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Conflict on Public Lands: The Case of Off-Road Vehicle Restrictions in Cape Hatteras National Seashore

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New limits on off-road vehicles in North Carolina's Outer Banks aim to protect endangered species. They also add another chapter to the United States' long history of conflict over use of public land.

Current public land holdings by the federal government span 640 million acres, or more than one quarter of all U.S. land. The Bureau of Land Management and the U.S. Forest Service manage a majority of these lands for multiple purposes, ranging from natural resource extraction to habitat conservation. There is a long history of conflict between those wishing to utilize public lands for private benefit (e.g., grazing livestock, harvesting timber, recreation) and for public benefit (e.g., land conservation, species preservation).

Nowhere is this conflict more evident than on lands managed by the National Park Service (NPS). The NPS is charged with the dual mission of promoting both recreational access and environmental protection on the 401 units it manages. This article discusses recent conflicts on Cape Hatteras National Seashore (CAHA) in North Carolina's Outer Banks. New rules limiting recreational access for off-road vehicles (ORV) were adopted in 2012 to stem negative impacts to endangered species habitat on the Outer Banks. We present the findings from our research assessing the recreational costs of these regulations to local anglers against the benefits to all North Carolina residents from endangered species protection (Dundas, von Haefen and Mansfield 2018).

Background

Although ORV use is prohibited on most NPS-managed land, it is permitted in many national seashores where road networks are primitive. In the case of Cape Hatteras, there is a long-standing tradition of recreational anglers using beaches as vehicular corridors for accessing the most desirable fishing locations. These beaches also serve as nesting sites for endangered and threatened species — most notably, piping plovers and loggerhead sea turtles — that are protected under both the federal Endangered Species Act and North Carolina state law.

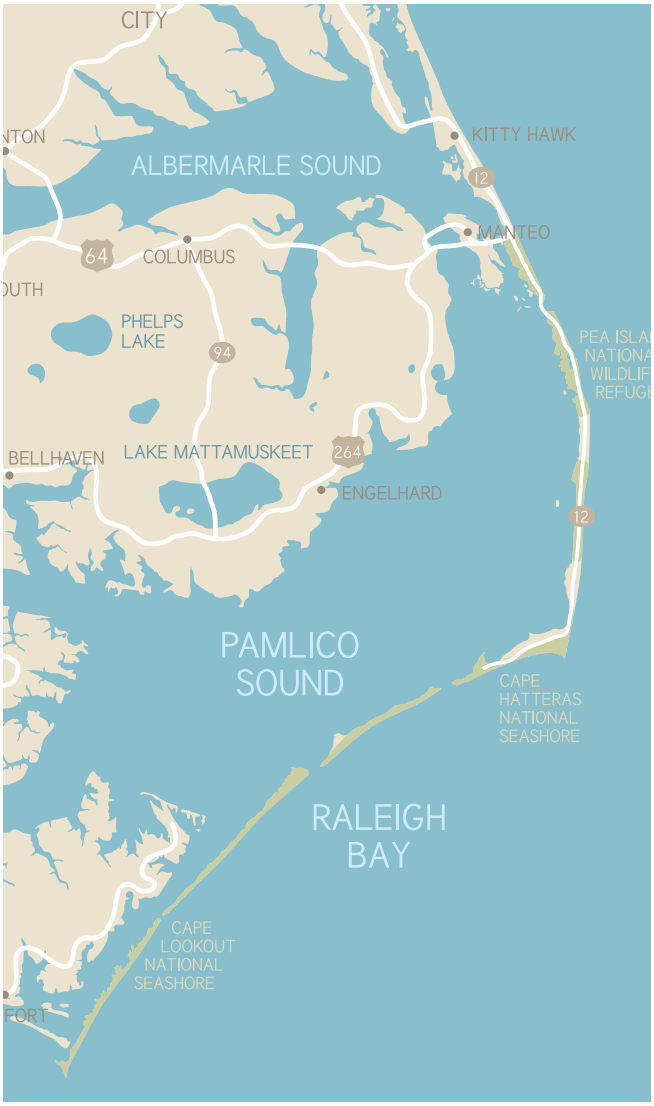

Figure 1 – Cape Hatteras National Seashore

Creation and Establishment

Cape Hatteras National Seashore (CAHA) was authorized by Congress in 1937 and established in 1953 as the first national seashore in the United States. The barrier island park stretches over 67 miles, contains three islands (Hatteras, Ocracoke and Bodie) and covers 24,470 acres of North Carolina's coastline (see Figure 1). CAHA is located in a relatively remote portion of the Outer Banks, with primary access available from a single bridge (the Herbert C. Bonner Bridge on NC Highway 12) on the north end and ferry service to Ocracoke Island on the south end. Since 1989, approximately 2.2 million people have visited CAHA per year. Visitors use the islands for a variety of recreation activities, including shoreline fishing. Recreation visits generate a robust local tourism industry that supports eight unincorporated villages on the islands.

