

Invasive Species as Ecological Threat:

Is Restoration an Alternative to Fear-based Resource Management?

by Paul H. Gobster

Communicating our fears about invasive species is tricky business, but ecological restoration offers a positive alternative message.

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Invasive species is a hot topic in the USDA Forest Service these days. Along with wildfire, land conversion and unmanaged recreation, Chief Dale Bosworth has called invasive species one of the “Four Threats” needing the attention of Forest Service land managers and researchers (USDA Forest Service 2004). My unit of the Forest Service, the North Central Research Station, has responded to the call by focusing a portion of our research capacity on invasives. As a social scientist, I began looking for my niche in the issue by searching the literature for what had been done on the social aspects of invasive species.

Not much, I soon concluded. Most work tends to focus on risk assessment and economic impact analysis (Pimental and others 2000) or the ethics of exotic species removal (Throop 2000). There are also some general outlines, done mostly by ecologists, documenting the human causes and consequences of introductions (McNeely 2001). Few social scientists, however, have looked at invasives within the context of questions considered of central importance to understanding the human dimensions of natural resource management—how people perceive, value and act toward nature, and what these imply for programs and policies. A few years ago, I began looking at these questions as they applied to ecological restoration projects (Gobster 1997, Gobster and Hull 2000), and now thought it might be worthwhile to do the same for invasives.

What I have been finding is that while ecological restoration and the science and management of invasive species share many of the same goals and concerns, there is a fundamental difference in how the two fields are conveyed to the public. This difference relates to the use of fear as a mechanism for gaining public support and motivating behavioral change. In the pages that follow, I attempt to identify the dimensions of this difference and suggest what it might mean for talking about and dealing with invasives in the context of restoration programs, with the goal of improving the success of these programs with people in mind.

Fear Factors

The Aliens-L listserv is an energetic forum of invasion biologists and other specialists that “seek and share information on invasive species and the threats which they pose to the biodiversity of our planet” (IUCN 2003). As part of my initial foray into the world of invasives, I found this worldwide network of academics and practitioners a good place to hear about the latest species to crawl, swim, or spread outside its recognized home boundaries. More importantly to my research, I also discovered a rich subtext about how invasives are or should be defined—what is considered natural, naturalized, and alien; how species are valued (and devalued); and how invasives



Figure 1. The creature that ate Chicago. Often enlarged to monstrous proportions, photos of insects, such as this Asian long-horned beetle, are prime examples of how the media help to instill fear and loathing for invasive species among the public. Photo by James E. Appleby. Used with permission.

information is communicated to the public by scientists and the media.

Of these and other topics, it was the last one that most captured my attention, particularly the newspaper articles forwarded by contributors from around the world. Here is a small sample of headlines culled from the archives in a month's time:

- Ring-necked parrots take over Germany and southern England (Anonymous 2004a)
- Experts monitor crazy ant impact (Anonymous 2004b).
- Sironga swamp threatened as 'magic tree' swallows up rivers (Nyasato 2004)
- Giant rats invade Florida Keys: 9-pound rodents could threaten native species (Anonymous 2004c)
- Alien invaders, a global environment under attack (Feanny 2004)

I could have slipped in "Attack of the Killer Tomatoes" among these without some readers noticing the fakery, for each real title has the potential to challenge the sensationalism of this famously bad 1978 sci-fi horror film. While this cult classic was done blatantly tongue-in-cheek, these news selections seem designed to inspire genuine fear among the public readership—fear that real aliens of a kind are invading our homelands and harming the

native species we love. Often coupled with photos of the unwanted invader baring its fangs, teeth, or tusks (pythons in the Everglades, feral pigs in Hawaii), choking out a tree or wetland (English ivy in California, purple loosestrife in the Midwest), or enlarged to monstrous proportions

(Asian longhorn beetle in Chicago, emerald ash borer in Detroit), these articles do their best to raise our anxieties (Figure 1).

