Since Carson is a hero, it's easy for people to think that the problems she addressed have been largely solved.

Sadly, that is not the case.



BIODIVERSITY LOSS

Decline of the North American avifauna

Kenneth V. Rosenberg[1,2]*, Adriaan M. Dokter[1], Peter J. Blancher[3], John R. Sauer[4], Adam C. Smith[5], Paul A. Smith[3], Jessica C. Stanton[6], Arvind Panjabi[7], Laura Helft[1], Michael Parr[2], Peter P. Marra[8]†

Species extinctions have defined the global biodiversity crisis, but extinction begins with loss in abundance of individuals that can result in compositional and functional changes of ecosystems. Using multiple and independent monitoring networks, we report population losses across much of the North American avifauna over 48 years, including once-common species and from most biomes. Integration of range-wide population trajectories and size estimates indicates a net loss approaching 3 billion birds, or 29% of 1970 abundance. A continent-wide weather radar network also reveals a similarly steep decline in biomass passage of migrating birds over a recent 10-year period. This loss of bird abundance signals an urgent need to address threats to avert future avifaunal collapse and associated loss of ecosystem integrity, function, and services.

Slowing the loss of biodiversity is one of the defining environmental challenges of the 21st century (1–5). Habitat loss, climate change, unregulated harvest, and other forms of human-caused mortality (6, 7) have contributed to a thousandfold increase in global extinctions in the Anthropocene compared to the presumed prehuman background rate, with profound effects on ecosystem functioning and services (8). The overwhelming focus on species extinctions, however, has underestimated the extent and consequences of biotic change, by ignoring the loss of abundance within still-common species and in aggregate across large species assemblages (2, 9). Declines in abundance can degrade ecosystem integrity, reducing vital ecological, evolutionary, economic, and social services that organisms provide to their environment (8, 10–15). Given the current pace of global environmental change, quantifying change in species abundances is essential to assess ecosystem impacts. Evaluating the magnitude of declines requires effective long-term monitoring of population sizes and trends, data that are rarely available for most taxa.

Birds are excellent indicators of environmental health and ecosystem integrity (16, 17), and our ability to monitor many species over vast spatial scales far exceeds that of any other animal group. We evaluated population change for 529 species of birds in the continental United States and Canada (76% of breeding species), drawing from multiple standardized bird-monitoring datasets, some of which provide close to 50 years of population data. We integrated range-wide estimates of population size and 48-year population trajectories, along with their associated uncertainty, to quantify net change in numbers of birds across the avifauna over recent decades (18). We also used a network of 143 weather radars (NEXRAD) across the contiguous United States to estimate long-term changes in nocturnal migratory passage of avian biomass through the airspace in spring from 2007 to 2017. The continuous operation and broad coverage of NEXRAD provide an automated and standardized monitoring tool with unrivaled temporal and spatial extent (19). Radar measures cumulative passage across all nocturnally migrating species, many of which breed in areas north of the contiguous United States that are poorly monitored by avian surveys. Radar thus expands the area and the proportion of the migratory avifauna that is sampled relative to ground surveys.

Results from long-term surveys, accounting for both increasing and declining species, reveal a net loss in total abundance of 2.9 billion [95% credible interval (CI) = 2.7–3.1 billion] birds across almost all biomes, a reduction of 29% (95% CIs = 27–30%) since 1970 (Fig. 1 and Table 1). Analysis of NEXRAD data indicates a similarly steep decline in nocturnal passage of migratory biomass, a reduction of 13.6 ± 9.1% since 2007 (Fig. 2A). Reduction in biomass passage occurred across the eastern United States (Fig. 2, C and D), where migration is dominated by large numbers of temperate- and boreal-breeding songbirds; we observed no consistent trend in the Central or Pacific flyway regions (Fig. 2, B to D, and table S5). Two completely different and independent monitoring techniques thus signal major population loss across the continental avifauna.

Species exhibiting declines (57%, 303 out of 529 species) on the basis of long-term survey data span diverse ecological and taxonomic groups. Across breeding biomes, grassland birds showed the largest magnitude of total population loss since 1970—more than 700 million breeding individuals across 31 species—and the largest proportional loss (53%); 74% of grassland species are declining. (Fig. 1 and Table 1). All forest biomes experienced large avian loss, with a cumulative reduction of more than 1 billion birds. Wetland birds represent the only biome to show an overall net gain in numbers (13%), led by a 56% increase in waterfowl populations (Fig. 3 and Table 1). Unexpectedly, we also found a large net loss (63%) across 10 introduced species (Fig. 3, D and E, and Table 1).

