

than 2 million sq. km., or 12 per cent of the Earth's land surface. Systems of protected areas existed in every country, wealthy and poor alike. The place of people in protected areas has been much discussed by academic researchers and human rights activists. For whom are parks set aside? On whose authority? At whose cost?

Debate about people and parks is typical of much wider questions about the social impacts of conservation on human welfare, including the compatibility of conservation and poverty alleviation and the feasibility of 'win-win' policy strategies. Action to conserve biodiversity, particularly in the creation of protected areas, is inherently political. Yet most writing about conservation draws, to only a limited extent, on an explicit understanding of the political and economic dimensions of conservation policy. There are various reasons for this. One is the profound and long-standing disciplinary gulf that exists between predominantly natural science-trained conservation planners and predominantly social science-trained critics of conservation. The field of political ecology offers productive possibilities for developing that engagement. Political ecology is a diverse and trans-disciplinary field. It first emerged in the 1970s, and developed through the 1980s, particularly in work by Piers Blaikie on the problem of soil erosion.

Political ecology views the environment as fundamentally social and political. The use, overuse, degradation, conservation and restoration of the environment are inherently social and political processes. Political ecology considers the interactions between ecology and the politics and impacts of social action affecting the

environment. It takes from ecology a concern with environmental dynamics and change, and from political economy a concern with the control of resources and labour. Moreover, in recent formulations (notably the work on 'liberation ecology' by Richard Peet and Michael Watts) it takes from social theory an interest in the way nature is understood and represented. It recognises the power of science and policy discourse to channel the way people combine to control the environment, and each other. Therefore not only does the actual state of nature need to be understood as the outcome of political processes, but the ways in which ideas about nature are formed, shared and applied are also inherently political, even those ideas that result from formal scientific experimentation.

The political ecology of conservation is now recognised as important in a variety of ways. A key issue is the social impacts of protected areas, particularly on people displaced (either through physical removal or denial of access), and the impacts of the ways such displacements are organised, particularly the issue of involuntary displacement and coercion. A related set of problems concerns the social impacts of conservation regulations (e.g., controls on hunting, fishing or forest use). Third, there are important political questions about the way the economic benefits of conservation activities (e.g., the revenues from tourism) are shared between people. This leads on to a fourth set of issues concerning the links between poverty and conservation, the debates about possibility of 'win-win' strategies that both conserve nature and reduce poverty. Behind all of these lies the issue of the power of ideas about nature to dictate the way conservation is thought about and practiced (for

example, in the concept of wilderness as a way of describing areas of forest or savanna with low human population densities).

Conservation has become a powerful political force, at least in the rural districts of poor developing countries. Large international NGOs have undertaken sophisticated exercises in conservation planning (such as Conservation International's 'hotspots'). Through such science and the funds they raise from supporters in developed countries, conservation organisations can wield considerable influence with governments and donor organizations. They can both initiate and drive forward conservation programmes on the ground with profound social and economic significance for rural people.

An understanding of the politics of conservation is vital if policy is to be effective and any potential harm is to be minimised. To achieve this, better dialogue is needed between conservationists (who are mostly trained in natural science) and critics of conservation, many of whom are social scientists. The emphasis of political ecology on the links between political economy and the actual state of the environment offers some potential to improve their conversation.

There is no doubt that politics matters for conservation. In December 2007, African Parks (now called the African Parks Network) withdrew from Nech Sar and Omo National Parks in Ethiopia, citing the unresolved issue of resettlement. The rights and needs of the many people resident in these parks could not be wished away. Such issues are fundamental to conservation planning. The political ecology of conservation offers a way of considering the conceptual

and material place for human society within, and not outside, nature.

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## Satellite-tracked Migrations by Galápagos Green Turtles and the Need for Multinational Conservation Efforts

Jeffrey A. Seminoff and Patricia Zárata

Over the last two decades there has been a dramatic increase in the application of satellite telemetry to track the movements of threatened and endangered species. Among the taxa that have benefited the most from these efforts are sea turtles. Every few years, adults of most sea turtle species undertake long-distance migrations between nesting sites and foraging areas; satellite telemetry is an ideal tool for determining where these areas are, and the migratory routes followed by adult turtles as they move between them. More importantly, for conservation purposes, this tool provides a better understanding of the amount of time turtles spend in international waters and economic exclusive zones (EEZs) of various nations, and thus can highlight the

potential susceptibility of sea turtles to human impacts (i.e., fisheries bycatch and hunting) that occur in these areas. This understanding is critical for improving conservation measures and maintaining healthy sea turtle populations.