In some respects we are accustomed to the media's use of fear as a device to grab our attention. But as I began to read more widely, the more pervasive the invasive fear seemed to be. Such is the case with the recent crop of popular titles on the subject. Among the books now gracing my office bookshelf, the covers on *A Plague of Rats and Rubbervines* (Baskin 2002), *Killer Algae* (Meinesz 1999), *Nature out of Place* (Van Driesche and Van Driesche 2000), and *Alien Invasion* (Devine 1998) feature blaring titles printed over pictures of creepy creatures and smothering vegetation (Figure 2). Inside, science writers portray a world gone awry, as cherished places across the world succumb to onslaughts of alien invaders. Brown tree snakes that slither into people's homes and attack babies in their sleep, attempting to swallow them whole. Tree species, such as melaleuca and Norway maple, that seed so densely that nothing else will grow. Marauding bands of feral pigs that can lay waste to a farmer's crop in a single night. These are just a few in a litany of examples that cumulatively press an apocalyptic



Figure 2. The covers of these recent popular books about invasive species, with their blaring titles printed alongside pictures of creepy creatures and smothering vegetation, seem designed to play on the fears and anxieties of potential readers. Courtesy of Paul H. Gobster.

vision upon the reader. Well-written and engaging, these books contribute much in the way of understanding the issues for lay audiences, but, nonetheless, are guaranteed to produce nightmares if used as bedtime reading.

Academic journals, such as *Biological Invasions*, *BioScience* and *Diversity and Distributions*, take a more measured and objective outlook, describing the patterns of spread and impacts of various invasives and evaluating attempts to reduce or control their populations. But, even in these more subdued expositions, I sensed that scientists were using fear to help make their case. Many of the articles I read began with a sentence identifying the problem of invasives as one of “ecological threat” to nature. By itself, this seems like a rather neutral way to describe the perceived state of affairs. It is the adjectives attached to it that tint the scientific prose with shades of fear. Here is one particularly colorful example: “Exotic species probably pose the greatest, most insidious and fastest-growing threat to global biodiversity (Williamson 1996), with alien terrestrial plants being responsible for extensive and far-reaching changes in natural ecosystems” (Zalba and Villamil 2002, p. 55).

To better understand what was happening, I electronically searched the back issues of *Biological Invasions* (1999-2004) to examine how scientists described invasive species issues. Using terms from news clippings and books I mentioned, and from David Theodoropoulos’s controversial book *Invasion Biology: Critique of a Pseudoscience* (2004), I compiled a list of 50 words implying fear and other concepts of negative value. Of the 239 articles I searched, “threat” and its variants were used 331 times in 100 documents. “Fear,” “danger,” “menace,” “insidious,” “destructive,” “urgent,” “crisis,” and “disaster” were less-often-used terms one also might associate with fear. Highly loaded words such as “evil,” “horrible,” “deadly,” “killer,” “vicious,” “choking,” “ugly,” “nasty,” and “pernicious” that I saw in books and news clippings were not present in these articles or appeared only in quoted text or references. As Theodoropoulos (2004) and others (Chew and Laubichler 2003, Colautti and McIsaac

2004) have found, I also saw invasives-related issues described using war-like terms (“combat,” “attack,” “onslaught”), terms referring to a species’ *introduced status* (“alien,” “biological foreignness,” “xenodiversity”), and terms connoting a *lack of health or purity* (“noxious,” “biopollution,” “macrofouling”).

My motivation here is not to play word police but to critique how information on invasives is communicated to the public. Ecologist Ingo Kowarik (2003) contends that there “is a long tradition in invasion ecology of misusing scientific

The issue of xenophobia perhaps most vividly exemplifies the fallout that can accrue from the language of introduced invasives.

terms by loading them with negative connotations” (p. 306), and while such a strategy can help evoke concern and sway perceptions, it may also carry some costs. The issue of xenophobia perhaps most vividly exemplifies the fallout that can accrue from the language of introduced invasives, with untold hours spent by invasion biologists, restorationists, and others refuting claims that their work is part of a “Nazi connection” and an extension of human ethnic cleansing (Groening and Wolschke-Bulmahn 1992, Egan and Tishler 1999, Subramaniam 2001, Simberloff 2003). While I think the fear factor is less serious a charge, it is one that seems to have enough substance to speculate why it is used and what effect it might have on furthering the goals of invasive species management programs.

Reasons and Repercussions

Why do the media, science writers, and scientists use fear to communicate to the public about invasives? In this section I

identify three likely reasons, then from my perspective as a social scientist point to major drawbacks inherent in each as a strategy, discussing how they may work at cross-purposes in gaining support for managing invasive species.

