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01/24/2011 09:09 PM

To comments-southern-francismarion-sumter@fs.fed.us

cc

bcc

Subject Georgia ForestWatch Comments on New Proposal for Management of the Upper Chattooga River

Dear Chattooga Planning Team:

Please find attached comments and supporting documents submitted in response to the December 9, 2010 request by the United States Forest Service for new comments on its re-initiation of the National Environmental Policy Act review of its decision to adopt "Alternative 4" presented in the "Environmental Assessment: Managing Uses on the Upper Chattooga River" in the Sumter, Chattahoochee, and Nantahala National Forests (August 2009).

These comments and supporting documents are filed on behalf of Georgia ForestWatch, c/o Wayne Jenkins, Executive Director, 15 Tower Road, Ellijay, Georgia, 30540, Tel: 706-635-8733. For your convenience, you will also receive a hard copy of these materials via U.S. mail. Please address all future correspondence to Mr. Jenkins.

Sincerely,

Nathan Moore

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January 24, 2011

32078.00112

**VIA E-MAIL AND U.S. MAIL**

**comments-southern-francismarion-sumter@fs.fed.us**

USDA Forest Service  
Attn: Chattooga Planning Team  
Francis Marion and Sumter National Forests  
4391 Broad River Road  
Columbia, South Carolina 29212

Re: Georgia ForestWatch Comments on New Proposals for Management of the  
Upper Chattooga River

Dear Chattooga Planning Team:

These comments are submitted in response to the December 9, 2010 request by the United States Forest Service for new comments on its re-initiation of the National Environmental Policy Act (“NEPA”) review of its decision to adopt “Alternative 4” presented in the *Environmental Assessment: Managing Uses on the Upper Chattooga River* in the Sumter, Chattahoochee, and Nantahala National Forests (August 2009) (“EA”). These comments are filed on behalf of Georgia ForestWatch (c/o Wayne Jenkins, Executive Director, 15 Tower Road, Ellijay, Georgia, 30540, Tel: 706-635-8733).

Georgia ForestWatch is a not-for-profit forest conservation group dedicated to the protection and appreciation of the national forests in Georgia and the watersheds, native plants, and wildlife they encompass. Georgia ForestWatch appreciates the difficulty of successfully managing and protecting a resource that, like so many in the Southeast, is at risk of being “loved to death.” Members of Georgia ForestWatch visit the Chattooga River corridor often for recreation, nature study, and spiritual renewal. The organization’s volunteer district leaders have organized and led public hikes along the Chattooga River in all three states where the Forest Service proposes to permit boating. Georgia ForestWatch has been represented at every public meeting held in connection with the Chattooga visitor study, and has participated at every opportunity in the Forest Service’s decision-making process for the Chattooga River.

In December 2009, Georgia ForestWatch intervened in opposition to American Whitewater’s administrative appeal of the Forest Service’s adoption of “Alternative 4” of the EA. The December 9, 2009 intervention comments submitted by Georgia

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ForestWatch to the Forest Service's Chattooga Planning Team made clear that the Forest Service has the authority to zone use of the Chattooga River, including excluding boating from some portions entirely, and showed that the administrative record supports prohibiting or restricting boating in the Upper Chattooga. Because Georgia ForestWatch's intervention comments were not made publicly available on the Forest Service website until January 13, 2011, Georgia ForestWatch wishes to refocus the Forest Service's attention on those comments to ensure they are considered in the newly re-initiated NEPA process. For your convenience, we have attached a copy of the intervention comments as "Exhibit A", and Georgia ForestWatch hereby incorporates those comments and all its other previous filings by reference.

Georgia ForestWatch continues to oppose the preferred alternative previously selected by the Forest Service or any other alternative or new plan that intensifies use of the Upper Chattooga corridor. Georgia ForestWatch also re-affirms its request that the Forest Service maintain the current zoning of the Chattooga River, which does not allow boating in the Upper Chattooga, and requests that the Forest Service vigorously defend this policy. While the vagueness of the Forest Service's December 9th scoping letter makes it difficult to comment with specificity, Georgia ForestWatch submits the following comments and information in support of its position.

**The Forest Service proposals underestimate and undervalue low-impact, nature-based recreation.**

The expensive multiyear planning effort undertaken for the Upper Chattooga since the American Whitewater lobby successfully appealed the management plan appears to be largely driven by a desire to appease boating and fishing interests. In focusing on these interests, the Forest Service has underestimated and undervalued the importance of low-impact and low-cost, nature-based recreation in the Upper Chattooga corridor.

For a public increasingly eager to "get away from it all," the Upper Chattooga provides solitude that is increasingly hard to find. In fact, demand for low-impact, nature-based recreation is growing at a much faster pace nationwide than the extreme sport of whitewater kayaking. In a forthcoming study on outdoor recreation trends, Forest Service Pioneering Scientist H. Ken Cordell explains:

Fishing and hunting are often thought of as widely popular, "traditional" outdoor activities. While still somewhat popular, participation in these activities generally has been declining and they are being replaced by other activities, such as wildlife or bird watching and photography."

Georgia ForestWatch members can attest from experience that the nature-based activities suggested in the Cordell study are the most popular activities in the Chattooga Cliffs,

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Ellicott Rock, and Rock Gorge reaches of the Upper Chattooga corridor. The river in these parts attracts families, picnickers, sunbathers, swimmers, photographers, and other hikers, whose enjoyment of the Chattooga resources would be impacted negatively by boating activities. Indeed, the lack of boating is one of the key reasons these low-impact recreationists are drawn to the area, in direct response to the boating-dominated lower reaches of the Chattooga and its tributaries. The Forest Service should conduct a scientific survey of the actual number and types of users as part of their analysis.

Georgia ForestWatch agrees with the Forest Service's determination that action is needed to support and protect the "outstanding remarkable values" of the Upper Chattooga. As a first step, Georgia ForestWatch urges the Forest Service to reassert practical control over the Sumter and Nantahala-Pisgah National Forest portions of the Ellicott Rock Wilderness. There is a notable lack of monitoring, law enforcement, and even basic signage in that part of the Wilderness, and improper use of the trails and dispersed campsites continues to cause resource damage. For example, organized groups often exceed current group size limits in this Wilderness, adversely affecting other visitors' experience of solitude and further degrading the natural resources.

New restrictions on access to the backcountry wilderness are necessary to protect the area, and the Ellicott Rock Wilderness and the Chattooga River should be managed to improve biological diversity and quality, rather than increasing recreational opportunities. While only low-impact recreation is appropriate in the Upper Chattooga corridor, ultimately recreation uses on all segments of the Chattooga River should be managed to levels at which the Forest Service realistically can sustain the biological elements. A scientific survey of the actual users is necessary to achieve these management goals.

**The Forest Service has inadequately analyzed the impact of its proposal on large woody debris (LWD) in the Chattooga River corridor.**

In its most recent study of LWD creation in the Upper Chattooga, the Forest Service recognized that LWD's role as a substrate, a source of energy for macro invertebrates, and a refuge for numerous organisms during times of high waters is crucial to the health of the Chattooga (*Large Wood in the Upper Chattooga Watershed*, Center for Aquatic Technology Transfer, January, 2008, Southern Research Station, Blacksburg, Virginia) ("LWD Study"). The LWD Study also concluded that current LWD amounts in the Chattooga are less than biologically optimal, but the Forest Service has not determined exactly what levels of LWD are desirable. Unless and until the Forest Service establishes desired LWD levels for the Chattooga, it cannot meaningfully evaluate the effect of its proposal on the appropriate management of LWD.

Although boaters are known to engage in unsanctioned LWD removal to eliminate the need for portaging, the Forest Service states in its December 9, 2010 scoping letter that it

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will assure no LWD will be removed “to accommodate recreation within the river or stream banks.” However, the Forest Service has historically assumed that a significant degree of LWD removal either will be undertaken by the Forest Service for liability reasons or will occur due to a lack of personnel to adequately monitor unsanctioned private removal, and the LWD Study acknowledged that “someone unknown” has been recently removing LWD from the Upper Chattooga’s West Fork headwaters. The Forest Service cannot adequately analyze the significance of this unsanctioned removal, which will certainly increase if the Forest Service allows boating in the Upper Chattooga, until it establishes desired LWD levels.

Georgia ForestWatch maintains that the Forest Service should consider actual LWD amounts when establishing, and managing toward, desired LWD levels. Visual inspection of the Upper Chattooga, especially its Chattooga Cliffs, Ellicott Rock, and Rock George reaches suggests that hemlock die-off and corollary LWD creation is increasing rapidly. In 2010, on-site review by Georgia ForestWatch identified approximately 50 dead-and-dying hemlocks along the Chattooga’s banks on the 0.25-mile stretch upriver from the Bull Pen Road Bridge, as depicted in the photographs attached as “Exhibit B.” Georgia ForestWatch urges the Forest Service to consult the excellent LWD Study and conduct additional research as necessary to ensure that its desired LWD levels reflect the realities of increasing hemlock die-off. Only then can the Forest Service adequately evaluate the effect of its proposal on LWD levels.

**The Forest Service’s proposals underestimate emergency search, rescue, and recovery burdens.**

In the EA, the Forest Service predicted that “if boating were allowed on the upper Chattooga . . . there would be some accidents, injuries and eventually a fatality” (EA, pgs. 160-161). However, the Forest Service assumed that the number of injuries and fatalities “would likely be low and few would require [search and rescue] responses.” In fact, a near drowning was reported as recently as October 2009 (<http://www.americanwhitewater.org/content/Accident/detail/accidentid/3257/>). Statistics maintained by the American Whitewater lobby suggest a nationwide increase in kayaking accidents and fatalities since 2004. In the first six months of 2010, more than thirty serious kayaking accidents nationwide resulted in 34 deaths. For your convenience, we have attached a copy the accident trend chart as “Exhibit C,” which is also available on The American Whitewater Accident Database at <http://www.americanwhitewater.org/content/Accident/view/>.

Georgia ForestWatch contends that current Forest Service proposals fail to adequately address the costs and impacts on local resources that will occur when local volunteer rescue squads and sheriffs’ departments in Oconee, Rabun, Macon, and Jackson counties

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inevitably find themselves taxed with a search and recovery effort. As a threshold matter, the Forest Service should evaluate whether local resources for such activities even exist.

**Adjacent road densities prohibit new boating access and portage roads.**

Any proposal to carve out new roads or access trails requires both identification of required resources and resource analysis, and may require amendments to existing Land and Resource Management Plans for the Nantahala-Pisgah, Chattahoochee, and Sumter National Forests. Any continuing proposal to turn the so-called "County Line Road Trail" into an access road for boaters or to create a new parking lot for boating access to the Upper Chattooga may run afoul of Forest Service rules. As of January 5th, the "County Line Road Trail" does not appear on the Forest Service's roads atlas for the Nantahala-Pisgah National Forests. Existing road densities in the area between Whiteside Cove Road and the Wild and Scenic River Corridor appear to preclude approval and construction of new roads in this area, including an effort to convert the "County Line Road Trail" into a road.

**The Forest Service underestimates the effect of federal budget constraints on its ability to adequately administer the proposed management plan.**

The Forest Service should consider any proposed management plan to address the boating situation against the new realities of a federal budget that appears to be subject to significant Congressional and administrative limitations at least through fiscal year 2012.

Georgia ForestWatch maintains that the Forest Service should identify and allocate the necessary budget to administer any new management plan for the Upper Chattooga prior to adopting that plan. The prior EA estimated that "Alternative 4" would cost \$227,000 per year, a significant amount even under the best of economic circumstances, and it is unclear whether this funding exists (EA, pg. 169). If the Forest Service cannot adequately fund its chosen management plan, then it should question the chances of that plan's success and must address this potential in its analysis.

**The Forest Service should consider additional new documents.**

The December 9, 2010 request by the Forest Service sought new documents and publications which may inform its new NEPA analysis. Georgia ForestWatch wishes to bring the following resources to the Forest Service's attention and urges the Forest Service to consider them fully.

- J. B. Ruhl and Robert Fischman, "Adaptive Management in the Courts," 95 MINN. L. REV. 454 (2010), which concludes that federal agencies and Congress "must be more disciplined about [adaptive management's] design and implementation. This

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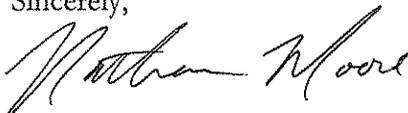
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includes resisting the temptation to employ adaptive management to dodge burdensome procedural requirements, substantive management criteria, and contentious stakeholder participation.” For your convenience, we have attached a copy of this article as “Exhibit D” and an electronic copy is available at [http://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=1542632&rec=1&srcabs=1537229](http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1542632&rec=1&srcabs=1537229).

- *The Last Wild River*, an essay by Bronwen Dickey, appearing in the Summer 2008 issue of the *Chattooga Quarterly*. Mr. Dickey’s essay depicts the very strong sense of place that the Wild and Scenic Chattooga evokes, a sense that is likely to disappear further if boaters are permitted on the last pristine stretch of its wild and scenic headwaters. Forest Service employees involved in the upcoming management decisions should read the entire essay to get a better feel for the enduring “poetry” of this last wild area of Southern Appalachia. Mr. Dickey’s essay is cited with express permission of the author and publisher, copyright 2008, Chattooga Conservancy, Inc., and is available at [http://www.chattoogariver.org/index.php?req=the\\_last\\_wild\\_river&quart=Su2008](http://www.chattoogariver.org/index.php?req=the_last_wild_river&quart=Su2008).

Georgia ForestWatch appreciates the opportunity to comment on the Forest Service’s re-initiation of the NEPA process and looks forward to continuing to work with the Forest Service to protect and preserve the resources of the Upper Chattooga. Please address any future correspondence to Wayne Jenkins, Georgia ForestWatch Executive Director, 15 Tower Road, Ellijay, Georgia, 30540, Tel: 706-635-8733.

Sincerely,



Nathan T. Moore

for PAUL, HASTINGS, JANOFSKY & WALKER LLP

NTM

Attachments

cc: Georgia ForestWatch  
Rene Voss, Esq.  
Rachel Doughty, Esq.

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**List of Attached Exhibits to be Made Part of the Administrative Record**

- “Exhibit A”: Intervention comments submitted by Georgia ForestWatch to the Forest Service’s Chattooga Planning Team on December 9, 2009.
- “Exhibit B”: Photographs of large woody debris and dead-and-dying hemlock trees in the Upper Chattooga corridor.
- “Exhibit C”: Chart showing nationwide upward trend in kayaking accidents, as reported on the American Whitewater Database.
- “Exhibit D”: J. B. Ruhl and Robert Fischman, “Adaptive Management in the Courts,” 95 MINN. L. REV. 454 (2010).

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# **Exhibit A**

December 9, 2009

32078.00112

**VIA E-MAIL AND U.S. MAIL**

**Appeals-southern-regional-office@fs.fed.us**

USDA Forest Service  
Attn: Appeal Reviewing Officer  
1720 Peachtree Road, NW  
Suite 811N  
Atlanta, GA 30309-9102

**Re: Georgia ForestWatch Intervention in the Administrative Appeal of American Whitewater**

Dear Chattooga Planning Team:

These comments concern the administrative appeal of American Whitewater, American Canoe Association, Atlanta Whitewater Club, Georgia Canoeing Association, and Western Carolina Paddlers (October 19, 2009). These comments are filed pursuant to Section 14 of the Optional Appeal Procedures (August 2009) on behalf of Georgia ForestWatch (c/o Wayne Jenkins, Executive Director, 15 Tower Road, Ellijay, Georgia, 30540, Tel: 706-635-8733). American Whitewater's administrative appeal is of the joint decision to adopt the management direction of "Alternative 4" presented in the *Environmental Assessment: Managing Recreation Uses on the Upper Chattooga River* in the Sumter, Chattahoochee, and Nantahala National Forests (August 2009) (hereinafter "EA"), and the three separate decisions by the three responsible officers to amend the Forest Plans of each of these National Forests. These decisions are established in the following documents (hereinafter collectively referred to as "decision notices"):

(1) Decision Notice and Finding of No Significant Impact for Amendment #1 to the Chattahoochee-Oconee National Forests Revised Land and Resource Management Plan Managing Recreation Uses on the Upper Chattooga River (Published in the Times on September 3, 2009); deciding officer: Forest Supervisor George Bain (Decision Notice signed on August 25, 2009) (hereinafter "Chattahoochee DN");

(2) Decision Notice and Finding of No Significant Impact for Amendment #1 to the Sumter National Forest Revised Land and Resource Management Plan Managing Recreation Uses on the Upper Chattooga River (Published in The State on September 4, 2009); deciding officer: Forest Supervisor Monica J. Schwalbach (Decision Notice signed on August 25, 2009) (hereinafter "Sumter DN"); and

(3) Decision Notice and Finding of No Significant Impact for Amendment #22 to the Nantahala and Pisgah National Forests Revised Land and Resource Management Plan Managing Recreation Uses on the Upper Chattooga River (Published in the Asheville Citizen-

Times on September 4, 2009); deciding officer: Forest Supervisor Marisue Hilliard (Decision Notice signed on August 25, 2009) (hereinafter “Nantahala DN”).

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## **I. Summary**

The Forest Service has appropriately allowed for administrative appeal of its decisions to amend three land and resource management plans. Contrary to American Whitewater’s mischaracterizations, management of the three National Forests affected by the Forest Service’s decisions to amend land and resource management plans is not a free-for-all in which only boaters are restricted in their use. The Forest Service imposes reasonable restrictions on all users of these public lands. Boating is not a low-impact activity, and in fact it is the dominant use on a majority of the Chattooga Wild and Scenic River Corridor. In response to the public desire for a wilderness experience and solitude for hiking, swimming, bird watching, camping, picnicking

and angling (all activities enjoyed by a larger segment of the nation's population than whitewater boating), the Forest Service zoned the Chattooga River in the 1970s. In so doing, it reserved the Upper Chattooga, which has superior fishing and is more isolated, for those accessing the corridor on foot, facilitating hiking and quiet walking and picnicking; access to the river corridor by boat was permitted on the remaining 2/3 of the river. This decision was not arbitrary and was consistent with Forest Service policy. The Forest Service regularly zones uses to create a diversity of recreational experience regionally. Furthermore, this decision was consistent with the Wild and Scenic Rivers Act and the Wilderness Act, both of which emphasize protection of the resource as a priority over creation of recreational experience. Nothing in American Whitewater's administrative appeal supports a change in the Forest Service's successful management of the Upper Chattooga.

**The absence of comments on any particular issue in American Whitewater's appeal does not reflect acceptance by Georgia ForestWatch of American Whitewater's position.**

## **II. The appeals process followed by the Forest Service is appropriate and legal action is premature.**

In late August 2009, three national forests (the Chattahoochee-Oconee, Sumter, and the National Forests in North Carolina) issued findings of no significant impact and decision notices amending each forest's land and resource management plan. The decision notices were supported by a final Environmental Assessment issued at the same time. *American Whitewater argues that there should be no opportunity to administratively appeal the Decision Notices of the Forest Service regarding boating on the Upper Chattooga and that it should be able to proceed directly to a court challenge of those decisions* (AW Appeal, 4-6). This is incorrect.

Administrative appeal of the three decision notices is governed by the *Optional Appeal Procedures Available during the Planning Rule Transition Period* (issued August 2009) ("*Transition Planning Rules*"). The *Transition Planning Rules* state that decisions to amend a national forest land and resource management plan are subject to appeal (*Transition Planning Rules*, Section 3(a)(1)). These three decision notices are subject to review by a court, but only after administrative remedies have been exhausted.<sup>1</sup> It is unfair to suggest that the Forest Service is creating endless loops of administrative appeals when this is in fact the first opportunity for administrative appeal of the three decision notices to amend the forest land and resource management plans.

## **III. Boaters are not the only user group restricted in their use of the Upper Chattooga.**

*American Whitewater argues that among user groups only boaters are restricted in any way at all in their use of the Upper Chattooga* (AW Appeal, p. 32). This is not true. Management of

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<sup>1</sup> See the attached Defendants' Memorandum in Opposition to Plaintiff's Motion for Reconsideration of the Court's Denial of Temporary Injunctive Relief in the case of *American Whitewater et. al v. Tidwell*, No. 8:09-cv-02665-RBH (D. S.C. filed Nov. 24, 2009), which Georgia ForestWatch incorporates by reference.

the River Corridor for all three national forests is directed by the Sumter land and resource management plan (“*Sumter LRMP*”) (Sumter LRMP, 3-8). The *Sumter LRMP* imposes the following limitations on recreational use in the Chattooga Corridor:

- Use of a saddle, pack or draft animal is prohibited (3-12);
- Off road vehicles and mountain bikes are allowed only on designated routes (2-22); and
- There are limitations on where camping can occur (2-23).

#### **IV. Boating is not a low-impact activity.**

*American Whitewater argues that boating is a “lower-impact” use of the National Forests.* It is not.

The Forest Service has identified canoeing, rafting and kayaking use on the Chattooga River as an example of where the “facilities and resources are being stretched to capacity” ((Sumter National Forest, *Recreation Supply and Demand: The Sumter National Forest’s Place in Outdoor Recreation in South Carolina*, p. 15) (“*Sumter Recreation Supply and Demand*”). In 1987, the Forest Service logged 62,200 recreation visitor days (“RVD”) spent in the activity of non-motorized boating, with projected growth to 96,410 RVD by 2040.<sup>2</sup> This intense use has a profound impact on the visitor experience of all users. In the 1970s development plan for the Chattooga Corridor (when it was first designated a Wild and Scenic River), at levels of *much* lower use (21,000 floaters in 1974), the Forest Service noted that “[a]lthough current levels of all types of use create some problems, uncontrolled future use would probably result in safety hazards and a lowering of the quality of the recreation experience. When the need warrants, this will be prevented by establishment of regulations limiting size, number, type, etc., to provide optimum use.” (41 Fed. Reg. 11847, 11850 (March 22, 1976) (emphasis added).)

The fastest growing recreational activity in the Sumter National Forest is bird watching (*Sumter Recreation Supply and Demand*, p. 2). “In South Carolina, the percent of population participation in an activity offered by the national forest is walking (about 63% of South Carolinians walk), picnicking (45%), swimming (35%), fishing (31%) and bird watching (24%)” (*Sumter Recreation Supply and Demand*, p. 3). None of these activities could be considered high impact when compared to boating.

Boaters are already demanding that management decisions be made to improve their experience in the Upper Chattooga rather than based primarily on resource protection:

- **Access.** In its appeal, American Whitewater complained that boaters would have to walk to access the Upper Chattooga (AW Appeal, p. 32). All other users must access the corridor by foot, but boaters are demanding that they be able to drive to a put-in point.
- **Large Woody Debris Management.** The affidavit of Kevin R. Colburn, submitted by American Whitewater, discusses removal of large woody debris introduced to the

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<sup>2</sup> One recreation visitor-day is the recreation use of National Forest land or water that aggregates 12 visitor-hours.

Chattooga as a result of the hemlock woolly adelgid infestation to protect the recreational use of the Chattooga (AW Appeal, p. 95).

The Forest Service appears to be responding to intense pressure from American Whitewater and the boating lobby. Nearly simultaneous with the issuance of the three Decision Notices, the National Forests in North Carolina proposed construction of a parking lot specifically for floaters on the Upper Chattooga. (See *Schedule of Proposed Actions* for the Forests in North Carolina for October through December 2009.)<sup>3</sup>

**V. The Forest Service has the authority to zone use of the Chattooga River, including excluding boating from some portions entirely.**

**A. The Forest Service may use zoning to protect regional diversity of recreational experience.**

*American Whitewater argues that the Forest Service does not have authority to exclude boating from the Upper Chattooga* (AW Appeal, 34). This is not true. The Forest Service has the final say on how the land it manages will be used, so long as it exercises that discretion reasonably.

Zoning recreational and commercial uses of public lands is consistent with Forest Service policy. Courts will uphold reasonable exercise of discretion by agencies, including the Forest Service. “Ultimately, it is the agency’s role--not the court’s--to balance competing recreational uses.” (*Riverhawks v. Zepeda*, 228 F. Supp. 2d 1173 (D. Or. 2002). “[W]hen specialists express conflicting views, an agency must have discretion to rely on the reasonable opinions of its own qualified experts even if, as an original matter, a court might find contrary views more persuasive.” (*Id.* at 1184-1185 (internal citations omitted).)

The Forest Service manages Wild and Scenic Rivers according to what are called the “*Secretarial Guidelines*” (*National Wild and Scenic Rivers System; Final Revised Guidelines for Eligibility, Classification and Management of River Areas*, 47 Fed. Reg. 39,454 (Sept. 7, 1982)). The Secretarial Guidelines envision the use of varying strategies and implementations, depending on the segment’s classification and ownership, and courts will defer to agency interpretation of which strategies make the most sense on any given river. *Id.* at 39,459 (See *Friends of Yosemite Valley v. Kempthorne*, 520 F.3d 1024, 1028 (9th Cir. Cal. 2008)). The *Secretarial Guidelines* direct that “[p]ublic use will be regulated and distributed where necessary to protect and enhance (by allowing natural recovery where resources have been damaged) the resource values of the river area. Public use may be controlled by limiting access to the river, by issuing permits, or by other means available to the managing agency through its general statutory authorities” (47 FR 39454).

It is Forest Service Policy to use the Recreation Opportunity Spectrum (“ROS”)<sup>4</sup> to guide recreational management of the national forests (FSM 2310.3-2). The basic assumption

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<sup>3</sup> Available at: <http://www.fs.fed.us/sopa/components/reports/sopa-110811-2009-10.pdf>.

<sup>4</sup> Roger N. Clark and George H. Stankey, *The Recreation Opportunity Spectrum: A Framework for Planning, Management, and Research*, General Technical Report PNW-98 (1979).

underlying the ROS is that quality in outdoor recreation is best assured through provision of a diverse set of opportunities. Providing a wide range of setting varying in level of development, access, and so forth insures that the broadest segment of the public will find quality recreational experiences, both now and in the future (ROS, p. 4, internal citation omitted).

Recognizing the great diversity of quality opportunities that the national forests can offer, if managed according to the ROS, it is Forest Service policy that “individual National Forests need not provide recreation opportunities for each ROS class” (FSM 2310.3-4). Inventories of Recreational opportunities “should encompass at least regional levels and transcend administrative boundaries” (ROS p. 23). Uses may be excluded from a particular area so that other uses may be emphasized, enhancing regional diversity of opportunity. Consistent with this philosophy, the Forest Service zoned the Chattooga: “The area with the best fishing was available for fishermen; the area best suited for boating was available for boaters” (Interview of James Culp, USDA Forest Service “River Ranger” from 1974-1980, *Chattooga River History Project: Literature Review and Interview Summary* (August 25, 2006) (“*Chattooga History Project*”). Allowing boating on the Upper Chattooga would decrease the regional diversity of opportunity because it would eliminate the one Wild & Scenic River in the Southeast where boating is prohibited to ensure a different kind of wilderness experience.

