

# On the Borders of Post-war Ecology: Struggles over the Ecological Society of America's Preservation Committee, 1917–1946

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Should ecologists advocate for the protection of natural ecosystems? What is the appropriate relationship between ecology and activism? These questions have been raised by ecologists and observers of the discipline since at least the early 1900s, and present discussions show no sign of a forthcoming resolution. Historian Stephen Bocking (1997) recently observed that 'Among ecologists there evidently is no consensus concerning their place in environmental politics. Indeed, the debate is nearly as old as the discipline, and it has helped shape the history and structure of the discipline'. The boundaries of ecology—the limits of the acceptable range of activities for ecologists acting as ecologists—seem always to be contested and shifting. One of the most revealing sites at which to observe these boundary struggles is the Ecological Society of America (ESA), the main professional society for ecologists in the United States. The ESA has, throughout its history, debated the extent to which it ought to advocate for public policy, and on certain occasions has taken action to officially delineate which activities are acceptable, and which activities fall beyond the scope of a professional scientific society. In so doing, the ESA has transformed its relationship with the state, shifting from agitation and opposition to advice and assistance.

One of the most important instances in which the ESA renegotiated its position on advocacy and relationship to the state occurred just prior to the end of World War II. On 20 July 1945, the ESA voted to amend its by-laws, excluding from its activities direct action to influence legislation. Until that time, the ESA's Committee for the Preservation of Natural Conditions had been actively involved in promoting legislation to protect and preserve natural areas, particularly in the form of national parks and monuments. The 1945 decision, passed by a majority vote, caused a rift in the organization. Those who favoured a strategy of direct involvement in legislative affairs formed a separate organization called

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the Ecologists' Union—renamed the Nature Conservancy in 1950—to continue the tasks that policy-oriented ecologists once undertook in the ESA. The ESA no longer advocated for preservation policies, instead presenting itself as a more conventional professional organization and a credible source of scientific advice.

This transformation in the ESA is still remembered and sometimes discussed by ecologists and conservationists today. In 2000, an article in the journal *Science* discussing recent advocacy efforts on the part of ecologists mentioned the ecologists who broke from the ESA to form the Nature Conservancy (Kaiser, 2000). In 1978, an article appeared in the *Bulletin of the ESA*, a publication sent to all members, summarizing the history of the preservation committee and the formation of the Ecologists' Union. A few years ago, when I interviewed current members and leaders of the ESA, many were aware of those events of 1945. The Nature Conservancy also maintains the history of the split with the ESA. On its website, the Nature Conservancy traces its own history to the founding of the ESA in 1915 and mentions the debate within the ESA, noting that from the very beginning, ESA members asked 'Should it exist only to support ecologists and publish research or should it also pursue an agenda to preserve natural areas?' (<http://nature.org/aboutus/history/>).

These recollections of this transformative event tend not to ask why it occurred, simply concluding that the majority of ecologists at that time came to see advocacy as an improper role for a scientific society. This paper attempts to delve deeper. The goal of examining this particular episode in the history of American ecology is not to determine the 'true' relationship between ecology and advocacy, but to explain why advocacy for the preservation of natural areas, once an activity associated with professional ecology, was, in the mid-1940s, deemed an inappropriate activity for the ESA. Why did this new separation of science and advocacy emerge? Were there precedents for this schism?

It is clear that members of the ESA did not oppose preservation in itself. At the time of these changes, nature preservation was a priority for many ecologists, at least in part because they needed pristine areas for their research. And in 1947, the year after the preservation committee was disbanded, Aldo Leopold, the outspoken advocate for the protection of nature, was elected president of the ESA. In this context, it is evident that the official decision to eliminate the ESA's role as an advocate for preservation policies was not the result of a shift away from previous concerns. So why did ESA members decide that their organization should abstain from advocating policies to protect natural areas?

To understand what happened within the ESA, it is necessary to look closely not only at the internal debates, but also their context, particularly the effects that World War II had on the practice and professional ideals of science in America. Members of the ESA had a heightened awareness of legitimacy pressures during the early 1940s. And, as I will argue below, the ESA looked to the broader scientific community for models of an appropriate relationship between science and the state. The organization constructed an organizational boundary between ecology and advocacy, and in so doing, I suggest, it reproduced a boundary that had long represented credibility and legitimacy in the world of American science.<sup>1</sup>

By engaging in a form of boundary-work that I call 'organizational splitting', the ESA separated the professional activities of ecology from the practice of political advocacy for preservation, while turning toward a more cooperative role with the US government.

### **Studies of Scientific Boundary-work**

The study of boundary-drawing has become an important part of science studies. Although questions of demarcation and definition have long been a part of historical and philosophical studies of science, today most analysts agree that there are no essential criteria that define science apart from the rest of the social world. Therefore, many sociologists focus on the social construction of boundaries and seek to understand how and why the definition of science has shifted with context and over time. The active construction of the boundaries of science—whether it is demarcated from politics, religion, pseudoscience, or other social institutions—has come to be known as ‘boundary-work’. Thomas Gieryn defines boundary-work as ‘the discursive attribution of selected qualities to scientists, scientific methods, and scientific claims for the purpose of drawing a rhetorical boundary between science and some less authoritative residual non-science’ (Gieryn, 1999, pp. 4–5). In general, Gieryn’s case studies have focused on the ways that individuals use rhetorical distinctions between ‘science’ and ‘non-science’ in order to secure credibility for their claims. These analyses typically emphasize the ways that actors strategically construct the boundaries of science through argumentation, suggesting that the definition of science is always under negotiation.

Like Gieryn, many analysts attuned to the notion of boundary-work have emphasized the socially constructed and flexible nature of the boundaries of science (e.g. Jasanoff, 1987; Ramsden, 2002; Mellor, 2003; Rogers-Hayden and Campbell, 2003). The goal has been deconstruction—to show that taken-for-granted ideas about the qualities and authority of science are historically contingent and socially constructed. A weakness of this approach, however, is that, in focusing on the ways that the boundaries of science are changeable, the broader patterns and durability of social institutions have been overlooked. For example, Sheila Jasanoff’s (1987, 1990) influential work on science advisors in United States policymaking emphasizes the ways that both politicians and scientists continuously negotiate (and sometime blur) boundaries between science and policy. In its emphasis on contingency and fluidity, however, this approach does not explain why particular ways of demarcating science from politics are accepted and, in some cases, are taken for granted for extended periods of time.<sup>2</sup>

Although he emphasizes strategic and active construction, Gieryn notes some of the ways in which boundary-work is dependent on previous, institutionalized constructions, suggesting that the repertoire of characteristics one may attribute to science is not limitless:

Interpretative flexibility in the boundaries of science need not imply infinitely pliable; some maps of science are easier than others to defend as bona fide representations, in part because some cartographers are more easily able to point to specific concrete practices or to earlier mappings as rhetorical ‘evidence’. Indeed, some maps achieve a provisional and contingent obduracy that may preempt boundary-work. Borders and territories of cultural spaces sometimes remain implicit, matters of personal belief or of such apparent tacit intersubjective agreement that people working together need not explicate ‘what everybody knows’ about the meaning of science (Gieryn, 1995, pp. 406–407).

