ENVIRONMENTAL POLITICS AND THEORY

Environmental Advocacy and Local Restorations

Richard M. Robinson

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Environmental Politics and Theory

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ISSN 2731-670X ISSN 2731-6718 (electronic)
Environmental Politics and Theory
ISBN 978-3-031-28438-0 ISBN 978-3-031-28439-7 (eBook)
https://doi.org/10.1007/978-3-031-28439-7

Cover illustration: Evandro Maroni/Stockimo/Alamy Stock Photo

This Palgrave Macmillan imprint is published by the registered company Springer Nature Switzerland AG
The registered company address is: Gewerbestrasse 11, 6330 Cham, Switzerland

This book is dedicated to Dr. MaryAnn Robinson and The Nature Conservancy, an organization of leadership in local restorations.

Preface: The Politics of Cleaning Our Rivers, Watersheds, and Bays

Our Age of Environmental Reaction

In North America, we are now fully in an era of environmental reaction, one of cleaning up our legacy of more than a century of industrial pollution. In the upper mid-west and northeast sections of North America, local environmental restorations largely involve cleanups of the remnants of these old and abandoned industries. These include our rust-belt brownfields, the derelict abandoned industrial buildings, the dumps of toxic wastes and their associated severe contaminations of our rivers, watersheds, and bays. But these restorations also require the interruption of our current generators of industrial pollution and also the disruption and prevention of our point and non-point sources of agricultural and suburban-urban toxic runoffs still flowing into our public waters, e.g. road chemicals, fertilizers, pesticides, herbicides, oils, plastics, and the like.

In other sections of North America, the environmentally destructive pollutions are not typically from the era of rusting and abandoned industry, but are from current industrial productions, such as the metal foundries located along the Grand Calumet River south of Chicago, or the textile mills along Georgia's Chattahoochee River. Counteracting these currently generated pollutions involves political challenges that are not present in restoring the poisonous remnants of abandoned industry, but eventually these currently generated problems will necessitate their

own remedies. Lessons now learned from our brownfield cleanups indicate why our current pollution generators must be regulated and stopped. These cleanups are expensive; they require marshalling scientific expertise. They also require that our environmental advocacy efforts counteract political resistance. Our political environmental emotions that once lurked below the surface are now erupting. The politics of cleanup now engulf us and act through our local environmental NGOs and governmental advocacy organizations. The totalities of our political emotions are likely to favor environmental concerns.

Perhaps during this age of global climate change, it might appear that local restorations should be of secondary importance. But this notion is contradicted by the emotions and involvements of our local citizen organizations who are ignited by the environmental causes of their locales, and who are devoted to "their" rivers, watersheds and bays. A national-level observer must now wonder if every waterbody in North America doesn't have a citizen advocacy organization that is devoted to its protection, one that lobbies local governments and organizes cleanup efforts. These organizations investigate the sources of their waterbody's pollution; they ponder how to stop those negative externalities. Our local waterbodies are immediately close by, and we know they affect our lives. We are outraged by their cavalier destruction by those who just don't pay attention to their adverse actions, or even worse, by those who profit from that destruction. Perhaps global climate change should be the top issue in all our minds, but that poses a more remote problem compared to the degradation of the immediate waterbodies that we interact with, that we grew up with, that we have fond memories of experiencing. For this reason, our local advocacy groups "will be heard from!" They manifest the emotional energy of the environmental movement.

