The Annotated Environmental Conflict Overview (ECO) Survey

Author Notes to TIEE Readers:

Below are the conflict reviews and statements from the ECO survey, as distributed to biology majors enrolled in the general ecology course at Virginia Military Institute (Spring 2007). A reduced version (including only issues 1, 2, and 4) was distributed to students of various majors enrolled in an environmental biology course at Phoenix College. We have included scoring procedure for each issue / statement. We have highlighted potentially problematic statements in italics, and offer comments about these statements at the end of each section.

Issue 1: Marine Protected Areas

Scientists have documented that many marine fish populations have reached critically low levels. In the case of reef fishes – those fish that are commonly found living in or near coral or rocky reefs – one way to protect part of the population is to completely prohibit fishing on certain reefs. There is a great deal of controversy surrounding this idea. Stakeholders generally argue that there is not enough evidence of fish population declines to support such drastic measures, that there isn't enough evidence that these Marine Protected Areas (MPAs) will actually work, and that there are already effective protection measures in place (closed seasons, minimum size restrictions, etc). More importantly, nobody wants to lose the right to fish their favorite local hotspot. Then there are disagreements between different groups of stakeholders as well. These conflicts and stakeholder positions are summarized below:

a. *Commercial Fishermen*. Commercial anglers catch fish and sell them for a living. They feel that closing reefs will hurt them economically, either by limiting the areas they can legally fish or by forcing them to travel farther to reach legal areas. They also feel that the current harvest restrictions are strong enough to keep stocks from collapsing.

b. *Recreational Fishermen.* Recreational anglers catch fish for fun, not profit; though some earn livings as charter captains. They fear that closing reefs would keep them from fishing productive areas, and in some cases might force them to travel further (i.e., spend more on gas) to fish legal reefs. Regulations only allow them to keep a few fish per day, and they insist that they do not kill nearly as many fish per year as commercial anglers. They would support closing areas to commercial fishing, but do not support prohibiting recreational fishing on any reefs.

c. *SCUBA Divers and Charter Dive-Boat Operators:* SCUBA diving and snorkeling are a popular activities in areas with good reef fish populations. Closing reefs to fishing would lead to good conditions for operators of charter dive boat businesses. Closing reefs to fishing means dive boats would not have to compete with fishing boats for anchor space in closed reefs, and eventually divers would start seeing more large fish in these areas. However, commercial and recreational anglers argue that divers damage coral reefs and scare fish out of the area. Anglers say that if

reefs are closed to fishing, they should be closed to snorkeling and SCUBA diving as well.

1.1	Since commercial anglers rely on these reefs for their livelihood, they should be allowed to fish everywhere.	Economic / Exploitation (+)
1.2	*Recreational anglers do not kill many fish, and therefore they shouldn't be barred from any reefs.*	Economic / Exploitation (+)
1.3	Protecting these fish populations from extinction is important. If evidence suggests that MPAs will protect the future of these stocks, then we should start closing some reefs to fishing.	Ecological Awareness (+)
1.4	If fishing is not allowed on a reef, then SCUBA diving and snorkeling should not be allowed there either.	Stakeholder Parity (+)
1.5	The loss of a few fish species is not likely to have a major impact on the entire coral reef ecosystem.	Ecological Awareness (-)
1.6	There is probably a solution that can satisfy the concerns of all stakeholders.	Stakeholder Parity (+)

Author Notes on Issue 1:

Statement 1.2 was designed to reveal a common misconception associated with the impacts of recreational fishing. However, this does not fit well into any scoring category. We scored it as favoring the economic value of recreational fisheries, however it could also be considered a negative indicator for stakeholder parity or ecological awareness. This statement should likely be replaced unless it is connected to a specific course objective.

