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Essay

Creation of a Gilded Trap by the High Economic Value of the Maine Lobster Fishery

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Abstract: *Unsustainable fishing simplifies food chains and, as with aquaculture, can result in reliance on a few economically valuable species. This lack of diversity may increase risks of ecological and economic disruptions. Centuries of intense fishing have extirpated most apex predators in the Gulf of Maine (United States and Canada), effectively creating an American lobster (*Homarus americanus*) monoculture. Over the past 20 years, the economic diversity of marine resources harvested in Maine has declined by almost 70%. Today, over 80% of the value of Maine's fish and seafood landings is from highly abundant lobsters. Inflation-corrected income from lobsters in Maine has steadily increased by nearly 400% since 1985. Fisheries managers, policy makers, and fishers view this as a success. However, such lucrative monocultures increase the social and ecological consequences of future declines in lobsters. In southern New England, disease and stresses related to increases in ocean temperature resulted in more than a 70% decline in lobster abundance, prompting managers to propose closing that fishery. A similar collapse in Maine could fundamentally disrupt the social and economic foundation of its coast. We suggest the current success of Maine's lobster fishery is a gilded trap. Gilded traps are a type of social trap in which collective actions resulting from economically attractive opportunities outweigh concerns over associated social and ecological risks or consequences. Large financial gain creates a strong reinforcing feedback that deepens the trap. Avoiding or escaping gilded traps requires managing for increased biological and economic diversity. This is difficult to do prior to a crisis while financial incentives for maintaining the status quo are large. The long-term challenge is to shift fisheries management away from single species toward integrated social-ecological approaches that diversify local ecosystems, societies, and economies.*

Keywords: common pool resources, domesticated ecosystems, ecosystem dynamics, fisheries, gilded trap, resilience, social traps

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Creación de una Trampa Dorada Debido al Alto Valor Económico de la Pesquería de Langosta en Maine

Resumen: *La pesca no sustentable simplifica las cadenas alimenticias y, como la acuicultura, puede resultar en una dependencia en unas cuantas especies valiosas económicamente. Esta falta de biodiversidad puede incrementar los riesgos de disrupciones ecológicas y económicas. Siglos de pesca intensiva han extirpado a la mayoría de los depredadores superiores en el Golfo de Maine (E.U.A. y Canadá), creando efectivamente un monocultivo de langosta americana (*Homarus americanus*). Durante los últimos 20 años, la diversidad económica de los recursos marinos cosechados en Maine ha declinado en casi 70%. Ahora, más de 80% del valor de las capturas de peces y mariscos consiste en langostas que son muy abundantes. El ingreso, corregido para la inflación, por langostas ha incrementado consistentemente en casi 400% desde 1985. Manejadores de pesquerías, políticos y pescadores ven esto como un éxito. Sin embargo, tales monocultivos lucrativos incrementan las consecuencias sociales y ecológicas de declinaciones de langostas en el futuro. En el sur de Nueva Inglaterra, las enfermedades y los estreses relacionados con incrementos en la temperatura del océano resultaron en una declinación de mas de 70% en la abundancia de langostas, lo que obligó a la propuesta del cierre de esa pesquería. Un colapso similar en Maine podría desestabilizar la base social y económica de su costa. Sugerimos que el éxito actual de la pesquería de langosta en Maine es una trampa dorada. Las trampas doradas son un tipo de trampa social en el que las acciones colectivas derivadas de oportunidades atractivas económicamente sobrepasan a las preocupaciones por los riesgos o consecuencias ecológicas y sociales asociadas. El gran ingreso financiero crea una fuerte retroalimentación reforzante que profundiza la trampa. Escapar de o evitar las trampas doradas requiere de manejo para el incremento de la diversidad biológica y ecológica. Esto es difícil de hacer antes de una crisis mientras los incentivos financieros para mantener el status quo son grandes. El reto a largo plazo es cambiar el manejo de pesquerías de una sola especie hacia enfoques sociales-ecológicos integrados que diversifiquen los ecosistemas, las sociedades y las economías locales.*

