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Considering Environmental Justice in Natural Resource Damage Assessment

Injury to Ecological Resources

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Abstract

A significant component of natural resource damages (NRDs) is the cost of restoration designed to compensate the public for injury to natural resources. To date, procedures used to identify restoration scale have not considered environmental justice. This paper discusses policy and technical issues associated with building concerns for environmental justice into the natural resource damage assessment (NRDA) process. The focus of this paper is on injuries to ecological services of resources. These are services that people do not use directly, such as recreation, which is the focus of White Paper 2021-1. For ecological services, current practice in NRDA employs "service equivalency" scaling models that do not use economic values. Habitat equivalency analysis (HEA) and resource equivalency analysis (REA) provide the basis for scaling compensatory restoration in almost every NRDA.

There is a significant barrier to including considerations of fairness in service equivalency models. By design, they do not incorporate information about the preferences of the public for the different services natural resources provide. This forces analysts to assume that the members of the public have identical preferences for different services and can be treated as a single person. If preferences differ, people may disagree about the amount of restoration needed to compensate for injury. Any one project will leave some persons undercompensated and some overcompensated. A method for aggregating over people is needed to resolve the differences and determine when the public as a whole has been compensated. An aggregation method that does not rely on economic values (that are used for human use services) has yet to be specified. Because service equivalency methods do not include valuation, they currently have no rational foundation if the public has heterogeneous preferences for nature's services.

[1]I wish to acknowledge helpful comments from David Anning, Heath Byrd, and George Parsons, while absolving them of remaining errors and opacities.

Closely related to this concern, incorporating environmental justice in restoration scaling also requires an aggregation procedure, one that recognizes ethically relevant differences among affected persons. Because there is no method whatsoever to aggregate over people who are different, there clearly does not exist one that recognizes environmental justice.

We seem to be at an impasse: when people disagree about restoration, we seem to need economic values to determine when the public has been compensated and to include a concern for environmental justice assessment, but measuring economic values is exactly what HEA and REA seek to avoid.

This paper fills these two gaps; it provides a way to aggregate effects over people without using economic values, and the method proposed allows for environmental justice to be incorporated into scaling by favoring restoration that effectuates a transfer from the relatively resource rich to the relatively resource poor.

The paper makes two contributions. First, it shows that in an REA, people can have different preferences for services and attach different implicit values to them, yet agree on the amount of restoration required. People have to have a certain type of preferences, but they can differ. Thus, REAs do not need additional information to have a rational foundation when people have different preferences for ecological services. This same condition does not apply to HEA, however. The basic problem remains in HEA that there is no way to compare the strength of the preference of those who are undercompensated to the strength of preference of those overcompensated to determine whether the public as a whole is compensated.

Second, the paper solves this problem and provides a way to aggregate heterogeneous preferences across people in HEA to yield an overall social ranking of restoration projects. The ranking rule is represented by a social welfare index, and restoration is scaled using social value-to-social value scaling. Moreover, the index includes environmental justice, as it favors projects that reduce inequality. The method does require some information on preferences, but not valuation.

The approach is called "REA-Equivalent Utility," which works as follows. A habitat being evaluated in an HEA provides some bundle of several services at baseline. It is postulated that the mix of services in that baseline bundle can be maintained as the acreage of the habitat is varied. This effectively turns the HEA into a hypothetical REA, with all services per acre staying in the same proportions but scaling up or down by varying acres. The critical step is to find a number of acres in the hypothetical REA to make the services it would provide indifferent to those provided in the injured and restored HEA habitats. The number of acres that achieves equivalency is an index of well-being that can be compared across persons and numerically aggregated into a social welfare index. The index is used in scaling, and includes the EJ criterion.

To read the full white paper by Theodore Tomasi, Ph.D., CLICK HERE.