Recently, some scholars, sharing these concerns with the obduracy of particular demarcations of science, have attempted to approach the study of scientific boundary-drawing

from an institutional perspective. That is, rather than emphasizing the flexibility and rhetorical nature of the borders of science, sociologists have noted both the institutional constraints on boundary-work and the ways that scientific boundaries take durable organizational forms (Moore, 1996; Moore and Frickel, 2005). This 'new political sociology of science' (Moore and Frickel, 2005) poses challenges to the social constructionist approach in social studies of science, particularly by reintroducing more explicit questions of power relations into the study of boundary-work. Political and institutional sociologists of science have paid more attention to broader political processes, such as social movements and policy debates, than found in previous boundary-work studies. The focus is often on the relationship between science and advocacy or between science and political power. The institutional approach also emphasizes the role of organizations in constructing and stabilizing a boundary between science and politics.

Kelly Moore (1996), for example, has argued that boundary-work can be organizational as well as rhetorical. Her research on the turbulent period from 1955 to 1975 in the United States shows how a delicate balance between neutrality and advocacy in the scientific field was achieved through the formation of public interest science organizations. These organizations, such as the Union of Concerned Scientists and Scientists' Institute for Public Information, provided an appropriate space in which scientists could be political actors, while preserving the autonomy and apparent neutrality of science back at the lab and in their professional societies. Thus, by organizing activist activities separate from scientific activities, scientists maintained the appearance of 'purity' while demonstrating social responsibility.

Similar themes can be found in the work of Scott Frickel (2005), whose research on the formation of the field of genetic toxicology in the mid-1970s examines the ways in which activism and contentious politics are negotiated by scientists in the context of rapid institutional change. Frickel found that the Environmental Mutagen Society, a small professional society supporting the field of genetic toxicology, engaged in boundary-work, drawing clear distinctions between their work and that of environmental groups. But at the same time, the 'conventional' scientific work of the EMS was extremely politically significant. Frickel's observations highlight the importance of examining the ways in which boundaries between science and activism can mask the deeply political nature of 'mundane' scientific work.

Building on some of the insights of the new political sociology of science, in this article I suggest the term *organizational splitting* to describe the kind of organizational boundary-work that aims to separate certain activities—particularly advocacy—from the conventional or orthodox activities of science. As Moore (1996) and Frickel (2005) have found, such organizational distinctions enable scientists to act as advocates without posing a threat to the overall credibility of their disciplines, which remain organizationally distinct from controversial advocacy work.

Also evident in the studies by Moore, Frickel, and others (e.g. Kinchy and Kleinman, 2003) is that much scientific boundary work, particularly when dealing with questions of politics and advocacy, reproduces existing, dominant maps of science in society. A concept of *reproductive boundary-work* helps to explain why certain constructions of the science–politics boundary are so durable, and why others are so unstable and contested. Scientific organizations in pursuit of credibility, legitimacy and prestige typically engage in reproductive boundary-work. They mimic organizations that are seen to be most credible or prestigious, and they adopt dominant, taken-for-granted discourses about the

ideal qualities of science. This perpetuates, both within the scientific field and society more broadly, commonsense ideas about the appropriate features of science.

Reproductive boundary-work occurs both organizationally and discursively. In their influential work on the institutional analysis of organizations, DiMaggio and Powell suggest that organizations facing similar environmental conditions confront pressures to resemble the others in their field (DiMaggio and Powell, 1983; Powell and DiMaggio, 1991). They argue that ‘organizations tend to model themselves after similar organizations in their field that they perceive to be more legitimate or successful’ (DiMaggio and Powell, 1983, p. 152). This mimicry does not necessarily improve the operations of the organization, but organizations that conform may be rewarded (with credibility and legitimacy, for example) for being similar to others in their field. Thus, through imitation, scientific organizations (such as professional societies) reproduce dominant organizational distinctions between science and non-science.

In addition to the organizational field, the discursive terrain is another factor that produces some regularity in the ways that the boundaries of science are drawn. Kleinman and Kloppenburg (1991) suggest that, at any particular time, certain discourses dominate the discursive terrain, lending legitimacy to those who use them, and rendering other discourses less effective. In particular, dominant discourses tend to be those with the greatest historical resonance—those beliefs and concepts that are taken for granted by arbiters of the debate. Sociologists John L. Campbell and Ove Pedersen describe discursive structures as ‘systems of symbolic meaning codified in language that influence how actors observe, interpret, and reason in particular social settings’ (Campbell and Pedersen, 2001, p. 9). Dominant discourses act as background assumptions, which ‘can be visible to actors yet taken for granted in the milder sense that they remain largely accepted and unquestioned, almost as principles of faith’ (Campbell, 2001, p. 166).

Organizations and discourses reinforce one another. Campbell notes that the relative dominance of certain discourses, or paradigms, depends on ‘the degree to which they are institutionalized within leading universities, think tanks, and professional organizations’ (Campbell, 2001, p. 171). Dominant discourses about the role of science in society influence scientists’ rhetorical and organizational boundary-work, and are in turn supported by the organizational evidence for the distinction between, for example, science and activism.

Of course, scientists and organizations that engage in reproductive boundary-work do not do so passively. They may innovate new ways of creatively making their organization fit the dominant ‘map’ separating science from contentious politics. For instance, the cases Kelly Moore analyzed showed that the invention of public interest science organizations like the Union of Concerned Scientists was an original way to deal with credibility pressures, while reaffirming the widely-held belief that science and advocacy should not mix. Thus, even as scientific boundary-work contributes to the reproduction and continued durability of previously constructed boundaries of science, these efforts may also result in organizational innovations. The ESA’s attempts at demarcating the limits of science and advocacy provide a good illustration of this sort of reproductive, yet creative, boundary-work.

### **History of Preservation Advocacy within the ESA**

The Ecological Society of America (ESA) was founded in 1915, with a membership of 286 ecologists by the end of its first year (Burgess, 1977, p. 2). It was the first and only

professional scientific organization of ecologists, formed at a time when ecology was still a barely developed and undefined field. Members were primarily plant and animal ecologists, but those affiliated with the society also included foresters, entomologists, geologists, and researchers from several other related disciplines (Burgess, 1977, p. 4).