Issue 2: The Yellowstone Gray Wolf Restoration Project

When Yellowstone National Park was created in the 1870's, gray wolves were native to the area. An aggressive predator control program effectively extirpated (i.e., exterminated) wolves from most of the lower 48 states in the early 1900's. Recent evidence indicates that wolf populations are slowly being reestablished naturally in some states (Montana, Idaho). In the mid 1990's the National Park Service (NPS) began a cautious wolf reintroduction program, releasing wolves captured from Canada into select areas of Yellowstone National Park. The public response has been mixed and emotionally charged.

a. *The National Park Service:* NPS policy calls for restoring native species if extirpation was caused by human activities, and if the present habitat can support

the species. Therefore, the NPS views wolf reintroduction as an integral part of its government-mandated mission for preserving the heritage of public lands.

b. *Tourism-Based Businesses:* People are generally fascinated with large, predatory animals, and wolf reintroduction will likely spur more people to visit Yellowstone every year. Business operations around Yellowstone that cater to tourists support the wolf reintroduction program. An increase in tourism would benefit local economies as a whole.

c. *Livestock Ranchers and Landowners:* Ranchers are allowed to graze their cattle and other livestock on public lands as well as on their private land. Ranchers contend that reintroducing wolves will lead to attacks on livestock in the areas surrounding Yellowstone National Park. They argue that visitors to Yellowstone will rarely see a free-roaming wolf, and meanwhile ranchers and landowners will have to deal with livestock losses and harassment by wolves. Landowners are also concerned about the safety of their families if wolf populations are reestablished.

2.1	*The wolves were once an important part of the ecosystem; their population should be restored so that the ecosystem can return to its original state.*	Ecological Awareness (+)
2.2	It is not realistic to expect humans and predators to live so closely together.	Anthropocentric (+)
2.3	The economic threat to livestock ranching is much more substantial than the environmental benefits of wolf reintroduction.	Anthropocentric (+)
2.4	*We should be certain of the ecological outcome before we reintroduce wild predators into our public lands.*	Ecological Awareness (-)
2.5	The tourism benefits to the local communities outweigh the potential losses to the smaller community of ranchers.	Stakeholder Parity (-)
2.6	There is probably a solution that can satisfy the concerns of all stakeholders.	Stakeholder Parity (+)

Author Notes on Issue 2:

Statement **2.1** does not fit any particular scoring category well and should likely be altered. The first part of the statement reveals an understanding of the importance of predators in community ecology; while the second part reflects a somewhat conservative environmental perspective (restoring "original" states is contentious).

The scoring of statement **2.4** is non-intuitive, but disagreement reflects an understanding of uncertainty in community dynamics and ecological states. To suggest that we can be

"certain" of the outcome of a community / ecosystem perturbation of this significance, or predict the subsequent equilibrium conditions, ignores any uncertainty in the strength of direct and indirect community interactions.

Issue 3: Johnston Atoll Chemical Agent Disposal System (JACADS)

Chemical weapons were commonly used in warfare early in the 20th century. Though their use was banned by the Geneva Protocol in 1925, many nations continued to develop, produce, and stockpile chemical weaponry. In 1990, the Soviet Union and the United States reached an agreement to destroy their ageing arsenals of chemical agents. The U.S. built an incineration facility (known as JACADS) on Johnston Atoll, a small island in the south Pacific. If JACADS is successful, it will be the model for other incineration facilities around the world. However, success has been slow to come and there have been several accidents at the facility.

a. *Environmental Protection Groups:* Many environmental advocacy groups (such as Greenpeace International) have protested the JACADS facility, suggesting that it poses many environmental risks. Dangerous emissions from the plant will enter the surrounding oceans and possibly contaminate fish populations. Ocean transport of ageing chemical weapons is risky, and the risk of environmental damage and/or loss of human life from an accidental spill is very high. They contend that the U.S. government has not considered cleaner, safer, and potentially portable alternatives to incineration, and provide evidence that such alternatives exist.

b. *South Pacific Island Nations:* Residents of the surrounding island nations (such as American Samoa, Micronesia, etc.) are very unhappy about the JACADS facility. Any toxic emissions from incineration – or chemicals lost in accidental spillage – will enter the surrounding ocean environment, and may contaminate the fish these local populations rely on for food. This could result in people being poisoned by toxins accumulating in fish, or large-scale fish kills and subsequent food shortages.

c. *The U.S. Army and Government:* The Army claims it has evaluated all possible options, and incineration is the safest and most efficient way to dispose of these weapons. All accidents at JACADS have been minor, and the local environment has not been compromised by spillage. Finally, nobody disputes that there will be harmful emissions produced by incineration. However, they will be easily diluted by the vast oceans around Johnson Atoll before they pose any threat to marine life or local human populations.