Nothing in the ROS suggests that lower-impact uses should always be selected over higher-impact uses, as American Whitewater suggests on page 35 of its appeal (paragraph 117). In fact, that kind of rule would result in a flattening of recreational opportunity across the National Forest System and would completely eliminate some uses—motorized sports, mountain biking, horseback riding, etc.

The ROS policy, including consideration of regional diversity, is explicitly included in the Forest Service’s management direction for Wild and Scenic Rivers (FSM 2354.32). Management plans for Wild and Scenic Rivers must establish management objectives river section by river section (FSM 2354.32 & 2354.41). Zoning is endorsed as a method to protect character and prevent overuse (FSM 2354.41).

The thirty plus year zoning of uses on the Chattooga has enabled the creation of excellent diversity of recreational opportunity in the Chattooga Corridor. Boater-oriented and dominated management prevails on the lower 36 miles of the Chattooga Wild and Scenic River. In 1987, 62,200 recreation visitor days dedicated to canoeing or kayaking in the Sumter National Forest were logged, so it would be disingenuous to argue that boating is banned on the Chattooga (Sumter National Forest, *Recreation Supply and Demand: The Sumter National Forest’s Place in Outdoor Recreation in South Carolina*, p. 15 (“*Sumter Recreation*”). Trout fishing is emphasized on the Upper Chattooga, where it is excellent. (Wild and Scenic River Study Report, p. 19 (1971); *Chattooga Wild and Scenic River Classification, Boundaries, and Development Plan*, 41 Fed. Reg. 11849 (March 22, 1976) (“*WDR Study Report*”). The Forest Service made the rational and reasonable management decision that fishing was enhanced where boating was prohibited on the heavily used Chattooga.

The Forest Service has limited particular uses in particular stretches, but it has not barred access to anyone. As the Forest Service successfully argued to the 11th Circuit Court of Appeals:

plaintiffs have the same ability as others to engage in a multitude of other recreational pursuits allowed throughout the Chattooga corridor. They are not prohibited from accessing the Headwaters of

the Chattooga for recreational pursuits such as swimming, fishing, hiking, camping, and photographing, to name just a few. Nor is it true, as plaintiff claim, that they are being treated unfairly as the only individuals prohibited from engaging in their desired recreational pursuit on the Chattooga. As an initial matter, it is not the individual that is prohibited from accessing and recreating in the Chattooga corridor. Instead it is the recreational use or pursuit that is limited in order to strike a balance that protects and enhances the Recreation ORV. Many uses, not just floating, are prohibited or limited in the Chattooga corridor. For instance, although floating is only prohibited in a small section of the Chattooga, off-highway vehicle use and mountain bike use is prohibited throughout the Chattooga corridor and only allowed in specific areas on the forest. Likewise, there are numerous restrictions on fishing, camping, and horseback riding, among others (*American Whitewater v. Bosworth*, 2:06-CV-0074-WCO, Document 11, p. 22 (filed July 7, 2006)).

The Forest Service may consider budgetary, personnel, and technical issues in establishing uses of a Wild and Scenic River (FSM 2354.41). So, the Forest Service may consider whether it is fair to dedicate resources to opening the Upper Chattooga to boating when only a small percentage of the population is able to engage in the technical boating that is feasible above Highway 28.

**B. The Wild and Scenic Rivers Act does not require the Forest Service to protect and enhance boating on all segments of the Chattooga River.**

*American Whitewater argues that boating was one of the values that prompted Congress to designate the Chattooga River as a Wild and Scenic River and that the Forest Service therefore has an obligation to protect and enhance boating on the entire Chattooga Corridor* (AW Appeal, 34). This is not what the law requires.

Section 10(a) of the Wild and Scenic Rivers act imposes a “nondegradation and enhancement policy for all designated river areas, regardless of classification” (U.S. Forest Service, *Wild & Scenic River Management Responsibilities* (A Technical Report of the Interagency Wild and Scenic Rivers Coordinating Council), p. 22 (March 2002)). The Wild and Scenic Rivers Act directs that “primary emphasis shall be given to protecting its esthetic, scenic, historic, archeologic, and scientific features” (16 U.S.C. § 1281(a)). Notably missing from this list is recreational features. Nothing in the Wild and Scenic Rivers Act requires maximization of recreational opportunity for any type of use. In fact, the Wild and Scenic Rivers Act provides authority to limit use. “Management plans for any such component [of the Wild and Scenic Rivers system] may establish varying degrees of intensity for its protection and development, based on the special attributes of the area” (16 USCS § 1281(a)). The Forest Service is expressly permitted to “utilize the general statutory authorities relating to the national forests in such manner as [the Forest Service deems] appropriate to carry out the purposes of [the Wild and Scenic Rivers Act]” (16 U.S.C. § 1281(d)). As discussed above, the Forest Service uses zoning to create a diversity of recreational experience. In keeping with its management responsibilities and goals across the region, the Forest Service provides for floating, hiking, hunting, fishing, and

camping in the Chattooga Corridor, but separates and regulates these uses to meet broad recreational diversity and resource protection goals.

**C. The Wilderness Act requires that preservation of wilderness value come before enhancement of recreational experience**

*American Whitewater argues that the Forest Service is required to protect and enhance boating in wilderness areas* (AW Appeal, 35). There is no such requirement. Where Forest Service managers determine that boating threatens wilderness values, it may be regulated or prohibited. In a wilderness, “[w]here a choice must be made between wilderness values and visitor or any other activity, preserving the wilderness resource is the overriding value. Economy, convenience, commercial value, and comfort are not standards of management or use of wilderness. The overarching concept is to preserve natural conditions and wilderness character” (FSM Ch. 2320.6) (emphasis added).<sup>5</sup> The Forest Service’s Wilderness Management policy is to always work toward closing the gap between the attainable level of wilderness purity and the less pure, human-influenced reality that exists on each wilderness (FSM Ch. 2320.6). By promoting solitude and foot travel only in the Upper Chattooga, the Forest Service is acting consistent with its policy.

In order to protect the character of the Chattooga Wild and Scenic River, the original *Wild and Scenic River Study Report*, p.86 (June 15, 1971) (“*WSR Report*”) for the river directed that “[r]ecreation use will be regulated on the basis of carrying capacity of the land and water rather than on demand.” It recognized that the major management challenge for the Chattooga would be to maintain the river in the condition that made it worthy of inclusion in the National Wild and Scenic Rivers System while providing for “a safe and satisfying recreation experience” (*WSR Report*, p. 86).

**VI. The Forest Service Chief did not reverse the ban on boating the Upper Chattooga River**

*American Whitewater argues in its appeal that the Forest Service Chief reversed the boating ban* (AW Appeal, 27). This is not true. The Reviewing Officer for the Chief, Gloria Manning, found that “the Regional Forester did not provide an adequate basis for continuing the ban on boating above Highway 28,” not that a ban could not be justified were an adequate basis to be established (See Decision for Appeal by American Whitewater, #04-13-00-0026, p. 6 (April 28, 2005) (“2005 Appeal Decision”). Specifically, Manning stated that the Regional Forester:

can limit or restrict use within a WSR or Wilderness area. To protect the Chattooga River’s ORVs and Ellicott Rock Wilderness resources, the Regional Forester may:

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<sup>5</sup> The portion of the Chattooga now proposed to be open to boating is subject to the provisions of both the Wilderness Act and the Wild and Scenic Rivers Act with respect to both the river and to its immediate environment. In case of conflict between the provisions of these Acts the more restrictive provisions shall apply (16 U.S.C. § 1281(b); FSM Ch. 2354.42e).

Disallow or restrict the number of (private and commercial) on-river and in-corridor recreation users,

Determine the type of recreation use,

Dictate the timing of such use.

This authority should be exercised only with adequate evidence of the need for such restrictions. (2005 Appeal Decision, p. 6 (emphasis added)).

The Reviewing Officer directed the Regional Forester to provide an adequate basis for whatever its final decision was regarding recreation on the Upper Chattooga.

## **VII. The administrative record supports restricting or prohibiting boating in the Upper Chattooga.**

*American Whitewater argues that there is insufficient evidence in the administrative record to limit boating on the Upper Chattooga* (AW Appeal, 33). Reviewing Officer Manning described the evidence necessary to support exclusion of boating from the Upper Chattooga in the 2005 Appeal Decision:<sup>6</sup>

- A capacity analysis, and
- Evidence for why excluding boaters but not other users to reduce resource impacts and preserve solitude.

Subsequent to that decision, an administrative record has been assembled by the Forest Service that includes sufficient data to justify strongly restricting or completely prohibiting boating above Highway 28, including the documents discussed below.

### **A. Capacity & Conflict on the Upper Chattooga River**

As directed by Officer Manning, the three forests prepared the *Capacity and Conflict on the Upper Chattooga River* (June 2007) (“*Capacity Analysis*”). The *Capacity Analysis* examined the “quantity and mixture of recreation and other public use which can be permitted without adverse impact on the resource values of the river area” (*Secretarial Guidelines*, 47 Fed. Reg. at 39459). Citing the *Capacity Analysis*, the Forest Service noted that increased use of the Chattooga might exceed 20% over the next decade in its Environmental Assessment supporting the decision to significantly restrict boating on the Upper Chattooga (*See Environmental Assessment: Managing Recreation on the Upper Chattooga River*, pp. 3-4 (August, 2009) (“*Chattooga EA*”). Relying on the *Capacity Analysis*, the Forest Service drafted the *Chattooga EA* which put in place limitations on use of the Upper Chattooga Corridor. It is Georgia ForestWatch’s position that the *Capacity Analysis* and *Chattooga EA* would support even greater restriction of boating.

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<sup>6</sup> 2005 Appeal Decision, p. 6.

## **B. *Chattooga EA***

The administrative record includes an EA in support of the Forest Service's decision to restrict boating in the Upper Chattooga. The *Chattooga EA* compiles historic river use and management data, projected uses and management concerns (e.g., hemlock woolly adelgid). The *Chattooga EA* is not without problems (see Georgia ForestWatch's appeal), but it does include sufficient data to support a ban on boating in the Upper Chattooga.

## **C. *Recreation Supply and Demand: The Sumter National Forest's Place in Outdoor Recreation in South Carolina***

The *Sumter Recreation Supply and Demand* discusses the impact of canoeing, rafting and kayaking use on the Chattooga River, finding that these uses are an example of where the "facilities and resources are being stretched to capacity."<sup>7</sup> Furthermore, this document discusses the relative demand for various recreation opportunities. Whitewater kayaking, for example, is enjoyed by only 1.3% of the general population (*Sumter Recreation Supply and Demand*, p. 16).

## **D. *Affidavit of the Director of Planning for the Southern Region***

In 2006, the Forest Service filed with the 11th Circuit Court of Appeals the declaration of Chris Liggett, the Director of Planning for the Southern Region of the Forest Service and a member of the Steering Team for the Chattooga River visitor capacity analysis process (2:06-cv-00074-WCO, filed July 7, 2006). Mr. Liggett had some idea of the expenses that permitting boating might impose on the Forests, and the lack of resources to do so:

[t]he Forest Service is not administratively prepared to immediately accommodate floaters on the uppermost section of the Chattooga Wild and Scenic River. It currently does not have sufficient staff to monitor the floating and to enforce existing applicable regulations on a new influx of users. The Forest Service also currently lacks the means necessary to search for and rescue stranded and injured floaters in that uppermost section of the river.

## **E. *Affidavits of rangers at the time of the original boating compromise***

The administrative record includes the affidavit of Max Gates, USFS Forest Ranger for the Andrew Pickens District from 1961 until 1972. He states that:

- "Many non-boaters told me that they felt that boaters were intruding on their feeling of safety and solitude in areas long used by such non-boaters for camping, swimming, hiking, fishing, and picnics."
- "I concluded that the increased boating usage [after the movie *Deliverance* was released] presented a threat to the quality of wilderness experience available to non-boating users."

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<sup>7</sup> Sumter National Forest, *Recreation Supply and Demand: The Sumter National Forest's Place in Outdoor Recreation in South Carolina*, p. 15.

- “I, with other managers, concluded that the area of the Chattooga River being designated as a Wild and Scenic River should be divided into zones of usage so as to allow citizens reasonable use of the Wild and Scenic river while minimizing conflicts between user groups, maximizing the ability of the USFS to manage the resource, and preserving the unique natural qualities of the river that resulted in such designation.”
- “In my opinion, based on 25 years of professional forestry experience in the area and 40+ years of enjoying the use of the Chattooga River, the portion of the Chattooga River above Highway 28 is unique in the Southeast in terms of the quality of its wilderness solitude experience, and the quality of its wilderness hiking, nature watching, fly fishing and other outstanding recreational experiences.”
- “In my opinion, based on my years of professional forestry experience in the area and my years of enjoying the use of the Chattooga River, lifting the ban on boating above Highway 28 will damage the unique wilderness solitude experience and quality of wilderness hiking, nature watching, fly fishing and other outstanding recreational experiences above Highway 28.”
- “Boaters already have access to the majority of the river and their usage of the river has impacted the quality of usage by non-boaters.”
- “[T]he USFS would not be able to enforce adequately any rules for limited boating access above Highway 28.”

Jim Barrett, the District Ranger for the Andrew Pickens Ranger District beginning in 1972, made similar statements to those of Max Gates. In addition, he made the following comment regarding management:

[G]iven its limited budget, the USFS has done an excellent job of managing the Wild and Scenic area of the Chattooga River, having a bright line demarcation between boating and non-boating areas has made that job easier, and maintaining the existing status quo would help the USFS continue to manage this unique resource for the benefit of all users.

#### **F. *River History Project: Literature Review and Interview Summary***

The *Chattooga River History Project: Literature Review and Interview Summary* looks back at the justifications for the original zoning of the Chattooga River, completing what was admittedly a sparse record because in the 1970s “NEPA or similar processes were far less structured” (*Chattooga History Project*, p. 5). The report discusses the reasons for zoning the Chattooga (*Chattooga History Project*, p. 6). As a Recreational Planner for the Forest Service, Charlie Huppuch noted, “[t]oday USFS doesn’t have the personnel to manage [the river] like it did [in the 80s and 90s]. They used to have wilderness and river rangers” (*Chattooga History Project*, interview). Max Gates, a former ranger on the Andrew Pickens Ranger District recalled that as boating increased, “[f]ishermen tended to feel pushed out, and looking for other places to fish because of the floaters” (*Chattooga History Project*, interview).

## VIII. Conclusion

American Whitewater has made much of its alleged right to access the Chattooga whenever and wherever it wants. The Forest Service ultimately makes the decision of how to manage the Chattooga Corridor, however, provided its management decision is reasonable. There is ample evidence that the Forest Service's management of the Upper Chattooga for the last thirty years has been excellent, and no evidence to the contrary. Since zoning of the river was first implemented, the Chattooga has moved from obscurity into the national spotlight as both a whitewater and angling destination. It is also prized for the solitude and high quality wilderness experience it offers to bird watchers, hikers, picnickers and swimmers. This is a tribute to the wisdom of the Forest Service employees who foresaw and planned for the increases in use of this resource that occurred. Only upon the insistence of American Whitewater has the Forest Service even considered upending its successful management approach to the Chattooga. But there is nothing new in American Whitewater's appeal to support a change in the heretofore successful management of the Upper Chattooga.

Submitted this day of December 9, 2009.

/s/Rachel Doughty

Rachel Doughty

for PAUL, HASTINGS, JANOFSKY & WALKER LLP

cc:

Cecil Huron Nelson, Jr.  
Nelson Galbreath  
Attorney for American Whitewater  
25 E. Court Street, Suite 201  
Greenville, SC 29601

Georgia ForestWatch

## **List of Documents to be Made Part of the Administrative Record**

1. Affidavit of Max Gates (April 10, 2006)
2. Affidavit of Jim Barrett (March 30, 2006)
3. Defendants' Memorandum in Opposition to Plaintiff's Motion for Reconsideration of the Court's Denial of Temporary Injunctive Relief in the case of *American Whitewater, et al v. Tidwell*, No. 8:09-cv-02665-RBH (D. S.C. filed November 24, 2009).
4. Sumter National Forest, *Recreation Supply and Demand: The Sumter National Forest's Place in Outdoor Recreation in South Carolina*.
5. Tetra Tech, *Chattooga River History Project: Literature Review and Interview Summary* (August 25, 2006) (prepared for the US Forest Service).

I, Max Gates, being first duly sworn, depose and say:

1. I am a citizen and resident of Clayton, Georgia.
2. I am competent and have personal knowledge of the matters discussed herein.
3. I served as USDA Forest Service ("USFS") Forest Ranger for the Andrews Pickens District of the Sumter National Forest in the Walhalla, South Carolina office from 1961-1972.
4. I served as Resource Assistant District Ranger for the USFS Tallulah District of the Chattahoochee National Forest from 1972 to 1986.
5. During the course of my employment with the USFS from 1961 to 1986 and as a citizen that often used and still uses the Chattooga River for personal enjoyment, I had regular and consistent opportunity to observe the Chattooga River and its uses before and after its designation as a Wild and Scenic River.
6. During the course of my employment with the USFS, I regularly traveled to and observed other wilderness and park areas throughout the Southeastern and Northwestern United States.
7. During the course of my employment with the USFS, I was involved in the study as how best to manage the newly established Wild and Scenic River portion of the Chattooga River.
8. Prior to this period, users of the portions of the Chattooga River that are now designated as wild and scenic enjoyed an experience of solitude and enjoyment of nature that was unique in the Southeast.
9. Following the publishing of the Wild and Scenic River Study (1971) and the release of the movie *Deliverance* (1972), boating usage of the Chattooga River increased dramatically.
10. As boating usage increased, we in the USFS had to respond to a number of boating accidents on the river both above and below Highway 28. One group involved 15 to 20 boy scouts in canoes floating from Burrell's Ford. Two of the boys showed up at my house at midnight after becoming separated from the rest of the group. Each of the canoes had capsized and I do not believe we recovered any of the canoes. We simply did not have the resources at the USFS to monitor and regulate adequately all this usage above and below Highway 28.

11. As boating usage increased, we also had to respond to reports of conflicts between boaters and non-boaters. Many local non-boaters told me that they felt that boaters were intruding on their feeling of safety and solitude in areas long used by such non-boaters for camping, swimming, hiking, fishing and picnics. Some of these people responded by expressing their anger at boaters through verbal barbs, throwing stones, and even firing of gunshots. USFS and other law enforcement personnel had to break up a number of such confrontations.

12. I concluded that the increased boating usage presented a threat to the quality of wilderness experience available to non-boating users.

13. I, with other managers, concluded that the area of the Chattooga River being designated as a Wild and Scenic River should be divided into zones of usage so as to allow citizens reasonable use of the Wild and Scenic river while minimizing conflicts between user groups, maximizing the ability of the USFS to manage the resource, and preserving the unique natural qualities of the river that resulted in such designation.

14. We concluded that boaters should be allowed access to sections of the Wild and Scenic River (often referred to today as Sections 2 through 4) but that the portion above Highway 28 should be preserved for those who desire the solitude experience that all sections of the river formerly provided.

15. The USFS adopted these recommendations to zone use.

16. Following adoption of the zoning, there were many people drowned while floating the Chattooga. (I remember 19 people were drowned in the first three years alone) There were a number of conflicts between boaters and other users in the sections zoned for boating. However, the conflicts between boaters and other users gradually declined because of limited road access and the sheer number of floaters which discouraged other uses.

17. In my opinion, based on 25 years of professional forestry experience in the area and 40+ years of enjoying the use of the Chattooga River, the portion of the Chattooga River above Highway 28 is unique in the Southeast in terms of the quality of its wilderness solitude experience, and the quality of its wilderness hiking, nature watching, fly fishing and other outstanding recreational experiences.

18. In my opinion, based on my years of professional forestry experience in the area and my years of enjoying the use of the Chattooga River, lifting the ban on boating above Highway 28 will damage the unique wilderness solitude experience and quality of wilderness hiking, nature watching, fly fishing and other outstanding recreational experiences above Highway 28. Boaters already have access to the majority of the river and their usage of the river has impacted the quality of usage by non-boaters. Therefore it is fair to protect the interest in solitude and outstanding recreation experience of non-boaters in the remaining section. In short, something should be set aside for solitude and wilderness experience.

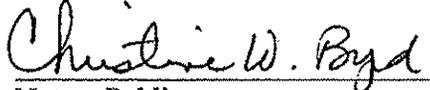
19. Finally, in my opinion based on 25 years of professional forestry experience in the area (that includes 14 years of responsibility for USFS law enforcement) and 40+ years of enjoying the use of the Chattooga River, the USFS would not be able to enforce adequately any rules for limited boating access above Highway 28.

Further, Affiant sayeth not.

  
Max Gates

Sworn to and subscribed before me

This 10<sup>th</sup> day of  
April, 2006.

  
Notary Public

My Commission Expires

~~My Commission Expires July 27, 2006~~

I, Jim Barrett, being first duly sworn, depose and say:

1. I am a citizen and resident of Rockport, TX.
2. I am competent and have personal knowledge of the matters discussed herein.
3. I served as USDA Forest Service ("USFS") title District Ranger for the Andrews Pickens Ranger District of the Sumter National Forest in the Walhalla, South Carolina office beginning in 1972. As such, I was responsible for timber, recreation, wildlife and general forest management in the district, including management of the portion of the Chattooga River that flowed through the District.
4. I served with USFS for six years in the USFS regional office in Atlanta. I then transferred to Louisiana and retired in 1987. Although I lived in the Atlanta area during this period I had regular opportunity to observe the Chattooga River and its uses before and after its designation as a Wild and Scenic River and still visit the river. I also had the opportunity during my 23 years of work with the USFS to travel to and observe forests and rivers throughout the Southeast.
5. During the course of my employment with the Andrew Pickens Ranger District, the UFS was conducting its study of the portions of the Chattooga River that were being considered for designation as a Wild and Scenic River and I had responsibility to assist with that study.
6. As part of its study, the USFS held a number of public forums to receive input from the general public, and various user interests and groups participated. We also discussed at these public forums proposed changes to the historic practices the USFS had used to manage the area, including the proposed zoning of the river for boating below Highway 28.
7. After much study and consideration of the public comments, we recommended and the USFS approved the use zoning that is still in place, and that I understand is currently being challenged.
8. In my opinion, based on 30 years of professional forestry experience in the Southeast and years of personal experience enjoying the Chattooga river
  - a. The portion of the Chattoga River above Highway 28 is unique in the Southeast in terms of the quality of its wilderness solitude experience, and the quality of its wilderness hiking, nature watching, fly fishing and other outstanding recreational experience;
  - b. lifting the ban on boating above Highway 28 will damage the unique wilderness solitude experience and quality of wilderness Hiking, nature watching, fly fishing and other outstanding

recreational experience above Highway 28. Boaters already have access to the majority of the river and their usage of the river has impacted the quality of usage by non-boaters. Therefore it is fair to protect the interest in solitude and outstanding recreation experience of non-boaters in the remaining section. In short, there is no legitimate, valid reason to allow boating from Burrells Ford to Highway 28, or from even further upriver as some suggest; and

- c. given its limited budget, the USFS has done an excellent job of managing the Wild and Scenic Area of the Chattooga River, having a bright line demarcation between boating and non-boating areas has made that job easier, and maintaining the existing status quo would help the USFS continue to manage this unique resource for the benefit of all users.

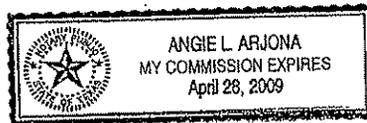
Further, Affiant sayeth not.

  
Jim Barrett

Sworn to and subscribed before me  
This 30 day of

March, 2006

  
Notary Public



My Commission Expires

4-28-09

IN THE DISTRICT COURT OF THE UNITED STATES  
FOR THE DISTRICT OF SOUTH CAROLINA  
ANDERSON DIVISION

AMERICAN WHITEWATER, AMERICAN )  
CANOE ASSOCIATION, GEORGIA )  
CANOEING ASSOCIATION, ATLANTA )  
WHITEWATER CLUB, WESTERN CAROLINA )  
PADDLERS, FOOTHILLS PADDLING CLUB, )  
Joseph C. STUBBS, Kenneth L. STRICKLAND, )  
and Bruce A. HARE, )

Plaintiffs, )

v. )

THOMAS TIDWELL, in his official capacity as )  
Chief of the United States Forest Service; the )  
UNITED STATES FOREST SERVICE, an agency )  
of the United States Department of Agriculture; )  
ELIZABETH AGPAOA, Regional Forester, )  
Southern Region, United States Forest Service; )  
MONICA J. SCHWALBACH, Acting Forest )  
Supervisor, Francis Marion and Sumter National )  
Forests; MARISUE HILLIARD, Forest )  
Supervisor, National Forests in North Carolina; )  
GEORGE M. BAIN, Forest Supervisor, )  
Chattahoochee -Oconee National Forests; )  
THOMAS VILSACK, in his official capacity as )  
Secretary of the United States Department of )  
Agriculture; the UNITED STATES )  
DEPARTMENT OF AGRICULTURE, )

Defendants, )

Civil Action No. 8:09-cv-02665-RBH

DEFENDANTS' MEMORANDUM  
IN OPPOSITION TO  
PLAINTIFFS' MOTION FOR  
RECONSIDERATION OF THE  
COURT'S DENIAL OF  
TEMPORARY INJUNCTIVE RELIEF

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Plaintiffs have filed suit seeking to have this Court take over management of the Chattooga Wild and Scenic River Corridor ("Chattooga"), which runs through three states and three national forests, prior to the Forest Service's final agency decision on appropriately amending three land and resource management plans to ensure proper management of the Chattooga. Contemporaneously with the filing of their complaint, Plaintiffs filed a motion seeking a temporary restraining order

and/or a preliminary injunction that would have immediately opened the upper one third of the Chattooga (“upper Chattooga”) to unlimited boating, and also for a finding that “the 2009 Amendment is Defendants’ final administrative action in this matter and that Plaintiffs’ claims are ripe for judicial review.”<sup>1</sup> This Court held an emergency telephone conference with the parties on October 15, 2009, and while the Court found that any filing by the plaintiffs of an administrative appeal will not constitute a waiver of their argument that the matter is ripe for judicial review, it denied all other relief pending a hearing on the requested preliminary injunction, which was not to be held earlier than late January of 2010. Memorandum Decision, Docket Entry 30.

Plaintiffs filed a motion for reconsideration on November 6, 2009, based on the Forest Service’s having now stayed the implementation of the 2009 amendments to the Forest Plans for the Sumter, Chattahoochee, and Nantahala National Forests. Docket Entry 35. According to Plaintiffs, the Forest Service’s granting of a stay amounted to a “drastic change in circumstances” justifying the Court’s revisiting its recent ruling on such short notice. Plaintiffs’ request for a reconsideration lacks merit and must be denied.

