

Name: _____ Pledge: _____

Environmental Studies 201 Test #1

Point Total: 100 pts possible

- 4 pts 1. Whom did the Supreme Court rule for in *TVA v Hill*?
They ruled for Hill, upholding the ESA and preventing the EVA from completing the Tellico Dam project. (Later the dam was exempted from the ESA by legislative action)
- 6 pts 2. **True or false:** according to Lynn White, the teachings of the Bible are directly responsible for the majority of human actions that degrade the environment. Briefly (1 sentence) defend your answer.
Not directly (false). White feels that the teachings of the Christian church—not necessarily justified by direct biblical interpretation—has been responsible for humankind’s cavalier and utilitarian attitude towards nature. Natural theology thus eventually lead to the marriage of science and technology, greatly increasing human ability to transform the environment. The church also suppressed pagan religions that deified various aspects of nature.
- 4 pts 3. **True or false:** in 1965, when Disney proposed developing Mineral King Valley into a ski resort, it was officially part of the Sequoia National Park.
False. At the time it was part of the Sequoia National Forest (it has since been added to Sequoia National Park).
- 8 pts 4. In *The Current State of Biological Diversity*, E.O. Wilson states
Wild species are in fact both one of the Earth’s most important resources and the least utilized. We have come to depend completely on less than 1% of living species for our existence, the remainder waiting untested and fallow.

List the distinct ways (as many as you can) in which we make use of biodiversity.

Biodiversity ensures robust and functioning ecosystems, which provide many services to humans, including:

- nutrient recycling
- soil formation
- pollination
- pollution degradation and dissipation
- water supply and regulation
- direct food supply
- genetic materials for improving agriculture
- medicines
- climate regulation (greenhouse effect; energy and water distribution/transport)
- materials: wood, minerals, etc
- energy sources (fuel): fossil fuels, fissionable materials, hydroelectric, wind, etc
- recreation

6 pts 5. In the ESA, what is the purpose of a Habitat Conservation Plan?

Habitat Conservation Plans (HCPs) are covered in §10 of the Endangered Species Act, and apply to private landowners. A person who is restricted from developing his property because of the presence of listed species (protected by the ESA) can propose an HCP by which efforts are made at conserving the species while development continues. The HCP must be approved by the Fish and Wildlife Service. The idea is to allow private property rights of landowners and species conservation goals of the ESA to coexist.

6 pts 6. (a) What types of organisms are most important in nutrient cycling in ecosystems?

Nutrient recycling occurs due to the breakdown of dead organic material (detritus) by the *decomposers* of an ecosystem. Most decomposition is due to microbial activity (bacteria and fungi) but invertebrate *detritivores* (worms, etc) that fragment the detritus are also important. The *microbivores* that feed on microbial decomposers are important in controlling the abundance and distribution of these decomposers.

10 pts (b) Why does higher diversity generally make healthier ecosystems?

As stated by ecologist Hutchinson, 'the reason why there are so many species of animals is at least partly because a complex trophic organization of a community is more stable than a simple one.' Naemm *et al.* list two reasons why this might be:

- *redundancy*. In a diverse ecosystem, reduced functioning of one species can be compensated by a similar or competing species.
- *averaging* (the 'portfolio effect'). The overall functioning level of an ecosystem—the rate of material and energy exchange—will show fewer year-to-year fluctuations in a more diverse ecosystem.

There are other theoretical advantages to more diverse ecosystems. As niches fill and species become more specialized, competition tends to ensure that ecosystem functions are performed more efficiently. Such an ecosystem is possibly more resistant to the invasion of outside species. Greater genetic diversity also translates into greater evolutionary potential, meaning that organisms tend to be more adaptable to environmental changes, or at least those that occur over evolutionary time scales.

8 pts 7. What does Aldo Leopold mean when he says that we must learn to 'think like a mountain?'

He means we must consider the effects of human actions on entire ecosystems over the long haul. In other words, we need to broaden our scope beyond a single species (eg, maximizing 'output' of deer or trees) and beyond a short period of time. In particular, we must explicitly account for resource limits and the interdependence of populations in a properly functioning ecosystem: 'the cowman who cleans his range of wolves does not realize that he is taking over the wolf's job of trimming the herd to fit the range.'

8. The battle over Hetch Hetchy pitted Pinchot's Conservatives against Muir's Preservationists.

8 pts (a) Summarize the conflict: what was it about?

The Hetch Hetchy valley, and the river running through it, are located in Yosemite National Park, which had been created in 1890. The goal of the national parks was to preserve nature for the recreational enjoyment of human visitors. But in 1903 the mayor of San Francisco applied to the Secretary of the Interior for the right to dam the river, providing water and hydroelectric power to the city. The request was denied, and the battle between Conservationists and Preservationists was joined.