Urgency

First, those concerned about invasives may use fear in communicating to the public because it gives invasives the sense of urgency needed to spur people into action. Stacked up against global warming, the reintroduction of charismatic megafauna and other high-profile environmental issues, most invasive species don’t draw the attention of the average person. The fear factor pumps up the volume and calls our attention that something in nature is seriously out of whack.

This interpretation agrees with research on “fear appeals” by psychologists working in the areas of persuasive communications and social marketing. Fear appeals present people with scary warnings and other threatening information to arouse fear and invoke a change in attitude or behavior (Ruiter and others 2001). Studied and applied mainly in the context of health issues, such as smoking and AIDS, the latest research shows that appeals that produce the highest levels of fear tend to be most effective, especially when the intended recipients have the ability or are given the tools to make recommended changes (Witte and Allen 2000).

Yet the increasing popularity of fear appeals in marketing also raises important issues about the ethics of their use. Gerard Hastings and his colleagues (2004) cite a number of ethical issues that have applicability to how information about invasives is communicated to the public. Some negative repercussions from fear appeals relevant to invasives include:

- **Collateral damage from mass-media messages:** Hastings and his colleagues state that any deliberate creation of anxiety has ethical implications, and thus fear campaigns should carefully target only those individuals and groups who are most able to enact change. There may be social value in creating awareness about invasives among the



Figure 3. Pretty flowers or nasty invaders? Children are especially vulnerable to fear appeals. They can have unsettling experiences when told that plants, such as this non-native *Oxalis*, will soon wipe out “real” nature. Insensitivity in communicating information about invasives can further separate nature into good and bad. Photo by Paul Gobster

general public, but fear appeals delivered through mass-media messages can produce a lot of “collateral damage” or unnecessary worry among people who cannot affect the situation.

- **Exploitation of vulnerable audiences:** Some audiences may be disproportionately affected by fear appeals. Children, especially those who don’t have a lot of familiarity with nature, already hold substantial fears and negative perceptions toward insects, animals, and storms (Bixler and Floyd 1997). To also be told that the pretty purple loosestrife or furry feral cats will soon wipe out “real” nature could be an unsettling experience (Figure 3). Lacking the conceptual maturity to handle this information, nature is further separated into good and bad.
- **Maladaptive responses:** Fear appeals can sometimes backfire. Efforts in California to demonize eucalyptus trees as “America’s largest weeds” (Williams 2002) has produced a bumper crop of advocacy groups that have thwarted eradication efforts. Scary warnings about an outbreak of the Asian long-horned beetle in Chicago, broadcast daily by the media, helped bring throngs of “tourists” to the affected

neighborhood, risking further spread of the insect across the city by unintentional transport or as souvenirs (Antipin and Dilley 2004).

Establishing the Discipline of Invasion Biology

A second reason why those working on invasives may play the fear card is because they may feel it will help to further establish the field of invasion biology in the eyes of the public and the scientific community. Like restoration ecology and conservation biology, invasion biology is a youthful science and its adherents must work to define its boundaries as an important and separate area of study. But can focusing on the “alien threat” help solidify the scientific understanding of invasions? In a critique of invasion biology, Mark Davis and his colleagues (2001) contend that scientists’ “preoccupation with a few conspicuous invaders has contributed to the belief that invasion is a unique phenomenon” that is driven in part by “funding and publication pressures [that] prompt ecologists to promote new and exciting research themes (p. 100).” Such a strategy, they conclude, is serving to further isolate invasion biology from other related disciplines, such as suc-

cession ecology and restoration ecology, and may prevent its adherents from deriving a more general theory of invasibility.

On a more public level, discussions of invasive species also tend to dissociate any positive value from the species of concern. Yet many species now disparaged as invasive aliens were intentionally brought in from other places because of their utilitarian or aesthetic qualities. Some of these uses persist, others remain part of a species’ historical legacy, and in some cases species that have become residents of natural areas fill an ecological role as food or habitat for native species (Ewel and Putz 2004, Shapiro 2002). Without understanding these positive values, efforts to eradicate or ban invasive species can meet with opposition (Blossey 1999).

