A Simple Method to Show the Economic and Educational Value of Wildlife and Wildlands

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Pressure of increased human population and its need for development increases the pressure to utilize preserves, wilderness, and other wild lands. Arguments that developers make to City, County, State and Federal councils, and Legislatures are that the proposed project will bring in X number of jobs, and X amount of tax dollars, often ignoring pollution, destruction of habitat, traffic congestion, demand on schools, etc. They present dollar figures to back up their proposal. Environmentalists working through Environmental Impact Reports and political action groups may point out that the locality has rare and endangered species, is important to the ecosystem, watershed, recreation (Hohensee et al. 2017) etc. Sometimes projects can be required to do an adequate amount of mitigation. Some simple experiments may affect the project and policy (Brattstrom and Bondello 1983). Developers and destroyers also try to get around impacts and mitigations (Brattstrom 1996). Ecologists come before deciding bodies and describe the Ecological Services of the site (Zheng et al. 2016). While these arguments and descriptions of services of the project site are clear to ecologists, they are just “pie in the sky” goodies presented by “bird watchers” to politicians. Politicians see numbers and votes (and perhaps a little money under the table), not energy flows, oxygen/carbon dioxide ratios, soil retention, and water quality.

It is not difficult, to place dollar values on monies spent in recreation. The California State Department of Fish and Game, for example, uses dollar amounts for fishing and hunting license fees and in its analysis of budget items for fish hatcheries, habitat improvements, etc. (number of hours spent in various activities, person/days, the amount of monies spent by users of food, equipment, lodging, and travel). Park and Recreation departments tally person/days/visits, costs of boats, water skies, etc. Bird watchers cite the number and costs of binoculars and field guides sold. For example, over 15 million field guides were sold in the United States in the last 20 years; with an average cost of $5.00, this gives a dollar value of this part of bird watching to over $75 million! Hikers, horseback riders, and rock hounds cite mileage traveled or people/days as documentation of the use of wild areas (Hohensee et al. 2017). The protection of habitats, such as estuaries, is also defended based on the dollar value of the land per se. Estuaries can be defended not only on its ecological importance as a nursery for commercial and sport fish, but also with the dollar value of the catch of adult fish and its subsequent market value.

Here, I describe a different method that I used successfully to help the Friends of Newport Bay stop a land trade that would have resulted in extensive housing in and about one of the few remaining California estuaries, Upper Newport Bay, Orange County, California. Newport Bay west of U.S. Hwy 101 consists of big and small houses and big and small boats, all crowded together. East of Hwy 101, there is an extensive, functional estuary that is the breeding ground for many species of ocean sports and commercial fish, and a large breeding and migratory area for over a hundred species of birds. In the 1960s, developers wanted to build expensive bay-view houses around and on the cliffs surrounding the bay. They had developed a “plan” to trade lands elsewhere for State of California lands in and around the bay. The Friends of Newport Bay is a group of amateur and professional peoples who have, and still...
do, work hard to “save the bay.” In 1967, they asked me if I could come up with some monetary value of the educational value of the bay.

I was a university zoology professor who taught field courses, so I appreciate the amount of time, hence money that my colleagues and I spend with classes and in doing research in the desert or chaparral or in marine habitats. In 1968, I presented for the California State Assembly Committee on Natural Resources, Subcommittee on Conservation and Beaches (chaired by early conservationist, Alan Sieroty), and for the Friends of Newport Bay, an analysis of the amount of money the State of California had spent and was committed to spend on teaching and research for one campus of the California State University System, and or just one site, Newport Bay. I presented a second report to the Friends of Newport Bay in 2000.

I started out ridiculously simple, and I calculated how many times I took classes to Newport Bay in a year (teaching Natural History of the Vertebrates, Animal Ecology, Ornithology), my salary/year divided by number of days, and then times the number of trips to the Bay. Yes, the number was small, but then I realized that I took a State of California Vehicle, so I also calculated the cost of the car, gas, and maintenance for the days I used it to go to the Bay. I also calculated the cost of nets, binoculars, a small boat, environmental testing equipment, their life expectancy, the cost per day plus storage costs throughout the rest of the year. Wow, the number was big! I did the same for my colleagues who taught field courses (Ichthyology, Plant Ecology, Plant Taxonomy, etc.).

I used a standard State, campus, or Biology Department formula for calculating monies (faculty hours and salaries, student hours and costs, course budgets, space allotment, transportation, equipment, student and technical assistants, secretaries, storage, stockroom, internships, and research grants). I rounded off most figures. I used minimum values and did not change amounts due to inflation. I wanted the basics. I projected these costs from 1968 back to when California State University, Fullerton, started in 1960 and forward to the year 2000. The total that the State of California had or was committed to spend at the Fullerton Campus only, and only for work at Newport Bay was $12,399,300, adding Federal support for research, equipment, institutes, workshops, etc. The amount came to over $24 million! The state of California canceled the land exchange.