Pinchot's camp argued that natural resources are meant to be used, although in a manner that is efficient and for the longest possible time. Muir's camp argued that the National Parks existed to preserve nature for human recreation, which was just as important in its way as the more traditional, consumptive uses of nature. The conflict between the groups eventually played out to a national audience, the first time that development was seriously contested in such a manner. Even though it was eventually dammed, the Hetch Hetchy controversy did much to bring the Preservationist cause to the mind of the American public.

8 pts (b) Briefly compare the tactics of the two camps.

Both Muir and Pinchot prevailed upon their friendship with Theodore Roosevelt, who was conflicted about the decision. As an avid hunter and hiker, he valued the recreational aspects of nature, but ultimately felt that the well-being of San Francisco's citizens had the greater claim. In response, Muir and the Sierra Club turned to a grass-roots campaign to increase public awareness and indignation that a portion of a National Park would fall victim to the 'almighty dollar.' They stressed the despoilation of the valley that damming would bring, the existence of viable alternatives to provide water and power to San Francisco, and the importance of recreation in natural areas to the human spirit.

Pinchot, who almost single-handedly established Forestry as a discipline for scientific management of the nation's forests, was forced to respond to these public charges. His supporters claimed that no suitable alternative existed, that the beauty of the valley would not be destroyed—indeed, it would be enhanced—and that the urgent needs of the city's citizens should not be denied by Eastern elitists who lived far from the area.

A major difference in tactics, however, was the greater political savvy shown by the Pinchotists. Besides their public forum, they did more to convince those with political power that the needs of the San Francisco citizen's were paramount. Although public opinion probably favored Muir's group, the more effective lobbying of Pinchot and his allies decided the issue.

10 pts 9. What is the distinction Mark Sagoff makes between *political* and *economic* decisions? What is the point he is trying to make by drawing attention to this distinction?

Sagoff draws a distinction between his choices as a consumer and as a citizen when he asks the rhetorical question, 'would I vote for the sort of things I shop for?' The difference between the two is clear when he asserts that 'we act as consumers to get what we want *for ourselves*. We act as citizens to achieve what we think is right or best *for the community*.' The point he is making is that consumer choices reflect personal *preferences* while citizen choices reflect ethical *values*, and those values are not easily reflected in the marketplace. The distinction between the two is that 'a value judgement...claims to be *true* not merely to be *felt*.' He illustrates this distinction by highlighting the absurdity of applying cost-benefit analysis to ethical issues such as abortions or pacifism.

10 pts 10. In *Sierra Club v Morton*, the Supreme Court ruled against the Sierra Club. What exactly were they ruling on, and how did they justify their ruling?

They were ruling on the Sierra Club's *standing to sue* the Secretary of the Interior over the Forest Service's plan to build a road through Sequoia National Park and to allow Disney to develop nearby Mineral King Valley into a ski resort. According to the court, under section §10 of the Administration Procedure Act (APA), 'the question of standing depends upon whether the party has alleged...a personal stake in the outcome of the controversy.' The Sierra Club asserted that it had standing *as an organization* because 'its very purpose for existence was the preservation of the Sierra Nevada' (Turner p 16). The court disagreed, saying that 'the alleged injury will be felt directly only by those who use Mineral King and Sequoia National park.' Furthermore, they were worried about frivolous lawsuits, speculating that 'if a special interest in this subject were enough to entitle the Sierra Club to commence this litigation, there would appear to be no objective basis upon which to disallow a suit by any other bona fide special interest organization, however small or short-lived.'

12 pts 11. Economists and many others believe that applying a market-based approach to environmental goods and services can help resolve many environmental policy dilemmas. Summarize their reasoning, in a general sense (don't worry about the specifics of cost-benefit analysis, discounting, or pricing).

In a world of limited resources (including time and money) we can't all have what we want. Some people will want to develop a certain area such as Mineral King valley; others will want to preserve the area for recreation or ecosystem protection. Or perhaps the residents near a power plant want to reduce its toxic emissions while the owners do not want to incur the expense necessary to do so. A marketplace approach, according to economists, allows for an objective way to decide between such alternatives by measuring the strength of the desires for each alternative. Economists have devised a set of tools to measure the monetary value of traditionally nonmarket environmental goods and services such as recreational enjoyment or clean air. By reducing all alternative to a single scale (currency), objective decisions can be made between them.

One benefit to such an approach is the incorporation of *external costs and benefits* into the cost-benefit equation. An external cost is one that is incurred by a third party to a transaction. For example, organizations often make use of 'free' environmental services such as pollution assimilation or pollination without considering the cost of these services (or their degradation) to the general public. Since the services are not part of any accounting sheet they are considered free, and their loss or degradation has no effect on the transaction. Assigning a monetary value to these services allows them to be valued and included in any economic assessment of proposed actions.

Once all environmental goods and services are valued properly, then a cost-benefit analysis will help decide on the proper allocation of resources and will result in the maximum benefits to society as a whole. It is a utilitarian philosophy whereby currency is the measure of overall well-being; the overall happiness of society will be maximized under a free marketplace where everything is properly valued.