Not only does the science and management of invasive species fail to acknowledge the positive side of the equation, it seems as though everything about the field is drenched in negativity. The fear-inducing, negative conceptual and operational language of the field has already been mentioned, but the activity of invasive species management seems even more negatively charged. Managers spend their days taking things out of ecosystems, often using fearsome instruments of death—herbicides, sharp blades, fire, guns, traps, and even electrocution devices. Looking through the eyes of the public, one might easily surmise that the main goal of the field is killing. While programs based on threats and negativity might gain people’s attention, they often fail to capture the support needed for long-term success.

A Creeping “Culture of Fear”

A final reason why I think fear has become a part of the public discourse about invasives relates to what some sociologists and others have referred to as a growing “culture of fear”—the widespread perception of persistent threat that results in societal changes in attitudes and behavior. Some consequences of living in a culture of fear include increased feelings of victimization (Altheide 2002), mistrust of individuals and institutions leading to destabilization of civil society (Sparks 2003), redesign of private and civic spaces that minimizes

When might fear appeals be justified? An example with the Emerald Ash Borer

When might a fear-based strategy for communicating invasives problems to the public be justified? One instance might be to prevent the establishment of new populations of a species where people likely to be most responsible for spreading it can be identified. The Emerald Ash Borer (EAB) has resulted in the death of millions of trees since its discovery in southeast Michigan in 2002. When invasive species managers discovered that vacationers from this region were transporting EAB larva in firewood they were carrying to campgrounds and second homes into northern Michigan, Indiana, and Ohio, they launched a 15-county firewood quarantine and informational campaign about it in the media and through signs posted at State Parks, highway rest stops, and other areas. Yet a Memorial Day 2004 "firewood blitz" conducted at key vacation-area rest stops using highway signs instructing motorists to stop for a "firewood check point" found more than 40 percent were unaware of the quarantine and that many were transporting firewood from the quarantine zone to all parts of Michigan, including six cases where EAB larvae was found (Kellogg 2004).

With the environmental and economic stakes so high and with the opportunity to slow the spread of the

EAB still within reach, a targeted campaign aimed at campers and second-home owners and using fear appeals as part of an overall strategy might be warranted. Campground and resort registration data could be used to identify previous visitors from the quarantine zone, and property tax bills might be used in the same way to identify second-homeowners. Urgently worded messages and photographs showing the dire consequences of EAB spread (for example, a camper standing in front of his tent surrounded by dead trees and stumps) could be accompanied by threats of hefty fines for lack of compliance. Importantly, messages must tell people how their actions can effectively prevent spreading EAB. Incentives (for example, a coupon for a free basket of firewood at any state park) might also be used to give people an attractive alternative.

Any threat-based campaign should avoid demonizing the species of concern; it is simply a plant or animal that has been taken out of its natural habitat and controls. Instead, the focus should be placed on the human activity responsible for that species becoming a problem and the consequences that can result from continued unthoughtful action.

Paul H. Gobster

contact with strangers (Maher 2003), and restrictions placed on individual choice and freedom (Robin 2004).

The terrorist attacks of September 11, 2001 have done much to spread a culture of fear across American society and engender a heightened suspicion toward the "other" (Freyd 2002). But it was the anthrax scares that followed a month after the attacks that likely extended this fear into the environmental arena, including how we might think about and treat invasive alien species. It wasn't long before terrorist-introduced biological weapons, such as anthrax and smallpox, were being talked

about in the same breath as accidentally or purposely introduced plants and animals that may invade natural areas. For example, in their 2003 article "Bioinvasions, bioterrorism, and biosecurity," ecologists Laura Meyerson and Jamie Reaser state:

Despite their high profile and potentially devastating consequences, bioterrorist acts are relatively unpredictable, rare, and thus far small-scale events. In contrast, biological invasions are occurring daily in the United States and have significant impacts on human health, agri-

culture, infrastructure, and the environment, yet they receive far less attention and fewer resources. Scientists and the U.S. government must work together to implement a comprehensive approach to biosecurity that addresses not only bioterrorism, but also the more common incursions of invasive alien species. *This approach should also address the potential for the deliberate use of invasive alien species as agents of bioterrorism.* (2003, p. 307, emphasis added).