My childhood occurred twenty miles north of Boston. My family gatherings were mostly at the rivers, bays and beaches of northeastern Massachusetts and immediate areas. We considered these public waters our family assets, not to the exclusion of other people, but just the opposite. It was along those sites that we and our friends gathered, but all were welcomed and invited. We recommended these public assets to others. When some of these assets were managed poorly by our "responsible" regional government agencies, that is by the organizations who were created explicitly for their protection, we and our blue-collar society could not be more outraged. Our political force was properly directed, and the required changes occurred. The political message was also clear. We

might not enjoy the so-called "outstanding cultural assets" of "Symphony Hall," or the outstanding "Museum of Fine Arts," but we did enjoy our family and friends fishing for "stripers" on the Merrimack. We organized clam bakes at Wingaersheek or Nahant Beach, and we watched the "young ones" catch their first bluegills at Lake Quannapowitt. We gathered to cook hamburgers at one of the "by-permit-only" cookout sites in Squannacook Brook State Forest, or we just enjoyed a warm summer afternoon of group-walking along Crane's Beach. We had strong reservation demands for all such activities. We believed that one aspect of our political processes must be to keep those public assets clean because they represented a considerable portion of our societal wealth.[1] Such are the motivations behind our local environmental restorations and the advocacy organizations that lead these efforts.

The Roles of Local Environmental Organizations

Many of our local restorations are not led by local environmental groups, but this is not necessarily a negative trait to be avoided. As examples, we have many restorations along the Great Lakes that are largely led by the efforts of state government agencies, but nevertheless they have local advocacy groups joining in to promote those efforts. The *Great Lakes Water Quality Agreement* (GLWQA) of 1972 is the pact between Canada and the US intended to manage the Great Lakes Basin and to initiate through federal, state or provincial funding, the cleanups of those local sites that suffer from environmental degradation. These tend to be old industrial sites that require removal of massive amounts of toxic sediment, and that also need their current sources of new pollution to be disrupted in order for local habitats to be restored. These local sites are termed *areas of concern* (AOCs) under the GLWQA.

Citizens prefer that their governments establish and maintain environmental quality. Some become outraged and active when they observe severe degradation, especially when it affects them directly. It should be normal, therefore, that state (or provincial) and local government agencies should be the lead institutions in our local restoration efforts, but non-government advocacy organizations can also provide special motive

[1] By "reservation demand," we mean that we want these waterbody resources to exist even when we have no immediate intention to use them. We are willing to expend our tax revenues to maintain them until we do arrange to use them if ever.

force.[2] This "special motive force" is an important component in our society's model of local environmental restoration, one that should be kept in mind in order to fully understand a particularly interesting genre of the environmental movement. This essential component provides the "vision of what could be," as introduced and explored previously in Robinson (2021).[3] Envisioning what can be accomplished through collective action is the necessary initial ingredient to the restoration process. This "new vision" poses a significant challenge for the environmental experts of our various federal and state agencies, but perhaps it is even a more important challenge for our local environmental advocacy organizations. It is one thing to clean a river or bay of toxic pollution that makes local residents sick; it is another thing to pose a "new vision" for their local river and port facilities, one that alters their economic future, or is radically opposite their past modality of industry and transportation. The "new vision," if it can be accomplished, can be frightening to some. This environmental problem is entirely political in its substance. It is the *environmental advocacy organization* (EAO) that can bring this new vision to the greater public, and by articulating the knowledge of the experts found in our government agencies—such as the US Fish and Wildlife Service, the US EPA, or the various state environmental agencies—EAOs can lower the fright level. By accomplishing this, the difference between the old modality and the new can be explained to the public so as to bring the visioned restoration to fruition. The "grassroots" political force, therefore, need not offer a spontaneous and temporary mirage, but it can have a scientifically sound focus that sets in motion an organized lasting political impetus.

Within the AOC Program, what roles have local environmental organizations played? In some of these AOC polluted areas, local environmental groups formed to lobby government to initiate their cleanups. In other areas, the local organizations formed after the methods established by the GLWQA identified the locality as in need of specific remediations. In some of these AOCs, local environmental organizations were engaged by federal government agencies to play roles in the *citizen advisory committees* (CAC) who then organized to develop and monitor the area's

[2] Excellent examples of this advocacy include the Chesapeake Bay Foundation and the Friends of the Columbia River Gorge as reviewed in Robinson (2021), *Environmental Organizations and Reasoned Discourse*, Palgrave Macmillan.