A total of 419 native migratory species experienced a net loss of 2.5 billion individuals, whereas 100 native resident species showed a small net increase (26 million). Species overwintering in temperate regions experienced the largest net reduction in abundance (1.4 billion), but proportional loss was greatest among species overwintering in coastal regions (42%), southwestern aridlands (42%), and South America (40%) (Table 1 and fig. S1). Shorebirds, most of which migrate long distances to winter along coasts throughout the hemisphere, are experiencing consistent, steep population loss (37%).

More than 90% of the total cumulative loss can be attributed to 12 bird families (Fig. 3A), including sparrows, warblers, blackbirds, and finches. Of 67 bird families surveyed, 38 showed a net loss in total abundance, whereas 29 showed gains (Fig. 3B), indicating recent changes in avifaunal composition (table S2). Although not optimized for species-level analysis, our model indicates that 19 widespread and abundant landbirds (including two introduced species) each experienced population reductions of >50 million birds (data S1). Abundant species also contribute strongly to the migratory passage detected by radar (19), and radar-derived trends provide a fully independent estimate of widespread declines of migratory birds.

Our study documents a long-developing but overlooked biodiversity crisis in North America—the cumulative loss of nearly 3 billion birds across the avifauna. Population loss is not restricted to rare and threatened species, but includes many widespread and common species that may be disproportionately influential components of food webs and ecosystem function. Furthermore, losses among habitat generalists and even introduced species indicate that declining species are not replaced by species that fare well in human-altered landscapes. Increases among waterfowl and a few other groups (e.g., raptors recovering after the banning of DDT) are insufficient to offset large losses among abundant species (Fig. 3). Notably, our population loss estimates are conservative because we estimated loss only in breeding populations. The total loss and

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Since Silent Spring, Major declines in North American birds

Rosenberg, et al., 2019
Science 366: 120-124.

- 25% of all North American birds since 1970
- 50% grassland birds

Some a bit better: Wetland biomes “only” - 13%

Individuals:
> 3 billion individual birds

NGO Campaign: 3billionbirds.org. #Bringbackbirds

#BRINGBIRDSBACK

HOME FINDINGS NEWS ROOM HOW TO HELP

How to Help

WHY BIRDS MATTER

7 SIMPLE ACTIONS

7 Simple Actions To Help Birds

1. MAKE WINDOWS SAFER, DAY AND NIGHT

The challenge: Up to 1 billion birds are estimated to die each year after hitting windows in the United States and Canada. (source).

Many window collisions happen when birds see reflections of trees and fly toward them. *Photo by Damian Pollet via Creative Commons.*

The cause: By day, birds perceive reflections in glass as habitat they can fly into. By night, migratory birds drawn in by city lights are at high risk of colliding with buildings.

These simple steps save birds: On the outside of the window, install screens or break up reflections—using film, paint, or Acopian BirdSavers or other string spaced no more than two inches high or two inches wide. (source).

Take it further: Work with businesses or public buildings to offer a contest for creative "window mural" designs that make windows safer for birds. Support legislation for bird-friendly building designs. Start a lights-out campaign in your city.

Get started today:

- Quick, affordable ways to keep birds from hitting your windows

“7 simple actions to help birds”