One of the first committees established in the ESA was the Committee on Preservation of Natural Conditions. Upon its initiation in 1917, the ESA's president, Elsworth Huntington, indicated that the preservation committee would address relevant legislative issues and work to compile a list of areas that should be preserved across the country (Shelford, 1938). The driving force behind the committee was ecologist Victor Shelford, a founding member of the ESA and the society's first president. Shelford was a vocal proponent of direct action on the part of scientists to promote the preservation of natural areas for scientific study purposes. He strongly believed that scientists should advocate for legislation to protect natural areas, plants and animals, and that it was a mistake for scientists to leave the job of advocacy to others.

The ESA's advocacy for preservation was quite different from the environmental movement that emerged later in the twentieth century. The organization was advocating the preservation of natural areas for scientific purposes, and did not espouse ideas typically associated with environmentalism today, such as the protection of nature for its own sake or human harmony with nature. Preservationists like Shelford and his colleagues urged ecologists to see preservation as a professional imperative, calling attention to the fact that preservation of natural areas meant preservation of *research materials*.

Although the preservation committee may have been motivated primarily by research interests, their demands led them into contentious politics. The preservation committee



**Figure 1.** Victor Shelford (1877–1968) in 1940, first president of the Ecological Society of America.  
*Credit:* <http://www.nceas.ucsb.edu/~alroy/lefa/Shelford.html>

was critical of the US government's approach to managing natural resources, which was based on the principles of Progressive conservation. As historian Donald Worster explains, Progressive conservationists in the early 1900s viewed nature 'chiefly as a commodity to be used for man's economic success' (Worster, 1994, p. 262). Federal conservation agencies such as the Bureau of Biological Survey and the Geological Survey pursued policies of predator elimination and resource extraction. As late as 1939, 'game management' in National Forests and other public lands meant the destruction of thousands of mountain lions, wolves, coyotes and bobcats (Worster, 1994, p. 271).

In contrast, preservation-minded animal ecologists like Victor Shelford and Charles C. Adams advocated for creating areas where predatory animals would be protected, a position that contradicted large agricultural interests and the dominant attitude of the time. Shelford and his colleagues aimed to create areas that were completely isolated from human contact (aside from ecologists who wished to study those areas). Shelford believed that 'preservation' meant allowing nature to 'take its course', whereas conservation—which implied human use, and possible depletion—had created serious obstacles for ecologists and other biologists. In a 1933 editorial, he wrote, 'There is or has been so much interference with natural processes in the form of "control" of this and that organism that the student of "wild life" management who would seek a basis for more scientific treatment of the animals in his charge is left without guiding principles or reliable information' (Shelford, 1933a, p. 535).

In addition to the protection of predators, the preservation committee wanted to create areas where valuable natural resources, such as timber and grazing land, could be left completely untouched, often against the interests of industry and the US government. In summary, the preservation committee's positions were in direct opposition to many powerful interests.

The preservation committee took on several related activities. One of the main tasks was to list and describe areas which were 'preserved or desirable for preservation'. In just three years after its founding, the committee had identified over 600 such areas in the US and Canada. Beyond identifying valuable areas, the committee also advocated for preservation policies. The members of the preservation committee researched the policies governing existing reservations, such as national parks, and studied the desirability of reserving natural areas within those areas. They 'collect[ed] arguments in favor of preserves', an effort that included 'determining lines of research and education, scientific, artistic and historical, which require or can make use of reservations' (Shelford, 1920, p. 316). The ESA developed a plan for preserving wild areas for scientific research purposes that involved subdividing existing wildlife reserves into three parts: 'sanctuaries, buffer areas of partial protection and areas of development for human use' (Shelford, 1933b, p. 282).

Finally, the committee adopted 'methods which have been successfully employed in securing reservations', as Shelford obliquely put it in a 1920 statement (1920, p. 316). These 'methods' included letter-writing campaigns and other correspondence with politicians and administrators, urging the preservation of tracts of land. For example, in 1937, the committee wrote letters to about 800 people and organizations, asking them to use their influence in opposition to a proposed tunnel through Rocky Mountain National Park (ESA, 1938, p. 331).

The structure of the preservation committee was important to successful advocacy. The committee had 'two or more representatives in each political division (states, etc.) to



**Figure 2.** Rocky Mountain National Park. *Credit:* Ansel Adams, <http://www.archives.gov/research/ansel-adams/>

provide an annual list of officers of local organizations in their territory' (Shelford, 1943). Through these representatives, the ESA could then contact all of the organizations working on conservation and preservation issues across the nation. Shelford often complained that the ESA did not cover most of the expenses of running the committee, noting that 'a considerable part of the expense was provided by contributions of the interested societies who were a part of the organization' (Shelford, 1943). Organizations including the Florida Audubon Society, the American Society of Mammalogists, and the Oklahoma Academy of Science made small contributions to support the preservation committee, typically in amounts of two or three dollars. These donations, combined with the royalties collected from the sale of a book prepared by the committee, the *Naturalists' Guide to the Americas*, made up more than half of the committee's tiny budget (ESA, 1938, p. 331).

Shelford complained of the difficulty of keeping the contact list up to date, but in general seemed to believe that the committee's structure was effective (Shelford, 1943). Local committees of the preservation committee would take direct action, keeping a close eye on government practices and protesting a variety of destructive activities. For example, in 1936 the Illinois local committee studied several areas throughout the year and sent a protest to the state conservation department about the use of thalium to poison crows (ESA, 1937, p. 308).

One of the most important preservation-related accomplishments of the ESA was the establishment of the Glacier Bay Monument in Alaska.<sup>3</sup> At the 1922 annual meetings of the ESA, botanist William S. Cooper presented the results of his long-term study at Glacier Bay. The discussion grew into a proposal to form a nature preserve there. A committee was formed to take on the task. Its members included Cooper, Barrington Moore, Robert F. Griggs, and Charles C. Adams. Griggs suggested that they campaign for the establishment of a national 'monument' rather than a national park, because the former could be created by presidential proclamation and would have the same outcome, while the latter required an act of Congress and would be much more difficult to obtain.<sup>4</sup> In 1924, the ESA passed a resolution in support of the monument, emphasizing its value as a place of scientific study and recreation. The resolution was sent to President Calvin Coolidge, the secretary of the interior, the director of the National Park Service, the secretary of the Smithsonian Institution, and the governor of Alaska (Catton, 1995).