[3] Ibid.

remedial action plan (RAP). CACs would then communicate these plans and actions to the broader public. In some other AOCs, these citizen committees served merely as sounding boards for the efforts of *technical advisory committees* (TACs), which consisted of state, federal and academic scientists and experts who organized the RAPs, and who also set in motion the remediations that followed. (These RAPs specified the actions required for the cleanups of the AOCs.) These *advisory committees* sometimes included the local citizen activists, but they tended to be dominated by state, local, and federal government experts who helped organize and fulfill these effective plans. Each of these differing structures of organization has manifested some degree of success; they provided the expertise, the funding, and in some cases, the local energy and dedication of activists, all of which are necessary to accomplish the restoration's tasks. This has been especially true after the passage of the *Great Lakes Restoration Initiative* (GLRI) of 2009, which finally injected adequate funding to accomplish the task of restoring these sites. The GLRI reignited some dormant local advocacy organizations since with new funding, they believed that their plans would now succeed.

When the *areas of concern* (AOC) program was initiated in 1987, forty-two locales along the Great Lakes were identified as in need of significant environmental remediation. Identification was made by objective criteria, i.e. the recognition of particular environmental impairments such as degraded benthos or fish deformities or bacteria in the water.[4] The four AOCs identified in the Detroit area and the two AOCs in the Cleveland area represent urban-suburban restorations (as are most of the other AOCs). They involve rivers that in the late 1960s had the industrial effluents floating on their surface catch fire. These areas once represented the old-style heavy industrialization at its worst, i.e. an industry model that used our waterways as sewers in order to dissipate industrial wastes, thereby imposing the social costs of those externalities onto the populations of the Great Lakes Basin. Now, the old industrialization has been abandoned. Now, the abandoned toxic sediments of these rivers have been removed, and their poisonous discharges halted. All occurred because of the vociferous efforts of their area's environmental

[4] Benthos refers to the living organisms in riverbeds and soils at the bottom of other water bodies.

advocates. These advocates were organized, and by design, their organizations were used by the AOC's programs to help plan and direct their areas' restorations. But government experts from federal agencies, state agencies, local government representatives, and also academic experts led the planning and implementation processes along with representatives of environmental NGOs. As suggested above, this can be a significant advantage of the *areas of concern program*, that is, the utilization of local *environmental advocacy organizations* to combine with the federal and state expertise to manage the restoration efforts. Why is such a combination important? Because by this combination, the politics of resistance can be overcome by the energy and soundness manifested by various scientific experts. This environmental scientific expertise is now present in the federal and state agencies, but the energy necessary to marshal these resources is often present in the local citizens and advocates. This is the phenomena visibly demonstrated by the AOCs of Cleveland and Detroit and illustrated by their stories. The same is also true of Duluth, Green Bay, Buffalo, and Toledo—all urban areas. But this phenomenon is also demonstrated by the "preserve-after-restoring" motivation of the rural wonderfulness of Saginaw Bay and Muskegon Lake. Both of these organizations have activist organizations involved in their restorations.

The Motivation for This Book

All of these locally organized initiatives and involvements form the subjects of this book. My analysis, however, shows that in some instances the politics of local restoration should not be separated from the politics of the overall environmental movement. In particular, confrontational politics have always surrounded our paramount vehicle for federal funding of environmental causes, i.e. the US Environmental Protection Agency (EPA). Since so many of the EPA's involvements have been politically contentious, but the *areas of concern* program does not appear to be politically controversial, it should therefore be a relief for the EPA to administer. Perhaps this aided the successes of the AOCs' restorations because EPA involvement is a significant aspect of the AOC Program. EPA involvement is also of indirect interest for some New England rivers where the initiatives of some local organizations are yet to have significant federal funding. They have nonetheless been successful. For three New England rivers (Housatonic, Mystic, and Penobscot), federal funding appears to be on-the-way through our relatively new *Urban*

Waters Program and Partnerships. But considerable success has already been achieved in each of these river restorations.