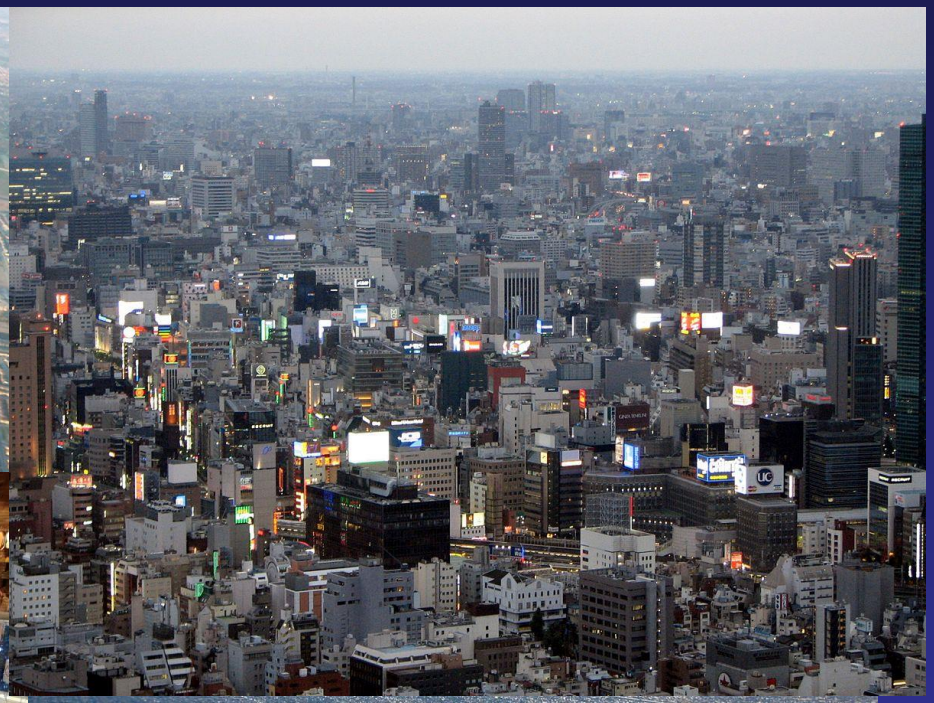
1. Put screens or decals on windows
2. Keep cats indoors
3. Reduce lawns, plant natives
4. Avoid pesticides by buying organic food
5. Drink shade-grown coffee
6. Reduce use of plastics
7. Watch birds, share what you see.

These are all individual actions

- Framework of “individual responsibility.”
- Similar to the idea promoted by oil and gas company, BP, of a “carbon footprint.”
- As if decline in birdlife is due to individual negligence

With exception of cats, main causes of bird life loss are <u>not</u> attributable to personal choices:

The number 1 reason for wildlife loss, globally, according to UNEP, IPBES, the US Fish and Wildlife Service, and other sources, is **habitat destruction.**



The number 2 cause of bird loss **in US is collision with large glass buildings, communication towers, and electrical lines (not private homes).**

Additional important sources of mortality:

- Pesticides, mostly used in commercial agriculture.
- Commercial fishing by-catch.

On other words, most bird death is not caused by things ordinary people do in daily life, but by industrial and commercial activity.

This means we need law and governance to regulate how we do business.

The 3billionbird campaign acknowledges that political action could also be useful

Under avoiding pesticides, it offers:

Take it further: Urge U.S. Representatives to cosponsor the Saving America's Pollinators Act. The bill, H.R. 1337, requires the Environmental Protection Agency (EPA) to suspend registration of neonics.

BUT ONLY after telling you to buy organic food.

Typical of a larger pattern particularly in US of focusing on "what you can do…"

…while ignoring the commercial interests that push unregulated chemicals, weaken laws and regulations that protect birds (and other life).

As the call for this conference notes, the world remains awash in chemicals, many of which are weakly regulated, if at all.

Many species, particularly pollinators, are threatened by damaging chemicals in the environment.

Rosenberg et al. study suggests only type of bird that has not declined in North America are waterfowl.

Almost certainly because wetlands are far more protected than any other biome.

Federal, state, provincial, and tribal laws protect wetlands, in ways that they do not protect other habitat.

RESEARCH

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In other words, the law is almost certainly the most powerful tool to protect birds, and other life.

But today, as in the past, powerful actors work to prevent meaningful legal protection to protect habitat and control toxic chemicals.

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This is not new.