When the US Geological Survey opposed the plan, the preservation committee took action. The committee contacted conservation groups throughout the nation and urged them to express their support for the monument to the Department of the Interior. The ESA received confirmation that over 80 groups responded to this plea and advocated for the monument. The ESA also obtained an endorsement for its proposal from the Council on National Parks, Forests, and Wild Life, which 'comprised representatives from twenty-eight large organizations and often came to the defense of national parks by organizing letter-writing campaigns and by lobbying congressmen'. After a lengthy campaign, President Coolidge finally declared Glacier Bay a national monument on 25 February 1925 (Catton, 1995).

The preservation committee's work continued throughout the 1930s, following public policy matters related to preservation and proposing resolutions to be adopted at the annual business meetings of the ESA. The committee engaged in direct communication with politicians and advocacy groups throughout the year on important policy matters such as the protection and use of Yellowstone Park and the US government's policy of predator control. The committee was particularly busy during the New Deal, and had direct contact with administrators involved in President Roosevelt's policies, urging attention to nature sanctuaries and their usefulness for scientific study. The preservation committee reported in 1936 that it had been in contact with Roosevelt's Administration and was urging wildlife protection projects (ESA, 1937, p. 308). Shelford's biographer, Robert Croker, notes some of the more important correspondence with figures such as Secretary of the Interior Harold Ickes, Bureau of Biological Survey chief Ira N. Gabrielson and Forest Service chief Ferdinand Silcox (Croker, 1991, p. 133). The committee asked the head of the Biological Survey if the ESA could assist in helping to save game, recreation and natural areas under the Taylor Grazing Act, but this offer was declined. Evidently the ESA and the federal conservation agencies did not have a cooperative relationship in this period (ESA, 1937, p. 308).

The ESA typically passed several resolutions proposed by the preservation committee each year. For example, in 1936, the ESA approved a round of resolutions on a range of preservation issues, including predator destruction and the creation of buffered nature sanctuaries (ESA, 1937, p. 308). Those resolutions were sent to the heads of several governmental agencies (ESA, 1937, p. 308). In 1937, the ESA passed a strongly worded resolution against the diversion of water for commercial utilization from Yellowstone Lake in Yellowstone National Park. The resolution asserted that the ESA was 'unalterably

opposed' to such a plan because 'the scenic, biological and economic benefits derived, directly and indirectly, by the hundreds of thousands of people that visit the park annually are tremendously more valuable than any benefits that might accrue to a few thousand people from irrigation of arid lands' (ESA, 1938, p. 340). This resolution is interesting because it goes far beyond the plea for preservation for research purposes. That same year, the ESA supported a resolution that supported the adoption of specific language on land use for the New York State constitution (ESA, 1938, p. 341). Clearly, the ESA was involving itself in politically sensitive issues and sometimes going beyond the 'scientific' basis for its political demands.

In 1939, the ESA adopted resolutions on the protection of elk in Yellowstone and several other controversial policy matters. The organization also adopted a resolution against a bill proposed in the US Congress that would have opened the Organ Pipe Cactus National Monument in Arizona to prospecting and mining. Advocacy on similar legislative matters continued until 1944. For example, a 1944 resolution opposed efforts to abolish the Jackson Hole National Monument, which was considered an area of 'outstanding scientific interest and value' (ESA, 1945a, p. 233). In summary, for many years, the ESA engaged in both the typical activities of a professional scientific society (conferences, publishing) as well as the less-conventional and more contentious work of advocating for public policies in the interest of preserving natural areas.

### **From Conflict to Cooperation: The ESA's Reproductive Boundary-work**

Victor Shelford sometimes treated advocacy for preservation as a form of applied ecology. In a 1944 editorial urging scientists to advocate preservation, he wrote, 'To minimize misconstructions and misrepresentations, public application of scientific principles and the needs of future research should be urged by the specialists themselves. . . . [Scientific societies must] urge the application of their knowledge directly and simply whenever it is in the interest of society to do so. No scientific society devoted to research should fail in fulfilling this obligation' (Shelford, 1944a, p. 451).

Not all members of the ESA agreed with Shelford on this point. Debates about whether to engage directly in issues of legislation and political change have characterized the field of ecology throughout its history, to the present day. One case suggests that concerns about the propriety of advocacy influenced the activities of ecologists as early as the 1880s. In his study of the ecologist Stephen Forbes, Daniel W. Schneider found that Forbes had become increasingly concerned about preservation of the Illinois River, but, heeding the warnings of scientists in other states, recognized that his credibility as a scientist could be threatened if he became involved in practical politics (Schneider, 2000, p. 701). As Schneider illustrates, to head off this threat to his credibility, Forbes 'worked to create a public image of scientific objectivity even while striving to influence state policy', refusing to publicly support political candidates and presenting himself as a disinterested expert (Schneider, 2000, p. 701). When he and fellow ecologist Robert Richardson sought to prevent the dumping of Chicago sewage into the Illinois River, they presented themselves as simply 'biological expert[s]' and relied on local fisherman to express their political concerns (Schneider, 2000, pp. 700–701).

Similar concerns emerged within the ESA. Over the years, ESA members made several efforts to make a clearer distinction between science and advocacy. For example, at the 1928 Annual Meeting of the ESA, participants worried that taking positions on pieces of

controversial legislation would have negative repercussions. They discussed a proposal 'that the Society consider the question of whether or not it was the function of this Society to assist in the preservation of natural areas in view of the opposition and unfavorable publicity sometimes aroused' (ESA, 1929, p. 308). According to records of the meeting, members reached an agreement that the ESA should continue its efforts for preservation of natural areas (ESA, 1929, p. 259). No organizational changes were made at that time.

However, two years later, the issue was raised again. Because some members of the preservation committee worked for state or federal governments and thus were forbidden to lobby or felt uncomfortable with the committee's efforts to influence government bureaus and legislative bodies, in 1930, the committee was split into two separate parts. The Committee on the Preservation of Natural Conditions was the 'action' body. The Committee for the Study of Plant and Animal Communities, on the other hand, was a 'fact-finding' body and served as an advisory group for the preservation committee (Croker, 1991, p. 127). The division into two separate committees seems to have been motivated not by worries about the propriety of ecologists acting as advocates, but rather by the concern that *government* scientists, as part of their responsibility to the state, were not permitted to be advocates in partisan politics. After this internal organizational split, the preservation committee continued the work of writing letters to politicians, sending resolutions to government bureaus and attending hearings. In Victor Shelford's words, the committee worked 'to urge governmental agencies to act in certain ways' (Shelford, 1943, p. 280). Despite the nominal separation, the study committee appears to have been closely linked to the preservation committee, to the extent that concerns were raised about too much overlap between their efforts (ESA, 1942, p. 252).

Shelford came to believe that this arrangement, having two distinct committees, was ideal because ecologists who worked for the federal government could still contribute to the preservation committee's efforts through the study committee. In a 1943 editorial in which he promoted increased advocacy among all biological scientists, he urged other scientific societies to follow the successful model of the ESA (Shelford, 1943).