3.1	If there is potential risk to the ocean ecosystem, the JACADS facility should shut down until such risk is properly evaluated.	Ecological Awareness (+)
3.2	There is a certain amount of risk in the destruction process, but there is greater risk in keeping these deteriorating weapons around and in reach of potential terrorists.	Anthropocentrism (+)

3.3	Johnson Atoll is sufficiently isolated so that no human populations should be directly harmed by emissions or accidents. Potential risk to the ocean ecosystem is an acceptable tradeoff for minimizing threat to human life.	Anthropocentrism (+) Ecological Awareness (-)
3.4	Science can easily find a way to fix any environmental damage caused by activities at JACADS.	Anthropocentrism (+) Ecological Awareness (-)
3.5	The cost of shutting down JACADS and evaluating new disposal methods is too high to consider at this point.	Economic / Exploitation (+)
3.6	There is probably a solution that can satisfy the concerns of all stakeholders.	Stakeholder Parity (+)

Issue 4: Managing Deer Herds for Hunters, Farmers, and Forests

Around the end of the 19th century, whitetail deer populations reached an all-time low due to the combined pressure of habitat destruction and unregulated hunting. With deer populations apparently on the verge of collapse, most states prohibited deer hunting and the whitetail deer became a protected species. By the mid 1900's, populations were rebounding to the point that limited hunting was allowed again. Following decades of restrictive harvest regulations (e.g., males only, one deer per year, etc.) the whitetail deer populations are now at an all-time high. There is now a great deal of concern that deer populations are too large, and that they pose a threat to the forest ecosystem. Evidence indicates that browsing by deer has severely affected forest vegetation in areas of high deer density, and damage to farm crops has increased as well.

a. *Deer Hunters:* Deer hunters are enjoying the high deer densities, and most do not want deer populations reduced. They maintain that the goal of game population management has always been to provide quality hunting opportunities for the public. Harvest by deer hunters is presently the only form of deer population control; therefore, any successful control effort will require the support of the deer hunting community.

b. *Farmers and Landowners:* Land and crop damage by deer has increased as the deer populations have grown in number, causing economic losses to farmers. Landowners are often granted permission to harvest large numbers of deer on their property, but the high density of deer on nearby public lands simply means that more deer move on to their property every year to replace the ones removed the year before. These people would like to see a more aggressive population control strategy on public lands.

c. *Game and Forest Management Departments:* The effect of deer on forest habitats has been profound. The composition of forest vegetation has changed, which in turn has affected the populations of other animals that inhabit the forests. Game and forest management offices would like to see the numbers of deer reduced so that the forests may return to their 'natural' composition, thereby improving habitat for other animals.

4.1	Deer hunting provides major economic benefits to surrounding communities, outweighing any losses from crop and land damage.	Stakeholder Parity (-)
4.2	Deer populations should be managed to minimize crop damage on farms.	Anthropocentrism (+)
4.3	The goal of management should be to provide excellent opportunities for deer hunting.	Anthropocentrism (+)
4.4	Deer populations should be reduced until the forest ecosystem is restored to its original state.	Environmental Conservatism (+)
4.5	We should allow people to kill as many deer as they want on their own land.	Anthropocentrism (+)
4.6	There is probably a solution that can satisfy the concerns of all stakeholders.	Stakeholder Parity (+)

Issue 5: Impacts of Introduced Species

When a new species is introduced into a system, the results are unpredictable. In some cases, introduced species have had devastating effects on native species. In other cases, introduced species simply don't last in their new environment. When an introduced (or *exotic*) species can out-compete and aggressively "push out" native species, the introduced species is described as invasive. Some ecologists have said that invasive species are the greatest threat to the future of our ecosystems.

Others have argued that introduced species are not a pressing environmental issue. They argue that ecosystems will adapt to introduced species, and that the introduced species will eventually just become an integral part of the ecosystem. Moreover, it would be an economic and logistic nightmare to try to stop new introductions, or remove all the existing invasive species from their present habitats. Humans have introduced many species around the world, on purpose and by accident. Fish have been stocked into lakes and rivers where they previously never existed, exotic tree and shrub species are commonly planted as landscape 'ornamentals,' and species occasionally "hitch a ride" between countries and continents in shipping crates, etc. While there are many examples of invasive species upsetting ecosystems, there are also many examples of "successful" species introductions as well.