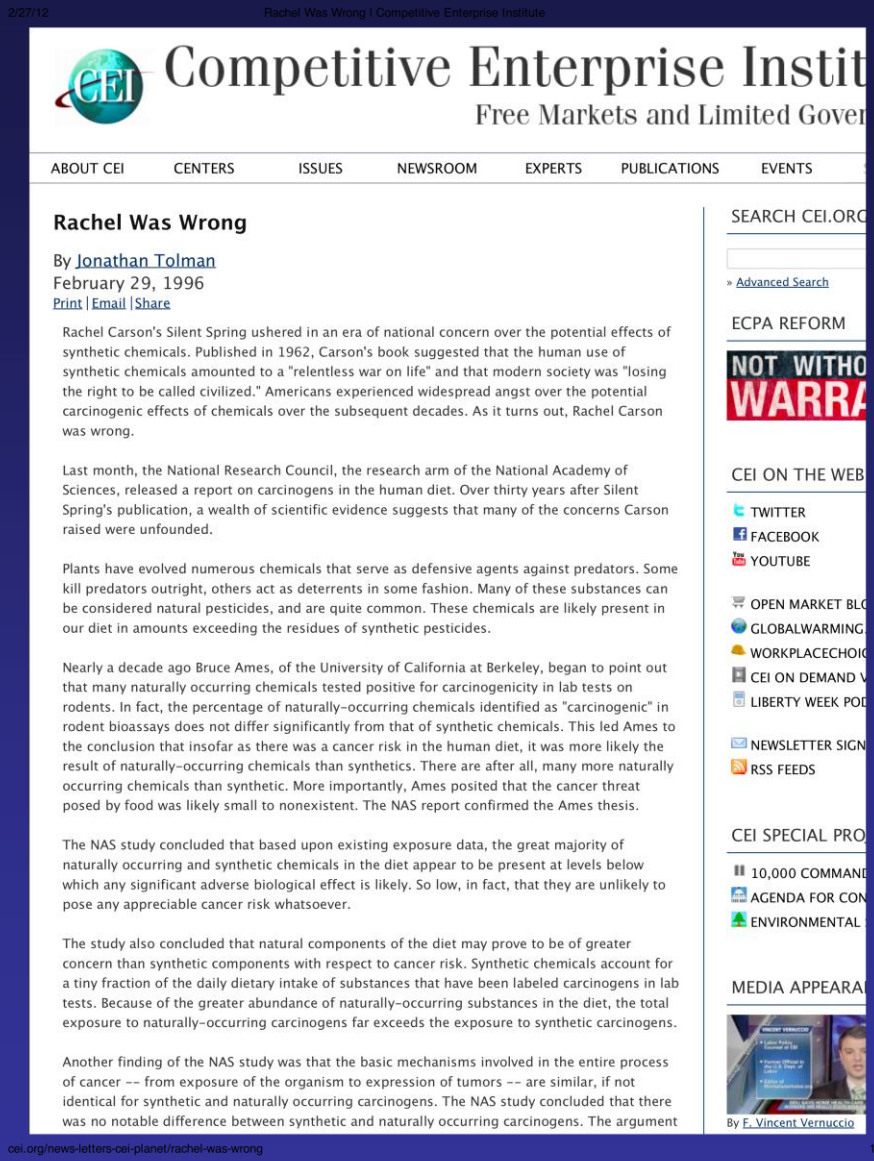
At the time, Rachel Carson faced attacks from the food industry in America and its allies.

In the 1990s and onwards, continued by corporate and other advocates opposed to government "interference" in the "free market."

Often this involved outrights lies about Carson, about the effect of DDT, and effects of banning DDT…

That she wanted an outright ban on all chemicals (not true)

That millions of people died unnecessarily from malaria caused by "over-reaction" about DDT (also not true. DDT had already by 1970s stopped working well because insects had evolved resistance.)



Competitive Enterprise Institute: Promotes "free market" solutions.

"Rachel was wrong" campaign.

"As it turns out, Rachel Carson was wrong. …Over thirty years after Silent Spring's publication, a wealth of scientific evidence suggests that many of the concerns Carson raised were unfounded." (1996)

No scientific study has been able to replicate a case of actual human harm from DDT, despite more than five decades of its use around the globe.

The political nature of the banning of DDT for agricultural use was subsequently confirmed when it appeared that much of the scientific basis for the ban contained in *Silent Spring* was either wrong or exaggerated. The 1972 edition of *Silent Spring* even testified to that. On the back cover of the book was the following: "No single book did more to awaken and alarm the world than Rachel Carson's *Silent Spring*. It makes no difference that some of the fears she expressed ten years ago have proved groundless or that here and there she may have been wrong in detail." It is interesting that the publishers freely admit to the alarmist nature of her book yet are reluctant to admit that it in fact does make a very big difference that Carson's fears were wrong.