These issues of boundary-drawing would be raised again, but in general, the membership seemed to support the work of the preservation committee through the 1930s. At ESA meetings in 1933 and 1934, members praised Victor Shelford's work with the preservation committee and approved the continuation of both the preservation and study committees (Croker, 1991, p. 131). The 1937 presidential address by Robert E. Coker listed preservation advocacy as one of three main functions of the ESA. Yet, in his speech, there were also indications of concern that the ESA's preservation goals did not resonate with the general American population. Coker lamented:

We are all too deeply impressed with the need for the preservation of natural conditions and the conservation of native plants and animals for it to be necessary before this group to enlarge upon the need . . . Unfortunately, however, the general public neither admits it nor knows anything whatever about it. That natural areas are necessary for research *in situ* and for controls against research conducted elsewhere and against our agricultural and industrial developments has little meaning to the ordinary sojourner in this great land . . . (Coker, 1938, p. 313).

Despite a lack of public appreciation of its efforts, until the mid-1940s the organization appeared to remain dedicated to the work of the preservation committee. Periodic

discussions about its role indicate a longstanding awareness that there was something unusual and perhaps improper about the ESA's preservation advocacy. Even so, it was only during World War II that the ESA began to seriously rethink whether the preservation committee ought to exist.

In the early 1940s, Victor Shelford became frustrated that 'in spite of the fact that the majority of members are interested', the ESA had never created a permanent role for the preservation committee in the organization's constitution (Shelford, 1943, p. 280). Perhaps more importantly, the organization had never fully financially supported the work of the preservation committee, typically only providing \$50 per year. As a step toward remedying this situation, in 1943, Shelford sent a questionnaire to 400 members of the ESA (of a total membership of approximately 650). Asked whether they believed attention to preservation should be on a par with other ESA activities, 282 of the 373 respondents said yes (Shelford, 1944b, p. 14). Shelford took this as evidence that the organization was neglecting an activity widely supported by its members.

In June 1944, Shelford published an open letter to all ESA members in the *Bulletin of the ESA*. He expressed dismay that 'the work devoted to the preservation of nature, the basic research material for a large part of the membership, has been delayed and neglected over long periods of years' (Shelford, 1944b, p. 13). The preservation committee, led by Charles Kendeigh and Curtis Newcombe, then submitted a proposed article for the ESA constitution that would maintain a permanent preservation committee and guarantee its funding.

This was unfortunate timing. By 1943, some prominent members of the ESA believed the Society should be concerned only with research and should not take an active role in preservation matters, despite what seemed to be ongoing interest in this work by the general membership (Dexter, 1978, p. 146). To the preservation committee's request for funding and a permanent status, the executive committee replied with something completely the opposite: they recommended abolishing the preservation committee (ESA, 1945a, p. 216). The executive committee later compromised by proposing the following amendment, to be decided by referendum, describing the duties of the Committee on the Preservation of Natural Conditions:

It shall encourage the preservation of natural conditions by providing information and advice to those interested in securing sound legislation for this purpose but shall not have authority to take direct action designed to influence legislation on its own behalf (ESA, 1945c, p. 12).

The explanation offered for the proposed amendment was that

the intention of this action is not to decrease the activity or importance of the Preservation Committee but merely to redirect its efforts . . . The role of the Ecological Society is intended to be that of a research organization and scientific adviser in its field (ESA, 1945b, p. 5).

There were multiple reasons for this seemingly dramatic shift in attitude. World War II had changed both the pressures on and opportunities for the profession of ecology. Historian Robert P. McIntosh characterizes the WWII period for ecologists as 'a world-wide trauma which had occupied the attention of ecologists, interrupted the training of new

ecologists, and created a lull in the progress of ecology' (McIntosh, 1974, p. 132). In addition, the war generated new demands for the exploitation of natural areas, making the preservation committee's work more controversial than before. At the same time, the rapid advancement of physics and chemistry through their contributions to national defense suggested to some ecologists that they too ought to refocus their efforts toward assisting, rather than challenging, the federal government. In short, a combination of legitimacy pressures and professional opportunities pushed the ESA's leadership to endorse a new model of organization and relationship with the state.

Unhappy with these developments, Victor Shelford astutely observed the pressures on ecologists to avoid getting involved in political agitation. In a 1944 editorial in *Science*, he noted a general trend for scientists to withdraw from preservation advocacy. He believed this was due to a conflict between preservation and industry. Shelford suspected that the primary reason for the withdrawal of scientific societies from politics was that the viewpoints of some scientists conflicted with those of the 'biological industries', particularly those interested in making use of protected forests and grasslands. Government agencies and politicians, he argued, seemed to take the side of industry. Shelford noted that while ecologists were not directly ordered to stay out of politics, government administrators suggested that it was improper and ineffective for science societies to engage in political advocacy. As a result, he lamented, 'it is now generally understood in the national capital that a scientific society should not exert pressure on governmental agencies or legislative bodies' (Shelford, 1944a, p. 450). In other words, Shelford believed that the US government, in support of industry, was exerting a kind of covert isomorphic coercion (DiMaggio and Powell, 1983), pressuring scientific societies to conform to a model of political neutrality.

Shelford's interpretation was probably right. During WWII, many previously protected areas were opened to logging and other industrial activities in order to provide more resources for the war. In 1943, the preservation committee reported that the war was having a negative effect on preservation efforts and hindered their work (ESA, 1944, p. 264). Although it was concerned about the use of National Park forests to supply timber for war purposes, the committee decided that 'it was not wise to launch a campaign against this movement at present' (ESA, 1944, p. 264). Likewise, the study committee considered war conditions to be a 'serious handicap' to even the basic work of surveying nature sanctuaries (ESA, 1944, p. 265).

Shelford responded to 'the wartime and post-war pressure to destroy nature' by encouraging other scientific societies to adopt the model of the ESA's preservation committee and push for the protection of nature (Shelford, 1943). But the ESA's executive committee believed that it was the ESA that should change, modelling itself after organizations that abstained from advocacy.

The executive committee's desire to transform the ESA did not only emerge from wartime pressures; it was also informed by the visible opportunities that more conventional disciplines seemed to be attaining. Some ecologists, such as ESA executive committee member Robert Griggs, envied the dramatic increase in status experienced by physicists in the wake of their contributions to the war effort. During World War II, many biological scientists felt that their knowledge and skills were underutilized. While physics and chemistry were gaining in prestige, influence and funding as a result of their contributions to the war effort, it was less obvious that ecologists and other biologists could be of much assistance. In the mid-1940s, ecology was still a young (inter)discipline, and in comparison to

other scientific fields during this period, ecologists had very little prestige. In one editorial, Griggs compared the public relations of the biological sciences to the poor situation of the physicists in the 1930s. Describing the rapid increase in status and funding for physics in the 1940s, he declared his hope that: 'We can have similar prestige and opportunity in biology' (Griggs, 1947, p. 559).