Historically, ORV use in Cape Hatteras remained largely unregulated. This changed in 2008 when a U.S. District judge signed a consent decree that settled a lawsuit brought forward by three environmental groups. Each claimed that the NPS had not faithfully discharged its responsibilities under the Endangered Species Act. The decree immediately placed restrictions on nighttime driving, as well as ORV access to sensitive beaches during nesting seasons. The NPS agreed to develop an adaptive management plan for ORV use with input from environmental groups and recreational stakeholders.

The final management rule went into effect on February 15, 2012, after four years of contentious debate and policy uncertainty. After considering several alternatives, the NPS ultimately selected an approach that gave ORV users year-round access to 27.9 miles of beaches, seasonal access to 12.7 miles of beaches — depending on nesting patterns — and no access to 26.4 miles of beaches.

The NPS also permanently banned nighttime driving during summer months; restricted all driving in wildlife management areas and village beaches during shorebird breeding seasons (typically March to July); and committed to building new parking lots and improved sand road networks outside of nesting areas. This new infrastructure, as well as enforcement of the ORV restrictions, would be paid for through new ORV user fees ($120 and $50 for annual and seven-day permits, respectively).

The new restrictions were met with considerable opposition from local communities where ORV culture is deeply ingrained. The rule-making process was reopened after the U.S. Congress, under pressure from a local Congressman, added a late rider to the 2015 National Defense Authorization Act requiring another review. This second review ultimately led to refinements to the final rule that opened beaches earlier in the morning during peak summer months, expanded ORV routes and access points and modified the size and location of vehicle-free areas in Cape Hatteras.

These modifications were published in the December 2016 Federal Register and are now in effect. In the benefit-cost analysis described in the next section, we considered only the original 2012 ORV rules.

However, since the more recent revisions were relatively modest in scale and should, if anything, reduce regulatory costs, we are confident that our qualitative findings about the benefits and costs of the restrictions remain unchanged.

Loggerhead Sea Turtle

Piping Plover

Costs and Benefits of ORV Restrictions

Like virtually all government regulations, the ORV rule generates multiple costs and benefits to local communities and to the general public. In terms of costs, the regulations limit the CAHA sites where anglers can fish. On the benefits side, the regulations protect and enhance endangered species populations. A growing body of evidence suggests that all North Carolinians — not just local residents — are willing to pay for this. The ORV rule might also impact economic activity at local hotels, restaurants and bait shops, but available evidence suggests these impacts are modest at best. Visitation rates in Cape Hatteras have remained largely unchanged over the past decade, and although there is some evidence that particular business establishments have suffered, there is also evidence that economic activity has increased in other Outer Banks communities such as Kitty Hawk and Nags Head. In our analysis, we therefore focused on the costs to anglers and the endangered species preservation benefits to the general public.

There are three primary channels through which angler costs from ORV restrictions can arise. First, in response to the regulations, anglers might cancel Cape Hatteras trips and engage in other activities instead. Second, anglers might substitute trips away from their preferred Cape Hatteras sites to non-Cape Hatteras sites in other parts of the Outer Banks. Third, anglers might continue to take trips to Cape Hatteras sites but enjoy them less. A complete assessment of angler costs arising from these regulations must account for all three of these behavioral responses.

To do so, we developed an economic model predicting angler participation (whether to take a trip) and site choice (where to go) decisions across the recreational season. Although Cape Hatteras entrance fees are minimal, anglers often bear significant time and out-of-pocket travel costs (e.g., for fuel). These costs can be thought of as the implicit price of a recreation trip.

Our model estimated how anglers would change the quantity, timing and location of trips in response to ORV restrictions, recognizing that the new rules might result in cancelled, substituted and diminished recreational trips. We used three years of data from the National Oceanic and Atmospheric Administration's Marine Recreational Information Program (MRIP) to calibrate key model parameters. Simulations based on our model suggest that anglers are sensitive to travel costs and willing to substitute other recreation sites if their preferred site is unavailable.