Palabras Clave: dinámica de ecosistemas, ecosistemas domesticados, fondo de recursos comunes, pesquerías, resiliencia, trampa dorada, trampas sociales

Introduction

The resilience of an ecosystem, society, or economy is defined as its capacity to absorb recurrent stochastic events (e.g., natural disasters, economic or political turbulence) and to continue to function without changing fundamentally (e.g., Walker & Meyers 2004). Human activities can reduce ecological resilience and lead to phase shifts in which an alternative ecosystem with different dynamics and feedbacks emerges. For example, when coral reef ecosystems are gradually polluted or fished unsustainably, they can lose their resilience to natural or human-made disturbances and may rapidly become dominated by nonreef building organisms, such as seaweed (Hughes et al. 2007*b*). Similarly, in temperate marine systems, phase shifts to alternative states commonly occur between kelp forests and intensively grazed sea urchin barrens. These alternative states are resistant to change and can persist for decades or centuries (Steneck et al. 2002; Hughes et al. 2005). When 2 or more of these potential system states exist, there may be societal consensus or conflict on which is most desirable (Lebel et al. 2006). Recognizing this ecological and social dynamic, natural resource management is increasingly focused on building the resilience of desirable states and decreasing the resilience of undesirable alternatives (Hughes et al. 2007*a*; Chapin et al. 2010; Hughes et al. 2010).

Managing the desirable resilience of a social-ecological system is particularly difficult when efforts to do so are at odds with its short-term economic trajectory. To explore this, we introduce the concept of gilded traps. Gilded traps connote reinforcing feedbacks between social and ecological systems in which social drivers (e.g., population growth, globalization, and market demand) increase the value of natural resources as the ecological state moves closer to a tipping point (or critical transition, sensu Scheffer 2009). These dynamics differ from typical, uncompensated environmental costs of human activities (e.g., pollution) because in a gilded trap it is the consequences of increasing risks of precipitous decline without warning that is of greatest concern.

The gilded-trap concept builds on a substantial body of literature on social traps (Hardin 1968; Platt 1973; Costanza 1987). Social traps exist where individuals or societies "get started in some direction or some set of relationships that later prove to be unpleasant or lethal and that they see no easy way to back out or to avoid" (Platt 1973). Much has been written about "poverty traps" in linked social and ecological systems, in which collective actions, driven by lack of economic alternatives, often liquidate natural resources (Bowles et al. 2006; Cinner 2010; Cinner et al. 2010). We provide an example of the other end of this social-ecological spectrum in which the perceived lucrative value of a natural resource drives stakeholders and managers to overlook risks of its unexpected decline and the associated negative social and ecological consequences.

We suggest that the current high abundance of the American lobsters (*Homarus americanus*) in the Gulf of Maine (United States and Canada) is a gilded trap.

However, it is by no means the only gilded trap. Arguably, most aquaculture ventures are also gilded traps. They are designed to increase economic value of a natural product, and they require a simplified (e.g., predator-free) ecosystem. Although aquaculture is economically attractive, it carries with it risks that are often associated with gilded traps (e.g., susceptibility to disease [Murray & Peelerb 2005]). The gilded trap of the Maine lobster fishery is unusual because this "wild" fishery operates at a very large spatial extent in a simplified ecosystem (Steneck et al. 2004) and has a large number of human dependants. We focused on the gilded trap of Maine's lobster fishery to stimulate discussions among fishers, managers, policy makers, and scientists to better understand and consider the risks and consequences associated with this trap.