I have argued that to be effective, the process for environmental restoration must have certain characteristics of being *fair and reasoned* in order to fully engage our local advocacy organizations.[5] Without these *fair and reasoned* characteristics, the local organizations will likely feel excluded or ineffective, and the process of restoration will falter. The politics of the "environmental justice movement" are relevant for this "exclusion and ineffectiveness" issue. Hence, the "process" is important and needs to be fair and reasoned.

The restoration narratives presented in this book are actually tales of organized expertise. They are stories about the political entities who energize the environmental movement to demand local restoration. Some have yet to receive significant federal funding, but they do have significant state and private organizational funding. They represent heavily used rivers with substantial restoration efforts led by dedicated *environmental advocacy organizations*. How else could these restorations occur if they were not initiated by large federal programs?

As emphasized above, the processes of local restorations vary as to the involvements of the state, provincial, and federal agencies. In particular, the involvements of local environmental advocacy organizations also vary. The key to success in all these efforts is, however, the utilization of the expertise of dedicated scientists (biologists, chemists, engineers, and ecologists) who reside in governmental agencies, academia, and NGOs. To a great extent, these scientists even provide the vision of "what could be." We should be aware of these narratives since they could potentially provide directions for other restorations. Expressing these narratives is the purpose of this book.

Poking About the Poisons

Writing compositions about river restorations in New England left me with rather mixed emotions since I witnessed many of their degradations. These reviews force remembrances of my Huckleberry type boyhood of poking around the brush, dirt, and muck of the streams that flowed into our town's reservoir (Crystal Lake in Wakefield, Massachusetts). This

[5] This was argued in Robinson (2021). See footnote 2.

poking around picked up copious amounts of stickers on my clothing and pounds of muck on my shoes. I distinctly recall my first time staring at an abandoned rusty metal barrel hidden by brush at the edge of a pond. The water of that pond flowed through a short brook into the town's reservoir. I was walking at the time with my father and older sister. I was only six years old. My father pondered what poisons were in that barrel that someone thought had to be hidden and abandoned. But I went back to that pond innumerable times prior to my teenage years, always looking at that barrel rusting away, and always with the same questions.

This experience repeated only a few years ago when I walked through some Western New York fields that I was considering for purchase. I walked down a hill, my clothing picking up the familiar stickers, and the dirt and muck along the way. I felt at home on this strange but familiar piece of land. I was heading toward a pond and a marsh along the edge. On the northern edge of the marsh, behind some juniper brush, stood a dilapidated old semi-trailer, propped up by the deflated remains of tires. I could barely perceive the old dirt road that led to the truck. At its back end, I could see that the trailer enclosed rusted metal barrels, some spilled out on the edge of the marsh. Again, barrels were abandoned by a pond, hidden from any easy view. Scratch around the brush, stickers, muck, and dirt that surround isolated water sites, and what do you find? Such places are where we abandon our poisons that contaminate our waters. Hidden ponds and streams provide a resource we find convenient for dissipating our toxins. But perhaps that behavior is the remnant of an old culture; one that has finally given way to a classier and cleaner culture of restoration. I view the restoration efforts of today's culture as strongly encouraging and deserving of admiration. There is still, however, something to be said for poking around in the brush, and the dirt and muck to find what is there. Over a lifetime of this sort of experience, I know that one can easily clean the stickers and dirt off. Unfortunately, the poisons remain.

North East, PA, USA Richard M. Robinson
January 2023

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Dr. Richard M. Robinson is a long serving Professor of Business at SUNY Fredonia. He received his PhD from the University of Oregon (Economics) in 1981. This is his fourth scholarly book. He has also published numerous peer-reviewed articles in scholarly journals. His publications include environmental concerns. He is the former editor of the *Journal of Economics and Finance*, a Springer journal. He instructs courses in business ethics, statistics, and environmental ethics. His web page is at "profrichardrobinson.com."