The Stockholm Convention

Most of the environmental concerns resulting from the use of DDT came from its application in agriculture. With some degree of government subsidy supporting the use of DDT in most Western countries, farmers used enormous quantities of the pesticide to treat their crops, often hiring crop-duster planes to spray very liberal applications of the chemical over their fields. The unscientific banning of DDT may have proved costly for farmers around the world, but there were alternative agricultural insecticides available to them. Although most countries followed the lead of the United States and banned DDT for agricultural use, the bans did not halt the use of DDT in disease control, and public health use continued in parts of Africa, Latin America, and Asia.

The public health use of DDT was always completely different from the agricultural use. When sprayed in tiny quantities on the inside walls of houses, DDT simply does not escape into the wider environment and poses little or no threat to wildlife. Nonetheless, various environmentalist groups continued to press for a complete ban on the production and use of DDT. The most significant threat to the continued use of DDT in disease control came with the Stockholm Convention on Persistent Organic Pollutants.

The Stockholm Convention came out of a decision made in 1995 by the United Nations Environment Program Governing Council to develop a legally binding instrument to control certain chemicals. The convention initially targeted 12 chemicals, known as the "dirty dozen," arguing that those chemicals "pose major and increasing threats to human health and the environment."[33]

DDT is certainly the most effective of those chemicals in malaria control. However, the other chemicals play an important role in agriculture and certain production processes in the developing world. None of the industrialized nations driving the Stockholm Convention, such as the United States and Canada, uses those chemicals.

The UNEP held five negotiating committee meetings between June 1998 and December 2000 where governments negotiated and finally agreed on the final text of the convention. At the initial negotiating meeting it seemed that the convention might unconditionally ban DDT, a position supported at the time by environmental groups such as the WWF. Country delegates interviewed by the authors in Geneva in September 1999 and in Johannesburg in 2000 denied that they had ever contemplated a ban on DDT. But political memories are often short, and it is difficult to know what the result of pressure from the greens would have been had it not been countered by pro-DDT members of the health community.

The countries that still rely on DDT for disease control are mostly less developed and could not afford to match the large numbers of delegates sent by European countries or the United States. Usually, the less-developed countries could afford to send only one or two delegates to the negotiating committee meetings. Almost invariably, those delegates came from government environmental agencies. Some of the representatives were not even aware that their countries were using DDT for disease control, as their health departments had failed to correctly brief them.

Despite those problems, however, the efforts of some countries, particularly South

CATO Institute:

Banning DDT was "disastrous"… "no scientific study has been able to replicate a case of actual human harm from DDT…"

Also false.

Lancet (2005): When used at levels required for mosquito control, DDT exposure is associated with significant impacts on human reproduction

- Increased rate of pre-term birth, low birth weight, possibly birth defects.
- Shortened duration of lactation and early weaning.
- Correlated with higher infant mortality.

Walter J. Rogan and Aimin Chen, "Health Risks and Benefits of bis (4- chlorophenyl)-1,1,1- trichloroethane (DDT)," *Lancet 366, no. 9487 (August 27, 2005): 763–73.*

Major argument in the 1970s was whether DDT caused cancer in humans, particularly breast cancer.

Hard to answer because of long latency effects.

2007: Berkeley study of reproductive-aged women exposed to DDT in 1950s and 60s examined their mortality and morbidity from breast cancer.

The results showed a *fivefold increase in breast cancer risk among women with high levels* of serum DDT or its metabolites.

- Barbara A. Cohn et al., "DDT and Breast Cancer in Young Women: New Data on the Significance of Age at Exposure," *Environmental Health Perspectives 115, no. 10 (October*2007): 1406–14; Rick Weiss, "Long Hidden Dangers? Early Exposure to DDT May Raise Risk of Breast Cancer," *Washington Post, October 9, 2007, sec. F, 1, http://* www .washingtonpost .com/ wp -dyn/ content/ article/ 2007/ 10/ 05/ AR2007100502253.html .