Fishing and Ecosystem Change in Maine

As with many fisheries, the intensity and effect of fishing on Maine's coastal ecosystems has escalated over time, reflecting the evolution of new technologies and growing market demand. Large predatory groundfishes, especially Atlantic cod (*Gadus morhua*), dominated coastal zones from prehistoric (over 4000 years ago) to early historic times (Jackson et al. 2001; Bourque et al. 2007). The earliest fisheries data from the late 1800s indicate cod was once Maine's most monetarily valuable marine resource (Collins & Rathbun 1887). During the 1930s fishers developed the ability to target spawning aggregations of coastal cod and haddock (*Melanogrammusaeglefinus*) (Steneck & Carlton 2001). By 1949 coastal populations of these species were declared "depleted" by Maine's Commissioner of Sea and Shore Fisheries, and groundfish were no longer major predators of lobsters, sea urchins (*Strongylocentrotus droebachiensis*), and other species (Steneck & Carlton 2001; Steneck 2006). From the 1950s to the 1970s, the economic effect of the depletion of coastal cod was offset by the harvest of more distant offshore stocks of cod and other predatory finfish. Then during the 1970s to 1990s, jurisdictional changes (i.e., establishment of the Exclusive Economic Zone 200 miles off shore) and technological developments in fishing gear and transportation increased the diversity of commercially harvested species. Fishing rates increased on other previously ignored groundfish species, such as monkfish (*Lophius americanus*) and invertebrates such as the blue mussel (*Mytilus edulis*) and sea urchins (Fig. 1), for which new global markets had developed (e.g., Berkes et al. 2006).

In some cases, unsustainable fisheries emerged for prey species that had increased in abundance following the depletion of their predators. Sea urchins provide a good example. Following the decline of coastal predatory finfish, such as cod, their population densities steadily increased, reaching peak densities in the early 1980s (Steneck et al. 2002). Then a new and initially unregulated fishery for sea urchin roe for the Japanese market began in Maine in 1987. Landings peaked in 1993, when the sea urchin briefly became the second-most valuable harvested species, (15.6% of the state's total fisheries earnings) (Fig. 1). By 2005 sea urchin landings had declined to 1.3% of the total value of all fisheries in Maine. This increase and decrease in landings of herbivorous sea urchins led first to the depletion and then to the recovery of Maine's kelp forests (Steneck & Carlton 2001; Steneck et al. 2002, 2004).

Today, the Gulf of Maine is a highly simplified and arguably "domesticated" ecosystem similar to many agricultural and aquacultural systems (Kareiva et al. 2007). The system is dominated by species that were formerly prey of extirpated predators (Steneck & Carlton 2001). This release from predation has resulted in a high abundance of lobsters (Butler et al. 2006; Boudreau & Worm 2010). The number of lobster traps in the Gulf of Maine has increased more than 10-fold since 1930 (Fig. 2a) to well over 3 million since the year 2000. In effect, lobster-fishing effort has tracked the increase in lobster abundance over recent decades (Steneck & Wilson 2001). The population increase is so great that the catch per unit effort (a proxy for abundance) has steadily increased over the past 20 years (Fig. 2b) despite the increased fishing effort (number of traps). The sustained increase in lobster abundance likely results from the depletion of their predators, the imposition of size and other limits that protect reproductive lobster, as well as the strong conservation ethic among lobstermen (Acheson & Steneck 1997; Steneck 2006; Boudreau & Worm 2010). Today, the average population densities of lobsters in coastal Maine are higher than anywhere else in the world (Butler et al. 2006) (range 1–2 lobsters/m^2 over hundreds of kilometers of coastline; Steneck & Wilson 2001). Lobsters have also expanded into low-quality habitats such as inshore sediment bottoms, from where they were once excluded by groundfish predators (Butler et al. 2006). Most of the lobsters' diet today comes from herring bait supplied by the trap fishery (Saila et al. 2002; Grabowski et al. 2010), which effectively creates an artificial trophic link between a pelagic fish and a benthic scavenger. In many respects, harvesting lobsters in Maine shares many characteristics of aquaculture, such as control of predators, provision of food, and a greatly simplified food web.