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CHAPTER 1

Habitat Restoration: An Introduction

1 Introduction: Restoring Habitats

This volume concerns our North American society's efforts at restoration of habitats, especially the habitats of our rivers, lakes, marshes, estuaries, and the wetlands adjacent to these various water bodies. This restoration does not typically mean restoring to an original pristineness. It does mean that at a minimum we have restoration from an industrial, or agricultural, or urban-suburban polluted environment toward an ecologically sound, unpolluted, and sustainable environment. As a society, we aspire that our polluted waters will be restored to a level of cleanliness that will not make people or wildlife sick; that these waters will have a clarity that is aesthetically pleasing; that they will be inviting to native fish and fowl, and other healthy animals. We aspire that the walkways along our water bodies will be inviting, and that they will offer views of sustainable flowers and native vegetation, and not the scenery of poisoned corruption. We aspire that our water bodies will offer unpolluted recreation and provide unobtrusive transportation arteries that are reasonably absent of negative externalities.

As a society, we recognize that our rivers historically were used to dissipate industrial, agricultural, and sewerage pollutions by sending them to flow downstream to have negative effects on neighbors. We recognize that our ponds, rivers, bays, marshes, wetlands, and estuaries were used as dissipation dumps. Our historical pollutions were costly to our society

R. M. Robinson, *Environmental Advocacy and Local Restorations*, Environmental Politics and Theory,
https://doi.org/10.1007/978-3-031-28439-7_1

because of their negative health effects and because of their deprivations of recreation and aesthetic benefits. But these buildups of past pollutions typically remain and continue to generate ill health and continue to deprive us of our recreation and aesthetic benefits. These negative externalities persistently linger to impose substantial costs on us even to today. We recognize, however, that restorations are also costly, but in general we recognize that the benefits of restoration far outweigh the costs of cleanup. Our society recognizes that the only reason for not undertaking these restorations stems from the political protection of narrowly vested commercial interests.[1] We further recognize that in order to pursue our desired ends and methods for restoration, we aspire that our decisions should be (i) scientifically informed, (ii) inclusive of input from all those affected, (iii) logical in analysis and decision, and (iv) not frustrated by the political influence of those with narrow self-serving commercial interests. As explained below, these four criteria describe our society's aspirations for a "fair and reasoned" decision process concerning our environmental matters.[2]

Most of this volume tells the story of the restoration efforts taking place in various locales around our five North American Great Lakes, including our US and Canadian joint efforts of recent decades. These restorations have been organized and funded by federal, regional (state and province), and private auspices under our joint Canadian-US *Great Lakes Compact*, our *Great Lakes Water Quality Agreement*, and our *International Joint Commission*. Furthermore, these efforts are now directed using detailed plans with effective monitoring of progress as based on the "fair and reasoned" criteria cited above and examined below. The story of this Great Lakes' program should provide us with some degree of optimism that perhaps properly organized environmental efforts can succeed.

Some other restorations are also explored in the chapters below. These include remediations of some rivers in New England which also offer success narratives. Perhaps the methods documented in the chapters below should be extended to other locales. To this end, the story of the Great Lakes *areas of concern programs*, and the New England rivers,

[1] See Robinson (2021, Chapter 10) for a review of one of these "vested interests," the role of Big Sugar in blocking restoration of Florida's "Everglades."

[2] See Chapter 2 or Robinson (2021, Chapter 3) for a full review and examination of the criteria necessary for "fair and reasoned environmental discourse and decisions."

should be recognized and analyzed. This recognition and analysis provide a motivation for this book.