Responding to this combination of pressures and opportunities, the ESA sought to increase its credibility and prestige by following dominant models of the relationship between science and advocacy that were available in the discursive terrain and the organizational field. The ESA's executive committee endorsed the organizational model that kept advocacy distinct from science and embraced a discourse of utility that framed scientists as neutral advisors.

The field of organizations—the set of scientific societies and science organizations of which the ESA was a part—particularly influenced the ESA's boundary-work. The writings of ESA leaders at the time provide strong evidence that the organization's leadership consciously wished to emulate more prestigious scientific disciplines and organizations, particularly physics. Ecologists on the executive committee believed that the proper model for organizing a scientific society was to restrict the society's activities to those believed to be central to the pursuit of science, and to avoid advocating policy positions. Other scientific societies like the American Physical Society existed primarily to facilitate professional communication, like publishing journals and holding academic conferences (Lustig, 1999). Until the late 1960s, 'it was a rare professional science organization that had a committee or program that linked the interests of scientists with those of ordinary people' (Moore, 2000, p. 108). The legitimacy of this model of autonomy from the world of politics was arguably taken for granted by many scientists at the time, as evidenced by its prominent role in the founding goals of the National Science Foundation (Kleinman, 1995).

Also shaping discussions about ESA's role with respect to the government was a concept of utility, or science for the public good. This utility argument, although far from novel, had recently regained importance as a defence of science against criticism that had arisen in the inter-war period (Mitman, 1988). The utility argument served to promote greater investment in science, just as the possibilities for large-scale government support for science were beginning to be seen. Disciplines like physics were seen as contributing to the public welfare through their assistance to the military and federal government.

During the debates about the preservation committee, the executive committee was made up of several very prestigious scientists who opposed the ESA's advocacy role. Some ecologists at the time speculated that because of their high status, they were able to influence the membership to adopt their position. For instance, Charles Kendeigh, the Chairman of the ESA's Committee for the Study of Plant and Animal Communities, was convinced that the amendment to eliminate the ESA's advocacy role passed only because of the prestige of the members of the executive committee (Croker, 1991, p. 144).

One of the key players in the campaign to eliminate the preservation committee was Robert Griggs. Sara Tjossem portrays Griggs as 'a Washington administrator who, in the opinion of some members of the preservation committee, cared more for the proper way of doing things than getting them done' (Tjossem, 1994, p. 54). Griggs's efforts to guide the ESA's transformation were crucial because he was directly familiar with other organizational models. He had served as Chairman of the National Research Council's Division of Biology and Agriculture and chaired the Rockefeller Foundation's

Natural Sciences Division, so he would have had contact with members of many different scientific organizations, not to mention funding bodies and state agencies (Croker, 1991; Mitman, 1992).

Griggs clearly believed in preservation. He had played a central role in the ESA's advocacy for the Glacier Bay National Monument in the 1920s, as mentioned above. He had also supported the ESA's preservation efforts as late as the mid-1930s. For instance, in 1936 Griggs was a member of the preservation committee and urged ESA members to oppose Congressional legislation that aimed to create a tunnel through Rocky Mountain National Park (ESA, 1937, p. 310). But by the early 1940s, Griggs had come to believe that it was inappropriate for scientists and scientific organizations to advocate policy positions. In his position at the National Research Council in 1943, Griggs abolished the NRC's preservation committee, saying that 'it is against the policy of the Council . . . to engage in agitation' (quoted in Tjossem, 1994, p. 53). He then turned to the ESA to enforce a similar boundary between science and 'agitation'. He raised the issue during his tenure as ESA president in 1944, and then led a committee that continued the effort to restrain the preservation committee's advocacy efforts. In 1946, addressing the ESA membership, Griggs's committee wrote that 'the Ecological Society is devoted to the "promotion of the interests of ecology"'. The Society therefore exists *solely to advance ecology* by all reasonable means' (Griggs *et al.*, 1946, p. 40, my emphasis).

Victor Shelford perceived that Griggs and his colleagues wished to make the ESA resemble other scientific societies. In a letter to ecologist W.C. Allee, Shelford commented:

I am convinced that those who take part in the running of the society—rank and file who attend the business meetings and hold offices—are smugly conservative and unwilling to admit anything into the Society not characteristic of such organizations as the Society of Naturalists (quoted in Croker, 1991, p. 134).

By contrast, Shelford celebrated the fact that the ESA was atypical of science societies of the time, writing in 1944:

The Ecological Society is not of the ordinary type, such as the majority which are affiliated with the A.A.A.S. [American Association for the Advancement of Science]. The fact that it has carried on this work, which fundamentally is concerned with the preservation of research materials for its members, for twenty-seven years is an indication of its unique character (Shelford, 1944b, p. 12).

This 'unique character', however, was precisely what elite ecologists on the ESA's executive committee sought to eliminate. In part, this was because of legitimacy pressures. It simply seemed improper for the ESA to continue to engage in political advocacy, and doing so threatened the discipline's credibility. As Shelford put it, 'It is merely that certain people do not think that the action of the committees constitute good form. It is something like cutting your salad with a knife or eating your lettuce leaves' (quoted in Tjossem, 1994, p. 54).

Beyond the pursuit of propriety, however, was a broader desire to transform the image of ecology. Griggs believed that ecologists, and biologists more generally, needed to demonstrate their usefulness for American national defence. He noted in 1941 that it

was ‘hard to get anything done in Washington these days unless it can be labeled “defense”’ (quoted in Tjossem, 1994, p. 48). In a number of editorials, he explicitly linked the prestige of ecology and the other biological sciences with their ability to further national objectives in the same ways that physicists had during the war. In 1945 he argued that ‘it is perfectly clear that the biological sciences can never grow and prosper until they develop services to the public comparable to the other professions’ (Griggs, 1945, p. 239).

To do this, he believed it was necessary ‘to create more jobs in the biological sciences by enlarging their services to the public welfare’ (Griggs, 1945, p. 239). He lamented that the public, and the military in particular, did not seek out the assistance of ‘patriotic mycologists’ (fungus biologists) during the war, which would have ‘made a tremendous contribution to the war and would have secured a recognition of the importance of their science, which is still a long way off’ (Griggs, 1945, p. 236). Griggs called for a professional organization of biologists to improve their public relations and advocated strongly for the formation of the American Institute for the Biological Sciences. He went so far as to argue that the most compelling reason to establish such an institute was that it would make the public aware that the biological sciences were needed in case of biological warfare (Griggs, 1947, pp. 564–565).