The economic diversity of Maine's fisheries is the lowest in 50 years (Fig. 3). We used the Shannon index (H') to calculate economic diversity by weighting the contribution of each species landed by its value (inflation corrected to constant 1980 dollars) (Fig. 1). Thus, economic value replaced abundance, which typically indicates species diversity when the Shannon index is used. The Shannon index ranges between 1 and 3.5. In our application, higher index values indicated Maine state fisheries with more species and with more evenly

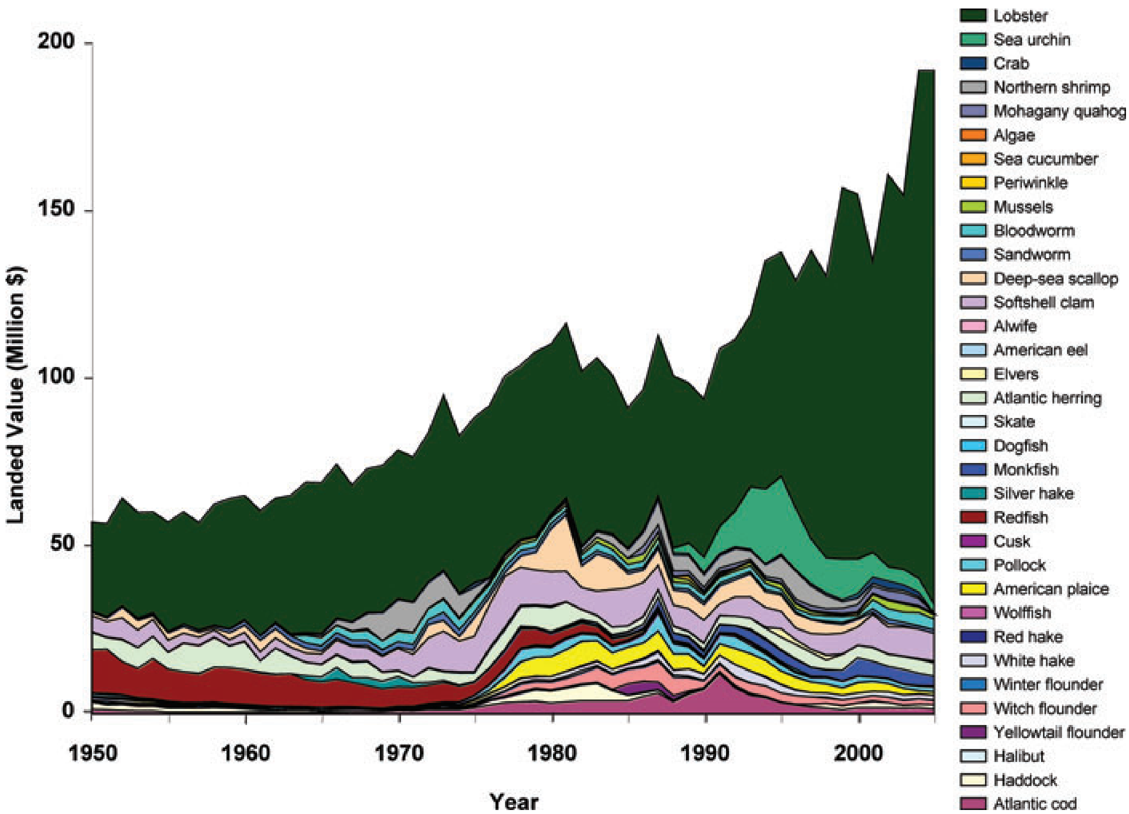

Figure 1. The value (corrected for inflation via the Consumer Price Index for 1980) (U.S. Bureau of Labor Statistics 2010) of the top 34 fisheries species landed in Maine between 1950 and 2005 (Maine Department of Marine Resources 2010). During that period, nearly all lobsters were caught in the coastal zone. Species names are in Pollock (1998).

distributed value per species landed. The economic diversity index increased steadily during the diversification of fisheries from the early 1970s through the late 1980s. After that period, economic diversity began a steep 20-year decline (Fig. 3). With the recent decline in economic diversity, lobsters have become the region's primary economic driver.