While it is not my intent to diminish the seriousness of either bioterrorism or invasive species issues, I think it is a mistake to confound the two. Post-9/11 efforts to bring federal invasive species programs under the Department of Homeland Security, opposed early on by a large group of scientists organized by the Union of Concerned Scientists (Windle 2002), reflects the operational difficulties of such a merger. An investigative report by *The St. Louis Post-Dispatch* (Lambrecht 2004), corroborated by a Government Accountability Office study on agroterrorism (US GAO 2005), found that staffing levels for agricultural inspector positions at United States border operations has dropped markedly since this function was merged with customs and immigration activities under Homeland Security's "One Face at the Border" strategy. With the emphasis now on catching terrorists rather than catching invasive species, many agricultural and natural resource officials feel that a critical frontline in preventing invasions has been compromised.

My primary concern about linking invasive species with bioterrorism, however, is that such a strategy may work to remove one of the last symbolic refuges—natural environments—we have from the rising culture of fear. People have long looked to natural environments for mental, physical, and spiritual restoration in times of stress, and more recently environmental psychologists have begun to document these powerful benefits of interaction with "nearby nature" (Kaplan and Kaplan 2005). In the days and weeks following 9/11 people all over the United States

gathered in parks to mourn and seek solace in the beauty of nature (Cronon 2002). In New York City, for example, attendance at local parks and botanic gardens rose as people came to see nature as a safe and pleasant outlet for healing (Miller 2001, Stewart 2001). By extending a culture of fear into the realm of the natural environment, it is questionable whether scientists

jects, the preceding discussion has as much relevance for the field of ecological restoration as it does for invasion biology. Are restorationists also prone to using fear about invasives to generate public support for their work? In a similar analysis of media stories, popular books, and academic journal articles focusing on ecological restoration I found some evidence of this

additional problems that restorationists see threatening natural areas today.

What separates communications about restoration from those focusing on the science and management of invasive species, however, is not just the degree of fearful and negative language. In the restoration writings I also found a wealth of counterbalancing language that I felt much more positively and effectively communicates the importance of restoration endeavors. This language embodies metaphors, values, and motivations relating to restoration and can be grouped into the following categories:

- **Ecological-** Restoration has intrinsic value in its aims to improve the health and diversity of ecosystems and protect species that are *native*, *rare*, and/or *endemic*. These *classic* landscapes have *heritage* and *legacy* value and restoration work strives for *authenticity*.
- **Functional-** Restoration projects support a range of other environmental goals that aim to increase *sustainability* for ecological and human goals. These projects supply various *environmental services*, such as wetlands for flood control, wildlife habitat and water quality improvement, and do so in a manner that is *economical* and *environmentally friendly*.
- **Humanistic-** Restoration projects enhance people's outdoor *enjoyment and use* and are appreciated for their *beauty* and for bringing people *closer to nature*. Native ecosystems help reestablish people's *sense of place* in landscapes that have otherwise grown increasingly generic and homogeneous.
- **Integrative-** Engagement in restoration *volunteer stewardship* activities instills a *sense of pride* and *dedication* in people in their *altruistic* efforts to *rescue nature*. Through the *ritual* and *performance* aspects of restoration, we come closer to understanding and achieving *community* with other humans and with nature.

In the context of restoration, invasive species management becomes a stepping-stone to achieving these broader goals and values. Restoration in this way can help to "reframe" the issue of invasives and thus improve success in dealing with management problems on the



Figure 4. Restorationist Jake Sigg leads a spring "wildflower walk and weed pull" at San Francisco's Bayview Hill. When many first-time participants are in attendance, beginning restoration workdays with an instructive and experiential tour can help increase people's appreciation of the natural values of the site and the context in which invasive species management is needed. Photo by Paul Gobster

and managers will gain resources or public support to more effectively manage invasive species. It is quite possible, however, that it could change the way we as a society perceive and experience natural environments, and do so in a way that erodes the restorative benefits that such environments can uniquely provide.

Restoration and the Reframing of Invasives

Because the management of invasive species is often central to restoration pro-

happening, though not to the extent that I did with work focusing solely on invasives.¹ Some restorationists see invasives as severe threats that can destroy entire ecosystems if vigilant fights against them are not kept up. Others view particular species, such as buckthorn, as the bane of restoration projects, describe them with terms like "rapacious" and "choking," and charge them with "bringing a cancer on the land." One reason why restorationists may not seem as fearful about invasives is because they have other things to express their fears about. Land fragmentation, development, fire suppression, and illegal plant collection are

ground and public support in the community. For example, in attempting to gain community support for management of a prairie in Montana, Chris Woodall and colleagues (2000) found that it was necessary to reconceptualize the project from that of a state-mandated weed control effort to one focused on restoration. The authors state: "...the key to the resolution was a reaffirmation of an ecosystem management scheme in which a grassland ecosystem would be restored, not a list of species eliminated" (p. 40).