5.1	Introduced species only need to be removed if they threaten native species.	Stakeholder Parity (-) Ecological Awareness (-) Environmental Conservatism (-)
5.2	Ecosystems will eventually adapt to introduced species.	Environmental Conservatism (-) Ecological Awareness (-)
5.3	The cost of preventing species introductions – or removing invasive species – is too high to consider.	Economic / Exploitation (+) Environmental Conservatism (-)
5.4	New species introductions should never be allowed.	Environmental Conservatism (+)
5.5	I rarely encounter any introduced species.	Ecological Awareness (-)
5.6	Invasive species are here to stay, so we may as well find a way to live with them.	Stakeholder Parity (-)

Author Notes on Issue 5:

In this issue, native species and invasive species emerge as "stakeholders" in the conflict. The human aspects of this issue are largely represented in either a protective tendency toward native species or in the cost of control.

Issue 6: Logging and Deforestation in Belize

In the Toledo district of Belize, several communities exist that are direct descendents of the Maya Indian civilization. The Maya have lived in the rainforests of Belize for the past four centuries, though their distribution is now limited to this southern area due to extensive logging activity in the rest of the Belizean rainforest. Logging has been an integral part of the Belizean economy since early British settlement, but in the last 20 years it has increased dramatically. In 1993 the Belizean government began granting access for foreign logging companies on to traditionally Mayan forest lands. Though these companies are required to follow strict sustainable land management guidelines, violations have been reported. Violations include: logging in restricted areas, harvesting protected species, and logging during the normally closed rainy season. Many environmental groups indicate that the rainforests will never recover from this level of logging activity, leading to massive loss and even extinction of local plant and animal

populations. They also claim that deforestation is affecting Belize's river and coastal ecosystems.

a. *The Maya:* The Maya claim that the unrestricted logging is exceeding the limits of what the forest can sustain. Animals that they hunt are being scared away by logging activity, and logging during the rainy season increases soil erosion which muddies the rivers they rely on for drinking water. Their traditional way of life – and the very existence of these extremely poor communities – is being threatened in order to support a foreign market.

b. *The Logging Industry:* The logging industry provides many jobs for the Belizean people and makes up a substantial proportion of the nation's economy. They insist that while some violations have occurred, the lack of adequate maps makes it difficult to distinguish areas that are closed or open to logging. They claim that the amount of timber they harvest is monitored by the Belizean government, and insist they are harvesting a renewable resource in a sustainable manner.

c. *Environmental Groups:* The rainforests of Belize are home to a tremendous variety of plant and animal species, many of which are not found anywhere else in the world. Deforestation threatens to destroy the habitats these species rely on, and increased soil erosion is affecting the river habitats and drinking water sources. The loss of Belizean rainforests would have far-reaching, devastating impacts on the global environment.

6.1	The primary goal should be to preserve the economic benefits of the logging industry while meeting the needs of the Maya communities.	Economic / Exploitation (+) Stakeholder Parity (+) Environmental Conservatism (-)
6.2	New trees will eventually replace the trees removed by logging, and then the forest animals will return as well.	Ecological Awareness (-)
6.3	The economic benefits of logging to the nation of Belize far outweigh the concerns of a small community of people.	Economic / Exploitation (+)
6.4	Lack of compliance on the part of logging industries is the source of the problem; better enforcement is the solution.	Economic / Exploitation (+)
6.5	*If rainforests are maintained in pristine condition, the potential for a strong "eco-tourism" industry in Belize would make up for the loss of logging revenues.*	Environmental Conservatism (+)

6.6	There is probably a solution that can satisfy the concerns of all stakeholders.	Stakeholder Parity (+)

Author Notes on Issue 6:

Statement **6.5** does not fit neatly into a scoring category, as it reflects economic valuation of the resource as well as a conservative environmental perspective. It should likely be replaced or modified unless it corresponds with a particular course topic / objective.