Coastal societies and the local economy of Maine (and much of the rest of coastal New England and eastern Canada) have adapted well to the current lobster monoculture. Twenty years of steadily increasing landings, abundance, value, and market share (Figs. 1–3) has left younger and middle-aged fishers with little of the financial caution of older fishers, who have first-hand experience of previous fisheries declines (R.S.S., personal observation). As older fishers retire, the memory of a more diverse ecosystem and its fisheries will likely fade.

Increased Risk and Effects of Collapse

As with many artificial monocultures, the high density of lobsters in Maine today may increase their susceptibility to disease, leading to an unprecedented decrease in abundance, as has recently occurred in southern New England. In eastern Long Island Sound (<200 km south of the Gulf of Maine), the abundance of American lobsters declined by more than 70% in the late 1990s due to a lethal disease that affects lobster shells (i.e., "a *Vibrio fluvialis*-like" disease [Castro et al. 2006]). After 16 years of increasing lobster abundance to record-high population densities, epizootic disease broke out in the population during the anomalously warm summer of 1998 (Glenn & Pugh 2006). The decline in adult lobsters was so severe that newly settled (young-of-the-year) lobsters also declined, presumably because there were too few adults available to reproduce (Wahle et al. 2009). Such reproductive limitations will slow the recovery of lobster populations in southern New England. In June 2010 fisheries managers declared lobster stocks in the region were experiencing "recruitment failure" due to an unprecedented period of physiologically stressful conditions. Specifically, 11 out of 12 years between 1998 and 2009 had stressful seawater temperatures as indicated by the large number of days above 20 °C (Plante 2010). This lowers oxygen levels and increases the incidence of disease (Castro & Angell 2000; Castro et al. 2006). Managers proposed a 5-year moratorium on lobster fishing (Plante 2010).

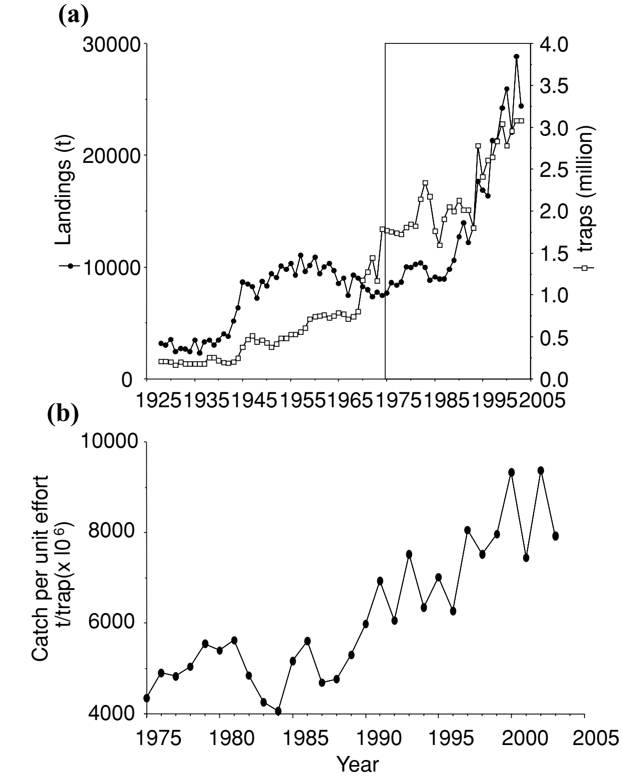

Figure 2. Maine lobster (a) landings and number of traps deployed and (b) catch per trap haul (i.e., catch per unit effort) as a proxy of abundance (data from Maine Department of Marine Resources [2010]; graphs modified from Steneck [2006]).