As a first point, the stay application must be put into context. Plaintiffs’ action in this Court is an attempt to avoid exhausting the administrative process, as the plaintiffs have not completed the required appeal of the administrative decisions. The United States will be filing a motion to dismiss this action based upon plaintiffs’ failure to exhaust administrative remedies and, as will be briefly explained below, the motion to dismiss will likely be granted. Plaintiffs are required to show a likelihood of success on the merits to be entitled to preliminary relief in a case. Munaf v. Geren, 128 S.Ct. 2207, 2218-2219 (2008); Amoco Production Co. v. Gambell, 480 U.S. 531, 542(1987). Since

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<sup>1</sup> Plaintiffs’ Memorandum in Support of Motion, Docket Entry 15-1 at 34-35.

this action is very likely to be dismissed as premature, this Court was correct to initially deny the plaintiffs preliminary relief on October 15, and that decision should not be disturbed by this motion.

In 1994, Congress added a mandatory exhaustion requirement for all administrative appeal procedures that are established by the Department of Agriculture (which includes the Forest Service) or are otherwise required by law. The mandatory exhaustion requirement appears in section 212(e) of the U.S. Department of Agriculture Reorganization Act of 1994,<sup>2</sup> and states:

(e) Exhaustion of Administrative Appeals

Notwithstanding any other provision of law, a person **shall** exhaust all administrative appeal procedures established by the Secretary or required by law before the person may bring an action in a court of competent jurisdiction against - -

- (1) the Secretary;
- (2) the Department; or
- (3) an agency, office, officer, or employee of the Department.

[Emphasis added.] This provision is codified at 7 U.S.C. § 6912(e). This provision was enacted by Congress after the Supreme Court issued its opinion in Darby v. Cisneros, 509 U.S. 137, 143-154 (1993), which held that exhaustion is generally not a prerequisite to APA review of otherwise final agency action unless specifically mandated by statute or agency rule. Exhaustion of administrative appeals is explicitly required by this provision.

The courts of appeals are split as to whether 7 U.S.C. § 6912(e) is jurisdictional. See Dawson Farms, LLC v. Farm Serv. Agency, 504 F.3d 592, 603-06 (5th Cir.2007) (discussing the views of the various circuits). This Court need not resolve the issue, though. Regardless of whether the statutory provision is jurisdictional, the explicit exhaustion requirement in § 6912(e) is, nonetheless, mandatory. McCarthy v. Madigan, 503 U.S. 140, 144 (1992) (“Where Congress specifically mandates, exhaustion is required.”); see also Bastek v. Fed. Crop Ins. Corp., 145 F.3d 90, 94-95 (2d

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<sup>2</sup> Pub.L. 103-354, Title II, § 212, Oct. 13, 1994, 108 Stat. 3210.

Cir.1998) (noting that § 6912(e) “unambiguously required plaintiffs to exhaust their administrative remedies before bringing suit, and their failure to do so deprived them of the opportunity to obtain relief in the district court”); Forest Guardians v. U.S. Forest Service, 579 F.3d 1114, 1121 (10th Cir. 2009).

Even if the exhaustion requirement were not jurisdiction, and even if Congress had not mandated by statute that the administrative appeal process be followed before coming to court, and the exhaustion requirement therefor only prudential, this Court should still require the administrative appeal process to be completed. “[M]erely because exhaustion requirements are prudential does not mean that they are without teeth. Even prudential exhaustion requirements will be excused in only a narrow set of circumstances.” Wilson v. MVM, Inc., 475 F.3d 166, 175 (3d Cir. 2007). In the present case, it is clear that the underlying dispute involves complex issues. This is an additional reason why the administrative process should not be short-circuited, since “even where a controversy survives administrative review, exhaustion of the administrative procedure may produce a useful record for subsequent judicial consideration, especially in a complex or technical factual context.” McCarthy v. Madigan, 503 U.S. 140, 145-146 (1992). See Weinberger v. Salfi, 422 U.S. 749, 765 (1975) (exhaustion may allow the agency “to compile a record which is adequate for judicial review”); Association of Flight Attendants-CWA v. Chao, 493 F.3d 155, 159 (C.A.D.C. 2007).

This action is therefor not properly in this Court at this time. However, even if this action were appropriately in this Court at this time, the plaintiffs’ motion for reconsideration should still not be granted, for the reasons discussed below.

To being with, the memorandum in support of the plaintiffs’ motion makes three statements in support of their contention that the stay the agency issued is invalid: “The Stay was not issued by

the proper USFS officer, the USFS did not consider Plaintiffs' objections, and the USFS failed to provide sufficient reasoning for its decision to grant the Stay."<sup>3</sup> All three statements are incorrect.

In regard to the authority of the issuing officer, the plaintiffs analyze the Optional Appeal Procedures Available During the Planning Rule Transition Period ("Optional Appeal Procedures") as (1) requiring the "reviewing officer" to issue the stay and (2) requiring that the reviewing officer be the line officer one administrative level above the deciding officer, and plaintiffs then assert that the Regional Forester is the line officer above the deciding officials (who were all Forest Supervisors) and thus the only one who could issue the stay. According to the plaintiffs, since the Deputy Regional Forester issued the stay, it is invalid. However, in doing so, the plaintiffs ignore the plain language of the Optional Appeal Procedures, which provides in its definitions that:

*Forest Service line officer* is the Chief of the Forest Service or a Forest Service official who serves in a direct line of command from the Chief and who has the delegated authority to make and execute decisions under this procedure. Specifically, for the purposes of this procedure, a Forest Service employee who holds one of the following offices and titles: forest supervisor, deputy forest supervisor, regional forester, deputy regional forester, deputy chief, associate deputy chief, associate chief, or the Chief of the Forest Service.

Optional Appeal Procedures at 2 (emphasis added via underline). The deputy regional foresters are thus specifically designated as "Forest Service line officers" and, as they are one administrative level above the deciding officers in this case, they are appropriate reviewing officers.

Plaintiffs' second contention, that the Deputy Regional Forester failed to consider information in a letter plaintiffs sent to him in response to the stay request, is also incorrect, or, to be more precise, misleading. The letter from plaintiffs was received by the Deputy Regional Forester after he had issued the stay. He could hardly have considered information he had not received at the

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<sup>3</sup> Plaintiffs' Memorandum in Support, Docket Entry 35-1 at 5.

time he issued the stay.<sup>4</sup> Even if the Deputy Regional Forester had received the letter before issuing the stay, the plaintiffs cite no authority for their contention that the alleged failure to adequately consider the information they provided would have rendered the stay “invalid,” as opposed to, say, providing them with a basis for requesting the Deputy Regional Forester to reconsider his decision based on the additional information. Indeed, the plaintiffs do not even attempt in their motion to describe any information that was contained in their letter that the Deputy Regional Forester did not consider when granting the request stay (or, to be more precise, in granting a portion of the requested stay), much less how or why that information might have altered his decision.

Plaintiffs’ third ground for alleging that the stay is “invalid” is their displeasure with the Deputy Regional Forester’s description of his reasons for granting the stay, but the plaintiffs again cite no law to support their claim that a too cursory explanation of the reasons for the stay decision would render the stay “invalid.” Even if that were the law, the plaintiffs misrepresent the extent of the Deputy Regional Forester’s explanation. According to the plaintiffs, his explanation was nothing more than: “Due to the volume and complexity of issues raised in these appeals, I believe granting your stay request is the most prudent course of action.”<sup>5</sup> However, after discussing in his decision the grounds raised by Georgia Forest Watch in its stay application, the Deputy Regional Forester explained his reasoning in partially granting the Georgia Forest Watch stay request as follows:

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<sup>4</sup> Plaintiffs do admit that their letter objecting to the stay was dated the same day the stay was issued, but do not acknowledge that it was received after the stay was issued. The applications for stays, objections to stay requests and decisions on stay requests in regard to the administrative appeals at issue in this case are posted online at the Sumter National Forest web site: <http://www.fs.fed.us/r8/fms/sumter/resources/Chattooga.php>. That site notes that the plaintiffs’ letter was received after the stay was issued.

<sup>5</sup> Plaintiffs’ Memorandum in Support, Docket Entry 35-1 at 7.

Your request for stay regarding allowing boating between the confluence of Norton Mill Creek in North Carolina and Burrells Ford Bridge in South Carolina between December 1 and March 1 at flow levels of approximately 450 cfs or higher is granted. Pursuant to the Optional Appeal Procedures (Section 10(e)), I have considered the information you have provided and I have considered the effect that granting your stay request would have on preserving a meaningful appeal on the merits. A total of 5 administrative appeals have been filed. Each appeal raises issues that the Forest Service must review. Due to the volume and complexity of issues raised in these appeals, I believe granting your stay request is the most prudent course of action. The granting of this stay allows for a meaningful appeal process to proceed based on the merits of each issue raised by all of the appellants. Thus, the status quo is preserved until a decision is finalized on each of the appeals filed. This stay will remain in effect until the final administrative decision by the Department of Agriculture is made for each of the appeals.

The decisions at issue concern amendments to the three affected Forest plans and do not unilaterally authorize the construction of a parking lot. The parking lot project requires a separate site specific NEPA analysis and decision, which has already been initiated by the Nantahala-Pisgah National Forest. However, the planning process is not complete for this decision and no work has yet been authorized. Therefore, your request for stay on this project activity is denied. I do encourage you to participate in the opportunities for public input into the planning process for the parking lot project in the future.

My decision on your stay request does not prejudice the issues raised in your or others' project appeals. A meaningful review of all appeal issues will be conducted based on their merits, and independent of this stay decision. I encourage your continued involvement in local decisionmaking.<sup>6</sup>

The above is a well-reasoned, careful explanation of the decision on the stay request, which was required to be issued with some haste. Nor should the plaintiffs be heard to suggest that the Deputy Regional Forester's explanation is incorrect in stating that the administrative appeals involve a "volume and complexity of issues," as plaintiffs filed approximately 2,500 pages of materials in their initial filing with this Court on October 14, 2009. Even allowing for an excess of zeal on the part of the plaintiffs in collecting and filing materials they might have hoped to support their case

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<sup>6</sup> Letter from Ken S. Arney to Rachel S. Doughty, Exhibit B to Plaintiffs' Memorandum in Support, at page 2.

in this Court, this will likely not be a simple dispute to resolve. In addition, one may presume (based on their other conduct) that plaintiffs did not fully provide the Court with documentation of the opposing parties' positions on all the issues that will have to be considered during the administrative appeal, even given the 2,500 pages of material they have filed with the Court.<sup>7</sup>

The agency's granting of a stay to preserve the status quo pending the resolution of the five appeals that have been filed hardly amounts to a "drastic change in circumstances," since boating on the upper Chattooga has been continuously banned since 1978. On January 27, 1978, the Department of Agriculture issued a final rule amending 36 C.F.R. § 261.77 to prohibit boating on all portions of the Chattooga that lay within the national forests unless authorized by a permit from the Forest Service. 43 FR 3706. While the Forest Service has permitted boating on the lower two-thirds of the Chattooga, it has never permitted boating on the upper Chattooga. The only change resulting from the recently granted stay is the prevention of the 2009 plan modifications from taking immediate effect, plan modifications that plaintiffs contend are illegal and from which they have also filed an administrative appeal. Indeed, the plaintiffs have (somewhat confusingly) also asked for an administrative stay of the imposition of the 2009 plan modifications, though their request was denied.<sup>8</sup>

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<sup>7</sup> All five of the administrative appeals are available online at:  
<http://www.fs.fed.us/r8/fms/sumter/resources/Chattooga.php>

<sup>8</sup> The denial of the plaintiffs "stay" application is unsurprising, since in their request they asked for the abolition of all controls on boating on the Chattooga. Rather than proposing reverting to the status quo before the implementation of the 2009 plan modifications, the plaintiffs' stay application asked the reviewing officer to summarily restore boating access to the river to its status thirty years earlier, that is, essentially uncontrolled access to all portions of the river. The plaintiffs' stay application is available online at:  
<http://www.fs.fed.us/r8/fms/sumter/resources/documents/AmericanWhitewaterRequestForStay.pdf>

The 2009 plan, had it still been in effect on December 1, 2009, would have provided for limited boating on the upper Chattooga, on days when the river flowed above a certain level, which the Forest Service estimated would occur on approximately six days per year during a three-month period. While Plaintiffs now describe the loss of this limited boating on the upper Chattooga as a “drastic change in circumstances,” it should be recalled that in their memorandum in support of their original motion, the Plaintiffs denigrated the 2009 plan’s boating provisions: “Notably, the 2009 Amendment limits floating access to only seven of the nearly twenty-two miles of Headwaters (those seven miles remain separated from the lower Chattooga), for only three months of the year (during the winter), at only exceptionally high water levels.”<sup>9</sup>

In this lawsuit, Plaintiffs are seeking to judicially short-circuit the administrative process to benefit one group of citizens with one set of interests, while the Forest Service is attempting in its administrative process to carry out its legal obligation to accommodate the varying interests of different groups of citizens, while also preserving the upper Chattooga. Plaintiffs’ motion and memorandum adopts the passive voice in noting that the Forest Service “received a stay request,” without bothering to identify from whom that request was received. For all that the body of the plaintiffs’ motion and memorandum informs the Court, the stay request might have appeared by magic. The stay request was, however, submitted by an organization representing citizens who do not want any boating on the upper Chattooga. There have been five administrative appeals filed in regard to the 2009 proposed plan amendments, and four of the five appeals are by parties that are opposed (in varying degrees and in varying manners) to boating on the upper Chattooga. This

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<sup>9</sup> Plaintiffs’ Memorandum of Law in Support of Plaintiffs’ Motion for Temporary Restraining Order and Preliminary Injunction, Docket Entry 15-1 at 16-17.

situation is simply not a case of deranged Forest Service bureaucrats pursuing their own unexplained animus against whitewater boating. It is, rather, the result of conflicting viewpoints among citizen groups about the proper uses of the various sections of the Chattooga, being processed through the administrative system that Congress has established to resolve such disputes.

Plaintiffs have asked this Court to act on a preliminary relief basis by issuing a mandatory injunction that would undo thirty years of boating prohibition on the upper Chattooga. To do so would be an abuse of the standards for preliminary relief:

“Mandatory preliminary injunctions [generally] do not preserve the status quo and normally should be granted only in those circumstances when the exigencies of the situation demand such relief.” Wetzel v. Edwards, 635 F.2d 283, 286 (4th Cir.1980). That is to say, a mandatory preliminary injunction must be necessary both to protect against irreparable harm in a deteriorating circumstance created by the defendant and to preserve the court’s ability to enter ultimate relief on the merits of the same kind.

In re Microsoft Corporation Antitrust Litigation, 333 F.3d 517, 526 (4th Cir. 2003). While the Supreme Court has clarified the law regarding preliminary injunctions somewhat since the Microsoft Corporation case, in Winter v. Natural Resources Defense Council, Inc., 129 S.Ct. 365 (2008), the effect of the Winter case was to narrow the range of circumstances in which preliminary injunctions should be granted. Plaintiffs identified no urgent basis for the extraordinary relief of a mandatory preliminary injunction in either their voluminous initial filings or in their presentation to the Court on October 15, 2009, and none has been identified in the motion for reconsideration.

This Court should not intervene until the administrative process has been completed. Plaintiffs filed around 2,500 pages of materials with this Court on October 14, 2009, and asked the Court to overturn a thirty-year prohibition on boating on the upper Chattooga with a temporary restraining order. The audacity of that request, coupled with plaintiffs’ failure to be forthcoming

regarding the interests of other citizens who hold differing views on the proper management of the upper Chattooga, support allowing this conflict to be properly and completely developed through the established administrative process. In that regard, it should also be noted that Plaintiffs repeatedly misrepresent the Wild and Scenic River Study (“Study”) that was done in 1971. While Plaintiffs are correct in noting that the suitability of the Chattooga for boating was discussed in the Study, Plaintiffs fail to note the Study’s numerous description of other uses for the river. For example, “Trout fishing is excellent in the upper areas – marginal in the lower most reaches.” Study at 19. Even Plaintiffs recognize that boating was viewed as a minor potential use for the upper Chattooga until fairly recently, due to the level of expertise required to boat on that section with older equipment. Complaint ¶¶ 109-111.

The defendants’ deadline for responding to the Complaint is December 28, 2009, but, as noted above, the defendants anticipate filing a motion to dismiss before that time based on the failure of the plaintiffs to exhaust administrative remedies. It is entirely possible that the motion to dismiss will be fully briefed and ready for decision by the end of January, the earliest the Court had contemplated further entertaining the motion for a preliminary injunction, so both motions may well be dealt with at one time.

Since the administrative process will result in a resolution of the interests of all of the concerned citizens and will further provide this Court with a full administrative record, should any of the parties involved be aggrieved by the final administrative decision, it should be allowed to proceed. While the defendants will argue that this Court does not have the authority to interfere with the administrative process during the administrative appeals, it clearly should not do so in the context of the current motion for reconsideration.

There is no merit to plaintiffs' motion for reconsideration and it should be denied.

Respectfully submitted,

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Charleston, South Carolina

November 24, 2009

CERTIFICATE OF SERVICE

I hereby certify that I am an employee in the Office of the United States Attorney for the District of South Carolina, and on November 24, 2009, I served one true and correct copy of the forgoing document, in the above-captioned case, via the court's e-noticing system.

s/John H. Douglas  
John H. Douglas

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**Sumter National Forest  
South Carolina**

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# **Recreation Supply and Demand**

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The Sumter National Forest's Place in  
Outdoor Recreation in South Carolina



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## Executive Summary

This report assesses the current situation of the recreation use of the Sumter National Forest and to evaluate demand for recreation in the future. Several different sources of information will be used to complete this task. Wilderness supply and demand will be addressed in a separate document. This document will also be used in the revision of the Land and Resource Management Plan and provide a basis of information for responding to the recreation issues raised by the public.

Findings of this recreation supply demand include:

- South Carolina has diverse recreation opportunities and a wealth of natural resource settings in which to recreation. The Sumter National Forest provides a large part of those natural resource settings.
- The economic value of recreation produced by the Sumter National Forest is substantial. Recreation's economic effects and impacts are over 24 million dollars annually.
- There are hot spots of recreation on the Sumter National Forests including the Chattooga Wild and Scenic River. Use has increased within the river corridor and boater use on the river has increased steadily over the past ten years.
- South Carolina State Parks, adjacent National Forests, other federal agencies, and many local providers all provide pieces to the entire recreation picture of South Carolina.
- The Southern Appalachian Assessment identified that the majority of the more remote recreation settings lie on public lands, including the Sumter National Forest.
- Populations are increasing in South Carolina and other southern states. Population increases pressure the system of recreation facilities.
- People are living longer as well as remaining more active and healthier.
- The backlog of maintenance for recreation facilities on the Sumter National Forest is large. Volunteers, partners, cooperators and user groups all participate in the upkeep and reconstruction of recreation facilities.
- New recreation activities are emerging, including mountain biking, mountain and rock climbing. Fast growing sports can often overwhelm recreation programs and budgets.
- Recreationists are more likely to join groups of fellow recreationists and be more involved in recreation resource decisions than ever in the past.
- Recreation use increased about 4 ½ percent from 1987 to 1995 on the Sumter National Forest. The largest increase was on the Andrew Pickens Ranger District with an increase of 13 percent.
- The fastest growing recreational activity is birdwatching, with an increase of over 155% in number of people participating in that activity.

- In South Carolina the biggest percent of participation is walking (about 63% of South Carolinians walk), picnicking (45%), swimming (35%), fishing (31%) and birdwatching (24%).

Section  
**1**

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## **Introduction**

### **General Purpose**

This report is intended to assess the current situation of the recreation use of the Sumter National Forest and to evaluate demand for recreation in the future. Several different sources of information will be used to complete this task. This report will help determine if the supply of recreation opportunities are sufficient or if more/less and different opportunities are needed. Wilderness supply and demand will be addressed in a separate document.

The National Forests have played a large part in outdoor recreation for many years with over 191 million acres available throughout the United States. South Carolina has over 600,000 acres of National Forest, including both the Francis Marion National Forest (250,000 acres) and the Sumter National Forest (350,000 acres). This report will focus on the contributions that the Sumter National Forest makes to outdoor recreation in South Carolina.

The Sumter National Forest consists of three Ranger districts, the Enoree, Long Cane and Andrew Pickens. The Enoree is approximately 161,500 acres located in the central part of South Carolina. The Long Cane Ranger District is approximately 117,500 acres in the western part of South Carolina, bordering Georgia. The Andrew Pickens is approximately 79,500 acres located in the northeast corner of the state, bordering both Georgia and North Carolina.

The National Forests role in recreation includes traditional outdoor recreation opportunities. Included in this is primitive and developed camping, hunting, fishing, hiking and backpacking, horseback riding and OHV driving, as well as picnicking, sightseeing, nature watching, walking for pleasure and driving for pleasure.

### **Relationship with National Planning Analyses**

The Forest and Rangeland Renewable Resources Planning Act of 1974 (RPA), requires the USDA Forest Service to conduct an assessment of national level economic trends in renewable resources, including outdoor recreation, every ten years. The 1989 RPA Assessment of Outdoor Recreation and Wilderness (Cordell and other 1990) provided national estimates and projections of the demand for and supply of recreation trips in several activities. A five-year update of the RPA Assessment, Regional Demand and Supply Projections for Outdoor Recreation (English and other 1993), provided important regional projections of several recreation opportunities. South Carolina is included in the Southern Region in that update.

The National Survey on Recreation and the Environment (NSRE) is a multiple agency sponsored project implemented in the United States to help understand people's outdoor behaviors and interests. Specifically, this survey describes and explores the participation of people in the United States for a variety of outdoor recreation activities. The total

sample size of this survey was 17,220, making it the most comprehensive recreation database to date.

Estimates and projections of the wildlife and fishing were gathered from the 1991 National Survey of Fishing, Hunting and Wildlife Associated Recreation, South Carolina (US Department of the Interior, Fish and Wildlife Service and the US Department of Commerce, Bureau of Census). This survey has been conducted since 1955 and is one of the oldest and most comprehensive continuing recreation studies. The purpose of this study is to gather information on the number of anglers, hunters, and nonconsumptive participants in our country, as well as how often they participate and how much they spend on these activities. For the purpose of this report we will use the above mentioned survey to define supply and demand for hunting and fishing on the Sumter National Forest. For a complete description of hunting and fishing supply and demand, see Appendix E

### **Relationship with Regional Planning Analyses (Southern Appalachian Assessment)**

The Southern Appalachian Assessment (SAA) is an ecological assessment of the Southern Appalachian region. It describes conditions that goes beyond state, federal and private boundaries. Using this data allows managers to base decisions on the natural boundaries of ecosystems rather than on artificial boundaries of counties, states, or national parks or forests.

The Southern Appalachian Assessment is a collaborative effort among federal agencies, state agencies, universities, special interest groups and private citizens. All played a key role in the development of the assessment. Four reports as well as a summary report were produced. For the purposes of this supply and demand study, the Summary Report (Report 1 of 5) and the Social/Cultural/Economic Technical Report (Report 4 of 5) will be used. Please note, the SAA provides information for the mountain areas ( the Andrew Pickens Ranger District) of South Carolina (about 80,000 acres). Its conclusions and references do not cover the piedmont regions of the Sumter National Forest.

### **Relationship with Sub-Regional and Local Planning Analyses**

The State of South Carolina's Division of Park, Recreation and Tourism (PRT) has a large role in the outdoor recreation of the state. PRT manages 48 state parks and 5 historic sites across the state. To help them manage these resources, PRT conducts several studies to assess recreation issues, visitor preference as well as actual participation rates of over 44 activities. These studies include Participation in South Carolina State Survey, South Carolina Recreation Participation and Preference Study as well as the South Carolina Outdoor Recreation Plan (SCORP). These are excellent references for recreation participation as well as some specific activity information that is specific to South Carolina.

Another source for local recreation information is a report done specifically for the Sumter National Forest in South Carolina, (Outdoor Recreation in South Carolina and Its Surrounding Market Area, Cordell and other, 1996). This report, using the NSRE database focuses on the demographic profile of the South Carolina recreation user, a demographic profile of the participation patterns as well as trip and travel patterns.

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## National Forest Activities, Recreationists and Market Area

### Activities and Opportunities

The Sumter National Forest provides several recreation opportunities and activities.

Recreation opportunities are varied and include primitive, semi-primitive nonmotorized, semi-primitive motorized, roaded natural, rural and urban. The system by which the Forest Service classifies this spectrum of recreation opportunities is called the Recreation Opportunity Spectrum (ROS). This system of classifying lands into different opportunities helps land managers like the Forest Service manage the lands appropriately for the opportunities that are desired. These opportunities depend on, access, size of the area, remoteness of the area, what type of facilities are available and how the area is managed, as well as how much social interaction that a person may encounter. For a complete description of the ROS classes see Appendix A.

For instance, the SAA used a combination of the ROS and the Scenery Management System (SMS) to produce the landscape setting descriptors of primitive (natural evolving), semiprimitive (natural evolving, nonmotorized), semiprimitive (natural appearing or areas with high potential, nonmotorized and motorized), roaded natural (natural appearing), rural (forested), rural (partially forested). For further definition of these classifications see Appendix. There is no data in the SAA on the demand for each of the landscape character descriptors. Also, there is no data for the Piedmont districts of the Sumter National Forest. However, there are some general findings from the SAA report that could be useful in recreation management on the Sumter National Forest. These findings include:

- Some places are becoming crowded including 1) road corridors that parallel rivers and streams for fishing and dispersed roadside camping, 2) interconnected trail networks for mountain biking, horseback riding, off-road vehicle driving, and hiking 3) trail and road corridors for access to favorite places, such as waterfalls and scenic overlooks.
- Most of the remote settings in the SAA region lie on public land. The Great Smoky Mountain National Park is the only primitive setting in the Southern Appalachian Assessment (SAA) region.
- There are about 6 million acres of public land in the SAA region, about 80 percent of are in roaded-natural appearing or remote settings.
- Most rural settings are on private lands.

- A high density of recreation use occurs at the outer edges of mountain ranges on federal land, particularly in the southern portion of the Blue Ridge section. Large population centers such as Atlanta, GA, Knoxville, TN and Charlotte, NC may cause this pattern of use.

Recreation activities can take place in many different ROS classes. Recreation activity based information is tied to a specific activity, such as hunting or camping. There is often information on how far people drove, how much money they spent, how long they stayed as well as many other characteristics of the activity. The activities that we will focus on in this report include primitive and developed camping, day use activities such as swimming, picnicking, trail use like hiking and walking for pleasure, mountain biking, horseback riding, ORV driving and boating including canoeing/kayaking and motor boating.

### **Demographics of Recreating Publics**

Demographic characteristics of the recreating public are constantly changing. These changes such as the general aging of the population and overall population increases, changes in lifestyle, exhibited by growing concerns over "healthier" foods or the need for more exercise, and changes in the preferred activities of different groups all contribute to the dynamic character of the demand for outdoor recreational activities in the State. (Recreation Participation and Preference, 1994 Summary of Major Findings on South Carolina)

One of these trends is that the recreationists who live near public land in the SAA region have increased in both number and diversity. The Southern Appalachian Assessment region's population has grown and, for all recreating activities the percentage of the population that participates has grown or remained stable. Increasingly, older Americans and nonwhites are recreating outdoors. (SAA, Social/Cultural/Economic Technical Report) Statewide, people over 65 years of age and older has increased about 2 percent while other age groups have remained the same or decreased. The Pickens district even had a higher increase in people over the age of 65, about 3 percent. (Sumter National Forest Analysis of the Management Situation, 1996)

Population changes in the eastern piedmont was generally positive but less than 10 percent. Population changes in the western piedmont was not evenly distributed but ranged from a 25 percent population decrease in Edgefield County to a 39 percent increase in Laurens County. Many small towns in and around the Forest are losing population. In the western piedmont, in the 1980's nearly two-thirds of the incorporated towns lost population, in the eastern piedmont only one-fourth of the incorporated towns lost population.