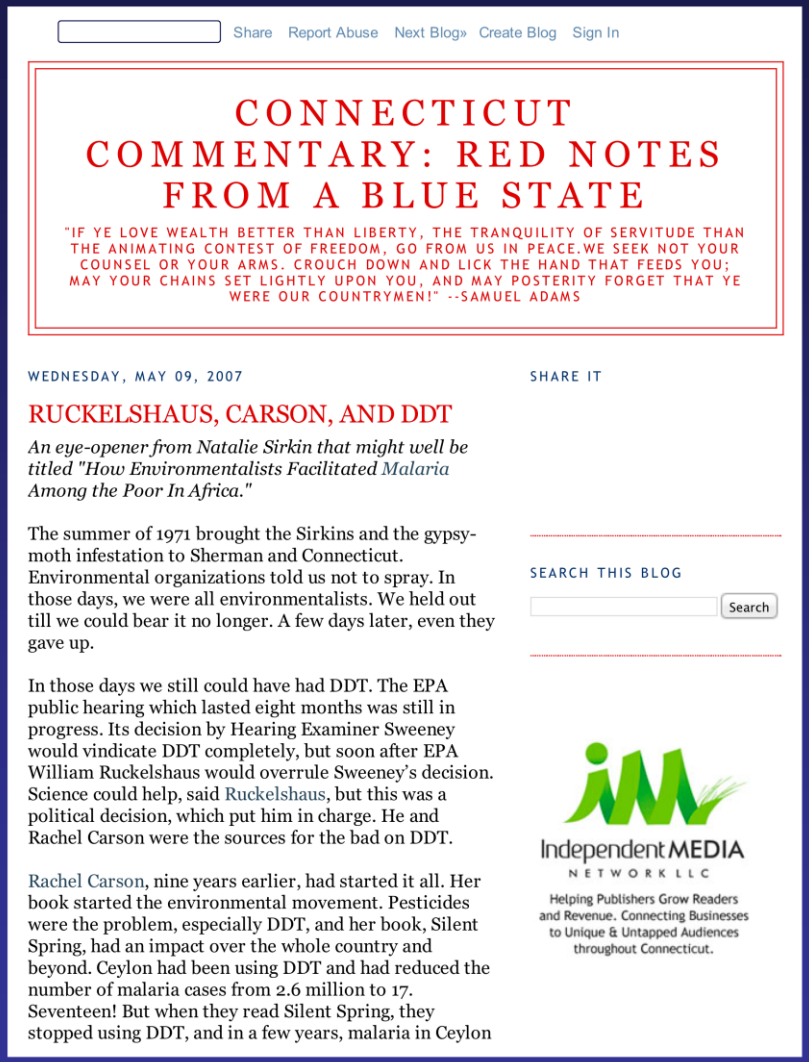
Science is clear:
DDT was (and is) dangerous to wildlife and to humans.

Abundant scientific evidence in the 1950, ‘60s, ‘70s has been corroborated by further studies

More than a half century of accumulated (and consistent) scientific evidence.

In hindsight, it is clear that we avoided many serious harms from DDT because we *acted*.

And we acted, in no small part, because of Rachel Carson's eloquent and urgent voice.



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CONNECTICUT COMMENTARY: RED NOTES FROM A BLUE STATE

"IF YE LOVE WEALTH BETTER THAN LIBERTY, THE TRANQUILITY OF SERVITUDE THAN THE ANIMATING CONTEST OF FREEDOM, GO FROM US IN PEACE.WE SEEK NOT YOUR COUNSEL OR YOUR ARMS. CROUCH DOWN AND LICK THE HAND THAT FEEDS YOU; MAY YOUR CHAINS SET LIGHTLY UPON YOU, AND MAY POSTERITY FORGET THAT YE WERE OUR COUNTRYMEN!" --SAMUEL ADAMS

WEDNESDAY, MAY 09, 2007

RUCKELSHAUS, CARSON, AND DDT

An eye-opener from Natalie Sirkin that might well be titled "How Environmentalists Facilitated Malaria Among the Poor In Africa."

The summer of 1971 brought the Sirkins and the gypsy-moth infestation to Sherman and Connecticut. Environmental organizations told us not to spray. In those days, we were all environmentalists. We held out till we could bear it no longer. A few days later, even they gave up.

In those days we still could have had DDT. The EPA public hearing which lasted eight months was still in progress. Its decision by Hearing Examiner Sweeney would vindicate DDT completely, but soon after EPA William Ruckelshaus would overrule Sweeney's decision. Science could help, said Ruckelshaus, but this was a political decision, which put him in charge. He and Rachel Carson were the sources for the bad on DDT.

Rachel Carson, nine years earlier, had started it all. Her book started the environmental movement. Pesticides were the problem, especially DDT, and her book, Silent Spring, had an impact over the whole country and beyond. Ceylon had been using DDT and had reduced the number of malaria cases from 2.6 million to 17. Seventeen! But when they read Silent Spring, they stopped using DDT, and in a few years, malaria in Ceylon

SHARE IT

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Many of these false claims about Rachel Carson and DDT emanate from sources who also deny climate change.