2 Habitats and Species

As indicated above, most of the chapters of this book concern the lessons to be drawn from restorations of the Great Lakes *areas of concern* (AOC). These are environmentally degraded areas of significant pollution; areas that were once natural habitats for varieties of fish and other wildlife; areas that were once not hostile to human interactions for recreation or aesthetic enjoyment. Today, by law (*The Endangered Species Act* of 1973), we preserve habitat for the purpose of saving various species from extinction from the earth. But today we also restore local habitats to preserve a large variety of species from local extinctions, i.e. local disappearance. Restoring an industrially degraded area to a natural park-like setting where people can stroll among wildlife (perhaps semi-domesticated wildlife), and view pleasing native vegetations and clean waters, is also restoring habitat, but it is a restoration for the purpose of preserving human health—both physical health and mental health—and thereby of preserving civilization at its core. These restored places provide more than habitat for human existence; they facilitate our flourishment through natural interactions that are necessary for human contentment.

In the US, our political movement for these sorts of preservations began in the late 1800s. At the century's turning, the Western frontier had closed with all that its closing implied for American culture. The age of electrification was looming with all that this implied. Railroad transportation and telegraph communication linked our various culturally compatible regions. Politically active big agriculture and big industry may have appeared to dominate the Nation, but their elicitation of political reactions generated the progressive era with its Sherman Act of 1892 and the Standard Oil decision of 1911. We took from the land all that we could: oil, coal, lumber, minerals, and the bounty from the tilling of our great prairies. We also depleted the wild bison and our great aviary flocks. We drove the passenger pigeon to extinction for the same reason, and the bison, bald eagle, and whooping crane were driven to near extinction. The politics of the late nineteenth and early twentieth centuries ripened for various local restorations and preservations. People were migrating to our cities where parks were needed. As examples, *Central Park* in New York City was completed in 1876, and *Boston Public Gardens* was

completed in 1880 so that city dwellers could have some degree of natural interaction. But during our late nineteenth century's North American industrialization, we also had societal reactions against the threats of species extinctions.

Outrage over the slaughter of millions of water birds for the millenary business of urban fashion (primarily women's hats), particularly the slaughter of egrets and other waders, led to the formation of the Massachusetts Audubon Society in 1896. This facilitated cultural-political changes driven by the Audubon Society's activities:

- Between 1896 and 1898, following the formation of the Massachusetts chapter, sixteen other state Audubon Societies were formed.
- In 1901, these state-level Societies joined in a loose national-level organization to help preserve our first National Wildlife Refuge—Pelican Island in Florida in 1903—and facilitated the engagement of wardens to protect breeding areas in several states.
- In 1905, the National Audubon Society was formed with the declared priority of protecting water birds of various sorts: gulls, terns, egrets, herons, and others.
- In 1910, New York State enacted the "Audubon Plumage Law" which prohibited the sale or possession of feathers from protected bird species. Since New York City was the center of the US fashion industry, this substantially changed the women's fashion trend away from feathered hats.
- In 1918, the "Migratory Bird Treaty Act" was passed and signed. It remains one of the strongest laws protecting wild North American birds.
- In 1923–1924, the Audubon Society established its first system of water-bird sanctuaries in seven East Coast states, and also Rainey Sanctuary in Louisiana and the Theodore Roosevelt Sanctuary on Long Island. This also initiated large-scale scientifically-based bird conservation efforts.
- The "Migratory Bird Conservation Act" of 1937 plus the "Bald and Golden Eagle Protection Act" of 1940 were passed due to Audubon's influence.

By 1941, only sixteen whooping cranes remained in the wild. By 1963, only 487 nesting pairs of bald eagles remained. Loss of habitat, DDT poisoning, and hunting were our aviary's enemies. Rachel Carson's *Silent Spring* was published in 1962. This explained that chemical poisons, especially pesticides, were the primary contaminant that caused the declines in aviary populations. *Silent Spring* renewed our environmental movement.