Use by individuals who account for a majority of outdoor recreation activity has remained constant. The most active one-fourth of participants, who account for two-thirds of RVD's, is still predominately white, male, and under age 60. In the last 10 years, however, more women have become avid participants. (SAA, Social/Cultural/Economic Technical Report)

The average number of days or trips per participant has increased in the last 10 years. In addition, technological changes have made more activities available to more people. For instance, mountain biking does not appear as an activity in the 1982 national recreation survey. However, today it is one of the fastest growing recreation activities.

For the SAA region, the population will continue to increase, as will the participation by women and minorities. The proportion of participation over the age of 60 also is likely to continue to increase as the first wave of "Baby Boomers" retire in 10 to 20 years. As a result, the SAA report expects major growth in the less physically demanding activities, including pleasure driving, sightseeing, nature and cultural resources study, and developed camping. (SAA, Social/Cultural/Economic Technical Report) The Piedmont can expect to experience similar trends for recreating publics according to national projections.

For the South Carolina area, demographic information for both the Piedmont and the Mountains was reported from the *Outdoor Recreation in South Carolina and its Surrounding Market Area*.

Please note that the above survey included 71 different outdoor recreation activities, not just the small list we are focusing on in this study. The following is a general description of our recreating publics in the State of South Carolina. For more detailed information on demographics see the report *Outdoor Recreation in South Carolina and its Surrounding Market Region*.

**GENDER** Overall, more males participated in the activities surveyed than did the females. Males were the predominate participators in camping, all types of hunting and fishing.

**AGE** Participation rates drop as peoples' age increase. The youngest age category, 16 years old to 29 years old, participated the most in outdoor recreation activities. The oldest category of respondents, at least 50 years old, enjoyed walking, picnicking, gathering with family and sightseeing.

**RACE** Overall, more Caucasians participated in the activities in the survey. Caucasians greatly outnumbered non-Caucasians in such activities as day hiking, all types of camping and all types of fishing.

**EDUCATION** People with more education typically participated in outdoor recreation more than those with less education. In the case of hunting, people with some high school education participated more than others with more education.

**INCOME** The higher the family income the more times they participated in outdoor activities in general. For South Carolina, there did not seem to be a significant difference in participation levels between respondents in the highest income category and respondents earning between \$25,000 and \$50,000.

**NUMBER AND AGE OF FAMILY MEMBERS IN THE HOUSEHOLD** People living in homes with only one or two family members did not participate as much as people living in homes with more than two people. People with one child under the age of six participate more which is consistent with participation patterns of younger, more active Americans. People with more than two people over the age of sixteen participated more than households where there were only two or one adult over the age of sixteen.

**LEISURE HOURS AND RECREATION PARTICIPATION** The number of leisure hours available to people affects their participation in outdoor recreation activities. In South Carolina, retirees and the people over 50 years have the most time available to participate in outdoor activities. Generally, males report that they have more hours of leisure time available to them than do females. College graduates report that they have more time the participate than persons with less education. Also, the more people that

live in each household the fewer hours each person has time to participate. Household with one or more children under the age of six had the least amount of leisure time each week.

### **Market Area for the Sumter National Forest**

The location of the Sumter National Forest across the state of South Carolina makes it readily accessible to people in most of South Carolina as well as several surrounding states such as Georgia, North Carolina and Tennessee. To help determine recreation demand and supply it is necessary to decide what the market area is for your products (recreational activities). A market area defines the distance that people drive for certain recreational activities. In general the Sumter National Forest has a market area with three distinct segments.

One segment of the market area is the local users. The majority of recreational use is from the local users. These users are from predominately rural or small town environments. This would include towns like Union, Whitmire, Greenwood and Walhalla. Sometimes these local users may include some larger cities like Augusta/North Augusta, depending on how far the National Forest is to those cities. Another segment of the market area includes users that are about a ½ days travel or 1 tank full of gas from highly populated cities. This segment of users stretches from Atlanta, GA to Columbia, SC to Greenville, SC to Asheville, NC and even into Tennessee. Intermediate points between the highly populated cities to the forests make up the remaining segment of the market area. These points are about a two to three hour drive from the forest.

The market areas for specific activities in the Sumter National Forest are as follows: camping (125 mile market area), day use activities, (50 mile market area), fishing, (50 mile market area), hunting (50 mile market area), motorized boating, (50 mile market area), non-motorized boating, (150 mile market area), non-motorized trails, (150 mile market area) and sightseeing, (50 mile market area). The market area for the Sumter National Forest using a weighted average of the above activities is 81 miles.

To find the weighted average market area find the percentage of each activity based on the total RVD's for all the activities. Multiply that percentage by the number of miles that 66% of the people drive to participate in that activity (see above paragraph). Then average those weighted numbers to find the average market area.

<b>Activity</b>	<b>RVD's (1996)</b>	<b>%</b>	<b>Miles</b>	<b>Weighted Average</b>
Camping	183.5	21.8	125	27.25
Day use	54.2	6.4	50	3.20
Driving	124.8	14.9	50	7.45
Nature study	16.7	2	50	1.00
Motorized boating	16.5	2	50	1.00
Nonmotor. boating	68.5	8.2	125	10.25
Motor. trails	30.3	3.6	50	1.80

Section  
**3**

## **Recreation Supply and Demand**

### **Statewide Recreation Supply**

The public recreation supply encompasses all lands, waters and developments which are available to the public under any circumstances and which have not been designated for residential, commercial, industrial, or other such uses that exclude recreation (Cordell et al. 1990).

The 1989-90 *Public Recreation Facility Inventory* identified 1,050,366 acres of recreation facilities and resources within the state. The South Carolina State Park system includes 48 state parks on 81,000 acres. The South Carolina Forestry Commission manage three state forests in South Carolina, Sand Hills State Forest, Manchester State Forest, and Harbison State Forest, over 65,500 acres in total. The Department of Natural Resources manages 1.3 million acres of designated wildlife management areas in the state. These lands are a combination of public and private lands. The South Carolina Department of Natural Resources also manages 43 state heritage preserves throughout the state.

South Carolina contains 6 National Park sites and six National Wildlife Refuges totaling over 120,000 acres. The US Army Corps of Engineers manages 325,000 acres of land and water along the Savannah River including three large lake projects, Lake Hartwell, Lake Russell and Lake Thurmond.

There are many county recreation commissions and some of them offer recreation opportunities that are similar to those offered on the National Forest, like picnicking as well as more urban activities like basketball, tennis, soccer and playgrounds.

South Carolina also has a vast amount of private recreation facilities. Because there is not a database available for these sites they were not considered in depth in this study. It can be noted that the Forest Service typically does not compete with private recreation facilities and often offers different opportunities and experiences. However, on occasion there is some overlap.

### **Sumter National Forest Recreation Supply**

The Enoree Ranger District is located in central South Carolina, between Spartanburg and Columbia. Rose Hill State Park is located in the middle of the district.

The Enoree Ranger District has a very rural setting with National Forest lands interspersed with pastured lands, crop lands, industrial timberlands, and small communities. National Forest lands in this area are not consolidated and often are adjacent to private lands. The recreation resources include campgrounds and primitive camps, rifle ranges, trails for a variety of uses (including off-highway vehicle use),

interpretive opportunities, hunting and several recreational fishing lakes. The Palmetto Trail will traverse this district when it is complete.

The **Long Cane Ranger District** is located on the western edge of the state. There are several state parks located within the Forest boundaries, including Baker Creek State Park, Hamilton Branch State Park and Hickory Knob State Park. Also, there are several Corps of Engineer projects along the Strom Thurmond Lake which borders the district to the west. A state scenic highway (State Highway 28/81) runs through the district. Also, the National Heritage Corridor also runs through the district.

The Long Cane Ranger District also has a rural setting and an unconsolidated land base. Small towns and communities dot the landscape. Forested lands, pastures and private residences and industrial timberland coexist. The recreation resources on this district include two developed campgrounds, primitive camps, rifle ranges, trails for a variety of uses, including off-highway vehicles, interpretive opportunities, hunting and fishing opportunities.

The **Andrew Pickens Ranger District** is located in the northwest corner of the state. There is one state park within the forest boundaries, Oconee State Park. Another large state park, Devils Fork State Park is located just a few miles to the east of the forest. This district is located on the state line for North Carolina, South Carolina and Georgia and borders both the Chattahoochie National Forest and the Nantahala. These National Forests also provide recreation settings and opportunities that affect recreation supply in the area.

The Andrew Pickens Ranger District is also rural in nature. Apple orchards and small residential complexes are common sights. The district's land base is much more consolidated either the Enoree or Long Cane Ranger Districts. Forested land dominates the landscape with some occasional private lands. The recreation resources include two developed campgrounds, some primitive camps, several types of trails, including the Chattooga Wild and Scenic River, a rifle range, hunting and fishing opportunities. Hotspots on this district include the recreation use associated with the Chattooga Wild and Scenic River. The river is one of the main attraction of this area and people flock to see it.

### **Developed Recreation Capacity**

The Forest Service defines the capacity of its developed recreation sites as being the number of "people at one time" the site can support. There are about 50 developed sites currently managed by the Sumter National Forest. (This includes PAOT's from primitive camping, developed camping, picnicking, swimming, rifle ranges, and boat ramps.) These sites have a combined PAOT capacity of 3,941 and a capacity of 297,609 RVD's. For the detailed information see Appendix C.

### **Dispersed Recreation Capacity**

The Sumter National Forest is open to the public for dispersed recreation use on its entire 350,000 acres. Most of the Sumter National Forest is in a wildlife management area (WMA) and available for hunting. Trail usage, hunting, boating, fishing and nature viewing are all dispersed recreation activities. There are over 300 miles of various trails on the Sumter National Forest, including hiking, canoe, horseback riding, OHV driving and others. Trail capacity for the Sumter National Forest is 5,212 PAOT's and 276,811 RVD's.

The practical maximum capacity for dispersed recreation on the Sumter National Forest is approximately 85,107,832 million RVD's. This capacity is based on supply for each individual ROS class. For the detailed information see Appendix D.

## Recreation Use

Recreation use figures for the Sumter National Forest, as with all National Forest are accurate for some sites and not accurate for other sites. National Forests are typically very large with often unconsolidated land bases with many miles of roads. This ease of access for the public makes it very difficult in some areas to accurately count the recreation use. Some areas require the recreationist to pay a fee to use the facility. In those cases, the Forest Service may have a much better idea on the amount of use.

The Forest Service must rely on trained personnel that are familiar with the areas and with the local users to gather the use information that is needed. The database system used by the Forest Service to record recreation use by activity is known as the Recreation Information Management System (RIM). The RIM inventory tracks 61 different activities, not all are found here on the Sumter National Forest. Currently, this database is considered the most comprehensive and representative of past and current recreation use on the Forest. In the RIM database, recreation use is measured in RVD's. A formula can then be applied to convert RVD's to visits. For more detailed use information see Appendix C.

The total number of RVD's on the Sumter National Forest was 788,300 in 1987 and increased to 824,700 in 1995. This represents an increase of about 4 ½ percent. For the Andrew Pickens Ranger District it has increased from 272,900 RVD's in 1987 to 311,100 RVD's in 1995, a 13 percent increase. The Enoree/Tyger Ranger District has increased from 270,600 RVD's in 1987 to 303,500 RVD's in 1995, a 10 percent increase. The Long Cane Ranger District's use has declined from 244,800 RVD's in 1987 to 210,100 RVD's in 1995.

Historically, dispersed use on the Sumter National Forest accounts for about 75 percent of all the recreation use on the Forest. Driving for pleasure, hunting, camping, and hiking/walking are the biggest activities.

Camping on the Sumter National Forest has been steady over the last 10-15 years. The heaviest use on the weekends and during peak hunting season. The development level of most Forest development is low to moderate. There are no Forest developed campgrounds with electric, water or sewer hookups. Some toilet facilities have been refurbished and made accessible. Some primitive hunt camps have been upgraded and showers have been added.

Rifle ranges have been made accessible and use at the majority of them remains moderate to high.

Use on trails has increased on the forest for all types of activities, including hiking, horseback riding and OHV driving. Mountain biking has grown substantially in popularity and use. OHV driving use has also grown.

Trails, in general, in South Carolina have become more publicly recognized. The Palmetto Trail is a statewide trail that traverses the entire state of South Carolina, from the mountains to the sea. Two sections of this trail will cross the Sumter National Forest.

One portion will cross the Enoree Ranger District and one section will be on the Andrew Pickens Ranger District.

The concept of hot spots was introduced in the Southern Appalachian Assessment and are identified as areas where observed capacities are frequently reached during peak times of the year. All hot spots have some special attractions, for instance the Chattooga Wild and Scenic River. While it may be desirable to try to divert some existing use to other portions of the Forest, it is unlikely the increasing demand on these sites will be reduced and other portions of the Forest will remain underused. Some hot spots has have frequent, repeat visitors that have become attached to a certain place through a history of use. When an attachment develops, people are less willing to substitute other settings because the meaning of a special place is not interchangeable or reproducible.

### Demand on the Sumter National Forest

The RPA, as discussed earlier, made some generalized projections for certain recreation activities. These projections take into account the projected increase in population as well as the anticipated participation rates for the Southern Region. The following is the base year 1987 and using an index from the RPA the number of RVD's expected in 2040 for each of the activities that this study focuses on.

Activity	1987 RVD's	2040 RVD's
Primitive Camping	54,600	70,980
Dev. Camping	103,700	194,950
Horseback Riding	16,100	24,150
Day Hiking	40,800	82,000
Walking	6,900	12,000
Bicycling	2,170	3,290
OHV Driving	23,500	26,550
Pleasure Driving	156,100	209,170
Sightseeing	26,200	40,870
Picnicking	29,500	42,770
Canoeing/Kayaking	62,200	96,410
Swimming	16,200	24,460
Motor boating	17,600	22,350

*Recreation  
Visitors Day*

The following is the comparison of the current capacity for each of those activities and the demand in 2040. There is either enough supply to handle the expected demand or there is a gap, where there will not be enough supply.

Activity	Capacity in (RVD's)	2010 Demand in (RVD's)	2040 Demand in (RVD's)
Prim. Camping	136,069	60,606	70,980
Dev. Camping	113,575	136,884	194,950
Horseback Riding	90,638	19,642	24,150
Day Hiking/Walking	92,883	63,412	94,000
Bicycling	4,305	2,176	3,290
OHV Driving	10,129	24,205	26,550
Pleasure Driving	NA	174,832	209,170
Sightseeing	NA	30,654	40,870
Picnicking	19,960	33,335	42,770
Canoeing/Kayaking	78,856	73,396	96,410
Swimming	9,353	18,468	24,460
Motor boating	NA	19,184	22,350

There is already more use on some resources than the forest has the ability to provide. Canoeing, rafting and kayaking use on the Chattooga River is an example where facilities and resources are being stretched to capacity.

There is sufficient supply of all activities except developed camping, OHV driving, picnicking and swimming for the year 2010. In the year 2040 there is enough capacity for all activities except swimming, OHV riding, developed camping, picnicking as well as hiking/walking.

The role of the Sumter National Forest in providing for activities that require a large land base will become more important as other opportunities decline on private lands. The forest has had a role in providing some developed opportunities but some of this demand is met through local and state government opportunities and increased opportunities by the private sector.

There is an increasing demand for forest setting and facilities near population centers. This demand and use is expected to increase since all districts are within an hour of a population center.

### **Social Benefits and the Economic Value of Outdoor Recreation**

High quality recreation experiences provide users of the National Forests with many social benefits to individuals and to society as a whole in the form of enjoyment, increased self-esteem, better health and fitness, etc. People are willing to pay for these activities and experiences in many ways such as purchasing equipment, supplies, lodging

and paying for outfitter services and entrance fees. The 'willingness to pay' depends on the type of activity is usually measured in terms of the amount of money an individual is willing to spend on a trip to participate in a certain activity. The RPA values for recreation are based on a similar idea of market clearing prices and consumer surplus.

Activity	RPA Value* (\$)	1996 Use (M's)	Total Value (\$)
Camping	10.14/RVD	183.5 RVD's	1,860,690
Day Use	10.14/RVD	54.2 RVD's	549,588
Driving for Pleasure	7.73/RVD	124.8 RVD's	964,704
Motor. Boating	3.41/RVD	16.5 RVD's	56,265
Nonmotor. Boating	3.41/RVD	68.5 RVD's	233,585
Motor. Trail Use	7.73/RVD	30.3 RVD's	234,219
Nonmotor. Trail Use	3.41/RVD	75.1 RVD's	256,091
Hunting			
big game	33.00/WFUD	122.7 WFUD's	4,050,222
small game	34.00/WFUD	16.6 WFUD'S	565,658
waterfowl	53.00/WFUD	11.6 WFUD'S	614,906
other game	33.00/WFUD	5.2 WFUD'S	173,382
Fishing			
coldwater	40.00/WFUD	87.8 WFUD'S	3,514,000
warmwater	75.00/WFUD	36.1 WFUD'S	2,708,625
Nonconsumptive uses	39.00/WFUD	142 WFUD'S	5,538,663
<u>Other Uses</u>	<u>61.43/RVD</u>	<u>52.4 RVD's</u>	<u>3,218,932</u>
TOTAL			\$ 24,539,530

\*Based on Market Clearing Prices (1990 RPA, Appendix B, Table B.5 and Table B.6).

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## Participation Rates and Trends

### Recreation Use Trends

The NSRE gives us an excellent start to user preference and participation rates. This study with over 17,000 participants will be the most extensive to date. The following list gives us the percentage of population (16 years old and older) in the United States that participate in several outdoor activities. Also, it gives us the total number of people that participate in this activity. This reflects the entire country and regional differences in participation rates do exist. Although the study looked at many activities the only ones that we will utilize will be the ones that the National Forest can provide.

<i>Activity</i>	<i>Percentage of Pop.</i>	<i>Number of People (millions)</i>
Biking	28.7	57.4
Bird-watching	27.0	54.1
Wildlife Viewing	31.2	62.6
Fish Viewing	13.7	27.4
Sightseeing	56.6	113.4
Camping, overall	26.3	52.8
Camping, dev.	20.7	41.5
Camping, primitive	14.0	28.0
Hunting, overall	9.3	18.6
Hunting, big game	7.1	14.2
Hunting, small game	6.5	13.0
Hunting, migr. bird	2.1	4.3
Fishing, overall	28.9	57.8
Fishing, freshwater	24.4	48.8
Fishing, warmwater	20.4	40.8
Fishing, coldwater	10.4	20.8

Canoeing	7.0	14.1
Kayaking	1.3	2.6
Floating, rafting	7.6	15.2
Motorboating	23.5	47.0
Lake/river swimming	39.0	78.1
Hiking	23.8	47.8
Backpacking	7.6	15.2
Off-road driving	13.9	27.9
Horseback riding	7.1	14.3

Now that we have the general picture of the outdoor recreation in the United States it is good to know the trends for some of those activities. The NRSE data was compared to another National Recreation Survey (NRS) done in 1982-1983. This will show what the percent change for some activities. (Note: not all activities were included in the 1982-1983 NRS therefore some activities cannot be compared.)

<i>Activity</i>	<i>Percent Change in Participation</i>
Bicycling	+1.6
Horseback Riding	-10.1
Motorboating	+39.9
Lake/river swimming	+38.2
Fishing	-3.8
Hunting	-12.3
Hiking	+93.5
Walking	+42.8
Bird watching	+155.2
Picnicking	+15.9
Off-Road Driving	+43.8
Camping, overall	+24.5
Camping, dev.	+38.3
Camping, prim.	+58.2

Backpacking +72.7

Using this as base information shows the large-scale trends in outdoor recreation but does not give us the local picture. The NRSE database was then utilized to run a specific study for the National Forests in South Carolina. This study gives us the state level information that help us understand the local recreating publics and their needs. The list below shows the percent of people participating in several outdoor recreation activities for the South Carolina market region.

<b>Activity</b>	<b>SC Percent Participating</b>
Bicycling	22
Horseback Riding	7
Motorboating	23
Lake/river swimming	35
Fishing	31
Hunting	9
Hiking	18
Walking	63
Bird watching	24
Picnicking	45
Off-Road Driving	14
Camping, overall	21
Camping, dev.	16
Camping, prim.	12
Backpacking	7

The State of South Carolina conducts user participation and user preference studies periodically. These studies help determine the extent of their participation in a variety of recreational activities as well as what activities people prefer to do. There were similar studies done in 1979, 1984, and 1990 which aides in comparison and trends. These participation rates were similar to the NSRE study information mentioned above.

Preference rates refer to what kinds of activities in which they would most like to participate. In the 1994 survey, the recreational activity preferred by the largest percentage of these interviewed was playing ball followed by fishing, swimming and walking for pleasure. For more detailed discussion of user preferences in South Carolina see the report *Recreation Participation and Preference, 1994 Summary of Major Findings in South Carolina*.

strenuous activities including backpacking, bicycling hiking and swimming. (English, Betz, Young, Bergstrom and Cordell, RM-230)

These trends have caused an overall pressure on the recreation resources that the Sumter National Forest has available. The growing tourism industry, promoted by many county governments, looks at recreation as a means for economic diversity, providing jobs and boosting the economy.

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Section  
**6**

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## Appendix A

### Recreation Opportunity Spectrum (ROS) Classes

The Recreation Opportunity Spectrum (ROS) includes several classes. A general description of these follows.

- **Primitive** - Area is characterized by essentially unmodified natural environment of fairly large size. Interaction between users is very low and evidence of others is minimal. The area is managed to be essentially free from evidence of human-induced restrictions and controls. Motorized use within the area is not permitted.
- **Semi-Primitive Nonmotorized** - Area is characterized by a predominately natural or natural-appearing environment of moderate-to-large size. Interaction between users is low, but there is often evidence of other users. The area is managed in such a way that minimum on-site controls and restrictions may be present, but are subtle. Motorized use is not permitted.
- **Semi-Primitive Motorized** - Area is characterized by a predominately natural or natural-appearing environment of moderate-to-large size. Concentration of users is low, but there is often evidence of other users. The area is managed in such a way that minimum on-site controls and restrictions may be present, but are subtle. Motorized use is permitted.
- **Roaded Natural** - Area is characterized by predominately natural-appearing environments with moderate evidence of the sights and sound of man. Such evidences usually harmonize with the natural environment. Interaction between users may be low to moderate, but with evidence of others users prevalent. Resource modification and utilization practices are evident, but harmonize with the environment. Conventional motorized use is provided for in construction standards and design of facilities.
- **Rural** - Area is characterized by substantially modified natural environment. Resource modification and utilization practices are to enhance specific recreation activities and to maintain vegetative cover and soil. Sights and sounds of humans are readily evident, and the interaction between users is often moderate to high. A considerable number of facilities are provided for special activities. Moderate densities are provided far away from developed sites. Facilities for intensified motorized use and parking are available.
- **Urban** - Area is characterized by a substantially urbanized environment, although the background may have natural-appearing elements. Renewable resource modification and utilization practices are to enhance specific recreation activities. Vegetative cover is often exotic and manicured. Sights and sounds of humans, on-site, are predominant. Large numbers of users can be expected, both on-site and in

nearby areas. Facilities for highly intensified motor use and parking are available with forms of mass transit often available to carry people through the site.

The following is a list of the ROS classifications for the Sumter National Forest based on the 1985 Land and Resource Management Plan:

<b>ROS Class</b>	<b>Acres</b>
Rural	275,631
Roaded Natural	67,324
SPNM	7,716
SPM	8,741

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## Appendix B

### Landscape Setting Descriptors

Two systems were combined to determine the amount and types of settings across the Southern Appalachian Assessment Area. The Recreation Opportunity Spectrum (ROS) provides setting descriptors that integrate the social, physical, and managerial characteristics to classify the landscape. The Scenery Management System (SMS) accounts for natural and cultural systems and their influence on the landscape. By combining the two systems, landscape setting descriptors were developed which included both recreation and scenery components.

- **PRIMITIVE-Naturally Evolving**

This setting is characterized by a high degree of remoteness and relatively few contacts with other people. A naturally evolving landscape predominates. Only the highest ridges of the Great Smoky Mountains meet these criteria.

- **SEMIPRIMITIVE-Naturally Evolving (Non-motorized)**

This setting is characterized by a high degree of remoteness and a naturally evolving landscape such as is found in designated wilderness, wild and scenic rivers, or parts of national parks where human influence is minimal.

- **SEMIPRIMITIVE-Natural Appearing or Areas with High Potential (Nonmotorized and Motorized)**

This setting is characterized by a high degree of remote or the potential for a high degree of remoteness and a predominantly natural appearing landscape. Some areas may be accessible by the low-standard roads.

- **ROADED-Natural Appearing**

This setting is characterized by a predominantly natural appearing forested landscape with access by moderate standard roads (sometimes a gravel surface). Some areas are classified as naturally evolving if they are within wildernesses, wild and scenic rivers corridors, or parts of national parks. This setting occurs primarily on public land but may also occur on private land.

- **RURAL-Forested**

This setting is characterized by a culturally influenced landscape with forest cover. Structures may be present but usually occur in clusters. This setting occurs on public and private land.

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## Appendix C

### Developed Recreation Capacity

The developed recreation capacity will be calculated for the following activities, primitive and developed camping, horseback riding, OHV riding, canoeing/kayaking, day hiking/walking for pleasure, swimming, picnicking, rifle ranges, boat ramps and bicycling. The following activities will not be calculated pleasure driving and sightseeing due to the generalized nature of the activity.

The practical maximum capacity represents a realistic or practical number of visitors and factors in weekend versus weekday use, length of stay, etc.

The formula to find the practical maximum capacity is:

$$RVD = \frac{PAOT \times MS \times PU \times LOS}{12}$$

12

Where:

PAOT = People at one time that can comfortably occupy or use an area or facility.

MS = Managed season of use, this is given in days.

PU = This is the pattern of use, the relationship between average weekend use and average weekday use of sites.

LOS = Average length of stay for each activity

12 = This constant for conversion is used because all RVD's are reported in 12 hour increments.

The current PAOT capacity for the above mentioned activities is found below.