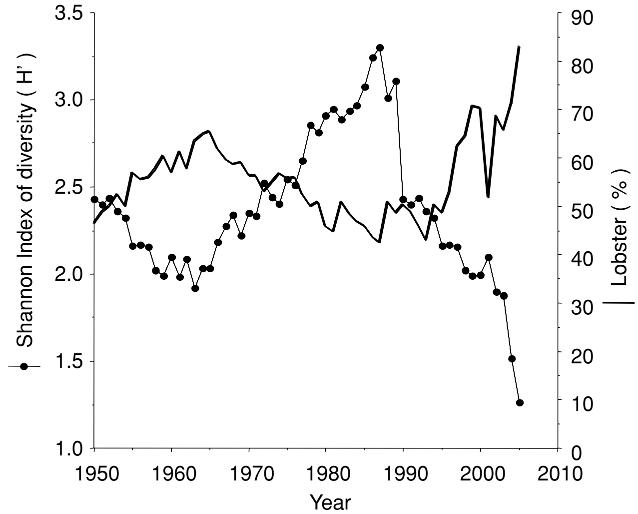

*Figure 3. The economic diversity of Maine's fisheries 1950 to 2006 on the basis of Shannon diversity index (H') and the percentage of economic value of all landings (34 commercial species) attributable to American lobster (*Homarus americanus*).*

Similar or possibly higher lobster mortality could occur in Maine if the disease breaks out there because Maine's lobster densities are higher than those in Long Island Sound. At higher population densities per capita infection rates increase. As shallow-ocean temperatures in the Gulf of Maine continue to rise (Wanamaker et al. 2007), lobsters may become increasingly stressed and thus more vulnerable to disease (Factor et al. 2006). Moreover, if such mortality were to occur, there would be few economically viable alternative resources or opportunities to support coastal fishing villages. For example, the second-most valuable species today (soft shell clams [*Mya arenaria*]) accounts for 4.2% of the current total value of all the fisheries. The ecological effects of lobster decline may be modest because lobsters are weakly interacting scavengers that feed heavily on trap bait and on some benthic invertebrates (Grabowski et al. 2010). In contrast, the economic and social effects on Maine of an event akin to what happened in southern New England would be considerable.

Many lobster fishers operate in heavy debt because they and their bankers expect continued success in lobster landings, as has occurred over the past 30 years (e.g., Fig. 2). However, the economic stakes are higher today than in the past. Coastal property values and taxes have risen considerably (Gray 2005) and remain relatively high despite the 2008 economic downturn. In 2004 median shorefront properties were $650,000 per unit (Colgan 2004), whereas Maine's median residential home price was $174,000 (Maine Association of Realtors 2009). Seventy percent of all fishers access the water from private property (Waterman 2010). Indeed, coastal fishing communities succeed today because fishers can still afford to live on the coast, providing access to the fish co-ops and piers of the working waterfront (Waterman 2010). As lobster landings increased (Fig. 1), so too have fishers' per capita income. The inflation-corrected landings value divided by the number of lobster licenses over time reveals a 50% increase in per capita income of fishers (Maine Department of Marine Resources 2010). Nevertheless, there remains widespread concern about shoreline demographics in that "new property owners may not be so amenable to a fisherman using their driveway or piers, or they may not like fishing boats idling near their dock before sunup" (Gray 2005).

The social and economic condition of Maine's lobster fishery has low resilience in part because the fishery has been overcapitalized and in part because demographics are changing and the price of homes and taxes are rising (Conkling 2008). The fragility of this social and economic condition was evident during the economic decline in October 2008, when consumer demand for lobsters declined substantially and Canadian processors, who buy about 70% of Maine's lobsters for international distribution, shut down because they were financed by insolvent Icelandic banks. The market value of lobsters dropped to a record low of \$4.4/kg (\$2/pound), whereas fuel and bait costs were at record highs. Almost immediately the lobster industry was in a financial crisis (Conkling 2008). The governor of Maine issued an executive order (19 FY 08/09) in October 2008 to establish a task force on the Economic Sustainability of Maine's Lobster Industry. With remarkable speed, the larger economic effects were evident. In December 2008 an Associated Press article entitled "Lobster Boat Sales Dead in the Water" (Canfield 2008) was published. Despite the recession's effect on housing prices, "the pressure to convert working waterfront property to other uses remains high," and reportedly "[t]here are more fishermen looking to sell to get out from under their debts" (Waterman 2010).

