

Name: _____ Pledge (sign): _____

Envr 201 Test #1

Point Total: 100 pts possible

- 6 pts 1. Pinchot claimed that 'conservation stands for the prevention of waste.' What does he mean by 'waste?'
He means the *inefficient* use of *natural resources*. Natural resources should not be regarded as limitless; efficiency in their use is necessary to ensure that both present and future generations can use them.
- 6 pts 2. What is meant by 'biological diversity?'
In class, the definition given was from Malcolm Hunter: "The diversity of life *in all its forms* and *at all levels of organization*." Biodiversity within an ecosystem is the variability of organisms at both the genetic and species level; it also encompasses variability *between* ecosystems.
- 6 pts 3. (a) What did Leopold mean when he said that we must learn to 'think like a mountain?'
He meant that we must consider the consequences of our actions on the entire ecosystem over a long time scale. An ecosystem is the biological community, its physical surroundings, and the interactions between them. Managing the populations of individual species can have unpredictable consequences on ecosystem health, and some of these may not be felt immediately. His admonition meant that we must try to anticipate these broader consequences.
- 6 pts (b) Would Leopold say that his Land Ethic prohibits killing wildlife? Explain.
No, not necessarily. Leopold never questioned our right to manage natural resources, though he did question our ability to do so without harming the biological community. The Land Ethic is simply stated by Leopold: "A thing is right when it tends to preserve the integrity, stability, and beauty of the biotic community. It is wrong when it tends otherwise." The Land Ethic elevates ecosystems to the status of moral agent: we must consider the effects of our actions on the health of the entire ecosystem. Killing an individual animal may well have a negligible effect on ecosystem health; predation is a natural process, after all. However, wiping out entire populations of species may well be a different story, as his story with the wolves illustrates.

- 8 pts 4. Vandermeer and Perfecto maintain that small-scale farms are *not* a true cause of rain forest destruction. Explain their reasoning.

According to Vandermeer and Perfecto, blaming small-scale farmers is like 'blaming the victim' because circumstances largely force them to act as they do. Most peasant farmers in the rainforest are not indigenous to the area in which they farm, they were drawn there by jobs at large-scale operations such as industrial agricultural farms. Market fluctuations in an export economy can cause massive layoffs and the unemployed peasants are forced to farm to survive. Farming in the rainforest, however, is not always very successful due to acidic soils (which do not retain nutrients very well), pests and diseases. These factors cause productivity to fall in a few seasons, forcing the farmer to move to another part of the forest to start anew (with slash and burn tactics).

So, yes, small scale farming DOES destroy the rain forest but larger forces drive the actions of the peasants, and these are the factors that must be addressed in any policy aimed at alleviating the destruction.

- 8 pts 5. Explain the economic concept of *substitutability*. What are the consequences of this concept when applied to the environment?

According to Freeman, substitutability is the notion that 'the individual can be compensated for the loss of some quantity of one good by increases in the quantities of one or more of other goods.' In other words, everything has a price. Applying this to environmental decisions, economists believe that environmental goods or services (eg, the beauty of a national park) similarly have a price tag and are amenable to cost-benefit analysis *if* the proper value of the good/service can be determined. That is, of course, the difficult part of implementation, and undervaluing the environment can lead to excessive environmental degradation (rather than the optimal amount advocated by Baxter). However, economics is all about maximizing the efficiency with which resources are used, and resources used to overprotect the environment would be better used elsewhere (eg to grow food or build hospitals).

- 8 pts 6. What is the distinction Sagoff makes between *political* and *economic* decisions? What point is he making by emphasizing this distinction?

Political decisions are made by citizens according to their desires for society as a whole, while economic decisions are made by consumers according to their personal preferences. Sagoff believes that there is a fundamental difference in the basis of these decisions, since citizens vote according to their *values*, which are absolute in a way that consumer preferences are not. His point is that cost-benefit analysis is not always appropriate for environmental decisions; basically, he is rejecting the concept of substitutability for all aspects of the environment. Sagoff claims that environmental decisions have an ethical component that is absent from most marketplace transactions, so that CBA is an improper tool to evaluate such decisions. Sagoff states that the proper venue for such decisions is the political arena: citizen votes that result in legislation that reflect their values.

8 pts 7. What is *utilitarianism*? In your answer, distinguish between weak and strong utilitarianism.

Utilitarianism is an ethical system that evaluates actions based on their effects on the happiness of others. In other words, actions are good that increase human satisfaction and actions are bad if they tend to make people unhappy. Applying utilitarianism to environmental decisions necessarily means that only human preferences matter: in evaluating actions such as clear-cutting an old growth forest, we must only consider the impact on humans and not on the creatures that reside in the forest (except to the extent that their well-being affects the happiness of humans).