#### DEVELOPED FACILITIES

Activity	PAOT's	RVD Capacity
Primitive Camping	1845	136,069
Dev. Camping	770	113,575
Picnicking	525	19,960
Swimming	430	9,353
Rifle Ranges	140	3,194
Boat Ramps	231	15,458

<b>Dev. Facilities Total</b>	<b>3,941</b>	<b>297,609</b>
<b>TRAIL CAPACITIES</b>		
Horseback Riding	1386	90,638
OHV Driving	185	10,129
Day Hiking/Walking	1740	92,883
Bicycling	149	4,305
Canoe	608	40,685
White Water Kayak	1,144	38,171
<b>Trail Capacity Total</b>	<b>5,212</b>	<b>276,811</b>

The following are the calculations for finding the PAOT and RVD capacity for the developed activities on the Sumter National Forest:

PRIMITIVE CAMPING

PAOT for Prim. Camping = 1845

RVD Capacity for Prim. Camping = 1845 X 150 X .50 X 11.8

12

= 136,068

DEV. CAMPING

PAOT for dev. camping = 770

RVD capacity for dev. camping = 770 X 300 X .50 X 11.8

12

=113,575

PICNICKING

PAOT for picnicking = 525

RVD capacity for picnicking = 525 X 365 x .50 X 2.5

12

= 19,960

SWIMMING

$$\begin{aligned} \text{PAOT for swimming} &= 430 \\ \text{RVD Capacity for swimming} &= \underline{430 \times 180 \times .50 \times 2.9} \\ &12 \\ &= 9353 \end{aligned}$$

RIFLE RANGES

$$\begin{aligned} \text{PAOT for rifle ranges} &= 140 \\ \text{RVD Capacity} &= \underline{140 \times 365 \times .50 \times 1.5} \\ &12 \\ &= 3,194 \end{aligned}$$

BOAT RAMPS

$$\begin{aligned} \text{PAOT for boat ramps} &= 231 \\ \text{RVD Capacity} &= \underline{231 \times 365 \times .50 \times 4.4} \\ &12 \\ &= 15,458 \end{aligned}$$

The following provide the capacity for trail opportunities on the Sumter National Forest. These are not included in the capacity for developed capacity.

HORSEBACK RIDING

$$\begin{aligned} \text{PAOT for Horseback Riding} &= 7 \text{ groups per mile} \times 3 \text{ people per group} \times \text{miles} \\ \text{of trail} & \\ &= 21 \times 66 \\ &= 1386 \\ \text{RVD Cap. For Horseback Riding} &= \underline{1386 \times 365 \times .50 \times 4.3} \\ &12 \\ &= 90,638 \end{aligned}$$

### OHV DRIVING

PAOT for OHV Driving = 4.5 riders per mile X miles of trail

$$= 4.5 \times 41$$

$$= 185$$

RVD Capacity for OHV Driving = 185 X 365 X .50 x 3.6

$$12$$

$$= 10,129$$

### HIKING/WALKING

PAOT for Hiking/Walking trail = 5 groups per mile X 3 people per group X miles of trail

$$= 5 \times 3 \times 116$$

$$= 1740$$

RVD Capacity for Hiking/Walking = 1740 X 365 X .45 X 3.9

$$12$$

$$= 92,883$$

### BICYCLING

PAOT for Bicycling = 4.5 riders X miles of trail

$$= 4.5 \times 33$$

$$= 149$$

RVD Capacity for bicycling = 149 X 365 X .50 X 1.9

$$12$$

$$= 4,305$$

### CANOEING

PAOT for canoeing of trail = 4 canoes per mile X 2 people per canoe X miles\*

$$= 4 \times 2 \times 76$$

$$= 608$$

$$\text{RVD Capacity for canoeing} = \frac{608 \times 365 \times .50 \times 4.4}{12}$$

$$12$$

$$= 40,685$$

\* This does not include the canoe/kayak trail on the Chattooga River.

#### White Water Kayaking

$$\text{PAOT for kayaking} = (8 \text{ kayaks} \times 1 \text{ person per kayak} + 6 \text{ rafts} \times 6$$
  
$$\text{persons per raft}) \times \text{miles of trail}$$

$$= (8 + 36) \times 26$$

$$= 1144$$

$$\text{RVD Capacity for kayaking} = \frac{608 \times 182 \times .50 \times 4.4}{12}$$

$$12$$

$$= 38,171$$

The RVD capacity of whitewater rafting is added to the RVD capacity for canoeing to get the total canoeing/whitewater rafting RVD capacity (40,685 + 38,171) of 78,856.

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## Appendix D

### Dispersed Recreation Capacity

#### Practical Maximum Dispersed Capacity

The practical maximum capacity for dispersed recreation on the Sumter National Forest is approximately 85,386,789 million RVD's per year and 233,936 RVD's per day using the following formula:

$$\text{RVD's} = \text{PAOT} \times \text{MS}$$

Where:

PAOT = Acres per ROS class X Coefficient by ROS class

MS = Managed Season of Use (365 days)

#### RURAL

$$\begin{aligned} \text{PAOT (Rural)} &= .83 \times 275,631 \text{ acres} \\ &= 228,773.73 \end{aligned}$$

$$\begin{aligned} \text{RVD's (Rural)} &= 228,773.73 \times 365 \\ &= 83,502,411 \end{aligned}$$

#### ROADED NATURAL

$$\begin{aligned} \text{PAOT (Roaded Natural)} &= .06 \times 67,324 \text{ acres} \\ &= 4,039.44 \end{aligned}$$

$$\begin{aligned} \text{RVD's (Roaded Natural)} &= 4,039.44 \times 365 \\ &= 1,474,396 \end{aligned}$$

#### SEMIPRIMITIVE MOTORIZED

$$\begin{aligned} \text{PAOT (SPM)} &= .025 \times 7,716 \text{ acres} \\ &= 192.9 \end{aligned}$$

$$\begin{aligned} \text{RVD's (SPM)} &= 192.9 \times 365 \\ &= 70,409 \end{aligned}$$

#### SEMIPRIMITIVE NONMOTORIZED

$$\text{PAOT (SPNM)} = .019 \times 8,741 \text{ acres}$$

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## Appendix E

### Hunting and Fishing Demand

Hunting and fishing supply and demand was calculated using information from the 1991 National Survey of Fishing, Hunting and Wildlife Associated Recreation, South Carolina (USDI, 1991).

#### Hunting

The resident hunters include 177,800 (number of licensed resident hunters) and 27,500 (residents hunters that were less than 16 year old) for a total of 205,300 hunters across the State of South Carolina. (Table 10 and table B-1, USDI, 1991)

The counties where a majority of hunters on the Sumter National Forest come from are; Abbeville, Aiken, Anderson, Cherokee, Chester, Edgefield, Fairfield, Pickens, Richland, Saluda, Spartanburg, Union and York. The 1990 Bureau of Census population for these counties is approximately 54.4 percent of the state population. Assuming an even distribution of hunting across South Carolina, there are approximately 111,683 hunters in these counties ( $205,300 \times .544 = 111,683$ ).

Approximately 25 percent of resident hunters hunted public land. Assuming an equal distribution of hunters across public hunting lands, there are approximately 27,921 resident hunters using public land to hunt ( $111,683 \times .25 = 27,921$ ). (Table 12, USDI, 1991)

The Sumter National Forest provides 46.7 percent of the public hunting land in the counties in and around the Forest. Assuming an equal distribution of hunters across all public lands, there are approximately 13,039 hunters hunting on the Sumter National Forest. ( $27,921 \times .467 = 13,039$ )

There are approximately 57,100 nonresident licensed hunters. There is no figure provided for the percent of nonresident licensed hunters that hunted public land. Assuming the relationship given in Table 12 (USDI, 1991) between the total resident and nonresident hunter approximately 9200 nonresident hunters hunt on public land ( $54,100$  total hunters -  $44,900$  resident hunters =  $9200$ )

Statewide, the Sumter National Forest is approximately 27.2 percent of all public hunting land in South Carolina. Assuming an equal distribution of non residents hunters on public land, there are approximately 2500 nonresident hunters hunting on the Sumter National Forest. ( $9200 \times .272 = 2500$ )

The resident hunters spend 19.3 days hunting per year which equals 251,653 activity days per year ( $13,039$  resident hunters  $\times$   $19.3$  days). The nonresident hunters spend 8.9 days hunting per year which equals 22,250 nonresident activity days per year ( $2500$  nonresident hunters  $\times$   $8.9$  activity days =  $22,250$ ). The total activity days of hunting per year is 273,903 ( $251,653$  activity days for nonresident plus  $22,250$  activity days for residents)

Of the 273,903 activity days, 63 percent of them are spent in pursuit of big game, 19 percent small game, 12 percent migratory birds and 6 percent other species. This equals

172,559 activity days for big game, 52,042 activity days for small game, 32,868 activity days for migratory bird hunting and 16,434 activity days for hunting other game species.

Conversion of activity days to WFUD's:

big game	.583 X	172,559	=	100,602
small game	.333 X	52,042	=	17,330
waterfowl	.333 X	32,868	=	10,945
other game	.333 X	16,434	=	<u>5,473</u>
		total	=	134,283

Projected WFUD's for 1996

big game	1.22 X	100,602	=	122,734
small game	0.96 X	17,330	=	16,637
waterfowl	1.06 X	10,945	=	11,602
other game	0.96 X	5,473	=	<u>5,245</u>
		total	=	156,227

Projected WFUD's for 2010

big game	1.34 X	100,602	=	134,807
small game	1.03 X	17,330	=	17,850
waterfowl	1.16 X	10,945	=	12,696
other game	1.03 X	5,473	=	<u>5,637</u>
		total	=	170,990

Valuation of current demand in 1996

big game	\$33/day X	122,734	=	\$4,050,222
small game	\$34/day X	16,637	=	\$ 565,658
waterfowl	\$53/day X	11,602	=	\$ 614,906
other game	\$33/day X	5,254	=	<u>\$ 173,382</u>
		total	=	\$5,404,168

Fishing

### Resident Anglers

From Table 5 and Table B-1 (USDI - 1991):

Number of licensed resident anglers	511,900
Residents <16 old that fished	<u>205,000</u>
Total	716,900

Approximately 33,600 anglers fished for trout in South Carolina (USDI - 1991). The Sumter National Forest provides approximately ½ of the cool/coldwater fisheries in the state. Assuming equal distribution of anglers across all trout waters, there are about 16,800 licensed resident anglers that fish for trout on the Sumter National Forest ( $33,600 \times .5 = 16,800$ ).

Assuming that all trout anglers also fish for warmwater species, there are approximately 716,900 anglers that fish for warmwater species. The counties in and around the Sumter National Forest provide about 40 percent of the water available for warmwater fishing in the state. Assuming an equal distribution of anglers, there are about 286,760 anglers in these counties ( $716,900 \times .4 = 286,760$ ). The Sumter provides about 2.6 percent of the warmwater fisheries in these counties. Assuming an equal distribution of anglers in these, there are about 7456 anglers fishing for warmwater species on the Forest ( $286,760 \times .026 = 7456$ ).

### Nonresident Anglers

From Table 5 (USDI - 1991)

Number of licensed nonresident anglers	133,400
--	---------

Approximately 12,200 nonresident anglers fish for trout. Assuming equal distribution of nonresident trout anglers across trout waters in South Carolina, there are about 6,100 nonresident anglers fishing for trout on the Sumter National Forest ( $12,200 \times .5 = 6,100$ ).

Again, assuming trout anglers also fish warmwater, there are about 133,400 nonresident anglers fishing for warmwater species in South Carolina. Assuming equal distribution of nonresident anglers across the state, there are about 1387 nonresident anglers that fish on the Forest ( $133,400 \times .4 \times .26 = 1387$ ).

### Resident anglers activity days

coldwater	16,800	X	15.5	=260,400
warmwater	7,456	X	15.5	= <u>115,568</u>
Total				=375,968

### Nonresident angler activity days

coldwater	6,100	X	7.6	=46,360
warmwater	1,387	X	7.6	= <u>10,541</u>

Total =56,901

Total days of fishing

coldwater	260,400	+	46,360	=306,760
warmwater	115,568	+	10541	=126,109

WFUD's

coldwater	.333	X	306,760	=102,151
warmwater	.333	X	126,109	= <u>41,994</u>
			Total	=144,145

Projected WFUD's for 1996

coldwater	0.86	X	102,151	=87,850
warmwater	0.86	X	41,994	= <u>36,115</u>
			Total	=122,412

WFUD's for 2010

				98,065 (.96x)
				<u>40,314 (.96x)</u>
			Total	138,379

Valuation of current demand in 1996

coldwater	87,850	X	\$40/day	=\$3,514,000
warmwater	36,115	X	\$75/day	= <u>\$2,708,625</u>
			Total	=\$6,222,625

**Nonconsumptive use**

Residents

From Table 22 and Table B-4 (USDI - 1991)

Residents participating in nonconsumptive activities away from their home	178,600
Residents <16 years old participating	<u>48,000</u>
Total	226,000

Approximately 62 percent (Table 24, USDI - 1991) of residents nonconsumptive users visit public areas to participate in these activities. Approximately 9 percent\* of public recreation land in South Carolina is provided by the Sumter National Forest. Assuming there is equal distribution of people participating in these activities across public land in the state, there are about 12,644 South Carolina residents using the Sumter for nonconsumptive activities (226,600 X .62 X .09 =12,644).

Nonresidents

From Table 24 (USDI - 1991)

Nonresidents participating in nonconsumptive activities =225,700

In Table 24 (USDI - 1991) 2/3, or 67%, of nonresident nonconsumptive users visited public land. Assuming equal distribution of nonresident nonconsumptive use across all public land, there are about 13,610 nonresident nonconsumptive users of the Forest ( $225,700 \times .67 \times .09 = 13,610$ ).

Resident activity days	12,644 X 13.5	=170,694
Nonresident activity days	13,610 X 6	= <u>81,660</u>
	Total	=252,354 activity days

WFUD's

$.333 \times 252,354 = 84,034$

Projected WFUD's 1996

$1.69 \times 84,034 = 142,017$

Projected WFUD's 2020

=162,186 (1.93x)

Valuation of Current Demand in 1996

$142,017 \times \$39/\text{day} = \$5,538,663$

\*This figure represents Sumter National Forest land within ¼ mile of an open road (219,041 acres) divided by the sum of land in recreation facilities in South Carolina (1,050,366 acres) and wildlife management area lands (1,317,063). Not all acreage of National Forest land lends itself to these activities, most if not all of these activities are thought to occur on or near destination type facilities, along trails or near water. For comparison, using all Sumter acreage (360,386 which is about 15 percent of recreation lands in South Carolina) the total activity days would be about 420,597.



	$=100*(59)/53761$ $=5900/53761$ $=.1097$
PCTGLOW	<p>Ratio of non-proxy low use GFA days to all non-proxy open site days in the forest.</p> $=100*(\# \text{ non-proxy GFA Low days}) / (\# \text{ all non-proxy site days})$ $=100*(42568)/ 53761$ $=4256800/53761$ $=79.18$
OPROXD	<p>Number of Overnight Developed Site days for which there is some proxy count of visitation, summed across all use levels and proxy codes.</p> $=0$
PCTOHIGH	<p>Ratio of all non-proxy site days on the forest that are OUDS High.</p> $=100*(\# \text{ non-proxy OUD's HIGH})/(\# \text{ of all non-proxy days})$ $=100*(31)/53761$ $=3100/53761$ $=.0576$
INTERACT	<p>Product of PCTHDEV and PCTGLOW</p> $=.1097*79.18$ $=8.6860$

**3. For non-proxy strata, compute the log of visitation per site day according to the formulas indicated in Tables 2 through 5. Note the Sumter is a non-urban forest.**

For DUD's HIGH USE strata, the log of site visits per day (LOGSVDAY) is:

$$\begin{aligned}
 \text{LOGSVDAY} &= 2.75120 + 2.02342 - (0.74034*\text{PCTOHIGH}) + (0.00603*\text{INTERACT}) + \\
 &\quad (0.52368*\text{R3AND8}) \\
 &= 2.75120 + 2.02342 - (0.74034*.0576) + (0.00603*8.6860) + (0.52368*1) \\
 &= 2.75120 + 2.02342 - 0.04264 + .052376 + 0.52368 \\
 &= 5.3080
 \end{aligned}$$

For DUD's MEDIUM USE strata, the log of site visits per day (LOGSVDAY) is:

$$\begin{aligned}
 \text{LOGSVDAY} &= 2.75120 + 1.27382 - (0.74034*\text{PCTOHIGH}) + (0.00603*\text{INTERACT}) + \\
 &\quad (0.52368*\text{R3AND8}) \\
 &= 2.75120 + 1.27382 - (0.74034*.0576) + (0.00603*8.6860) + (0.52368*1) \\
 &= 2.75120 + 1.27382 - .042643 + .052376 + 0.52368 \\
 &= 4.5584
 \end{aligned}$$

For **DUD's LOW USE** strata, the log of site visits per day (LOGSVDAY) is:

$$\begin{aligned}\text{LOGSVDAY} &= 2.75120 - (0.74034 * \text{PCTOHIGH}) + (0.00603 * \text{INTERACT}) + (.52368 * \text{R3ANDR8}) \\ &= 2.75120 - (0.74034 * .0576) + (0.00603 * 8.6860) + (0.52368 * 1) \\ &= 2.75120 - .042643 + .052376 + 0.52368 \\ &= 3.2846\end{aligned}$$

For **ODU's HIGH USE** strata, the log of site visits per day (LOGSVDAY) is:

$$\begin{aligned}\text{LOGSVDAY} &= 2.21119 + 1.52803 + (95471 * \text{R3ANDR8}) \\ &= 2.21119 + 1.52803 + (.95471 * 1) \\ &= 2.21119 + 1.52803 + .95471 \\ &= 4.6939\end{aligned}$$

For **ODU's MEDIUM USE** strata, the log of site visits per day (LOGSVDAY) is:

$$\begin{aligned}\text{LOGSVDAY} &= 2.21119 + .87823 + (95471 * \text{R3ANDR8}) \\ &= 2.21119 + .87823 + (.95471 * 1) \\ &= 2.21119 + .87823 + .95471 \\ &= 4.0441\end{aligned}$$

For **ODU's LOW USE** strata, the log of site visits per day (LOGSVDAY) is:

$$\begin{aligned}\text{LOGSVDAY} &= 2.21119 + (.95471 * \text{R3ANDR8}) \\ &= 2.21119 + (.95471 * 1) \\ &= 2.21119 + .95471 \\ &= 3.1659\end{aligned}$$

For **WILD's HIGH USE** strata, the log of site visits per day (LOGSVDAY) is:

$$\begin{aligned}\text{LOGSVDAY} &= -.23051 + 1.58341 + (.46683 * \text{PCTHDEV}) + (.01656 * \text{PCTGLOW}) - \\ &\quad (.69918 * \text{PCTOHIGH}) + (.58593 * \text{R3ANDR8}) \\ &= -.23051 + 1.58341 + (.46683 * .1097) + (.01656 * 79.18) - (.69918 * .0576) + (.58593 * 1) \\ &= -.23051 + 1.58341 + .05121 + 1.31122 - .04027 + .58593 \\ &= 3.2609\end{aligned}$$

For **WILD's MEDIUM USE** strata, the log of site visits per day (LOGSVDAY) is:

$$\begin{aligned}\text{LOGSVDAY} &= -.23051 + 1.09682 + (.46683 * \text{PCTHDEV}) + (.01656 * \text{PCTGLOW}) - \\ &\quad (.69918 * \text{PCTOHIGH}) + (.58593 * \text{R3ANDR8}) \\ &= -.23051 + 1.09682 + (.46683 * .1097) + (.01656 * 79.18) - (.69918 * .0576) + (.58593 * 1) \\ &= -.23051 + 1.09682 + .05211 + 1.31122 - .04027 + .58593 \\ &= 2.7753\end{aligned}$$

For **WILD's LOW USE** strata, the log of site visits per day (LOGSVDAY) is:

$$\begin{aligned}\text{LOGSVDAY} &= -.23051 + (.46683 * \text{PCTHDEV}) + (.01656 * \text{PCTGLOW}) - \\ &\quad (.69918 * \text{PCTOHIGH}) + (.58593 * \text{R3ANDR8}) \\ &= -.23051 + (.46683 * .1097) + (.01656 * 79.18) - (.69918 * .0576) + (.58593 * 1) \\ &= -.23051 + .05121 + 1.31122 - .04027 + .58593 \\ &= 1.6775\end{aligned}$$

The **GFA's HIGH USE** strata, the log of site visits per day (LOGSVDAY) is:

$$\text{LOGSVDAY} = 1.43028 + 1.94635 + (.00009 * \text{OPROXD}) + (.00272 * \text{INTERACT}) +$$

$$\begin{aligned}
& (.01199 * \text{PCTGLOW}) \\
& = 1.43028 + 1.94635 + (.00009 * 0) + (.00272 * 8.6860) + (.01199 * 79.18) \\
& = 1.43028 + 1.94635 + 0 + .02362 + .94936 \\
& = 4.3496
\end{aligned}$$

The GFA's MEDIUM USE strata, the log of site visits per day (LOGSVDAY) is:

$$\begin{aligned}
\text{LOGSVDAY} & = 1.43028 + 1.24272 + (.00009 * \text{OPROXD}) + (.00272 * \text{INTERACT}) + (.01199 * \text{PCTGLOW}) \\
& = 1.43028 + 1.24272 + (.00009 * 0) + (.00272 * 8.6860) + (.01199 * 79.18) \\
& = 1.43028 + 1.24272 + 0 + .02362 + .94936 \\
& = 3.6459
\end{aligned}$$

The GFA's LOW USE strata, the log of site visits per day (LOGSVDAY) is:

$$\begin{aligned}
\text{LOGSVDAY} & = 1.43028 + (.00009 * \text{OPROXD}) + (.00272 * \text{INTERACT}) + (.01199 * \text{PCTGLOW}) \\
& = 1.43028 + (.00009 * 0) + (.00272 * 8.6860) + (.01199 * 79.18) \\
& = 1.43028 + 0 + .02362 + .94936 \\
& = 2.4032
\end{aligned}$$

4. Calculate the average site visits per day as:  $\exp(\text{LOGSVDAY})$ . Work with forest staff, especially the persons responsible for developing the spreadsheet, to see if the result is within the expected range of site visits for that site-type/stratum combination. This is an important reality check.

For DUD's HIGH USE strata, the average site visits per day is:

$$\begin{aligned}
& = \exp(\text{LOGSVDAY}) \\
& = \exp(5.3080) \\
& = 201.9459
\end{aligned}$$

For DUD's MEDIUM USE strata, the average site visits per day is:

$$\begin{aligned}
& = \exp(\text{LOGSVDAY}) \\
& = \exp(4.5584) \\
& = 95.4307
\end{aligned}$$

For DUD's LOW USE strata, the average site visits per day is:

$$\begin{aligned}
& = \exp(\text{LOGSVDAY}) \\
& = \exp(3.2846) \\
& = 26.6983
\end{aligned}$$

For OUD's HIGH USE strata, the average site visits per day is:

$$\begin{aligned}
& = \exp(\text{LOGSVDAY}) \\
& = \exp(4.6939) \\
& = 109.2785
\end{aligned}$$

For OUD's MEDIUM USE strata, the average site visits per day is:

$$\begin{aligned}
& = \exp(\text{LOGSVDAY}) \\
& = \exp(4.0441) \\
& = 57.0598
\end{aligned}$$

For OUD's LOW USE strata, the average site visits per day is:

$$= \exp(\text{LOGSVDAY})$$

$$\begin{aligned} &= \exp(3.1659) \\ &= 23.7101 \end{aligned}$$

For **WILD's HIGH USE** strata, the average site visits per day is:

$$\begin{aligned} &= \exp(\text{LOGSVDAY}) \\ &= \exp(3.2609) \\ &= 26.0730 \end{aligned}$$

For **WILD's MEDIUM USE** strata, the average site visits per day is:

$$\begin{aligned} &= \exp(\text{LOGSVDAY}) \\ &= \exp(2.7753) \\ &= 16.0434 \end{aligned}$$

For **WILD's LOW USE** strata, the average site visits per day is:

$$\begin{aligned} &= \exp(\text{LOGSVDAY}) \\ &= \exp(1.6775) \\ &= 5.3522 \end{aligned}$$

For **GFA's HIGH USE** strata, the average site visits per day is:

$$\begin{aligned} &= \exp(\text{LOGSVDAY}) \\ &= \exp(4.3496) \\ &= 77.4475 \end{aligned}$$

For **GFA's MEDIUM USE** strata, the average site visits per day is:

$$\begin{aligned} &= \exp(\text{LOGSVDAY}) \\ &= \exp(3.6459) \\ &= 38.3172 \end{aligned}$$

For **GFA's LOW USE** strata, the average site visits per day is:

$$\begin{aligned} &= \exp(\text{LOGSVDAY}) \\ &= \exp(2.4032) \\ &= 11.0585 \end{aligned}$$

5. Calculate estimated total site visits for each non-proxy site-type and use stratum combination as:  
**SITEVISITS = exp(LOGSVDAY) \* # of site days in that category.**

For **DUD's HIGH USE** strata, the estimated total site visits is:

$$\begin{aligned} \text{SITEVISITS} &= \exp(\text{LOGSVDAY}) * \# \text{ of site days in that category} \\ &= 201.9459 * 28 \\ &= 5,654.4852 \end{aligned}$$

For **DUD's MEDIUM USE** strata, the estimated total site visits is:

$$\begin{aligned} \text{SITEVISITS} &= \exp(\text{LOGSVDAY}) * \# \text{ of site days in that category} \\ &= 95.4307 * 640 \\ &= 61,075.648 \end{aligned}$$

For **DUD's LOW USE** strata, the estimated total site visits is:

SITEVISITS =exp(LOGSVDAY)\*#of site days in that category  
=26.6983\*3153  
=84,179.7399

For OUD's HIGH USE strata, the estimated total site visits is:

SITEVISITS =exp(LOGSVDAY)\*#of site days in that category  
=109.2785\*31  
=3,387.6335

For OUD's MEDIUM USE strata, the estimated total site visits is:

SITEVISITS =exp(LOGSVDAY)\*#of site days in that category  
=57.0598\*278  
=15,862.6244

For OUD's LOW USE strata, the estimated total site visits is:

SITEVISITS =exp(LOGSVDAY)\*#of site days in that category  
=23.7101\*1360  
=32,245.736

For WILD's HIGH USE strata, the estimated total site visits is:

SITEVISITS =exp(LOGSVDAY)\*#of site days in that category  
=26.0730\*92  
=2,398.716

For WILD's MEDIUM USE strata, the estimated total site visits is:

SITEVISITS =exp(LOGSVDAY)\*#of site days in that category  
=16.0434\*363  
=5823.7542

For WILD's LOW USE strata, the estimated total site visits for is:

SITEVISITS =exp(LOGSVDAY)\*#of site days in that category  
=5.3522\*629  
=3,366.5338

For GFA's HIGH USE strata, the estimated total site visits is:

SITEVISITS =exp(LOGSVDAY)\*#of site days in that category  
=77.4475\*190  
=14,715.025

For GFA's MEDIUM USE strata, the estimated total site visits is:

SITEVISITS =exp(LOGSVDAY)\*#of site days in that category  
=38.3172\*4429  
=169,706.8788

For GFA's LOW USE strata, the estimated total site visits is:

SITEVISITS =exp(LOGSVDAY)\*#of site days in that category  
=11.0585\*42568



**Table 1. Definitions for independent variables for non-proxy site-types:**

HIGH	Indicator variable, = 1 for HIGH use stratum, =0 otherwise.
MEDIUM	Indicator variable, = 1 for MEDIUM use stratum, =0 otherwise.
R3AND8	Indicator variable, = 1 if forest is in Region 3 or 8, =0 otherwise.
EAST	Indicator variable, = 1 if forest is in Region 8 or 9, =0 otherwise.
PCTHDEV	Ratio of nonproxy High use DUDS or OUDS site days to all nonproxy site days on the forest: $100 * (\# \text{ nonproxy DUDS High} + \# \text{ nonproxy OUDS High}) / (\# \text{ all nonproxy days})$ .
PCTGLOW	Ratio of nonproxy low use GFA days to all nonproxy open site days in the forest; i.e., $100 * (\# \text{ nonproxy GFA Low days}) / (\# \text{ all nonproxy site days})$ .
OPROXD	Number of Overnight Developed Site days for which there is some proxy count of visitation, summed across all use levels and proxy codes.
PCTOHIGH	Ratio of all nonproxy site days on the forest that are OUDS High:
INTERACT	Product of PCTHDEV and PCTGLOW

**Table 2. Coefficients for log of Site Visits per day for Developed Day Use Sites without visitation proxy information.**

	URBAN FORESTS*	Non-URBAN FORESTS
VARIABLE		
Intercept	3.54012	2.75120
HIGH	2.26382	2.02342
MEDIUM	1.23541	1.27382
PCTOHIGH	-----	-0.74034
INTERACT	-----	0.00603
R3AND8	-----	0.52368

\*Urban forests include: Arapaho-Roosevelt, Pike-San Isabel, Tonto, Cibola, Uinta, Wasatch-Cache, Angeles, Cleveland, San Bernadino, Los Padres, Mt Hood, Mt Baker-Snoqualmie, Gifford Pinchot, Chatahoochee-Oconee, Florida, Carribean, White Mtn, and Midewin NG.