This column, which quotes Oregon Institute of Science and Medicine's Art Robinson (2010), infamous for the "Oregon Petition" denying the scientific consensus on climate change.

After Rush Limbaugh
parroted the “Rachel was wrong” attack,
the Competitive Enterprise Institute
promoted him for the Nobel Peace Prize.

The New York Times

April 11, 2004

What the World Needs Now Is DDT

By TINA ROSENBERG

Correction Appended

The year 2000 was a time of plague for the South African town of Ndumo, on the border of Mozambique. That March, while the world was focused on AIDS, more than 7,000 people came to the local health clinic with malaria. The South African Defense Force was called in, and soldiers set up tents outside the clinic to treat the sick. At the district hospital 30 miles away in Mosvold, the wards filled with patients suffering with the headache, weakness and fever of malaria -- 2,303 patients that month. "I thought we were going to get buried in malaria," said Hervey Vaughan Williams, the hospital's medical manager.

Today, malaria has all but vanished in Ndumo. In March 2003, the clinic treated nine malaria cases; Mosvold Hospital, only three.

As malaria surges once again in Africa, victories are few. But South Africa is beating the disease with a simple remedy: spraying the inside walls of houses in affected regions once a year. Several insecticides can be used, but South Africa has chosen the most effective one. It lasts twice as long as the alternatives. It repels mosquitoes in addition to killing them, which delays the onset of pesticide-resistance. It costs a quarter as much as the next cheapest insecticide. It is DDT.

KwaZulu-Natal, the province of South Africa where Ndumo and Mosvold are located, sprayed with DDT until 1996, then stopped, in part under pressure from other nations, and switched to another insecticide. But mosquitoes proved to be resistant to the new insecticide, and malaria cases soared. Since DDT was brought back in 2000, malaria is once again under control. To South Africans, DDT is their best defense against a killer disease.

To Americans, DDT is simply a killer. Ask Americans over 40 to name the most dangerous chemical they know, and chances are that they will say DDT. Dichloro-diphenyl-trichloroethane was banned in the United States in 1972. The chemical was once sprayed in huge quantities over cities and fields of cotton and other crops. Its persistence in the ecosystem, where it builds up to kill birds and fish, has become a symbol of the dangers of playing God with nature, an icon of human arrogance. Countries throughout the world have signed a treaty promising to phase out its use.