Weak utilitarianism stops there, with the happiness of humans on an individual basis. Indeed, with weak utilitarianism, it is possible that the preferences of some may matter more than others; for example, an ecologist's opinion on actions that decrease biodiversity may have more weight. The strong form of utilitarianism considers the effect of actions on the sum total happiness of all humans, so that the best possible action is one that results in the maximum net benefit of all humans. In other words, strong utilitarianism is concerned with the effects on the overall happiness of society as a whole, and each person's happiness is weighted equally. Cost-benefit analysis is based on strong utilitarianism.

8. Many environmental controversies can be framed as the competition between two or more incompatible uses of public land.

8 pts (a) What are some of the uses to which public lands can be put? List six and circle the two most common uses.

- water (irrigation, drinking, hydroelectric power)
- minerals/mining (metals, fossil fuels)
- timber
- ***grazing of livestock***
- wilderness preservation (species/ecosystem protection)
- ***recreation***: ecotourism, hunting/fishing, climbing, etc

4 pts (b) In each of the following controversies, state the two competing uses that formed the heart of the controversy.

- i. Hetch Hetchy: ecotourism vs water for power/drinking
- ii. Mineral King: ecotourism (Park) and game reserve (Forest) vs skiing resort
- iii. Tellico Dam: preservation vs hydroelectric power
- iv. ANWR: preservation vs drilling

8 pts (c) Choose ONE of the previous controversies and describe it in a little detail, including the final outcome. Also state the main federal agency (or agencies) involved in the dispute.

See next pages.

Hetch Hetchy

Hetch Hetchy was a valley in Yosemite National Park. In 1903, San Francisco applied to the *Department of the Interior* for the right to dam Hetch Hetchy to supply water and power to the city. (Note that the National Park Service did not exist at this time.) Although denied twice, the DOI eventually agreed to allow the permit in 1908. This began a national debate between the preservationists, led by John Muir, and the conservationists, whose arguments were usually articulated by Gifford Pinchot, chief forester of the *US Forest Service*.

The preservationists argued that the National Parks should be preserved as wilderness for their aesthetic and spiritual value to the citizens. Muir's camp argued that the beauty of Hetch Hetchy valley would be severely lessened by the damming and that there were other suitable alternatives to supply SF with water and power. The conservationists argued that there were no other feasible alternatives, and that the needs of SF residents for essentials (water, electricity) should triumph over aesthetic considerations. They further argued that the water reservoir created by the dam would still be available for recreational purposes.

Eventually the conservationists won. In 1913, Congress passed the Raker Act authorizing the dam, and in 1923 O'Shaughnessy Dam was completed. In the aftermath of the debate, the *National Park Service* was formed in 1916 to manage the National Park System. The fundamental purpose of the parks was stated in their organic act: 'to conserve the scenery and the natural and historic objects and the wild life therein and to provide for the enjoyment of the same in such a manner as will leave them unimpaired for the enjoyment of future generations.'

Mineral King

At the time of the dispute, Mineral King Valley was a national game refuge and a part of the Sequoia National Forest. As such, it was under the management of the *Forest Service*, part of the Dept of Agriculture. In 1965, the FS invited bids to redevelop Mineral King as a recreational ski resort and accepted the bid from Walt Disney Enterprises. The bid included the redevelopment of the valley under a 30-year use permit. The state of California promised to build a 20-mile access road; since a portion of this road (as well as a power line) traversed the Sequoia National Park, managed by the *National Park Service*, approval was needed from the Secretary of the Interior. It was granted and in 1968 the Sierra Club sued the Departments of Interior and Agriculture, based on three points:

- (1) granting an access road through a National Park is illegal;
- (2) a ski resort is incompatible with the purpose of Mineral King as a national game resort; and
- (3) 30-year leases from the FS cannot exceed 80 acres.

The significant legal aspect of their lawsuit is that the Sierra Club asserted broad standing to sue as an organization that is concerned with wilderness preservation in the region.

The case eventually made its way to the Supreme Court, which was to rule on the issue of standing to sue. Although the Supreme Court ruled against the Sierra Club, stating that their claim of standing was too broad, a significant aspect of their decision is that they did not question that noneconomic (environmental) damages was sufficient to confer damages...as long as it could be shown that there were individuals who would be impacted by those damages. The Sierra Club amended their suit to include individual members who could document that they used the area and re-filed the suit. They also demanded that an Environmental Impact Statement (EIS) be filed as required under the newly-passed National Environmental Protection Act (NEPA). The EIS was prepared over the course of 3 years and it detailed the kinds of environmental harm that could be expected by the project, which the Sierra Club publicized. Disney lost interest in pursuing the project in the wake of the negative publicity and the case was dismissed in 1977 due to lack of prosecution. A year later, Mineral King Valley was absorbed into Sequoia National Park.