**Table 3. Coefficients for log of Site Visits per day for General Forest Area Sites without visitation proxy information.**

	URBAN FORESTS	Non-URBAN FORESTS
VARIABLE		
Intercept	3.32506	1.43028
HIGH	2.02829	1.94635
MEDIUM	1.23251	1.24272
OPROXD	-----	0.00009
INTERACT	-----	0.00272
PCTGLOW	-----	0.01199
PCTOHIGH	1.74761	-----
EAST	-0.91843	-----

**Table 4. Coefficients for log of Site Visits per day for Overnight Developed Sites without visitation proxy information.**

	URBAN FORESTS	Non-URBAN FORESTS
VARIABLE		

Intercept	2.96941	2.21119
HIGH	1.60808	1.52803
MEDIUM	0.70470	0.87823
R3AND8	-----	0.95471

**Table 5. Coefficients for log of Site Visits per day for Wilderness Area sites without visitation proxy information.**

VARIABLE	URBAN FORESTS	Non-URBAN FORESTS
Intercept	2.94776	-0.23051
HIGH	1.77845	1.58341
MEDIUM	0.93318	1.09682
PCTHDEV	-----	0.46683
PCTGLOW	-----	0.01656
PCTOHIGH	-----	-0.69918
R3AND8	-----	0.58593
OPROXD	-0.00008	-----

**Table 6. Site Visit per day coefficients by site type and proxy type.**

SITETYPE	PROXY	SVPERDAY	NOBS
DUDS	DUR4	61.53	4
DUDS	FE3	33.63	3
DUDS	FE4	16.73	2
DUDS	FR1	817.17	16
DUDS	FR3	158.12	13
DUDS	FR5	11.56	1
DUDS	PTC1	107.60	4
DUDS	PTC3	365.14	3
DUDS	RE1	20.34	4
DUDS	SV1	1089.35	20
DUDS	TB1	93.90	3
DUDS	TB3	406.18	3
GFA	FE3	135.03	1
GFA	FR1	20.90	2
GFA	PTC3	317.43	5
GFA	RE2	194.96	1
GFA	TB1	826.06	1
OUDS	DUR4	30.55	36
OUDS	DUR5	86.46	9
OUDS	FE1	39.13	2
OUDS	FE3	51.77	3
OUDS	FE4	23.30	29
OUDS	FR1	34.35	1
OUDS	FR2	7.16	4
OUDS	FR5	202.75	6
OUDS	RE1	12.23	8
OUDS	RE2	6.82	4
OUDS	RE4	35.62	19
OUDS	SUP1	2.55	1
OUDS	SUP2	2.50	2
OUDS	SUP4	6.99	12
OUDS	TB1	92.96	1
OUDS	TB3	41.24	2

WILDERNESS	MA2	144.76	5
WILDERNESS	PTC1	3.57	1

Table 7. Site Visit to National Forest Conversion Ratios, by region:

REGION	Site Visits per NF Visit.
1	1.12
2	1.20
3	1.22
4	1.10
5	1.21
6	1.22
8	1.28
9	1.23
10	1.14

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**NVUM Activities listed by RPA Categories (Alt. F - Current)**

	2000	2005	2010	2010	2015	2020	2020	2025	2030
	M Visits	M Visits	Factor	M Visits	M Visits	Factor	M Visits	M Visits	Factor
<b>RPA Camping, Picnicking, Swimming</b>									
Developed Camping	51.50	58.45	1.27	65.41	73.90	1.60	82.40	92.19	1.98
Primitive Camping	20.31	20.11	0.98	19.90	20.11	1.00	20.31	20.31	1.00
Picnicking	26.26	27.70	1.11	29.15	30.72	1.23	32.30	34.14	1.37
Swimming	5.73	5.91	1.06	6.08	6.28	1.13	6.48	6.68	1.20
Backpacking, Camp in Unroaded Areas	18.34	20.45	1.23	22.56	25.68	1.57	28.80	32.38	1.96
<b>Total for Group</b>	<b>122.15</b>	<b>132.62</b>		<b>143.10</b>	<b>156.69</b>		<b>170.29</b>	<b>185.69</b>	
<b>RPA Mechanical Travel &amp; Viewing Scenery</b>									
Viewing Scenery	144.79	155.65	1.15	166.51	178.09	1.31	189.68	201.98	1.48
Off-Highway Vehicles	1.97	2.01	1.05	2.06	2.11	1.10	2.16	2.22	1.16
Driving For Pleasure	93.03	100.01	1.15	106.99	114.43	1.31	121.87	129.78	1.48
Other Motorized Travel	0.00	0.00	1.15	0.00	0.00	1.31	0.00	0.00	1.48
Bicycling	15.72	16.67	1.12	17.61	18.71	1.26	19.81	21.07	1.42
<b>Total for Group</b>	<b>255.51</b>	<b>274.34</b>		<b>293.17</b>	<b>313.35</b>		<b>333.52</b>	<b>355.05</b>	
<b>RPA Hiking, Horseback Riding, Water Travel</b>									
Hiking/Walking	110.07	120.52	1.19	130.98	141.44	1.38	151.89	163.45	1.59
Horseback Riding	3.93	4.11	1.09	4.28	4.48	1.19	4.68	4.84	1.27
Motorized Water Travel	1.97	1.98	1.01	1.99	2.00	1.03	2.02	2.05	1.06
Non-Motorized Water Travel	50.45	50.70	1.01	50.95	51.46	1.03	51.96	52.72	1.06
<b>Total for Group</b>	<b>166.41</b>	<b>177.31</b>		<b>188.20</b>	<b>199.38</b>		<b>210.56</b>	<b>223.06</b>	
<b>RPA Winter Sports</b>									
Cross Country Skiing	0.00	0.00	0.74	0.00	0.00	0.55	0.00	0.00	0.44
Downhill Skiing	0.00	0.00	1.27	0.00	0.00	1.37	0.00	0.00	1.66
<b>Total for Group</b>	<b>0.00</b>	<b>0.00</b>		<b>0.00</b>	<b>0.00</b>		<b>0.00</b>	<b>0.00</b>	
<b>RPA Resorts</b>									
Resorts, Cabins	0.00	0.00	1.27	0.00	0.00	1.60	0.00	0.00	1.98
<b>Total for Group</b>	<b>0.00</b>	<b>0.00</b>		<b>0.00</b>	<b>0.00</b>		<b>0.00</b>	<b>0.00</b>	
<b>RPA Fish &amp; Wildlife</b>									
Hunting	47.83	47.11	0.97	46.39	45.44	0.93	44.48	43.52	0.89
Viewing Wildlife, Birds, Fish	37.66	41.62	1.21	45.57	50.28	1.46	54.99	59.51	1.70
Fishing	145.28	151.81	1.09	158.35	164.16	1.17	169.97	175.06	1.24
<b>Total for Group</b>	<b>230.77</b>	<b>240.54</b>		<b>250.32</b>	<b>259.88</b>		<b>269.44</b>	<b>278.09</b>	
<b>Wilderness</b>									
Wilderness	11.59	12.86	1.22	14.14	15.59	1.47	17.04	18.60	1.74
<b>Total for Group</b>	<b>11.59</b>	<b>12.86</b>		<b>14.14</b>	<b>15.59</b>		<b>17.04</b>	<b>18.60</b>	
<b>Other</b>									
Visiting Historical Sites	2.26	2.51	1.22	2.76	3.04	1.47	3.33	3.67	1.77
Visiting Nature Centers, VIS	0.00	0.00	1.22	0.00	0.00	1.47	0.00	0.00	1.77
General Relaxing	67.01	70.70	1.11	74.39	78.41	1.23	82.43	86.45	1.35
Gathering Berries, Natural Products	11.79	12.44	1.11	13.09	13.80	1.23	14.51	15.33	1.37
Nature Study	1.66	1.83	1.21	2.01	2.22	1.46	2.42	2.62	1.70
<b>Total for Group</b>	<b>82.73</b>	<b>87.49</b>		<b>92.25</b>	<b>97.47</b>		<b>102.68</b>	<b>108.07</b>	
<b>Total</b>	<b>869.16</b>	<b>925.17</b>		<b>981.17</b>	<b>1042.35</b>		<b>1103.53</b>	<b>1168.56</b>	

**Notes:**

- For Resorts and Cabins - Used the Developed Camping Factors
- For Wilderness - Used the Backpacking Factors
- For Viewing Scenery, Driving for Pleasure, Other Motorized Travel - Used the Sightseeing Factors
- For Non-Motorized Water - Used the Rafting/Floating Factors instead of Canoeing (Assumed more users are rafters/floaters)
- For Visiting Nature Centers - Used the Visiting Historical Sites Factors
- For General Relaxing - Used the Family Gathering Factors
- For Gathering Berries, Etc. - Used the Picnicking Factors
- For Nature Study - Used the Wildlife Viewing Factors

Used the "Days" Factors for those primarily day use  
 Used the "Trips" Factors for those primarily overnight use

2030	2035	2040	2040	2045	2050	2050
M Visits	M Visits	Factor	M Visits	M Visits	Factor	M Visits
101.97	113.82	2.44	125.66	140.34	3.01	155.02
20.31	20.82	1.05	21.33	20.01	0.92	18.69
35.97	38.07	1.53	40.18	42.54	1.71	44.90
6.88	7.14	1.29	7.40	7.74	1.41	8.09
35.96	37.06	2.08	38.16	43.94	2.71	49.71
201.09	216.90		232.71	254.56		276.40
214.29	227.32	1.66	240.35	254.83	1.86	269.31
2.28	2.35	1.23	2.42	2.53	1.34	2.63
137.69	146.06	1.66	154.43	163.74	1.86	173.04
0.00	0.00	1.66	0.00	0.00	1.86	0.00
22.33	23.82	1.61	25.32	27.05	1.83	28.77
376.59	399.55		422.52	448.14		473.76
175.01	185.46	1.78	195.92	204.72	1.94	213.53
4.99	5.05	1.30	5.11	5.13	1.31	5.15
2.08	2.13	1.11	2.18	2.24	1.17	2.30
53.47	54.99	1.12	56.50	58.77	1.21	61.04
235.56	247.63		259.71	270.87		282.02
0.00	0.00	0.38	0.00	0.00	0.36	0.00
0.00	0.00	2.07	0.00	0.00	2.71	0.00
0.00	0.00		0.00	0.00		0.00
0.00	0.00	2.44	0.00	0.00	3.01	0.00
0.00	0.00		0.00	0.00		0.00
42.57	41.13	0.83	39.70	38.02	0.76	36.35
64.03	67.61	1.89	71.19	73.63	2.02	76.08
180.14	181.60	1.26	183.05	183.05	1.26	183.05
286.74	290.34		293.93	294.71		295.48
20.17	21.73	2.01	23.30	24.92	2.29	26.54
20.17	21.73		23.30	24.92		26.54
4.01	4.41	2.13	4.82	5.30	2.55	5.77
0.00	0.00	2.13	0.00	0.00	2.55	0.00
90.47	95.16	1.49	99.85	105.21	1.65	110.57
16.16	17.10	1.53	18.04	19.10	1.71	20.17
2.82	2.98	1.89	3.14	3.25	2.02	3.35
113.45	119.65		125.85	132.86		139.87
1233.59	1295.81		1358.03	1426.05		1494.07

### NVUM Activities listed by RPA Categories (Alt. A)

	2000	2005	2010	2010	2015	2020	2020	2025	2030
	M Visits	M Visits	Factor	M Visits	M Visits	Factor	M Visits	M Visits	Factor
<b>RPA Camping, Picnicking, Swimming</b>									
Developed Camping	54.08	61.38	1.27	68.68	77.60	1.60	86.53	96.80	1.98
Primitive Camping	25.39	25.13	0.98	24.88	25.13	1.00	25.39	25.39	1.00
Picnicking	27.57	29.09	1.11	30.60	32.26	1.23	33.91	35.84	1.37
Swimming	6.02	6.20	1.06	6.38	6.59	1.13	6.80	7.02	1.20
Backpacking, Camp in Unroaded Areas	22.93	25.57	1.23	28.20	32.10	1.57	36.00	40.47	1.96
<b>Total for Group</b>	<b>135.99</b>	<b>147.37</b>		<b>158.75</b>	<b>173.69</b>		<b>188.63</b>	<b>205.52</b>	
<b>RPA Mechanical Travel &amp; Viewing Scenery</b>									
Viewing Scenery	180.99	194.56	1.15	208.14	222.62	1.31	237.09	252.48	1.48
Off-Highway Vehicles	2.46	2.52	1.05	2.58	2.64	1.10	2.70	2.78	1.16
Driving For Pleasure	116.29	125.01	1.15	133.73	143.04	1.31	152.34	162.23	1.48
Other Motorized Travel	0.00	0.00	1.15	0.00	0.00	1.31	0.00	0.00	1.48
Bicycling	19.65	20.83	1.12	22.01	23.39	1.26	24.77	26.34	1.42
<b>Total for Group</b>	<b>319.39</b>	<b>342.93</b>		<b>366.46</b>	<b>391.68</b>		<b>416.90</b>	<b>443.82</b>	
<b>RPA Hiking, Horseback Riding, Water Travel</b>									
Hiking/Walking	137.58	150.65	1.19	163.72	176.79	1.38	189.87	204.31	1.59
Horseback Riding	4.91	5.13	1.09	5.36	5.60	1.19	5.85	6.04	1.27
Motorized Water Travel	2.46	2.47	1.01	2.48	2.51	1.03	2.53	2.57	1.06
Non-Motorized Water Travel	63.06	63.37	1.01	63.69	64.32	1.03	64.95	65.90	1.06
<b>Total for Group</b>	<b>208.01</b>	<b>221.63</b>		<b>235.25</b>	<b>249.22</b>		<b>263.19</b>	<b>278.82</b>	
<b>RPA Winter Sports</b>									
Cross Country Skiing	0.00	0.00	0.74	0.00	0.00	0.55	0.00	0.00	0.44
Downhill Skiing	0.00	0.00	1.27	0.00	0.00	1.37	0.00	0.00	1.66
<b>Total for Group</b>	<b>0.00</b>	<b>0.00</b>		<b>0.00</b>	<b>0.00</b>		<b>0.00</b>	<b>0.00</b>	
<b>RPA Resorts</b>									
Resorts, Cabins	0.00	0.00	1.27	0.00	0.00	1.60	0.00	0.00	1.98
<b>Total for Group</b>	<b>0.00</b>	<b>0.00</b>		<b>0.00</b>	<b>0.00</b>		<b>0.00</b>	<b>0.00</b>	
<b>RPA Fish &amp; Wildlife</b>									
Hunting	59.78	58.89	0.97	57.99	56.79	0.93	55.60	54.40	0.89
Viewing Wildlife, Birds, Fish	43.61	48.19	1.21	52.77	58.22	1.46	63.67	68.90	1.70
Fishing	168.92	176.52	1.09	184.12	190.88	1.17	197.64	203.55	1.24
<b>Total for Group</b>	<b>272.32</b>	<b>283.60</b>		<b>294.88</b>	<b>305.90</b>		<b>316.91</b>	<b>326.86</b>	
<b>Wilderness</b>									
Wilderness	14.49	16.08	1.22	17.68	19.49	1.47	21.30	23.26	1.74
<b>Total for Group</b>	<b>14.49</b>	<b>16.08</b>		<b>17.68</b>	<b>19.49</b>		<b>21.30</b>	<b>23.26</b>	
<b>Other</b>									
Visiting Historical Sites	2.38	2.64	1.22	2.90	3.20	1.47	3.49	3.85	1.77
Visiting Nature Centers, VIS	0.00	0.00	1.22	0.00	0.00	1.47	0.00	0.00	1.77
General Relaxing	76.92	81.15	1.11	85.38	89.99	1.23	94.61	99.22	1.35
Gathering Berries, Natural Products	14.74	15.55	1.11	16.36	17.25	1.23	18.13	19.16	1.37
Nature Study	1.74	1.93	1.21	2.11	2.33	1.46	2.54	2.75	1.70
<b>Total for Group</b>	<b>95.78</b>	<b>101.26</b>		<b>106.75</b>	<b>112.76</b>		<b>118.78</b>	<b>124.99</b>	
<b>Total</b>	<b>1045.98</b>	<b>1112.88</b>		<b>1179.78</b>	<b>1252.75</b>		<b>1325.72</b>	<b>1403.27</b>	

**Notes:**

- For Resorts and Cabins - Used the Developed Camping Factors
- For Wilderness - Used the Backpacking Factors
- For Viewing Scenery, Driving for Pleasure, Other Motorized Travel - Used the Sightseeing Factors
- For Non-Motorized Water - Used the Rafting/Floating Factors instead of Canoeing (Assumed more users are rafters/floaters)
- For Visiting Nature Centers - Used the Visiting Historical Sites Factors
- For General Relaxing - Used the Family Gathering Factors
- For Gathering Berries, Etc. - Used the Picnicking Factors
- For Nature Study - Used the Wildlife Viewing Factors

Used the "Days" Factors for those primarily day use  
 Used the "Trips" Factors for those primarily overnight use

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2030	2035	2040	2040	2045	2050	2050
M Visits	M Visits	Factor	M Visits	M Visits	Factor	M Visits
107.08	119.52	2.44	131.96	147.37	3.01	162.78
25.39	26.02	1.05	26.66	25.01	0.92	23.36
37.77	39.98	1.53	42.19	44.67	1.71	47.15
7.23	7.50	1.29	7.77	8.13	1.41	8.49
44.94	46.32	2.08	47.70	54.92	2.71	62.14
222.41	239.33		256.26	280.09		303.92
267.86	284.15	1.66	300.44	318.54	1.86	336.64
2.85	2.94	1.23	3.02	3.16	1.34	3.29
172.11	182.58	1.66	193.04	204.67	1.86	216.30
0.00	0.00	1.66	0.00	0.00	1.86	0.00
27.91	29.78	1.61	31.64	33.81	1.83	35.97
470.73	499.44		528.15	560.17		592.20
218.76	231.83	1.78	244.90	255.91	1.94	266.91
6.24	6.31	1.30	6.39	6.41	1.31	6.44
2.60	2.67	1.11	2.73	2.80	1.17	2.87
66.84	68.73	1.12	70.63	73.46	1.21	76.30
294.45	309.54		324.64	338.58		352.53
0.00	0.00	0.38	0.00	0.00	0.36	0.00
0.00	0.00	2.07	0.00	0.00	2.71	0.00
0.00	0.00		0.00	0.00		0.00
0.00	0.00	2.44	0.00	0.00	3.01	0.00
0.00	0.00		0.00	0.00		0.00
53.21	51.41	0.83	49.62	47.53	0.76	45.44
74.14	78.28	1.89	82.42	85.26	2.02	88.09
209.46	211.15	1.26	212.84	212.84	1.26	212.84
336.81	340.85		344.89	345.63		346.37
25.21	27.17	2.01	29.12	31.15	2.29	33.18
25.21	27.17		29.12	31.15		33.18
4.21	4.63	2.13	5.06	5.56	2.55	6.06
0.00	0.00	2.13	0.00	0.00	2.55	0.00
103.84	109.22	1.49	114.61	120.76	1.65	126.91
20.20	21.37	1.53	22.55	23.88	1.71	25.21
2.96	3.13	1.89	3.29	3.41	2.02	3.52
131.20	138.36		145.52	153.61		161.70
1480.81	1554.70		1628.58	1709.24		1789.90

**NVUM Activities listed by RPA Categories (Alt. B)**

	2000	2005	2010	2010	2015	2020	2020	2025	2030
	M Visits	M Visits	Factor	M Visits	M Visits	Factor	M Visits	M Visits	Factor
<b>RPA Camping, Picnicking, Swimming</b>									
Developed Camping	51.50	58.45	1.27	65.41	73.90	1.60	82.40	92.19	1.98
Primitive Camping	21.33	21.11	0.98	20.90	21.11	1.00	21.33	21.33	1.00
Picnicking	26.26	27.70	1.11	29.15	30.72	1.23	32.30	34.14	1.37
Swimming	5.73	5.91	1.06	6.08	6.28	1.13	6.48	6.68	1.20
Backpacking, Camp in Unroaded Areas	19.26	21.48	1.23	23.69	26.97	1.57	30.24	34.00	1.96
<b>Total for Group</b>	<b>124.08</b>	<b>134.65</b>		<b>145.22</b>	<b>158.98</b>		<b>172.74</b>	<b>188.32</b>	
<b>RPA Mechanical Travel &amp; Viewing Scenery</b>									
Viewing Scenery	152.03	163.43	1.15	174.83	187.00	1.31	199.16	212.08	1.48
Off-Highway Vehicles	2.06	2.12	1.05	2.17	2.22	1.10	2.27	2.33	1.16
Driving For Pleasure	97.68	105.01	1.15	112.34	120.15	1.31	127.97	136.27	1.48
Other Motorized Travel	0.00	0.00	1.15	0.00	0.00	1.31	0.00	0.00	1.48
Bicycling	16.51	17.50	1.12	18.49	19.65	1.26	20.80	22.12	1.42
<b>Total for Group</b>	<b>268.29</b>	<b>288.06</b>		<b>307.83</b>	<b>329.01</b>		<b>350.20</b>	<b>372.81</b>	
<b>RPA Hiking, Horseback Riding, Water Travel</b>									
Hiking/Walking	115.57	126.55	1.19	137.53	148.51	1.38	159.49	171.62	1.59
Horseback Riding	4.13	4.31	1.09	4.50	4.71	1.19	4.91	5.08	1.27
Motorized Water Travel	2.06	2.07	1.01	2.08	2.11	1.03	2.13	2.16	1.06
Non-Motorized Water Travel	52.97	53.23	1.01	53.50	54.03	1.03	54.56	55.35	1.06
<b>Total for Group</b>	<b>174.73</b>	<b>186.17</b>		<b>197.61</b>	<b>209.35</b>		<b>221.08</b>	<b>234.21</b>	
<b>RPA Winter Sports</b>									
Cross Country Skiing	0.00	0.00	0.74	0.00	0.00	0.55	0.00	0.00	0.44
Downhill Skiing	0.00	0.00	1.27	0.00	0.00	1.37	0.00	0.00	1.66
<b>Total for Group</b>	<b>0.00</b>	<b>0.00</b>		<b>0.00</b>	<b>0.00</b>		<b>0.00</b>	<b>0.00</b>	
<b>RPA Resorts</b>									
Resorts, Cabins	0.00	0.00	1.27	0.00	0.00	1.60	0.00	0.00	1.98
<b>Total for Group</b>	<b>0.00</b>	<b>0.00</b>		<b>0.00</b>	<b>0.00</b>		<b>0.00</b>	<b>0.00</b>	
<b>RPA Fish &amp; Wildlife</b>									
Hunting	50.22	49.46	0.97	48.71	47.71	0.93	46.70	45.70	0.89
Viewing Wildlife, Birds, Fish	38.68	42.74	1.21	46.80	51.64	1.46	56.47	61.11	1.70
Fishing	149.37	156.09	1.09	162.82	168.79	1.17	174.77	179.99	1.24
<b>Total for Group</b>	<b>238.27</b>	<b>248.30</b>		<b>258.33</b>	<b>268.14</b>		<b>277.94</b>	<b>286.81</b>	
<b>Wilderness</b>									
Wilderness	13.33	14.80	1.22	16.26	17.93	1.47	19.60	21.39	1.74
<b>Total for Group</b>	<b>13.33</b>	<b>14.80</b>		<b>16.26</b>	<b>17.93</b>		<b>19.60</b>	<b>21.39</b>	
<b>Other</b>									
Visiting Historical Sites	2.26	2.51	1.22	2.76	3.04	1.47	3.33	3.67	1.77
Visiting Nature Centers, VIS	0.00	0.00	1.22	0.00	0.00	1.47	0.00	0.00	1.77
General Relaxing	68.65	72.43	1.11	76.20	80.32	1.23	84.44	88.56	1.35
Gathering Berries, Natural Products	12.38	13.06	1.11	13.74	14.49	1.23	15.23	16.10	1.37
Nature Study	1.66	1.83	1.21	2.01	2.22	1.46	2.42	2.62	1.70
<b>Total for Group</b>	<b>84.96</b>	<b>89.84</b>		<b>94.72</b>	<b>100.07</b>		<b>105.42</b>	<b>110.95</b>	
<b>Total</b>	<b>903.66</b>	<b>961.82</b>		<b>1019.98</b>	<b>1083.48</b>		<b>1146.99</b>	<b>1214.49</b>	

**Notes:**

- For Resorts and Cabins - Used the Developed Camping Factors
- For Wilderness - Used the Backpacking Factors
- For Viewing Scenery, Driving for Pleasure, Other Motorized Travel - Used the Sightseeing Factors
- For Non-Motorized Water - Used the Rafting/Floating Factors instead of Canoeing (Assumed more users are rafters/floaters)
- For Visiting Nature Centers - Used the Visiting Historical Sites Factors
- For General Relaxing - Used the Family Gathering Factors
- For Gathering Berries, Etc. - Used the Picnicking Factors
- For Nature Study - Used the Wildlife Viewing Factors