We used the model to predict the economic losses from the ORV restrictions. In doing so, one challenge we faced was that beach accessibility for anglers was uncertain for the 12.7 miles of Cape Hatteras beaches where ORV restrictions depend on actual nesting patterns. At these sites, park managers have some discretion and are expected to take an adaptive management approach to protect endangered species' nests. Due to this policy uncertainty, we considered a wide range of potential restrictions from no ORV access restrictions to complete beach closures. Based on these assumptions, our analysis implies annualized angler costs (in 2010 dollars) range from $1.1 to $5.8 million annually (Table 1).

Table 1. Costs of CAHA Off-Road Vehicle Regulations (in 2010 dollars)

Type of Cost	Lower Bound	Upper Bound
Angler Costs	$1.1 million	$5.8 million
Non-Angler Costs (e.g. surfing)	$1.1 million	$5.8 million
Administrative and Enforcement Costs	$1.1 million	$1.1 million
Total	**$3.3 million**	**$12.6 million**

In looking at these costs they appear substantial but likely incomplete. For example, surfing is another popular recreational activity for Cape Hatteras ORV users. Data is limited on these non-angling activities, but a recent intercept survey of Cape Hatteras visitors suggests that at most half of all ORV trips involved surfing and other non-fishing activities. We can therefore safely assume that accounting for these additional costs would at most double our total cost estimates to between $2.2 and $11.5 million.

Implementation of the ORV rules also involve additional administrative and enforcement costs. Discussions with park managers suggest that roughly half of the $2.2 million in additional fees raised each year from ORV users is designated for these costs, whereas the balance is used for new infrastructure projects (which presumably benefit park visitors). Including these administrative and enforcement costs raises total costs to between $3.3 and $12.6 million.

In isolation, it is difficult to assess the economic implications of these costs. From a policy perspective, a relevant question is whether the benefits for the ORV rules exceed or fall short of these costs. Estimating the benefits of government policies is an inherently difficult task, but NPS and other government agencies are often required to do so when promulgating new regulations.

Quantifying the endangered species protection benefits from the new CAHA regulations is especially hard because these benefits are generally "non-use" in nature, meaning that the public's value for species protection cannot be linked to market transactions. In such cases, thoughtfully crafted surveys are used as a basis for estimating the public's willingness to pay for the outcome the policy is meant to promote.

In the context of endangered species protection, existing studies suggest that North Carolinians are willing to pay at least $65 million (2010 dollars) annually to protect coastal endangered species in the state. Since only about 20 percent of all coastal endangered species nest in Cape Hatteras, these studies imply aggregate benefits of at least $13 million annually for the ORV rules.

Discussion

A simple comparison of the estimated benefits and costs reported in Table 1 suggests that the Cape Hatteras ORV rule would pass a strict benefit-cost test. The net benefits of the policy are modest when considering the upper bound estimates of costs: $13 million in benefits versus $12.6 million in costs. However, there are a couple of reasons to think that the net benefits are larger. In particular, our benefit estimates exclude benefits accruing to people residing outside North Carolina. It seems plausible that residents of Virginia and other neighboring states would also be willing to pay to protect endangered species in Cape Hatteras. Secondly, discussions with non-ORV users suggest that their recreational experiences would be enhanced if there was less driving on Cape Hatteras beaches; this source of potential benefits was not included in our estimates either.

Having said this, we caution readers from interpreting our benefit-cost findings here too literally and as providing a narrow decision rule for policy. Rather, we view our benefit-cost analysis as a potentially informative tool that can inform, structure and even discipline the rulemaking process. Equity considerations are significant in the Cape Hatteras context, given that most of the recreational costs are born by local residents. And long-run environmental sustainability should also play a role.

Nonetheless, our benefit-cost analysis provides a valuable contribution to policy discussions about the tradeoffs between recreational access and environmental protection on public lands. With the NPS now implementing similar ORV regulations in nearby Cape Lookout National Seashore and considering similar regulations in Texas' Padre Island National Seashore, we expect these discussions to only grow in importance.

Research Cited

Dundas, Steven, Roger H. von Haefen and Carol Mansfield. "The Costs of Endangered Species Protection on Public Land: Evidence from Cape Hatteras National Seashore," Marine Resource Economics, 33(1): 1-25, January 2018.