Whereas our nineteenth-century and early twentieth-century depletions of bison and various aviary species were due to commercial hunting, the specie depletions after World War I were largely due to habitat destruction. This presented the fundamental political issue for environmentalists; that is, species such as the tiny snail-darter fish might not carry the public's emotions as strongly as the bald eagle or prairie roaming bison, but to save a large number of species, habitats must be preserved. But habitat preservation affects much more than the threatened species. Preserving habitats usually involves economic opportunity costs that must be paid for species preservation. Our political process, however, needs to focus on the benefits of the preserved habitat with the specie preservation being only one of the subsidiary benefits. Preserving and restoring habitats intrinsically provide their own benefits in addition to preserving species, i.e. the benefits that serve our emotional-psychic requirements for natural interactions. This is clearly indicated by our *areas of concern* (AOC) efforts as explored extensively below and in latter chapters.

2.1 Silent Spring and Its Noisy Opponents

This author remembers his hometown's "fogging trucks" occasionally driving around our neighborhood at dusk on summer evenings during the mid-1950s. They sprayed a thick oily fog of pesticides to kill mosquitoes and other insects. I joined with other children in riding our bicycles behind those trucks. This "thick fog" offered some sort of adventure, i.e. surviving the almost blinding ride and the breathing of the oily fog. We thought that surely the town government would not poison us, so it must be safe. There was no public discussion, apparently no reflective thought about the ecological effects on children or other animals. It was just a matter of getting rid of mosquitoes. There was no debate concerning "using smaller dosage," or perhaps other mosquito killing methods. Our town was sold the DDT product and purchased it in large amounts. Across the US, the wide and indiscriminate use of this and

other pesticides stimulated a societal reaction that ultimately led to the environmental movement of the 1960s.

Prior to the 1950s, Rachel Carson was an employee of the US Federal *Fish and Wildlife Service*. In the mid-1940s, she became concerned about the use of synthetic pesticides which were developed from the military funding of chemical productions during World War II. She was a biologist and accomplished author. Her popular 1951 book, *The Sea Around Us*, was a best seller about marine ecology. After that publication, she organized her next effort, a book on saltwater tidal pools that she published as *The Edge of the Sea* (1955). This publication was more ecologically oriented in that she examined three ecosystems: (i) the rocky tidal pools of the New England coasts, (ii) the tidal pools along the sandy beaches of North Carolina, and (iii) the mangrove swamps of the Florida Keyes. She examined the question, "Why does an animal live where it does?" She did not group the marine animals examined in typical biological fashion. She grouped them according to their habitat. Appreciation of the habitat was the key to her explorations. With *The Sea Around Us*, Carson developed an appreciation for the esoteric marine life. But in *The Edge of the Sea*, she sought to develop our appreciation of the interdependent ecosystems of tidal areas. It concerned the wonders of saltwater life and the relationship of this life to the physical environment. Moreover, it concerned our psychic reactions to these micro-environments that many of us could explore close to home; these environmental interactions and psychic benefits could easily be ours. I read *The Edge of the Sea* as a juvenile in the late 1950s, but I had already discovered the mystery and wonderfulness of the tidal pools of Wingaersheek Beach on Cape Ann. Many of us discovered these sorts of natural interactions as children and fully enjoyed their benefits. As adults, we would never give them up; when we find them degraded, we would always prefer that habitats like tidal pools be restored.

The 1950s were the post-Hiroshima age of thermo-nuclear threat. This was also the age of post-World War II conformity, widespread paranoia toward communist subversion, and faith in America's institutions. But this was a fragile age of incipient skepticism toward our dominant faith in science and society's progress.[3]

The US Department of Agriculture's 1957 "fire ant eradication program" involved aerial spraying of DDT and other pesticides. These

[3] The science fiction movies of the 1950s manifest this "skepticism," movies such as *Them*, or *The Thing*, or *The Day the Earth Stood Still*.

were mixed with oil and aerially sprayed over public and private lands. The "fire ant program" involved the US Department of Agriculture (USDA) spraying of 20–30 million acres of public and private lands (mostly Southern lands) without obtaining the consent of the property owners. Observers noted the associated effects on wild birds and other wildlife.[4] This killing of wildlife elicited robust protest from conservationists.