Used the "Days" Factors for those primarily day use  
 Used the "Trips" Factors for those primarily overnight use

713.52

2030	2035	2040	2040	2045	2050	2050
M Visits	M Visits	Factor	M Visits	M Visits	Factor	M Visits
101.97	113.82	2.44	125.66	140.34	3.01	155.02
21.33	21.86	1.05	22.39	21.01	0.92	19.62
35.97	38.07	1.53	40.18	42.54	1.71	44.90
6.88	7.14	1.29	7.40	7.74	1.41	8.09
37.75	38.91	2.08	40.06	46.13	2.71	52.20
203.90	219.80		235.69	257.76		279.82
225.00	238.69	1.66	252.37	267.57	1.86	282.78
2.39	2.47	1.23	2.54	2.65	1.34	2.77
144.57	153.36	1.66	162.16	171.92	1.86	181.69
0.00	0.00	1.66	0.00	0.00	1.86	0.00
23.44	25.01	1.61	26.58	28.40	1.83	30.21
395.42	419.53		443.65	470.55		497.45
183.76	194.74	1.78	205.72	214.96	1.94	224.21
5.24	5.30	1.30	5.37	5.39	1.31	5.41
2.19	2.24	1.11	2.29	2.35	1.17	2.41
56.15	57.74	1.12	59.33	61.71	1.21	64.09
247.33	260.02		272.70	284.41		296.12
0.00	0.00	0.38	0.00	0.00	0.36	0.00
0.00	0.00	2.07	0.00	0.00	2.71	0.00
0.00	0.00		0.00	0.00		0.00
0.00	0.00	2.44	0.00	0.00	3.01	0.00
0.00	0.00		0.00	0.00		0.00
44.69	43.19	0.83	41.68	39.92	0.76	38.17
65.76	69.43	1.89	73.11	75.62	2.02	78.13
185.22	186.72	1.26	188.21	188.21	1.26	188.21
295.67	299.33		303.00	303.75		304.51
23.19	24.99	2.01	26.79	28.66	2.29	30.53
23.19	24.99		26.79	28.66		30.53
4.01	4.41	2.13	4.82	5.30	2.55	5.77
0.00	0.00	2.13	0.00	0.00	2.55	0.00
92.68	97.49	1.49	102.29	107.78	1.65	113.28
16.96	17.95	1.53	18.95	20.06	1.71	21.17
2.82	2.98	1.89	3.14	3.25	2.02	3.35
116.47	122.84		129.20	136.39		143.58
1282.00	1346.51		1411.02	1481.51		1552.00

**NVUM Activities listed by RPA Categories (Alt. D)**

	2000	2005	2010	2010	2015	2020	2020	2025	2030
	M Visits	M Visits	Factor	M Visits	M Visits	Factor	M Visits	M Visits	Factor
<b>RPA Camping, Picnicking, Swimming</b>									
Developed Camping	51.50	58.45	1.27	65.41	73.90	1.60	82.40	92.19	1.98
Primitive Camping	22.34	22.12	0.98	21.89	22.12	1.00	22.34	22.34	1.00
Picnicking	26.26	27.70	1.11	29.15	30.72	1.23	32.30	34.14	1.37
Swimming	5.73	5.91	1.06	6.08	6.28	1.13	6.48	6.68	1.20
Backpacking, Camp in Unroaded Areas	20.18	22.50	1.23	24.82	28.25	1.57	31.68	35.62	1.96
<b>Total for Group</b>	<b>126.01</b>	<b>136.68</b>		<b>147.34</b>	<b>161.27</b>		<b>175.20</b>	<b>190.96</b>	
<b>RPA Mechanical Travel &amp; Viewing Scenery</b>									
Viewing Scenery	159.27	171.22	1.15	183.16	195.90	1.31	208.64	222.18	1.48
Off-Highway Vehicles	2.16	2.22	1.05	2.27	2.32	1.10	2.38	2.44	1.16
Driving For Pleasure	102.34	110.01	1.15	117.69	125.87	1.31	134.06	142.76	1.48
Other Motorized Travel	0.00	0.00	1.15	0.00	0.00	1.31	0.00	0.00	1.48
Bicycling	17.30	18.33	1.12	19.37	20.58	1.26	21.79	23.18	1.42
<b>Total for Group</b>	<b>281.07</b>	<b>301.78</b>		<b>322.49</b>	<b>344.68</b>		<b>366.88</b>	<b>390.56</b>	
<b>RPA Hiking, Horseback Riding, Water Travel</b>									
Hiking/Walking	121.07	132.58	1.19	144.08	155.58	1.38	167.08	179.80	1.59
Horseback Riding	4.32	4.52	1.09	4.71	4.93	1.19	5.15	5.32	1.27
Motorized Water Travel	2.16	2.17	1.01	2.18	2.21	1.03	2.23	2.26	1.06
Non-Motorized Water Travel	55.49	55.77	1.01	56.05	56.60	1.03	57.16	57.99	1.06
<b>Total for Group</b>	<b>183.05</b>	<b>195.04</b>		<b>207.02</b>	<b>219.32</b>		<b>231.61</b>	<b>245.36</b>	
<b>RPA Winter Sports</b>									
Cross Country Skiing	0.00	0.00	0.74	0.00	0.00	0.55	0.00	0.00	0.44
Downhill Skiing	0.00	0.00	1.27	0.00	0.00	1.37	0.00	0.00	1.66
<b>Total for Group</b>	<b>0.00</b>	<b>0.00</b>		<b>0.00</b>	<b>0.00</b>		<b>0.00</b>	<b>0.00</b>	
<b>RPA Resorts</b>									
Resorts, Cabins	0.00	0.00	1.27	0.00	0.00	1.60	0.00	0.00	1.98
<b>Total for Group</b>	<b>0.00</b>	<b>0.00</b>		<b>0.00</b>	<b>0.00</b>		<b>0.00</b>	<b>0.00</b>	
<b>RPA Fish &amp; Wildlife</b>									
Hunting	52.61	51.82	0.97	51.03	49.98	0.93	48.93	47.87	0.89
Viewing Wildlife, Birds, Fish	39.70	43.86	1.21	48.03	52.99	1.46	57.96	62.72	1.70
Fishing	153.47	160.37	1.09	167.28	173.42	1.17	179.56	184.93	1.24
<b>Total for Group</b>	<b>245.77</b>	<b>256.06</b>		<b>266.34</b>	<b>276.39</b>		<b>286.44</b>	<b>295.52</b>	
<b>Wilderness</b>									
Wilderness	12.17	13.51	1.22	14.85	16.37	1.47	17.89	19.53	1.74
<b>Total for Group</b>	<b>12.17</b>	<b>13.51</b>		<b>14.85</b>	<b>16.37</b>		<b>17.89</b>	<b>19.53</b>	
<b>Other</b>									
Visiting Historical Sites	2.26	2.51	1.22	2.76	3.04	1.47	3.33	3.67	1.77
Visiting Nature Centers, VIS	0.00	0.00	1.22	0.00	0.00	1.47	0.00	0.00	1.77
General Relaxing	70.29	74.16	1.11	78.02	82.24	1.23	86.46	90.67	1.35
Gathering Berries, Natural Products	12.97	13.69	1.11	14.40	15.18	1.23	15.96	16.86	1.37
Nature Study	1.66	1.83	1.21	2.01	2.22	1.46	2.42	2.62	1.70
<b>Total for Group</b>	<b>87.19</b>	<b>92.19</b>		<b>97.19</b>	<b>102.68</b>		<b>108.16</b>	<b>113.83</b>	
<b>Total</b>	<b>935.26</b>	<b>995.25</b>		<b>1055.24</b>	<b>1120.71</b>		<b>1186.18</b>	<b>1255.77</b>	

**Notes:**

- For Resorts and Cabins - Used the Developed Camping Factors
- For Wilderness - Used the Backpacking Factors
- For Viewing Scenery, Driving for Pleasure, Other Motorized Travel - Used the Sightseeing Factors
- For Non-Motorized Water - Used the Rafting/Floating Factors instead of Canoeing (Assumed more users are rafters/floaters)
- For Visiting Nature Centers - Used the Visiting Historical Sites Factors
- For General Relaxing - Used the Family Gathering Factors
- For Gathering Berries, Etc. - Used the Picnicking Factors
- For Nature Study - Used the Wildlife Viewing Factors

Used the "Days" Factors for those primarily day use  
 Used the "Trips" Factors for those primarily overnight use

739.19

2030	2035	2040	2040	2045	2050	2050
M Visits	M Visits	Factor	M Visits	M Visits	Factor	M Visits
101.97	113.82	2.44	125.66	140.34	3.01	155.02
22.34	22.90	1.05	23.46	22.01	0.92	20.55
35.97	38.07	1.53	40.18	42.54	1.71	44.90
6.88	7.14	1.29	7.40	7.74	1.41	8.09
39.55	40.76	2.08	41.97	48.33	2.71	54.69
206.72	222.69		238.66	260.95		283.24
235.72	250.05	1.66	264.39	280.32	1.86	296.24
2.51	2.58	1.23	2.66	2.78	1.34	2.90
151.46	160.67	1.66	169.88	180.11	1.86	190.35
0.00	0.00	1.66	0.00	0.00	1.86	0.00
24.56	26.20	1.61	27.85	29.75	1.83	31.65
414.25	439.51		464.77	492.96		521.14
192.51	204.01	1.78	215.51	225.20	1.94	234.88
5.49	5.56	1.30	5.62	5.64	1.31	5.66
2.29	2.35	1.11	2.40	2.46	1.17	2.53
58.82	60.49	1.12	62.15	64.65	1.21	67.15
259.11	272.40		285.68	297.95		310.22
0.00	0.00	0.38	0.00	0.00	0.36	0.00
0.00	0.00	2.07	0.00	0.00	2.71	0.00
0.00	0.00		0.00	0.00		0.00
0.00	0.00	2.44	0.00	0.00	3.01	0.00
0.00	0.00		0.00	0.00		0.00
46.82	45.24	0.83	43.67	41.82	0.76	39.98
67.48	71.25	1.89	75.02	77.61	2.02	80.19
190.30	191.83	1.26	193.37	193.37	1.26	193.37
304.60	308.33		312.06	312.80		313.54
21.18	22.82	2.01	24.46	26.17	2.29	27.87
21.18	22.82		24.46	26.17		27.87
4.01	4.41	2.13	4.82	5.30	2.55	5.77
0.00	0.00	2.13	0.00	0.00	2.55	0.00
94.89	99.81	1.49	104.73	110.36	1.65	115.98
17.77	18.81	1.53	19.85	21.02	1.71	22.18
2.82	2.98	1.89	3.14	3.25	2.02	3.35
119.49	126.02		132.54	139.91		147.29
1325.35	1391.77		1458.18	1530.74		1603.30

**NVUM Activities listed by RPA Categories (Alt. E)**

	2000	2005	2010	2010	2015	2020	2020	2025	2030
	M Visits	M Visits	Factor	M Visits	M Visits	Factor	M Visits	M Visits	Factor
<b>RPA Camping, Picnicking, Swimming</b>									
Developed Camping	54.08	61.38	1.27	68.68	77.60	1.60	86.53	96.80	1.98
Primitive Camping	25.39	25.13	0.98	24.88	25.13	1.00	25.39	25.39	1.00
Picnicking	27.57	29.09	1.11	30.60	32.26	1.23	33.91	35.84	1.37
Swimming	6.02	6.20	1.06	6.38	6.59	1.13	6.80	7.02	1.20
Backpacking, Camp in Unroaded Areas	22.93	25.57	1.23	28.20	32.10	1.57	36.00	40.47	1.96
<b>Total for Group</b>	<b>135.99</b>	<b>147.37</b>		<b>158.75</b>	<b>173.69</b>		<b>188.63</b>	<b>205.52</b>	
<b>RPA Mechanical Travel &amp; Viewing Scenery</b>									
Viewing Scenery	180.99	194.56	1.15	208.14	222.62	1.31	237.09	252.48	1.48
Off-Highway Vehicles	2.46	2.52	1.05	2.58	2.64	1.10	2.70	2.78	1.16
Driving For Pleasure	116.29	125.01	1.15	133.73	143.04	1.31	152.34	162.23	1.48
Other Motorized Travel	0.00	0.00	1.15	0.00	0.00	1.31	0.00	0.00	1.48
Bicycling	19.65	20.83	1.12	22.01	23.39	1.26	24.77	26.34	1.42
<b>Total for Group</b>	<b>319.39</b>	<b>342.93</b>		<b>366.46</b>	<b>391.68</b>		<b>416.90</b>	<b>443.82</b>	
<b>RPA Hiking, Horseback Riding, Water Travel</b>									
Hiking/Walking	137.58	150.65	1.19	163.72	176.79	1.38	189.87	204.31	1.59
Horseback Riding	4.91	5.13	1.09	5.36	5.60	1.19	5.85	6.04	1.27
Motorized Water Travel	2.46	2.47	1.01	2.48	2.51	1.03	2.53	2.57	1.06
Non-Motorized Water Travel	63.06	63.37	1.01	63.69	64.32	1.03	64.95	65.90	1.06
<b>Total for Group</b>	<b>208.01</b>	<b>221.63</b>		<b>235.25</b>	<b>249.22</b>		<b>263.19</b>	<b>278.82</b>	
<b>RPA Winter Sports</b>									
Cross Country Skiing	0.00	0.00	0.74	0.00	0.00	0.55	0.00	0.00	0.44
Downhill Skiing	0.00	0.00	1.27	0.00	0.00	1.37	0.00	0.00	1.66
<b>Total for Group</b>	<b>0.00</b>	<b>0.00</b>		<b>0.00</b>	<b>0.00</b>		<b>0.00</b>	<b>0.00</b>	
<b>RPA Resorts</b>									
Resorts, Cabins	0.00	0.00	1.27	0.00	0.00	1.60	0.00	0.00	1.98
<b>Total for Group</b>	<b>0.00</b>	<b>0.00</b>		<b>0.00</b>	<b>0.00</b>		<b>0.00</b>	<b>0.00</b>	
<b>RPA Fish &amp; Wildlife</b>									
Hunting	59.78	58.89	0.97	57.99	56.79	0.93	55.60	54.40	0.89
Viewing Wildlife, Birds, Fish	43.61	48.19	1.21	52.77	58.22	1.46	63.67	68.90	1.70
Fishing	168.92	176.52	1.09	184.12	190.88	1.17	197.64	203.55	1.24
<b>Total for Group</b>	<b>272.32</b>	<b>283.60</b>		<b>294.88</b>	<b>305.90</b>		<b>316.91</b>	<b>326.86</b>	
<b>Wilderness</b>									
Wilderness	12.75	14.15	1.22	15.56	17.15	1.47	18.74	20.46	1.74
<b>Total for Group</b>	<b>12.75</b>	<b>14.15</b>		<b>15.56</b>	<b>17.15</b>		<b>18.74</b>	<b>20.46</b>	
<b>Other</b>									
Visiting Historical Sites	2.38	2.64	1.22	2.90	3.20	1.47	3.49	3.85	1.77
Visiting Nature Centers, VIS	0.00	0.00	1.22	0.00	0.00	1.47	0.00	0.00	1.77
General Relaxing	76.92	81.15	1.11	85.38	89.99	1.23	94.61	99.22	1.35
Gathering Berries, Natural Products	14.74	15.55	1.11	16.36	17.25	1.23	18.13	19.16	1.37
Nature Study	1.74	1.93	1.21	2.11	2.33	1.46	2.54	2.75	1.70
<b>Total for Group</b>	<b>95.78</b>	<b>101.26</b>		<b>106.75</b>	<b>112.76</b>		<b>118.78</b>	<b>124.99</b>	
<b>Total</b>	<b>1044.24</b>	<b>1110.95</b>		<b>1177.66</b>	<b>1250.41</b>		<b>1323.16</b>	<b>1400.47</b>	

**Notes:**

- For Resorts and Cabins - Used the Developed Camping Factors
- For Wilderness - Used the Backpacking Factors
- For Viewing Scenery, Driving for Pleasure, Other Motorized Travel - Used the Sightseeing Factors
- For Non-Motorized Water - Used the Rafting/Floating Factors instead of Canoeing (Assumed more users are rafters/floaters)
- For Visiting Nature Centers - Used the Visiting Historical Sites Factors
- For General Relaxing - Used the Family Gathering Factors
- For Gathering Berries, Etc. - Used the Picnicking Factors
- For Nature Study - Used the Wildlife Viewing Factors

Used the "Days" Factors for those primarily day use  
 Used the "Trips" Factors for those primarily overnight use

82735

2030	2035	2040	2040	2045	2050	2050
M Visits	M Visits	Factor	M Visits	M Visits	Factor	M Visits
107.08	119.52	2.44	131.96	147.37	3.01	162.78
25.39	26.02	1.05	26.66	25.01	0.92	23.36
37.77	39.98	1.53	42.19	44.67	1.71	47.15
7.23	7.50	1.29	7.77	8.13	1.41	8.49
44.94	46.32	2.08	47.70	54.92	2.71	62.14
222.41	239.33		256.26	280.09		303.92
267.86	284.15	1.66	300.44	318.54	1.86	336.64
2.85	2.94	1.23	3.02	3.16	1.34	3.29
172.11	182.58	1.66	193.04	204.67	1.86	216.30
0.00	0.00	1.66	0.00	0.00	1.86	0.00
27.91	29.78	1.61	31.64	33.81	1.83	35.97
470.73	499.44		528.15	560.17		592.20
218.76	231.83	1.78	244.90	255.91	1.94	266.91
6.24	6.31	1.30	6.39	6.41	1.31	6.44
2.60	2.67	1.11	2.73	2.80	1.17	2.87
66.84	68.73	1.12	70.63	73.46	1.21	76.30
294.45	309.54		324.64	338.58		352.53
0.00	0.00	0.38	0.00	0.00	0.36	0.00
0.00	0.00	2.07	0.00	0.00	2.71	0.00
0.00	0.00		0.00	0.00		0.00
0.00	0.00	2.44	0.00	0.00	3.01	0.00
0.00	0.00		0.00	0.00		0.00
53.21	51.41	0.83	49.62	47.53	0.76	45.44
74.14	78.28	1.89	82.42	85.26	2.02	88.09
209.46	211.15	1.26	212.84	212.84	1.26	212.84
336.81	340.85		344.89	345.63		346.37
22.19	23.91	2.01	25.63	27.41	2.29	29.20
22.19	23.91		25.63	27.41		29.20
4.21	4.63	2.13	5.06	5.56	2.55	6.06
0.00	0.00	2.13	0.00	0.00	2.55	0.00
103.84	109.22	1.49	114.61	120.76	1.65	126.91
20.20	21.37	1.53	22.55	23.88	1.71	25.21
2.96	3.13	1.89	3.29	3.41	2.02	3.52
131.20	138.36		145.52	153.61		161.70
1477.78	1551.43		1625.08	1705.50		1785.91

2030	2035	2040	2040	2045	2050	2050
M Visits	M Visits	Factor	M Visits	M Visits	Factor	M Visits
101.97	113.82	2.44	125.66	140.34	3.01	155.02
20.31	20.82	1.05	21.33	20.01	0.92	18.69
35.97	38.07	1.53	40.18	42.54	1.71	44.90
6.88	7.14	1.29	7.40	7.74	1.41	8.09
35.96	37.06	2.08	38.16	43.94	2.71	49.71
201.09	216.90		232.71	254.56		276.40
214.29	227.32	1.66	240.35	254.83	1.86	269.31
2.28	2.35	1.23	2.42	2.53	1.34	2.63
137.69	146.06	1.66	154.43	163.74	1.86	173.04
0.00	0.00	1.66	0.00	0.00	1.86	0.00
22.33	23.82	1.61	25.32	27.05	1.83	28.77
376.59	399.55		422.52	448.14		473.76
175.01	185.46	1.78	195.92	204.72	1.94	213.53
4.99	5.05	1.30	5.11	5.13	1.31	5.15
2.08	2.13	1.11	2.18	2.24	1.17	2.30
53.47	54.99	1.12	56.50	58.77	1.21	61.04
235.56	247.63		259.71	270.87		282.02
0.00	0.00	0.38	0.00	0.00	0.36	0.00
0.00	0.00	2.07	0.00	0.00	2.71	0.00
0.00	0.00		0.00	0.00		0.00
0.00	0.00	2.44	0.00	0.00	3.01	0.00
0.00	0.00		0.00	0.00		0.00
42.57	41.13	0.83	39.70	38.02	0.76	36.35
64.03	67.61	1.89	71.19	73.63	2.02	76.08
180.14	181.60	1.26	183.05	183.05	1.26	183.05
286.74	290.34		293.93	294.71		295.48
23.19	24.99	2.01	26.79	28.66	2.29	30.53
23.19	24.99		26.79	28.66		30.53
4.01	4.41	2.13	4.82	5.30	2.55	5.77
0.00	0.00	2.13	0.00	0.00	2.55	0.00
90.47	95.16	1.49	99.85	105.21	1.65	110.57
16.16	17.10	1.53	18.04	19.10	1.71	20.17
2.82	2.98	1.89	3.14	3.25	2.02	3.35
113.45	119.65		125.85	132.86		139.87
1236.62	1299.07		1361.52	1429.79		1498.05

**NVUM Activities listed by RPA Categories (Alt. I)**

	2000	2005	2010	2010	2015	2020	2020	2025	2030
	M Visits	M Visits	Factor	M Visits	M Visits	Factor	M Visits	M Visits	Factor
<b>RPA Camping, Picnicking, Swimming</b>									
Developed Camping	51.50	58.45	1.27	65.41	73.90	1.60	82.40	92.19	1.98
Primitive Camping	22.34	22.12	0.98	21.89	22.12	1.00	22.34	22.34	1.00
Picnicking	26.26	27.70	1.11	29.15	30.72	1.23	32.30	34.14	1.37
Swimming	5.73	5.91	1.06	6.08	6.28	1.13	6.48	6.68	1.20
Backpacking, Camp in Unroaded Areas	20.18	22.50	1.23	24.82	28.25	1.57	31.68	35.62	1.96
<b>Total for Group</b>	126.01	136.68		147.34	161.27		175.20	190.96	
<b>RPA Mechanical Travel &amp; Viewing Scenery</b>									
Viewing Scenery	159.27	171.22	1.15	183.16	195.90	1.31	208.64	222.18	1.48
Off-Highway Vehicles	2.16	2.22	1.05	2.27	2.32	1.10	2.38	2.44	1.16
Driving For Pleasure	102.34	110.01	1.15	117.69	125.87	1.31	134.06	142.76	1.48
Other Motorized Travel	0.00	0.00	1.15	0.00	0.00	1.31	0.00	0.00	1.48
Bicycling	17.30	18.33	1.12	19.37	20.58	1.26	21.79	23.18	1.42
<b>Total for Group</b>	281.07	301.78		322.49	344.68		366.88	390.56	
<b>RPA Hiking, Horseback Riding, Water Travel</b>									
Hiking/Walking	121.07	132.58	1.19	144.08	155.58	1.38	167.08	179.80	1.59
Horseback Riding	4.32	4.52	1.09	4.71	4.93	1.19	5.15	5.32	1.27
Motorized Water Travel	2.16	2.17	1.01	2.18	2.21	1.03	2.23	2.26	1.06
Non-Motorized Water Travel	55.49	55.77	1.01	56.05	56.60	1.03	57.16	57.99	1.06
<b>Total for Group</b>	183.05	195.04		207.02	219.32		231.61	245.36	
<b>RPA Winter Sports</b>									
Cross Country Skiing	0.00	0.00	0.74	0.00	0.00	0.55	0.00	0.00	0.44
Downhill Skiing	0.00	0.00	1.27	0.00	0.00	1.37	0.00	0.00	1.66
<b>Total for Group</b>	0.00	0.00		0.00	0.00		0.00	0.00	
<b>RPA Resorts</b>									
Resorts, Cabins	0.00	0.00	1.27	0.00	0.00	1.60	0.00	0.00	1.98
<b>Total for Group</b>		0.00		0.00	0.00		0.00	0.00	
<b>RPA Fish &amp; Wildlife</b>									
Hunting	52.61	51.82	0.97	51.03	49.98	0.93	48.93	47.87	0.89
Viewing Wildlife, Birds, Fish	39.70	43.86	1.21	48.03	52.99	1.46	57.96	62.72	1.70
Fishing	153.47	160.37	1.09	167.28	173.42	1.17	179.56	184.93	1.24
<b>Total for Group</b>	245.77	256.06		266.34	276.39		286.44	295.52	
<b>Wilderness</b>									
Wilderness	12.17	13.51	1.22	14.85	16.37	1.47	17.89	19.53	1.74
<b>Total for Group</b>	12.17	13.51		14.85	16.37		17.89	19.53	
<b>Other</b>									
Visiting Historical Sites	2.26	2.51	1.22	2.76	3.04	1.47	3.33	3.67	1.77
Visiting Nature Centers, VIS	0.00	0.00	1.22	0.00	0.00	1.47	0.00	0.00	1.77
General Relaxing	70.29	74.16	1.11	78.02	82.24	1.23	86.46	90.67	1.35
Gathering Berries, Natural Products	12.97	13.69	1.11	14.40	15.18	1.23	15.96	16.86	1.37
Nature Study	1.66	1.83	1.21	2.01	2.22	1.46	2.42	2.62	1.70
<b>Total for Group</b>	87.19	92.19		97.19	102.68		108.16	113.83	
<b>Total</b>	935.26	995.25		1055.24	1120.71		1186.18	1255.77	

Notes:

- For Resorts and Cabins - Used the Developed Camping Factors
- For Wilderness - Used the Backpacking Factors
- For Viewing Scenery, Driving for Pleasure, Other Motorized Travel - Used the Sightseeing Factors
- For Non-Motorized Water - Used the Rafting/Floating Factors instead of Canoeing (Assumed more users are rafters/floaters)
- For Visiting Nature Centers - Used the Visiting Historical Sites Factors
- For General Relaxing - Used the Family Gathering Factors
- For Gathering Berries, Etc. - Used the Picnicking Factors
- For Nature Study - Used the Wildlife Viewing Factors

Used the "Days" Factors for those primarily day use  
 Used the "Trips" Factors for those primarily overnight use

[739.19]