Besides Griggs, other members of the executive committee agreed that it was necessary to make over the image of ecology and the other biological sciences. Apart from contributing to the defence industry, ecologists could assist the government in managing natural resources. Orlando Park, another member of the executive committee who was opposed to the ESA’s advocacy activities, gave a 1944 address to the ESA in which he announced that he was ‘dissatisfied with the present professional position of ecology’ (Park, 1945, p. 1). In his view, ecologists had ‘missed the boat’ for professional advancement numerous times. One of his suggestions to improve the professional status of ecology was

Full collaboration with national and state agencies in the problems of conservation . . . Since this complex subject is also the responsibility of every intelligent citizen, it is fitting that the United States Government should also be deeply concerned in preservation of plant and animal resources. Therefore, biologists, by the very nature of their professional background, should be in an excellent position to cooperate with national and state groups in this problem (Park, 1945, p. 5).

In contrast to advocacy, preservation presented this way was not necessarily controversial. Indeed, Park used the terms preservation and conservation interchangeably. As historian Donald Worster points out, after 1945, US conservation strategies moved away from the Progressive conservation approach and became more amenable to the advice of ecologists (Worster, 1994, p. 256). Ecologists could advise government on issues such as forestry and range management, to promote the wise use of natural resources. This type of applied ecology did not constitute advocacy, but illustrated the utility of ecology for the government and industry.

These statements about the utility of ecology to national objectives resonated with the dominant discourses of the day. While scientists in the 1940s and 1950s routinely appealed to the ‘pure-science ideal’ in efforts to maintain credibility and autonomy, to obtain public funding for research they also needed to demonstrate that their work served a public purpose, contributing to the general welfare (Daniels, 1967; Kleinman and Solovey,

1995). For example, in the first 10 years after World War II, leaders of the newly-founded National Science Foundation struggled to assert both the relevance and value-freedom of the Foundation's projects (Kleinman and Solovey, 1995). To justify federal support for scientific research, the agency's leaders appealed to Cold War concerns, asserting that NSF programmes were essential to the effort to combat communism. But to preserve the autonomy of NSF projects, the scientific elite stressed the apolitical nature of science. Elite scientists successfully used both rhetorical strategies despite their inherent contradiction. The parallels with the case of the ESA are striking.

Of course, by turning away from preservation advocacy to support the nation's military and economic priorities, the ESA just replaced one form of politics with another, less contentious variety. But there is no evidence that ecologists perceived this contradiction or saw it as problematic. While leaders like Griggs warned against the 'embarrassment' brought upon scientific organizations through 'entangling alliances with propaganda agencies', they also explicitly advocated making ecology more relevant and useful to the needs of government (ESA, 1949a, p. 42). Thus, the ESA was not really creating a distinction between science and politics, but rather deciding between having a cooperative or contentious relationship with the state. In choosing a cooperative relationship, the ESA reproduced dominant ideas about how science could best serve the public.

When the membership of ESA was presented with a vote on the future of the preservation committee in 1944, it was faced with a wide array of pressures. On the one hand, the ESA's advocacy for preservation policies was interpreted as improper behaviour for a scientific society, particularly when that advocacy seemed to contradict military and economic priorities. On the other hand, ecologists needed to show that their science was useful for the American public—and the government—so that they could be part of the growing national interest in supporting the sciences. Thus, Shelford's argument that advocacy for preservation was a professional imperative of ecologists seemed to clash with the wartime ideas about the role of science. The fate of the ESA's preservation committee came down to a vote by the membership. The proposed amendment, which would restrict the preservation committee's freedom to advocate policy positions, received a vote of 213 for and 115 against, and in 1945 it was incorporated into the ESA's Constitution (ESA, 1945c, p. 12). By June 1946, the preservation committee, 'deprived of authority' to influence legislation, voted to disband (ESA, 1946, p. 35).

### **Organizational Splitting: The ESA and the Ecologists' Union**

Although after 1945 the ESA would no longer take a direct advocacy role, the organization sought to support advocacy efforts that were initiated by other, independent groups. In 1945, Robert Griggs and Charles Adams (both advocates for the elimination of the preservation committee) joined Curtis Newcombe and Charles Kendeigh (who had sought a permanent role for the preservation committee) in forming a committee to create a national conservation council 'to bring about the conservation of natural resources *in the public interest*' (Adams and Tate, 1945, p. 3, my emphasis). They soon established the Natural Resources Council of America, which, like the ESA, did not engage directly in lobbying, but assisted local groups in doing so (Redfield, 1947).

After the preservation committee disbanded, Victor Shelford and fellow ecologist Harold Hefley, with 300 of Shelford's own dollars, immediately took steps to start a new organization called the Ecologists' Union, 'devoted to the preservation of natural

biotic communities *for scientific use*' (Croker, 1991, p. 144; *Science*, 1948, p. 189, my emphasis). Some 158 ecologists became members of the Union in 1946 (Croker, 1991, p. 145). The organization took up many of the issues the ESA had previously addressed and continued lobbying Congress on preservation issues. Unlike the ESA, the Ecologists' Union opened membership to non-scientists, and its numbers grew rapidly (Croker, 1991, p. 145).<sup>5</sup>

The ESA promised full cooperation with the Ecologists' Union (Dexter, 1978, p. 147). This, at least for a short time, meant that the work of the preservation committee could continue, just not as part of the ESA. However, these political efforts were separated from scientific activities and were no longer part of the professional face of ecology. A 1949 ESA publication entitled 'The Ecological Society of America—Origins and Activities' described the organization's history and the activities of its standing committees, but made no mention of preservation advocacy (ESA, 1949b). And whatever nominal association the Ecologists' Union had with professional ecology did not last long. In 1950 the Ecologists' Union reorganized and renamed itself the Nature Conservancy.

The elimination of the ESA's preservation committee in 1945 and the subsequent formation of the Natural Resources Council of America and the Ecologists' Union constituted a form of boundary-work that might be called 'organizational splitting'. The result of the split was the creation of an organizational distinction between science and political advocacy. Although many ecologists would become members of both the ESA and the Ecologists' Union, the organizational separation of the professional activities of ecology from contentious advocacy efforts created a well-defined and durable line between science and 'agitation' where that boundary had once been blurred and contested within the ESA. The separation of these two concerns into distinctly different organizational bodies sent a message that the ESA was not itself an advocacy organization, and by extension, that the science of ecology was politically neutral and did not represent a position on nature preservation.