In addition, in 1957, the USDA sprayed DDT for gypsy moths over three million acres in New York, Michigan, Pennsylvania, and New Jersey; this also had detrimental effects on bird life. The USDA sprayed areas of Long Island fifteen times, and when influential citizens discovered that the USDA planned to repeat the spraying in 1958, they sought to intervene to halt it. This reaction led to *The Audubon Society* actively opposing these chemical spraying programs. It hired Rachel Carson to publicize the USDA's deleterious spraying practices. She reacted with moral outrage toward those pesticide spraying practices. In a letter to a friend, Carson complained about "the arrogance of humankind posing a threat to all life."[5] Carson organized *The Audubon Society's* campaign against this DDT overuse and began organizing her most significant and politically effective publication, *Silent Spring,* which she published in 1962.

In 1959, the Department of Agriculture's "Research Service" responded to Carson's earlier criticism with a public service film *Fire Ants on Trial*. Carson called it "flagrant propaganda" that ignored the dangers of spraying pesticides to humans and wildlife. She publicly blamed the 1950s' significant decline in bird populations on spraying pesticides. At that time, the nation's 1959 crop of cranberries was withdrawn from the market due to high levels of herbicide. Also in 1959, the FDA organized a conference on revising pesticide regulations, a conference Carson attended. She noted the aggressive approach of the pesticide industry's representatives who presented supposed expert testimony that was entirely in contradiction with the medical scientific literature that Carson was studying. During this time, and contrary to the claims of the pesticide industry, the research at the National Institutes of Health and the National Cancer Institute led to many pesticides being classified as carcinogens.

[4] A letter published by *The Boston Herald* in January, 1958, and also sent to Carson, listed these observations. This was the impetus behind *Silent Spring*.

[5] See Lytle (2007, p. 133).

In reviewing the contributions of *Silent Spring*, Patricia Hines (1989) wrote,

> Carson brought to her work a pragmatic, worldly critique of government, one benefit of 14 years of working for the federal government in the Fish and Wildlife Service. The book was activist, not just expository; it was written to reform, not just to have a forum. She pinned down the loopholes in federal regulation, exposed the manipulation of data to cover up pesticide hazards, and identified conflicts of interest in government regulation of pesticides. The reforms she called for in the book and afterwards in Congressional hearings were grounded and actionable. (p. 4)

In *Silent Spring* (1962), Carson's main argument was that pesticides have broad detrimental effects on the environment; that they should more properly be called "biocides" because their effects extend way beyond the targeted pests. DDT was a prime example, but many other synthetic pesticides are also subject to bio-accumulation, a significant problem with these chemical compounds.[6] Carson accused the chemical industry of intentionally spreading disinformation and also accused public officials of being uncritically accepting of the pesticide industry's claims without examination. *Silent Spring* did not just considered the aviary effects of pesticides, but it also provided a broader description of their effects on our natural habitat.

> I contend, furthermore, that we have allowed these chemicals to be used with little or no advance investigation of their effect on soil, water, wildlife, and man himself. Future generations are unlikely to condone our lack of prudent concern for the integrity of the natural world that supports all life. (Carson 1962, Chapter 2, p. 13)

In *Silent Spring*, Carson specifically described the spraying of pesticides on Pennsylvania orchards and their killing effects on nearby fish streams, and also described the same effects in tributaries of the Tennessee River in Alabama.[7] She also described the effects of pesticide discharged from the Rocky Mountain Arsenal on the ponds of nearby farms. She also detailed

[6] Bioaccumulation means that the chemical is passed up the food chain.

[7] Ibid., Chapter 4.