In a recent study by Seminoff et al. (2008), the movements of 12 green turtles (*Chelonia mydas*) were tracked by satellite telemetry after nesting in the Galápagos Islands. Turtles were tracked for up to 100 days (mean = 64 days) and moved between 75 and 1540 km away from their nesting sites. Three distinct post-nesting migratory strategies were observed, including residency within the Galápagos, migrations to Central America, and movements into oceanic waters southwest of the Galápagos (Fig. 1).

Green turtles occupied international waters as well as EEZ of Colombia, Panama, Costa Rica, Ecuador and Nicaragua. In two cases, green turtles apparently reached coastal foraging area destinations (in Nicaragua and Panama).

As the first-ever satellite telemetry research on Galápagos green turtles, novel insights gained about this insular nesting stock will be useful for the justification and implementation of conservation measures throughout the region. For example, with 10 of the 12 tracked turtles departing the Galápagos after nesting, the results of this study indicate that threats to the Galápagos nesting population, such as bycatch in high-seas fisheries gear, may be much more substantial in overall impact to the population

than previously considered. These wide-ranging movements (see Fig. 1) underscore the need for conservation efforts to be multinational in scope and multidisciplinary in action.

While no single law or treaty can be 100% effective at minimizing anthropogenic impacts to sea turtles in these areas, there are several international conservation agreements and laws in the region that, when taken together, provide a framework under which sea turtle conservation advances can be made. In addition to protection from the Galápagos Marine Reserve (GMR), green turtles may benefit from the following:

1) the ETP (Eastern Tropical Pacific) Marine Corridor (CMAR) Initiative agreed to by the governments of Costa Rica, Panama, Colombia, and Ecuador, which is a voluntary effort to work towards sustainable use and conservation of marine resources in these countries' waters;

2) the Eastern Tropical Pacific Seascape Program managed by Conservation International that supports cooperative marine management in the ETP, including implementation of the CMAR;

3) the Inter-American Tropical Tuna Commission (IATTC) and its bycatch reduction efforts that are among the world's finest for regional fisheries management organizations;

4) the Inter-American Convention for the Protection and Conservation of Sea Turtles (IAC), which is designed to lessen impacts on sea turtles from fisheries and other human impacts; and

5) the Permanent Commission of the South Pacific (Lima Convention), which has developed an Action Plan for Sea Turtles in the Southeast Pacific.

The conservation of green turtles in the ETP will require successful implementation and greater integration among the region's international instruments and accords. New legislation and enforcement of existing laws that curb the flow of turtle products in the region's coastal communities is also necessary, although it is increasingly clear that any such instruments will only be effective if the underlying human social drivers, such as local demand for sea turtle products or increasing fleet sizes despite lower target species catch rates, are also addressed. By implementing both new and existing conservation measures in an integrated manner, management efforts may be more effective at providing habitat protection that extends from nesting beaches and inter-nesting habitats within the GMR to far off coastal and offshore foraging areas, thereby conserving all life-history phases of green turtles in the ETP.