## Conclusion

The evidence examined here suggests that the ESA's response to pressures and opportunities generated by WWII and the post-war climate for science was guided by dominant discourses about the role of science in society and mediated through the ESA's organizational field. This boundary-work had a dramatic effect on the organization's practices and the relationship of ecology to the state.

The history of the preservation committee shows that ecologists had debated their role as advocates many times over the years. The initial creation of the preservation committee indicated that advocacy for preservation was one of the legitimate professional activities for ecologists. Worries about the propriety of such activism were raised, but quelled, in the 1920s. In the 1930s, the ESA took steps to ensure that ecologists working for government agencies could not be accused of engaging in political advocacy. This was accomplished by dividing the preservation committee into an action body and a research body.

The boundary created by the final decision to abolish legislative advocacy, however, had a more drastic effect on the ESA's practices than the decision to split the preservation committee into two parts. Leaders of the ESA during the early 1940s sought to portray ecology as politically neutral while simultaneously socially and militarily useful. This was achieved through an organizational split, which created a clear distinction between

preservation advocacy and the professional work of ecologists. In the earlier split, it was clear that ESA members already believed that research and advocacy were distinct activities; nevertheless, they were both considered appropriate roles for the ESA. But after the organization pushed out the preservation committee, advocacy was no longer considered part of the professional practice of ecology. Ecologists may sometimes also be advocates, but that work was distinct from their work as professional scientists.

The boundary-work of 1945 attained a permanence that previous attempts at boundary-work did not achieve. The 1945 decision was institutionalized not only in the ESA's constitution, but also in the broader cultural understanding that science and advocacy should not mix. During the late 1960s and early 1970s, as the emerging environmental movement brought ecology to prominence for the first time, the ESA took steps to ensure that the profession's credibility would not be damaged by a mistaken confusion with the political movement (Nelkin, 1977). To this day, the ESA maintains that, with regard to politics, the appropriate role for the organization and for ecologists in general is to provide factual information in a value-neutral way. As I have discussed elsewhere, the ESA today does recognize that scientists are also citizens with political viewpoints, but the organization encourages ecologists to make clear distinctions between their roles as scientists and citizens when talking to the public about politically relevant matters (Kinchy and Kleinman, 2003). Although the ESA's position on advocacy continues to be debated, there has never been a return to advocacy resembling that of the preservation committee. The ESA certainly engages in politics in other ways—writing position papers and training ecologists to be better communicators of scientific information, for instance—but the official position remains basically the same as it was in 1945.

It is important to note the other outcomes of this organizational split. By eliminating the preservation committee, the ESA kept its hands clean of controversial issues that might threaten its credibility as a government advisor. Ecology was still involved in politics in the sense of supporting the war effort or advising federal agencies on resource management, yet the 'political' nature of the ESA's work was obscured. This finding complements Scott Fricke's (2005) observations on how organizational boundary-work—including processes of 'institutionalizing impartiality'—may mask the political significance of everyday, 'mundane' science. Furthermore, many ESA leaders supported the activities of ecologist-activists and understood that their efforts through separate organizations like the Ecologists' Union were important both to the practice of ecology and to the public good. Thus, an additional outcome of organizational splitting was the creation of 'boundary organizations' (Guston, 1999) that linked ostensibly neutral scientific experts with political activists.

With the decision to 'redirect' the efforts of the preservation committee in 1945, the ESA reproduced well-known boundaries of science that were perceived as legitimate, rather than continuing an unconventional position on advocacy and contentious relationship with the state. That the ESA chose to change its longstanding position on advocacy to a stance that reflected the dominant models of the time suggests that certain maps of science are not only resilient, but also have effects on later boundary-work. Dominant discourses and prestigious organizations provide a map of the surest route to credibility.

These observations do not exclude the possibility that the ESA acted creatively. The ESA's boundary-work can be understood as both reproductive and constructive. While the ESA reproduced an existing and already dominant cultural map of the relationship between science and the state, it achieved this through organizational innovations.

Members of the ESA devised a way to continue to support the idea of preservation, by remaining linked to the Ecologists' Union and the Natural Resources Council of America. And Griggs's suggestions about how ecologists (especially 'patriotic mycologists') could contribute to the war effort were certainly novel. Still, these efforts had the effect of reproducing dominant ideas about the appropriate activities of scientists. All traces of the ESA's former unorthodox behaviour were erased in favour of a more cooperative relationship with the state, reproducing the ideal of the neutral scientific adviser as the proper role of a professional scientific organization in the world of contentious politics.

These insights suggest that analysis of scientific boundary-work can and should go further than simply identifying processes of construction. It is also possible to discern patterns in the ways that the boundaries of science are defined, consider the ways that boundary-work efforts are constrained, and ask why some cultural maps are so resilient. If unorthodox boundaries of science are more difficult to defend than those that are widespread and taken for granted, a task for future analysts should be to understand how and why dominant maps of science—both discursive and organizational—attain their obduracy, and in what contexts creative transformations of these maps become more or less possible.

### Acknowledgements

Many people provided thoughtful comments and advice on various stages of this article. The author would like to thank Daniel Kleinman, Scott Frickel, Ronald Numbers, Michael Shank, Gregg Mitman, Chas Camic, Fred Buttel, Jane Camerini, Les Levidow and the anonymous reviewers.

### Notes

<sup>1</sup>A note on sources: both primary and secondary sources form the basis of this study. I relied on a small number of existing historical works to form an initial picture of the debate (Crocker, 1991; Tjossem, 1994). I also found that the ESA itself had published a very brief history of the origins of the Ecologists' Union (Dexter, 1978). A major primary source used in this study was the *Bulletin of the Ecological Society of America*, the ESA's quarterly publication for members. The *Bulletin* from the period under study included meeting summaries, committee reports, letters, and referenda. The journals *Science* and *Ecology* were also a valuable source of editorials and letters written by ESA leaders.

<sup>2</sup>See Kleinman and Kinchy (2003) for a review of a variety of these studies.

<sup>3</sup>All information about the Glacier Bay Monument campaign is drawn from a publication available through the National Parks Service, entitled *Land Reborn: A History of Administration and Visitor Use in Glacier Bay National Park and Preserve*, by Theodore Catton (1995). Available online at <http://www.nps.gov/glba/adhi/adhi.htm>.

<sup>4</sup>The Antiquities Act of 1906 gave the US president the authority to proclaim 'historic landmarks, historic and prehistoric structures, and other objects of historic or scientific interest' to be national monuments. Originally intended to protect prehistoric ruins and artefacts, the Antiquities Act has enabled presidents to protect many 'scientifically interesting' tracts of federal land.

<sup>5</sup>After five years of existence, the Union reorganized and was renamed the Nature Conservancy. It has remained in this incarnation to the present time, as a leading national agency for the protection of natural areas.

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