In the years since that 1968 report, Orange County has grown faster than predicted. California State University, Fullerton, University of California, Irvine, and other campuses of both state systems are much larger than expected. Fortunately, Newport Bay is still here and in pretty good shape! We all still use it for teaching and research! In addition, various educational programs of the Department of Fish and Game, the Friends of Newport Bay, various school districts, nature centers, museums, and bird clubs, bring the educational use of the “Back Bay” higher than ever expected! Numbers are hard to obtain. How many people are enjoying, studying, painting, watching, sampling, measuring the bay at any one time? I have, regardless of the time of day or day of the week never seen less than 30 people bird watching, reading, walking biking, fishing, taking marine samples, photographing tidal changes on a single drive along the bay. Data provided to me by the Friends of Newport Bay done by Frank Robinson estimate that the average number of people on or beside the Back Bay Drive on a single pass is between 50 to 100 people. Even on a rainy day, his minimum estimate was 25 people! For calculation purposes, let us say 100 people/hour visit the bay. This number times 10 hours of a basic day (thus missing night fishermen and early morning bird watchers) give 1,000 people/day; times 365 days or a total of 365,000
people per year! Now let us add the estimated number of visitors (100,000/year) to the Back Bay by elementary and secondary school groups, guided tours, and other organized visits. This gives a total of 465,000 people/hours per year. Let us now assume that they all earn a wage of $4.00/hour, we could also try to calculate travel time, the costs of gas, books, binoculars, shoes, fishing equipment, cameras, etc., but let us just use $4.00/hour. The dollar value for education and recreational use of the Bay comes to………………………………………………………………… $1,860,000/year.

If I multiply this by the number of years (49) since my report in 1968, this gives us ………………………………………………………………………………… $91,140,000.

Now what about the other universities? In the Southern California area, there are three branches of the University of California and five branches of the California State University system, several private universities (e.g., University of Southern California, Pomona College, Occidental College, University of San Diego). I and others (via mail surveys, catalogue copy, and personal contact) surveyed all these institutions and calculated the same teaching value spent just on trips to Newport Bay. Both the California State University and University of California systems have Ocean Studies consortium and marine teaching and research vessels. Utilizing the methods of my 1968 report, the multi-university report in 2000 (including California State University, Fullerton, and now calculated to 2017), and using about $12 million/campus per year for a total university use of the above campuses for Newport Bay only, of………………………. $588,000,000.

Add to this amount what the U.S. Fish and Wildlife Service and the California Department of Fish and Game spends on the Bay in habitat preservation and rehabilitation, the federal monies on marine research going to scientists at the above named universities, and the monies spent on recreational and sport fishing. Then, add the commercial market value of the fish caught in the open sea whose larva or food was spawned or raised in the bay. All this gives an amazing value to the State of California of just one resource: Newport Back Bay. It is therefore important that the State of California protect its investment by assuring the maintenance of the ecological balance of the Bay and of informing the state’s citizens of its ecological and monetary value and of the potential for the abuse or destruction of this fragile habitat.

These reports were successful. The State of California realized its investment in Newport Bay and rejected the land trade and later established the Upper Newport Bay Ecological Reserve, monitored and protected by The Friends of Newport Bay (P.O. Box 2001, Newport Beach, CA 92663). Add to this monetary value, the number of people who enjoy the Bay (bird watchers, artists and joggers), the students having the experience of collecting in the mud, and the number of Master’s and PhD degrees resulting from research at the Bay, and those who just go to the Bay to look. This method of calculating the economic value of wilderness to education may start off small and simple, but it adds up and has positive outcomes. Try it!

Literature Cited

Brattstrom, B. H. 1996. Developers’ devious digressions. Environmental Conservation 23:109–110.
Brattstrom, B. H., and M. C. Bondello. 1983. Effects of off-road vehicle noise on desert vertebrates. Pages 51–79 in R. H. Webb and H. G. Wilshire, editors. Environmental effects of off-road vehicles. Springer Verlag, New York, New York, USA.
Hohensee, P., M. D. Samuel, and D. Drake. 2017. For what it’s worth, appreciating the economic value of wildlife. Wildlife Professional 11:40–43.
Zheng, H., Y. Li, B. E. Robinson, G. Liu, B. Ma, F. Wang, L. Fei, Z. Ouyang, and G. C. Daily. 2016. Using ecosystem service trade-offs to inform water conservation policies and management practices. Frontiers in Ecology and the Environment 14:527–532.