The 2008 recession-related crisis in the Maine lobster fishery was short lived. It eased quickly because landings continued to increase (2009 and 2010 were a record harvest), and the global and national markets for lobsters improved rapidly. In the wake of this financial situation, some lobster fishers tell us they have worked to reduce their debt and put money in savings, but we have no idea how broadly this practice was adopted. Additionally, the crisis revealed the extent of social and economic linkages that characterize this fishery and its supporting industries (e.g., bait suppliers, boat builders). It also exposed the low social and economic resilience among some stakeholders who had to sell their properties (with obvious social disruption) to service loans for their boats and fishing gear. In a more protracted economic crisis, these fishing communities could be diminished or even disappear through gentrification and the resultant loss of ownership of moorings, docks, and fisher cooperatives. Loss of shoreline access could transform local, community-based fishing at small extents to more distant enterprises at larger extents. If this scenario eventuated, the social shift could occur rapidly and the alternative state could be highly resilient.

Concerns about the economic vulnerability of the lobster fishery are growing. In 2009 Maine's governor appointed a task force called the Working Group for Sustainable Lobsters. The group held hearings and reported ways to increase the value of lobsters. They suggested the industry use less bait, fewer traps, and improve marketing by becoming a certified fishery (Hayden 2010). Nowhere, however, was there mention of the marine ecosystem, of its biological diversity, of opportunities for multispecies management, or that increasing the diversity of the marine-resource portfolio can be a good strategy for minimizing the consequences of future stochastic events (Costanza et al. 2000).

Escaping Gilded Traps

To confront and escape gilded traps requires recognition that increasing reliance on a few high-value species increases risks and consequences of precipitous stochastic declines in those species. We believe scientists can play a key role as information providers to stimulate public debate and offer viable alternatives to such gilded traps. In Maine marine biologists have established trust with many local fishers (Corson 2005), but biologists and fishers find it difficult to engage with government agencies tasked with managing individual fisheries rather than the ecosystem as a whole. Despite the rhetoric on moving to an ecosystem-based approach, fisheries managers rarely mention the low resilience of these altered and simplified systems. The potential social and economic consequences of gilded traps highlights the need for new forms of management that foster an effective ecosystem-based approach for restoring biological and economic diversity and for adjusting to social and environmental change (Ostrom et al. 2007; Olsson et al. 2008; Chapin et al. 2010).

Escaping gilded traps will require new and improved governance structures that operate to maintain and restore ecological functions at multiple scales, ranging from small-scale management by local fishers to the global marketplace (Ostrom et al. 2007; Steneck & Wilson 2010). Fisheries comanagement is particularly promising (Gutierrez et al. 2011). Maine has pioneered multiscale comanagement in its lobster fishery. The coast of Maine is subdivided into 7 zones, each with an elected representative who meets with the regions' well-established and most successful lobster fishers. They report the views of fishers in their region to a statewide board that meets with Maine's fisheries managers. New England states are represented in the Atlantic States Marine Fisheries Commission, which comanages lobsters with the federal National Marine Fisheries Service. Although we believe multiscale governance is important, management innovations are often most effective at a local scale. Recent studies of reproductive connectivity (i.e., the distance between reproductive lobsters and their offspring) determined that local lobster stocks contribute heavily to local larval recruitment (Incze et al. 2010). This, and several other connectivity studies (Cowen et al. 2007), suggest that local management and conservation can be effective at relatively small spatial scales. In other words, local lobster fishers who initiate conservation actions (such as reducing local fishing effort) will be the most likely to benefit from those actions.