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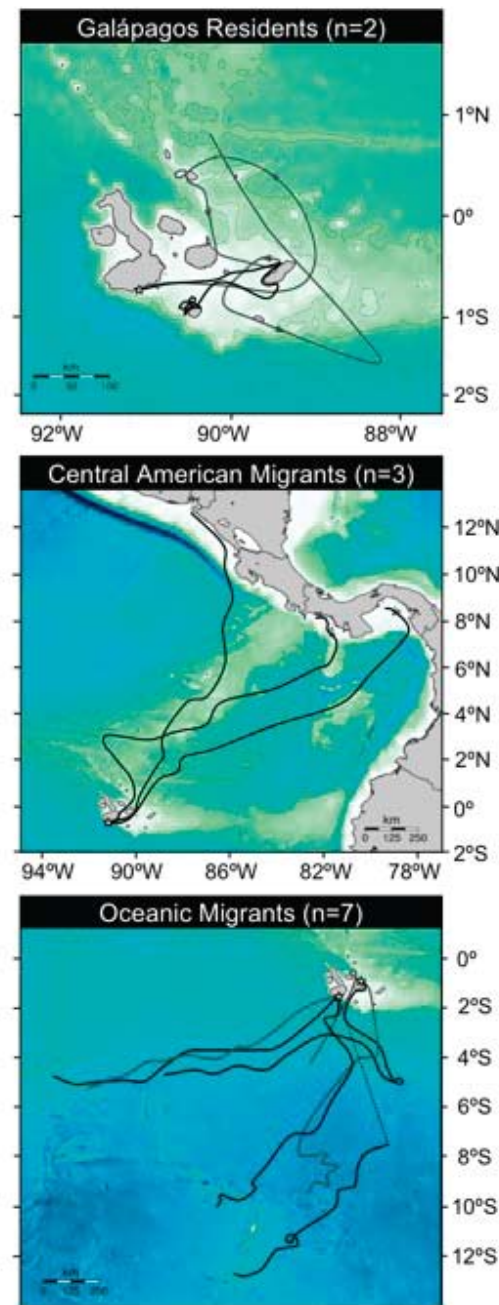


Fig. 1. Satellite-tracked movements of green turtles after nesting in the Galápagos during the 2003 (grey) and 2005 (black) nesting seasons. Satellite data processed in STAT (courtesy Michael Coyne) and maps constructed with MapTool.

# The Burden of History and the Mirage of Permanent Boundaries

Ashwini Chhatre

In the summer of 1999, approximately 750 sq. km. of territory in the Western Himalayas, in the district of Kullu in the northern Indian state of Himachal Pradesh, was declared closed to local populations and notified as the Great Himalayan National Park. Following the procedure laid down in the Indian Wild Life (Protection) Act, the rights of any claimants to the resources inside the Park were extinguished; out of the more than 15,000 users, a small compensation was ordered for those whose names appeared in the records that were consulted to determine legitimate users. Curiously, this legitimacy was derived from records dating to 1897, from the first forest settlement in the region that determined and codified the nature and extent of rights in all of these forests. Following the notification and the extinguishing of rights, local populations immediately organised themselves to lobby their political representatives for redressal. Through a combination of claims to a moral economy and electoral arithmetic, local residents were successful in securing access to the legally denied resources inside the Park, circumventing the restrictions and threats posed by the Forest Department and the law. This result resonates with a similar

effort in the 1880s, when the Forest Department attempted to reserve large tracts of forest in the same region and was frustrated in similar fashion.

In 1876, a team of three high-level forest officials led by the Inspector-General of forests, Dietrich Brandis, surveyed the area and provided detailed suggestions for the demarcation of the best forests in Kullu. They estimated that of the total area of approximately 1,200 square miles (~3108 sq. km.), only about 400 could be said to be under forest. In their report, they suggested that about 150 square miles (~388 sq. km.) be demarcated and subsequently managed for timber production. They also emphasised the need to separate the lands that could be made available for the expansion of cultivation from those to be maintained permanently as forests. Over the next two decades, actors at the local, provincial and national levels interpreted the report differently in light of the brand new Indian Forest Act of 1878. The legal categories were deliberated, interpretations were disputed and fault lines emerged within the state apparatus. A strict application of the legal categories prescribed in the 1878 law was thwarted by the provincial Revenue Department

through a characterization of Kullu as anomalous. Besides the Forest Department-Revenue Department rivalry, there emerged a strong local bureaucratic response to central direction, in interaction with the resistance of the local populations to the proposed restrictions on forest use. As the debate moved from an inter-departmental conflict, through the center-local tensions, to the formulation of a compromise during 1882-86, overt peasant resistance in the late 1880s again foiled attempts to implement and enforce the new boundaries around permanent forests.

The case throws light on historical contingencies in the evolution of property rights in forests, and their influence on the success of current conservation policies. The three dimensions of conflict – between departments, between center and states, and between conservationists and local populations – continue to define the contours of debate around conservation in India today, as evident in the case of the Great Himalayan National Park and numerous other protected areas.

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