This idea of reframing is central to the work of linguistics expert George Lakoff, who has developed and applied ideas of linguistics to public policy matters, including the environment. According to Lakoff, words are powerful symbols that shape or frame the public discussion of everyday issues. Environmental issues, he argues, have lost public support over the years because they have been framed in ways that make them appear elitist ("wilderness") or contrary to economic goals ("owls or jobs") (Butler 2004). Reframing environmental issues can help make the language used more expressive of the true values inherent in the issue, values that resonate with a broad spectrum of the public. In this same way, restoration may help reframe the issue of invasives, which in turn might offer new possibilities for dealing with it. Lakoff, however, cautions that framing must be an honest and forthright endeavor, and not the insincere spinning of language that is akin to Orwellian Newspeak.

In the sections below I suggest some ways, taken from my own experience and that of others mainly in urban natural areas, for restorationists to reframe the issue of invasives away from a negative, fear-based orientation to one that is more proactive and constructive in nature.

Focus on the Positive Values and Activities of Restoration

While invasive species managers usually focus their efforts on taking things out of the landscape, the end goal of restorationists is to make the landscape whole again by putting things back together. By

refocusing on the bigger picture of restoration's positive values and activities, invasive species management thus becomes a means to an end rather than an end in itself. The importance of this reframing became apparent to me on a restoration workday I attended last year at San Francisco's Bayview Hill (Figure 4). The day began with a hike of the area led by local restorationist Jake Sigg, who spoke eloquently of the beauty, diversity, and history of the site and its need for protection and management. Invasives issues emerged naturally from the questions and discussion, and after a lunch break attendees were invited to stay for a "weed pull" to remove oxalis and other invasive plants present on the site. This contrasts with a workday I attended some years ago in southeast Chicago, where as soon as we entered the site we were handed a pair of loppers to cut invasive brush, and not until after the work was completed were we given a chance to hike and learn about the site and its natural values. This latter, "work before pleasure" model is probably more typical of community-based restoration workdays, and may be the most efficient formula for getting work accomplished on a site. But for workdays when first-time participants are in attendance, the former approach might be more effective in gaining peoples' appreciation of the natural values of the site and the context in which invasive species management is needed.

Stress the Values of Balance and Diversity Over the Need to Eradicate Aliens

As a public relations strategy, using fear and other language to "demonize the alien" has not only invited charges of xenophobia, but in natural areas management it fails to address the ambiguity inherent in the phenomenon of invasiveness. For example, some people consider common reed a native, others believe it was introduced, and still others think of it as a hybrid "supercompetitor" of native and introduced origins (Sauer 1998). In a controversy about restoration in the Chicago forest preserves some years ago, critics who complained that restorationists

were removing native white ash, basswood, black cherry, and northern arrowwood trees from savannas and woodlands were told that the trees were natives but "offsite" or "out of the region" (Gobster 1996). Without frequent burning, prairie and savanna landscapes in many parts of the east are constantly being invaded by woody plants, many of which are native (Askins 2001). And native deer and other animals can seriously overbrowse vegetation if populations are not held in check. In all of these cases, it seems like a better argument would be to stress the values of balance and diversity within an ecosystem to keep particular species from dominating. This is a strategy Steve Packard and his colleagues have adopted in their control of invasives at Somme Prairie in suburban Chicago (Packard pers. comm.). In most places their focus is on non-natives, but in some cases they also work to rein in native forbs when they begin to dominate some sections of the site. I think it is also important to recognize and accept that these values may be more human than ecological in nature. Ecologists are quick to point out that ecosystems are not always balanced or diverse, but are also quick to work toward these values in an increasingly disturbed and fragmented landscape.