Tellico Dam

In 1966, the Tennessee Valley Authority began work on the Tellico Dam project on the Little Tennessee River. The purpose was to benefit rural areas and generate power. It would flood 30 miles of the river, and it was opposed by a broad coalition of interests, including environmentalists who wanted to preserve the river ecosystem. In 1973, after the project was about 80% completed, the Endangered Species Act (ESA) was passed; in the same year, a rare species of perch, the Snail Darter, was discovered in the Little Tennessee. It could not be found elsewhere, and the Secretary of the Interior listed the species as endangered. The ESA is administered by the *Fish and Wildlife Service*; environmentalists sued the TVA to gain an injunction on the dam, claiming that their actions would cause the extinction of an endangered species, which was forbidden by the ESA. The ESA has a citizen's suit provision which grants any citizen standing to sue, so that was not an issue in this case. The TVA claimed that (a) the project was well underway by the time the ESA was passed and that (b) Congress continued funding the project even after the act was passed, signifying that they never intended that the extinction of a small, unimportant species fish would outweigh a 100 million dollar project.

The case made its way into the Supreme Court, who ruled in favor of the environmentalists. After examining the language of the act and its legislative history, the Supremes concluded that Congress intended to afford species protection the highest priority and did not intend any exceptions due to cost considerations. Congress amended the ESA to include a special committee—the God Committee—to grant exemptions on the basis of cost. However, they refused to do so in the case of the Tellico Dam project. Eventually, a special bill was passed exempting the project from the ESA and the dam was completed. Eventually, other habitats of the snail darter were discovered and it was eventually de-listed.

ANWR

The Arctic National Wildlife Refuge (ANWR) was created by the Alaska National Interest Lands Conservation Act (ANILCA) in 1980. As part of the Wildlife Refuge System, ANWR is managed by the *Fish and Wildlife Service*. In addition, much of ANWR was designated as Wilderness—it became part of the National Wilderness Preservation System—entitling it to more protection under the Wilderness Act of 1980. However, the northern portion of ANWR, the '1002 area,' was designated for further study of its natural resources, especially its oil. Such studies, to provide estimates of the the volume of oil reserves in the region, have been carried out by the *US Geological Service*. Congressional approval is needed before drilling can commence in the area. There have been repeated attempts to commence drilling since 1980, but all have been blocked to this point.

The controversy, as so many others, pits those who argue for preservation of ecosystems and protection of wildlife, and those who say that resources on public lands should not be 'locked up.' ANWR, as befitting its status as a Wilderness Area, is a particularly pristine area, lacking even access roads (although some exemptions against the prohibition of mechanized equipment have been issued). FWS studies have centered on the potential deleterious effects of drilling on a number of species, particularly the caribou herds, and polar and grizzly bears, and other migratory animals. Proponents argue that drilling would help lessen our dependence on foreign oil, would improve the local economy, and that the effect on the local ecosystem would be minimized by modern drilling techniques. Another complicating issue is the effect on native villages that currently exist within ANWR.

12 pts 9. Ecologists often assert that biodiversity loss negatively impacts ecosystem *functioning* and *stability*. What is meant by this assertion? In your answer, be sure to distinguish between the two effects.

Ecosystem functioning is due to the activities of the biological community in an ecosystem; it includes energy processing between trophic levels and nutrient recycling. The level of ecosystem functioning can be quantified by measuring rates of matter transformation or energy flow. The statement means that these levels will decrease as biodiversity decreases in the community; in other words, ecosystem functioning is reduced as resources are used less efficiently.

Ecosystem stability is the ability to maintain levels of functioning over extended periods of time. Loss of biodiversity not only reduces functioning levels but increases the amplitude in their oscillations. In addition, biodiversity loss will render the ecosystem less able to rebound from large loss of functioning levels due to major disturbances in events such as large-scale fire or long-term drought.

12 pts 10. White argued that Christianity is largely to blame for our 'ecological crisis.' According to White, what were the two main effects of Christianity on human society, and how did these effects lead to greater environmental degradation?

According to White, Christianity led to two events that had major impact on the environment:

- the marriage of science and technology, and
- the triumph of Christianity over paganism.

Science arose out of natural theology: the desire to learn about God by studying His works. This study eventually gave rise to modern science and then to technology/engineering, which brought the benefits of technology to the common person. White states that technological advances gave humans the *means* of widespread environmental destruction.

According to White, the triumph of Christianity over paganism—'the greatest psychic revolution in the history of our culture'—removed the divine from nature. It replaced reverence for nature with indifference; indeed, a widespread Christian belief is that God gave humans dominion over nature, to do with what we will. Thus, the destructive effects of technology were no longer a matter of great ethical concern.