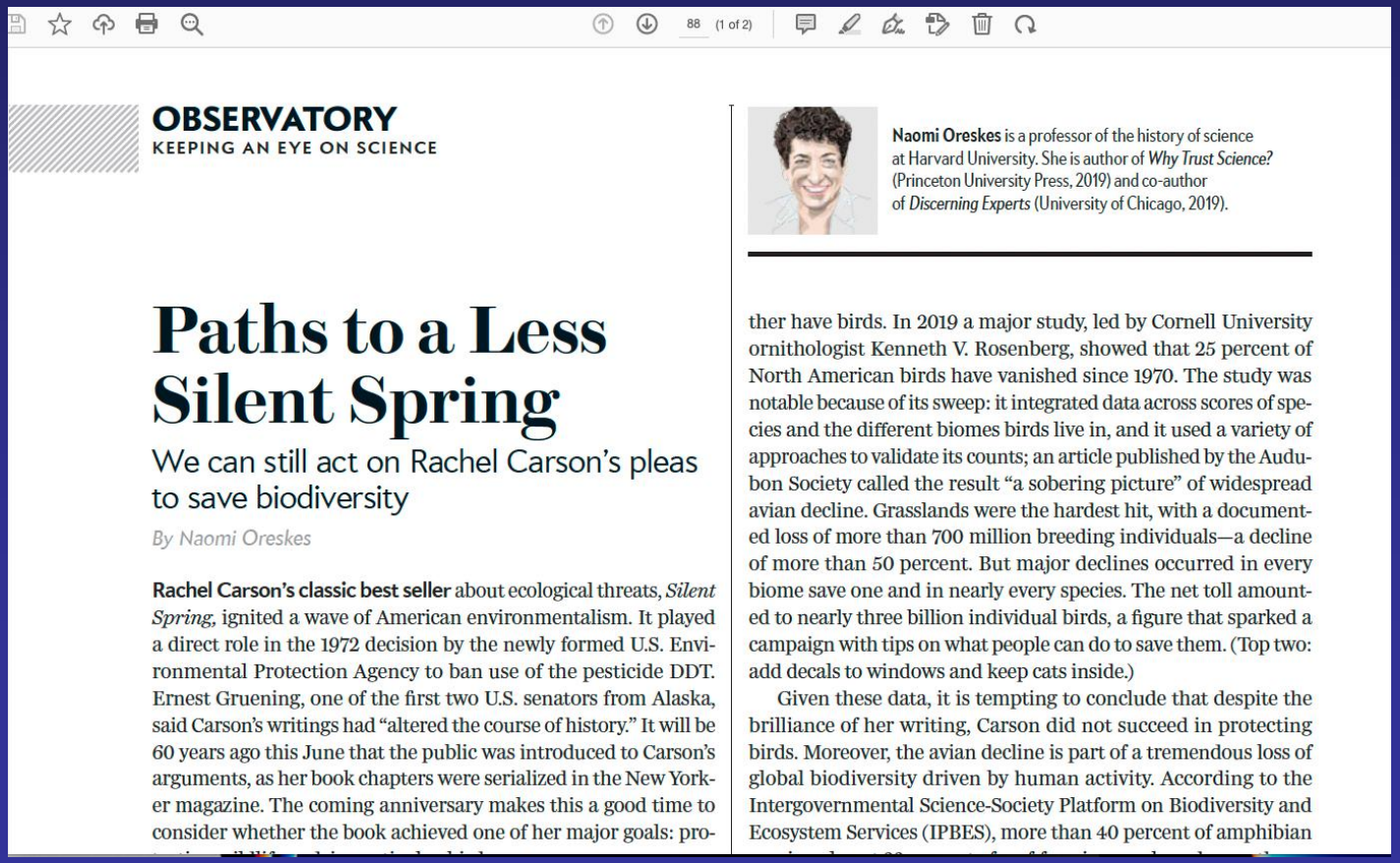
Yet what really merits outrage about DDT today is not that South Africa still uses it, as do about

Often these claims are repeated by people who should know better.

Tina Rosenberg, MacArthur Fellow, 2004

These patterns of misrepresentation, misinformation, and personal attacks on scientists, environmentalists, and journalists who try to cover these stories continue today.

I'm pleased to open this conference, on Science, Lobbies and the Environment, or what I like to call *Paths to a Less Silent Spring*.



OBSERVATORY
KEEPING AN EYE ON SCIENCE

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Paths to a Less Silent Spring

We can still act on Rachel Carson's pleas to save biodiversity

By Naomi Oreskes

Rachel Carson's classic best seller about ecological threats, *Silent Spring*, ignited a wave of American environmentalism. It played a direct role in the 1972 decision by the newly formed U.S. Environmental Protection Agency to ban use of the pesticide DDT. Ernest Gruening, one of the first two U.S. senators from Alaska, said Carson's writings had "altered the course of history." It will be 60 years ago this June that the public was introduced to Carson's arguments, as her book chapters were serialized in the New Yorker magazine. The coming anniversary makes this a good time to consider whether the book achieved one of her major goals: pro-

ther have birds. In 2019 a major study, led by Cornell University ornithologist Kenneth V. Rosenberg, showed that 25 percent of North American birds have vanished since 1970. The study was notable because of its sweep: it integrated data across scores of species and the different biomes birds live in, and it used a variety of approaches to validate its counts; an article published by the Audubon Society called the result "a sobering picture" of widespread avian decline. Grasslands were the hardest hit, with a documented loss of more than 700 million breeding individuals—a decline of more than 50 percent. But major declines occurred in every biome save one and in nearly every species. The net toll amounted to nearly three billion individual birds, a figure that sparked a campaign with tips on what people can do to save them. (Top two: add decals to windows and keep cats inside.)

Given these data, it is tempting to conclude that despite the brilliance of her writing, Carson did not succeed in protecting birds. Moreover, the avian decline is part of a tremendous loss of global biodiversity driven by human activity. According to the Intergovernmental Science-Society Platform on Biodiversity and Ecosystem Services (IPBES), more than 40 percent of amphibian