Reframe Invasive Species Management Strategies Within a Broader Values Framework

As mentioned earlier, many invasive species were purposely introduced because they held significant economic, aesthetic, or other values to some people. An invasive species management strategy that fails to understand and work within this broader set of values can lead to conflict. My brother-in-law, Michael Yanny, is a plant propagator for a tree nursery near Milwaukee and represents the Wisconsin Nurserymen's Association on an industry relations committee of the Invasive Plants Association of Wisconsin (IPAW). As a native plant enthusiast, he appreciates the problems that invasive species have brought to the natural areas of the state, problems for which he admits the nursery business must share some responsibility

(Editor 1999). Yet, as a propagator, he is also quick to praise the many positive qualities of some introduced plants and has fought against threats to blacklist entire species because of the invasive properties of certain varieties. Working jointly with stakeholders, IPAW is helping to develop solutions to invasive species impacts that are compatible with broader values and concerns such as these. In another case involving a Chicago natural area restoration project, gradual replacement of non-native honeysuckle shrubs with native ones has helped alleviate birders' concerns over the loss of bird habitat that might have occurred if all non-natives were removed first (Gobster and Barro 2000).

Conduct Invasive Species Management Efforts with Participatory Involvement

Species invasions can be dramatic and unsettling events and, as with many management crises, there may be a tendency by experts to take charge of the situation and limit interaction with the public so as to get the job done with minimal interference. But invasive species management can often become a very public issue, as was witnessed in Chicago when the Asian longhorned beetle was discovered in a north-side neighborhood in 1998. Because a large number of trees needed to be removed in a neighborhood known for its urban forest, officials began a public outreach and involvement program from the onset. Public meetings and door-to-door contact with residents were followed by grieving ceremonies and replanting events, each activity helping to raise support for the management efforts and in the process bringing the community closer together (Antipin and Dilley 2004). Some of the finest models of participatory involvement in resource management issues can be found in community-based restoration projects. Much has been written by Bill Jordan (2003), Andrew Light (2000), and others about the value that is created through engagement in such projects, and how the ritual and performative aspects of restoration can build commu-

nity and lessen the human-nature dichotomy. Rather than feeling victimized by invasions and the fear generated from the losses that might result, participatory engagement can empower communities to work toward positive new trajectories.

Conclusion

In this paper I have attempted to show how scientists, practitioners, and the media have used fear as a tool to communicate with the public and peers about the importance of invasive species issues. Other literature on the psychology and sociology of fear shows that while fear

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appeals may have some effectiveness, they must be well designed and effectively directed or they can negatively affect unintended individuals and increase the culture of fear in our society.

There may be cases where the use of fear and threatening information is justified in staving off the introduction or spread of a highly invasive species, such as an insect or pathogen. For most natural areas restoration projects, however, species that show up on "dirty dozen" (Stein and Flack 1996) and similar lists tend to be plants and animals already well established in a location, with available strategies usually limited to

management and mitigation. In such cases, throwing out general threats about an "alien nation" could result in an "alienation" of another sort—further separation of people from positive experiences and interactions with natural environments.

In a post-9/11 editorial entitled "What are We Afraid of?", Dave Egan (2002) pointed out that much of the history of environmentalism has operated under the motivation of fear—fear of loss of unique places, species and other environmental features, such as clean air and water, that contribute to the quality of life on the planet. More recently, Michael Shellenberger and Ted Nordhaus in their essay, *The Death of Environmentalism* (2004), have said the same thing and have also questioned whether such fear and negativity can continue to move the environmental movement ahead in dealing with complex issues such as global warming. Instead, they argue, a positive, "transformative" vision is needed, one that embraces values of hope, love, and beauty to inspire people to challenge old assumptions and create new solutions.

As I have suggested here, restoration may offer ways to reframe issues of invasive species management in a more positive way that broadens the set of values it considers and empowers participants to discover more successful and inclusive solutions. On an even broader scale, restoration might serve as alternative model of environmentalism, a hope-filled enterprise as Egan (2002) states, and one that can revitalize our human connection with nature (Jordan 2003). In this respect, we might begin to re-examine how other fear-based, negatively framed issues now on the resource management agenda might look through the lens of restoration.

NOTE

1. Material for this analysis included articles on ecological restoration from the *Chicago Tribune* March 1, 2004 – March 1, 2005 (n = 36); relevant chapters from books on restoration by Stephanie Mills (1995), Leslie Sauer (1998), and Steve Packard and Connie Mutel (1997); an electronic word search of articles from *Ecological Restoration* volumes 20 (2002) – 22 (2004) (n = 84); and articles from the same journal from 1999-2004 focusing predominantly on invasive species (n = 6).

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