An example of effective local community and state comanagement exists on Monhegan Island, Maine, where lobster fishers make collective decisions that improve both biological conservation and the diversity of economic opportunities (Acheson 2003). They deploy relatively few traps per fisher, which, along with the small size of the fishing community, results in the lowest lobster trap density in the state of Maine. This trapping effort may be effective in maintaining local abundance of lobsters because lobster population densities in the

Monhegan fishing zone are among the highest in the Gulf of Maine (Steneck & Wilson 2001). This community also established an unusual winter-only fishing season; in winter the price of lobsters is usually high and mortality during transport is low. Their fishing practices and economic strategy allow this community to better exploit domestic and international markets. These unusual fishing practices are possible in part because this community has exclusive fishing rights in the coastal zone around Monhegan Island. This provides the fishing community with incentives to take relatively few lobsters or postpone fishing if economic or environmental conditions are temporarily unfavorable. Additionally, the incomes of community members are diversified by the summer tourist trade, which weakens the reinforcing feedbacks that create the gilded trap of the lobster fishery. We think that if clusters of similar local fisheries cooperatives were encouraged to collaboratively manage multiple species within the Gulf of Maine, they could function as networks for testing innovative local solutions to escape this gilded trap.

Older fishers on Monhegan Island and elsewhere used to fish for species other than lobsters when marketable finfish were available. Many lobster fishers would like to do this again. Today, lobster fishers often release the occasional bycatch of groundfish in lobster traps. Were they to record data on the date, location, and identity of bycatch it could reveal the rate and location of recovery of depleted groundfish stocks. With time, a fishery that included more species could evolve through monitoring of recruitment pulses and not responding to these pulses with increased fishing effort. Some local communities (including Monhegan Island) provide affordable housing for fishers to help maintain coastal fishing communities. The development of such small- to large-scale experiments in the Gulf of Maine could improve multispecies and multilevel governance and increase the resilience of coastal communities.

Multiscale governance (sensu Wilson 2006) that allows local stakeholders to be innovative and conservative is gaining acceptance in many places of the world. For example, the development of a national system of exclusive, small-extent, territorial user rights for fisheries in Chile resulted in increases in both the abundance and value of harvested species (Gelcich et al. 2010; San Martín et al. 2010). Local innovations often lead to local compliance and a stronger conservation ethic, as has been reported for Maine's lobster fishery (Acheson 2003).

When an irreversible shift to an undesirable social or economic state becomes more likely, it makes sense to develop new ways of making a living (Walker & Meyers 2004). Such transformations can be triggered by unanticipated ecological or economic changes (e.g., had the financial crisis of 2008 been more protracted for lobster). To avoid radical change it is critical that coastal societies recognize the risks and move out of gilded traps. To do this, we believe stakeholders need to develop a shared vision of the future, perhaps through scenario analysis. We believe they also need leaders who can navigate complex social-ecological systems to develop high levels of trust, generate financial resources, and in particular promote adaptive governance that encourages experimentation (Olsson et al. 2006; Hughes et al. 2007*a*).

Gilded traps have complex ecological, social, economic, and policy dimensions. The managers of the Maine lobster fishery have succeeded in maximizing abundance and economic value of the species. The fishers, whose conservation ethic is aligned with maintaining a high abundance of lobsters, have worked collectively to minimize illegal actions and to preserve reproductive populations of lobsters (Acheson 2003). Hence, the lobster fishery is widely regarded as a model for sustainable management of a heavily fished stock. However, we wonder who sees it as their job to manage for biological or economic diversity to maximize ecosystem resilience and to minimize social and ecological risks associated with broader changes in the coastal marine ecosystem (e.g., climate-change–triggered disease). Although spatially extensive governance structures and policies sometimes identify probability of undesirable ecological or social change, they typically do not identify interactions or dependencies between ecological and social phenomena. In Maine integration of the consideration of social and ecological risks will be critical for collective actions that can make this system more resilient. By focusing on narrow, albeit attractive, measures of success (e.g., maximum sustainable yield, monetary value of lobsters, and other individual stocks), the potential for, and consequences of, unforeseen ecological events may continue to be overlooked. We suggest such gilded traps will be increasingly common to societies that do not maintain the functional diversity of their social and economic systems and their ecological foundations. We hope that by identifying the existence of a gilded trap and its possible consequences, we may stimulate constructive discussions among fishers, managers, and policy makers.

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