10/5/02

**Process Record for Projecting NVUM Activities listed by RPA Categories**

	2000	2005	2010	2010	2015	2020	2020	2025	2030
	M Visits	M Visits	Factor	M Visits	M Visits	Factor	M Visits	M Visits	Factor
<b>RPA Camping, Picnicking, Swimming</b>									
Developed Camping	51.50	58.45	1.27	65.41	73.90	1.60	82.40	92.19	1.98
Primitive Camping	20.31	20.11	0.98	19.90	20.11	1.00	20.31	20.31	1.00
Picnicking	26.26	27.70	1.11	29.15	30.72	1.23	32.30	34.14	1.37
Swimming	5.73	5.91	1.06	6.08	6.28	1.13	6.48	6.68	1.20
Backpacking, Camp in Unroaded Area	18.34	20.45	1.23	22.56	25.68	1.57	28.80	32.38	1.96
<b>Total for Group</b>	<b>122.15</b>	<b>132.62</b>		<b>143.10</b>	<b>156.69</b>		<b>170.29</b>	<b>185.69</b>	
<b>RPA Mechanical Travel &amp; Viewing Scenery</b>									
Viewing Scenery	144.79	155.65	1.15	166.51	178.09	1.31	189.68	201.98	1.48
Off-Highway Vehicles	1.97	2.01	1.05	2.06	2.11	1.10	2.16	2.22	1.16
Driving For Pleasure	93.03	100.01	1.15	106.99	114.43	1.31	121.87	129.78	1.48
Other Motorized Travel	0.00	0.00	1.15	0.00	0.00	1.31	0.00	0.00	1.48
Bicycling	15.72	16.67	1.12	17.61	18.71	1.26	19.81	21.07	1.42
<b>Total for Group</b>	<b>255.51</b>	<b>274.34</b>		<b>293.17</b>	<b>313.35</b>		<b>333.52</b>	<b>355.05</b>	
<b>RPA Hiking, Horseback Riding, Water Travel</b>									
Hiking/Walking	110.07	120.52	1.19	130.98	141.44	1.38	151.89	163.45	1.59
Horseback Riding	3.93	4.11	1.09	4.28	4.48	1.19	4.68	4.84	1.27
Motorized Water Travel	1.97	1.98	1.01	1.99	2.00	1.03	2.02	2.05	1.06
Non-Motorized Water Travel	50.45	50.70	1.01	50.95	51.46	1.03	51.96	52.72	1.06
<b>Total for Group</b>	<b>166.41</b>	<b>177.31</b>		<b>188.20</b>	<b>199.38</b>		<b>210.56</b>	<b>223.06</b>	
<b>RPA Winter Sports</b>									
Cross Country Skiing	0.00	0.00	0.74	0.00	0.00	0.55	0.00	0.00	0.44
Snomobile Travel	0.00	0.00	1.09	0.00	0.00	1.17	0.00	0.00	1.32
Downhill Skiing	0.00	0.00	1.27	0.00	0.00	1.37	0.00	0.00	1.66
<b>Total for Group</b>	<b>0.00</b>	<b>0.00</b>		<b>0.00</b>	<b>0.00</b>		<b>0.00</b>	<b>0.00</b>	
<b>RPA Resorts</b>									
Resorts, Cabins	0.00	0.00	1.27	0.00	0.00	1.60	0.00	0.00	1.98
<b>Total for Group</b>	<b>0.00</b>	<b>0.00</b>		<b>0.00</b>	<b>0.00</b>		<b>0.00</b>	<b>0.00</b>	
<b>RPA Fish &amp; Wildlife</b>									
Hunting	47.83	47.11	0.97	46.39	45.44	0.93	44.48	43.52	0.89
Viewing Wildlife, Birds, Fish	37.66	41.62	1.21	45.57	50.28	1.46	54.99	59.51	1.70
Fishing	145.28	151.81	1.09	158.35	164.16	1.17	169.97	175.06	1.24
<b>Total for Group</b>	<b>230.77</b>	<b>240.54</b>		<b>250.32</b>	<b>259.88</b>		<b>269.44</b>	<b>278.09</b>	
<b>Wilderness</b>									
Wilderness	11.59	12.86	1.22	14.14	15.59	1.47	17.04	18.60	1.74
<b>Total for Group</b>	<b>11.59</b>	<b>12.86</b>		<b>14.14</b>	<b>15.59</b>		<b>17.04</b>	<b>18.60</b>	
<b>Other</b>									
Visiting Historical Sites	2.26	2.51	1.22	2.76	3.04	1.47	3.33	3.67	1.77
Visiting Nature Centers, VIS	0.00	0.00	1.22	0.00	0.00	1.47	0.00	0.00	1.77
General Relaxing	67.01	70.70	1.11	74.39	78.41	1.23	82.43	86.45	1.35
Gathering Berries, Natural Products	11.79	12.44	1.11	13.09	13.80	1.23	14.51	15.33	1.37
Nature Study	1.66	1.83	1.21	2.01	2.22	1.46	2.42	2.62	1.70
<b>Total for Group</b>	<b>82.73</b>	<b>87.49</b>		<b>92.25</b>	<b>97.47</b>		<b>102.68</b>	<b>108.07</b>	
<b>Total</b>	<b>869.16</b>	<b>925.17</b>		<b>981.17</b>	<b>1042.35</b>		<b>1103.53</b>	<b>1168.56</b>	

**Notes:**

- For Resorts and Cabins - Used the Developed Camping Factors
- For Wilderness - Used the Backpacking Factors
- For Viewing Scenery, Driving for Pleasure, Other Motorized Travel - Used the Sightseeing Factors
- For Non-Motorized Water - Used the Rafting/Floating Factors instead of Canoeing (Assumed more users are rafters/floaters)
- For Visiting Nature Centers - Used the Visiting Historical Sites Factors
- For General Relaxing - Used the Family Gathering Factors
- For Gathering Berries, Etc. - Used the Picnicking Factors
- For Nature Study - Used the Wildlife Viewing Factors

Used the "Days" Factors for those primarily day use  
 Used the "Trips" Factors for those primarily overnight use

2030	2035	2040	2040	2045	2050	2050
M Visits	M Visits	Factor	M Visits	M Visits	Factor	M Visits
101.97	113.82	2.44	125.66	140.34	3.01	155.02
20.31	20.82	1.05	21.33	20.01	0.92	18.69
35.97	38.07	1.53	40.18	42.54	1.71	44.90
6.88	7.14	1.29	7.40	7.74	1.41	8.09
35.96	37.06	2.08	38.16	43.94	2.71	49.71
201.09	216.90		232.71	254.56		276.40
214.29	227.32	1.66	240.35	254.83	1.86	269.31
2.28	2.35	1.23	2.42	2.53	1.34	2.63
137.69	146.06	1.66	154.43	163.74	1.86	173.04
0.00	0.00	1.66	0.00	0.00	1.86	0.00
22.33	23.82	1.61	25.32	27.05	1.83	28.77
376.59	399.55		422.52	448.14		473.76
175.01	185.46	1.78	195.92	204.72	1.94	213.53
4.99	5.05	1.30	5.11	5.13	1.31	5.15
2.08	2.13	1.11	2.18	2.24	1.17	2.30
53.47	54.99	1.12	56.50	58.77	1.21	61.04
235.56	247.63		259.71	270.87		282.02
0.00	0.00	0.38	0.00	0.00	0.36	0.00
0.00	0.00	1.55	0.00	0.00	1.90	0.00
0.00	0.00	2.07	0.00	0.00	2.71	0.00
0.00	0.00		0.00	0.00		0.00
0.00	0.00	2.44	0.00	0.00	3.01	0.00
0.00	0.00		0.00	0.00		0.00
42.57	41.13	0.83	39.70	38.02	0.76	36.35
64.03	67.61	1.89	71.19	73.63	2.02	76.08
180.14	181.60	1.26	183.05	183.05	1.26	183.05
286.74	290.34		293.93	294.71		295.48
20.17	21.73	2.01	23.30	24.92	2.29	26.54
20.17	21.73		23.30	24.92		26.54
4.01	4.41	2.13	4.82	5.30	2.55	5.77
0.00	0.00	2.13	0.00	0.00	2.55	0.00
90.47	95.16	1.49	99.85	105.21	1.65	110.57
16.16	17.10	1.53	18.04	19.10	1.71	20.17
2.82	2.98	1.89	3.14	3.25	2.02	3.35
113.45	119.65		125.85	132.86		139.87
1233.59	1295.81		1358.03	1426.05		1494.07

# **Chattooga River History Project Literature Review and Interview Summary**

*Prepared for*

**USDA Forest Service  
Francis Marion and Sumter National Forests**

*Prepared by*

**Tetra Tech EC, Inc.  
Atlanta, Georgia**

August 25, 2006

## 1.1 INTRODUCTION

The Chattooga River originates in North Carolina and forms a partial border between the states of Georgia and South Carolina. It is one of the longer and larger free-flowing rivers in the southeast and is the only mountain river within a four-state region that has not been substantially developed along its length. The Chattooga River provides important recreation resources for local, regional, and national users and offers high quality fishing and boating.

A recent revision of the Sumter National Forest Land and Resource Management Plan (Forest Plan) addressed several recreation issues in the river corridor; among the management actions, the plan retained a 1976 ban on boating use upstream of Highway 28 (about 21 miles). This ban was later appealed by American Whitewater (AW), and the Forest Service (USFS) agreed to reassess that decision as part of broader examination of visitor capacity issues on the Upper Chattooga River. The Forest Service is employing a modified “Limits of Acceptable Change” (LAC) planning framework to address these visitor capacity issues, and is conducting several analysis “elements” to better inform that process or other management issues.

This report is one of those “elements,” and its goal is to describe the basis for the 1976 boating prohibition and other relevant capacity issues that informed initial management decisions for the Chattooga. This will include a description of the river’s USFS management history from about 1970 to the present based on existing documentation and a limited number of interviews with agency personnel.

Following a description of analysis methods, Section 1.2 provides a summary of the Chattooga River’s history from 1970 to the present and provides key findings by issue. Conclusions are summarized in Section 1.3, and are based on an integration of the document review and interview information.

### 1.1.1 Methods

Written documentation on use conflicts, river management issues, and public involvement associated with capacity issues were reviewed for this analysis. Table 1 describes documents provided by the USDA Forest Service for this review.

**Table 1-1.** Literature Review Documents

Document Name	Author	Year
Upper Chattooga River Visitor Capacity Analysis Plan	Doug Whittaker	2006
Affidavits from Max Gates and Jim Barrett		2006
Chattooga River Chronology Relating to Boating Above Highway 28	Terry Seyden	2005
History of the Access Closure Above Highway 28	John Cleeves	2005
History of the Boating Ban from the Angler's Perspective	Doug Adams	2002
Chattooga Wild and Scenic River – Analysis of Outstanding Remarkable Values	USDA FS	1996
Chattooga River Visitor Study	Dye et al	1994
Chattooga Sourcebook – An Interpretive Guide	William Clay	1993
Recommendations for Management of Private Floater Use on the Chattooga for Utah State Recreation Short Course Requirements	Brent Botts	1991
Sumter National Forest Land Management Plan Appendix M	USDA FS	1985
Chattooga River Recommended Management Objectives and Rationing Techniques	Joseph Wallace	1983
Chattooga River Visitor Characteristics	Carol Townsend	1982
Chattooga WSR Management Plan	USDA FS	1980
Handbook for Chattooga River Guides	Wildwater	1980
Chattooga! Case Study	Carol Townsend	1980
A Study of Floating Use on the Chattooga WSR	Craig et al	1979
Chattooga WSR Management Plan	USDA FS	1977
Chattooga WSR River Classification, Boundaries, and Development Plan	USDA FS	1976
Chattooga River Visitor Study	Howard et al	1975
Chattooga WSR Study Report	USDA FS	1971

**Note:** Francis Marion and Sumter National Forest literature review list

Because the written record of events may not have been comprehensive, interviews with decision-makers at the Forest Service and other natural resource agencies with knowledge of past forest decisions were also conducted. Table 2 provides a list of interviewees who could be located and agreed to participate; it includes Forest Service, South Carolina, and Georgia Department of Natural Resources (DNR) employees involved during or after the time of the boating ban above Highway 28.

**Table 1-2.** USDA Forest Service and Georgia Department of Natural Resources Interviewees

Name	Chattooga River Involvement
Max Gates	USDA Forest Service, Andrew Pickens District Ranger, 1961-1972 (Retired)
Jim Barrett	USDA Forest Service, Andrew Pickens District Ranger, 1972+ (Retired)
Dan Rankin	Georgia Department of Natural Resources
Dillard Barron	USDA Forest Service, Tallulah District (Retired)
Charlie Huppuch	USDA Forest Service, Andrew Pickens Ranger District (Retired)
Monte Seehorn	USDA Forest Service, Andrew Pickens Ranger District (Retired)
Jeff Durniak	Georgia Department of Natural Resources
James Culp	USDA Forest Service, River Ranger, 1974-1980 (Retired)

**Note:** Francis Marion and Sumter National Forest interviewee list

Interviewees were asked a set of questions that pertain to the 1976 Chattooga boating closure, fishing stocking, and general assessments of capacity issues in the 1970's and 80s. The set of questions (Table 3) elicits information on and gains insight into the closure when designated as a Wild and Scenic River (WSR). The questions were developed in an effort to gain insight on agency resource management decisions leading up to and including the 1976 boating ban. Information from the literature review was integrated with interview findings to provide greater understanding of the history of recreation use and management responses on the river.

**Table 1-3.** Interview Questions

Question Number	Question
1	What is your connection to the Chattooga River Closure?
2	What was the condition of the river prior to the closure in 1976?
3	What user conflicts occurred prior to the closure in 1976?
4	Why were the roads closed?
5	What were the reasons for developing the boating ban above Hwy 28?
6	What issues were you addressing prior to the closure?
7	Where any decisions made based on capacity concerns?
8	In your opinion, was the river approaching capacity at the time?
9	What stocking decisions were made and why?
10	In your opinion, was the river being managed for boating or angling?
11	How was the public involved and/or consulted during the decision-making process?
12	What impacts were believed to occur from river use above Hwy 28?
13	What impacts were believed to occur from river use below Hwy 28?

**Note:** Francis Marion and Sumter National Forest interviewee question list

Despite using both a literature review and interview responses to gain insight about the motivating factors in 1976 boating ban some information gaps remain. There are limitations on

making generalizations based on the information presented here due to the lack of documentation from the 1970s (NEPA or similar processes were far less structured in that time period) and the uncertain motivations of some interview respondents. The boating ban on the Upper River has become controversial and advocacy positions may filter memories of historical management decisions and their basis.

## **1.2 KEY FINDINGS**

Findings are organized by 1) an overview of management actions accompanied by a timeline; 2) information on boater-angler or other conflicts; 3) the basis for the initial boating ban; 4) the basis for fish stocking changes; 5) capacity judgments in the 1970s; and 6) evidence of public involvement during decision-making processes.

### **1.2.1 Overview of Chattooga Management and Timeline**

USDA Forest Service (Forest Service) management began more active management of the river in 1968 when the Chattooga was recommended for Wild and Scenic River (WSR) consideration, largely because of its outstanding wild nature (Cleeves 2005). The following year, the Forest Service began a three-year suitability study of the portions of the Chattooga River that were being considered for designation as a WSR, which included reconnaissance boating trips down the entire river.

One year after publishing the 1971 suitability study, the popular movie “Deliverance” was released and boating use on the Chattooga River increased dramatically, particularly on the lower river. Floating use on the Chattooga was estimated to be 100 days in the late 1960’s and escalated to over 20,000 in 1973 (Craig et al 1979). Until 1973, all use was private. After that time, commercial outfitters were permitted to work on the river. Comparatively, there was still substantial private use from 1973 to 1975. However, every year since 1976 commercial boaters have outnumbered private boaters (USDA Forest Service 1996). Current use levels exceed 57,000 individuals per year, with about 70 percent of that use commercial (Vaigas 2006).

The release of the movie occurred about the same time that whitewater rafting was dramatically increasing, contributing to the popularity of the Chattooga (Botts 1991). As use increased, there were accidents (including boater fatalities) below Highway 28, and the FS began to initiate education and regulation programs to minimize those problems (Clay 1993).

In addition, conflicts between boaters and anglers apparently began to develop about this time. Forest Service law enforcement responded to several verbal and physical confrontations (USDA Forest Service 2006), probably on the lower river (although documents do not specify their location or the number of specific incidents). In these early years, the Forest Service did not systematically monitor or actively manage any type of use, and documentation of accidents or law enforcement incidents is sparse.

By 1974, the Chattooga River’s outstandingly remarkable fish, wildlife, recreation, scenic, and historic values were recognized by Congress through designation as a WSR. Within one year, the

Forest Service was mandated to establish boundaries, classify sections for the river, and prepare an administrative management plan. This led to more proactive recreation management yet, with a particular focus on removing or minimizing development in the corridor. In the initial management plan (printed in the Federal Register in 1976, p. 11819), the river was divided into geographic zones with different use patterns and characteristics; zoning by type of recreation setting (using the Recreation Opportunity Spectrum ROS) was the dominant recreation planning framework in use at that time, and language in the 1976 Plan clearly indicate interest in “providing a range of recreation opportunities characteristic of, and in harmony with, the nature of individual river segments.” (USDA Forest Service, 1976).

As part of the zoning effort, the segment above Highway 28 was closed to boating. There is limited written documentation of the specific reasons for the ban, but the “Classification, Boundaries, and Development Plan” provided in the March 22, 1976 Federal Register includes statements that suggest three possible reasons: safety, the lack of sufficient flows, and to prevent conflicts/provide angling opportunities without boating encounters.

The boating ban was not the main focus of the plan; most of it detailed “development” actions that included two other significant management decisions. First, many primitive roads to or along the river (often remnants of timber activities from the first half of the century) were closed to provide a more primitive recreation setting. Except for major roads that crossed the river, virtually every road that reached the river’s shore was gated at least a quarter mile or more from the water. This substantially modified many existing recreation uses (vehicle-based camping, fishing, and picnicking next to the river was no longer possible) and limited stocking truck access, with additional implications for fishing as discussed below. Second, several trails were planned to be built, which would provide new hiking based access to the corridor, particularly upstream of Highway 28.

From the late 1970s through the 1990s, subsequent management plans (most notably in 1985) basically mimicked the 1976 “blueprint” for the river. The 1976 development plan guided the creation of several new trails or improvements in subsequent years, particularly in the Upper River corridor. In addition, continued increases in Lower River boating led to some of the most active management of commercial boating use on a national Wild and Scenic River. This included limits on trips per day, daily time scheduling to minimize encounters between trips, strict regulations that keeps river campers from being visible from the river, and a mandatory use registration system for private and commercial uses. While boating use increases on the lower river segments were documented during this time, use estimates of anglers and hikers were less systematically tracked. Based on limited information, however, they also appear to have increased.

Recent planning led to a 2004 Francis Marion and Sumter National Forest Land Management Plan. While this plan maintained the boating ban above Highway 28, an appeal has led to a review of this action and related capacity issues. In the interim management is based on the

direction in the 1985 Forest Plan which maintains the restriction on boating above Highway 28 (Cleeves 2005).

**Table 1-4. Timeline**

Year	Event	Comment
1968	Wild and Scenic Rivers Act recommendation	Recommends that Chattooga for consideration as a designated river under the act
1968	Lower river boating use estimated at 100 floaters per year	Estimated, no registration system in place
1969	FS begins Wild and Scenic Study	
1969	Public Meeting Held in December	Highlands, NC
1970	Public Meeting Held in March	Clayton, GA
1970	Deliverance novel published	
1971	Wild and Scenic Study report published	
1971	Fish stocking changes in accordance to the 1971 WSR Study Report	
1971	Roads begin to be closed in accordance with WSRA	As recommended in the 1971 WSR Study
1972	Deliverance movie released	July 30, 1972
1972	Boating use estimated about 7,600 boaters per year	Estimated, no registration system in place
1974	Wild and Scenic River act designation	Designates the Chattooga as a Wild and Scenic River
1976	Chattooga Classification, Boundaries, and Development (CBD) Plan prohibits floating above Highway 28	Federal Register Vol. 41, No. 56
1977	Chattooga Wild and Scenic River Management Plan published	
1985	Chattooga Wild and Scenic River Management Plan published in an Appendix to the NF Land Management Plan	

**Note:** Chattooga Wild and Scenic River Management Timeline

### 1.2.2 Conflicts

The number and severity of boater-angler conflicts is a major issue in need of documentation. All interviewees agreed that after the publishing of the 1971 River Study and the release of the movie *Deliverance*, there was a huge influx of floaters on the Chattooga River. The floaters were largely non-local tourists, and their use affected locals who used the river for fishing, swimming, and picnicking. By 1974, some lower river anglers were probably displaced due to the lack of solitude. Responses from other anglers may have included aggressive displays of frustration over these changes, and may have included shouting, raft-slashing, rock throwing, fistfights, and gunplay (Adams 2002). Max Gates, in an affidavit, recalls numerous confrontations between these users before 1976.

Most of these conflicts probably took place below Highway 28, although interviewees were not specific about locations or incidents. Some interviewees recalled heavy use at the access points,

and physical confrontations apparently were more likely to occur at these congested put-in and take-out areas.

The implicit notion underlying the boating ban, according to some interviewees, was to ensure that these conflicts did not migrate to the Upper River, which had less use, a more primitive setting (classified as “wild”), and few boaters because of lower water levels and more difficult whitewater. The idea according to these interviewees was to ensure that local anglers had a segment to fish where encounters with floaters would not take place.

A related controversial issue at the time focused on road closures. All interviewees remember that closures severely limited historical vehicle-based access, as all of non-major roads within the one-quarter mile river corridor were closed (while not specifically required by the WSR Act, these closures undeniably made the river corridor more primitive). From a local user perspective, however, these closures were de facto restrictions on their use and were concurrent with (although not caused by) the influx of non-local users, most of whom were boaters. As a result, angler-boater conflicts may have been confounded or at least exacerbated by the local/non-local resentment focused on road closures.

Even after the boating ban in 1976, the boater-angler or local/non-local conflicts may still have lingered to some degree, with continuing effects on users and resource managers. The Handbook for River Guides (Wildwater 1980) includes a section on “community relations,” described the issue in terms of locals vs. outsiders, and warned of past “acts of destruction and harassment.” The substantial changes in use and access due to the movie and Wild & Scenic status clearly made some local people feel that “their” river had been taken away, and these frustrations may have played a role in the conflict incidents that apparently occurred.

### **1.2.3 Basis for the Boating Ban**

As discussed above, specific documentation of the reasons for the 1976 boating ban is sparse, but safety, low water, and conflict-reduction/zoning appear to be central. The 1971 Wild and Scenic River Study describes the section above Highway 28 as “providing fair to good fishing” but also notes that the section from Bullpen Bridge to Highway 28 is of special interest because it is the only stretch providing “high quality trout fishing [and] that is large enough to float...rubber rafts are suitable.” This section is also described as beautiful, with many dangerous portions (USDA Forest Service 1971).

The 1976 plan includes statements about the difficulty of the whitewater in the headwaters areas, indicating a safety concern: “[The Rock Gorge] includes exciting but treacherous whitewater” (p. 11847) and “they include some beautiful but hazardous whitewater that should not be floated” (p. 11847). Similarly, other statements suggest low water is a related issue: “because of the small water flow and ruggedness of the gorge area, floating is not recommended” (p. 11832), even though a section along Nicholson Fields is “shallow and easy for the inexperienced canoeist” (p. 11819).

The 1976 plan also implies a potential rationale associated with conflicts and the protection of angling experiences: “the recent increase in floaters using the river has had a detrimental effect on the fishing experience. Conflicts have developed on certain sections of the river where floaters and fisherman use the same waters” (p. 11819).

A later study of floating on the Chattooga concurs with these reasons asserting that the first twenty-six miles of the river was closed to boating because that portion of the river is “generally too small for floating during most water levels,” which is distinct from the pure safety concern. This document also suggested the ban provided an area where people could “fish and hike without encountering boating traffic (Craig et al. 1979).”

Interviewees generally agreed with each of these points. On safety issues, one interviewee remembers surveying the rugged, rough land and water in the first 26 miles and noting the section was dangerous for users that are not highly skilled. Other interviewees remember that during the initial increase of users on the river, there were no outfitters and many inexperienced floaters attempted the river without proper equipment or guides. Once outfitters were in place, their presence helped increase the level of safety and control. Deaths from 1972 to 1975 averaged five per year, but since 1976, deaths have averaged less than one per year (Wallace 1983).

On conflict/experience issues, several interviewees indicated that protecting fishing experiences was an important rationale. One interviewee noted that he felt it was a wonderful idea to designate that section as a fishing area. Another interviewee remembers the boater and angler conflict as the driving force behind the 1976 ban. He asserts that the Forest Service took that conflict into consideration, and that the ban was a joint decision involving the Forest Service and DNRs in Georgia, South Carolina, and North Carolina.

#### **1.2.4 Trout Stocking Changes**

There has been stakeholder debate about concurrent stocking changes as the river became designated, roads were closed, and the boating ban was put into place. Documentation again is sparse, but during the 1971 WSR Study, the Forest Service suggested limiting stocking from Georgia, no stocking above Highway 28, but allowed for North Carolina to carry out stocking as needed. In South Carolina it recommended stocking at one point below Highway 28, and at the access points of Highway 28 Bridge and Burrell’s Ford (USDA Forest Service 1971). In 1976 and 1977, management direction stated that fish stocking from vehicles would be permitted only at Burrell’s Ford, the Highway 28 Bridge, Long Bottom Ford, and the Bull Pen Bridge on the main river and at Overflow and Warwoman bridges on the West Fort and the stocking changes were implicitly linked with the boating ban (USDA Forest Service 1976, USDA Forest Service 1977).” The 1985 plan confirmed these stocking priorities. Taken together, they suggest that stocking was generally encouraged on the upper river and discouraged on the lower.

However, all of the interviewees agree that there were no official bans on stocking on the lower river. One interviewee remembers that the changes to stocking decisions during his tenure with

the Forest Service were based on scientific reports and fish surveys (the idea being that the upper river has better conditions for stocking populations to survive). However, another recalls that stocking ceased in the lower sections of the river to be consistent with zoning decisions. He asserts that trout stocking was encouraged in the upper to facilitate fishing and discouraged below Highway 28 to facilitate boating.

In 1976, DNR quit stocking at a few places in North Carolina, but they were still stocking at the Highway 28 Bridge and Burrell's Ford in South Carolina. Helicopter stocking in replacement of the truck-based stocking began shortly thereafter, with some changes in helicopter stocking upstream of Burrells Ford because of the Ellicott Wilderness designation in 1975.

At least one interviewee remembers that the Department of Natural Resources once stocked all along the Chattooga River. After the wild and scenic designation was put in place and roads were closed, many stocking points were unreachable and stocking at those stations ceased. This interviewee also recalls the cessation of stocking below Highway 28 to help decrease conflicts between boaters and anglers. The idea here is that if the fishing becomes poor, fewer anglers will use the lower river and fewer conflicts would occur.

### **1.2.5 Impact and Capacity Judgments**

During the initial WSR Study, managers asserted that the "Chattooga River [was] not overused". However, even during this initial study, capacity concerns were evident. The study authors recommended that use and impacts be monitored and expressed concern that expected demand for multiple uses of the Chattooga River would increase because of the WSRA designation (a prophetic statement). Mitigation for this expected increase in demand included recommendations to assess the need for limiting the number of access points, budgeting for other access facility improvements, and monitoring the need for recreation developments to reduce pressure on "more primitive sections of the river (USDA Forest Service 1971)."

The assumption that use would increase was accurate. Floater use on the Chattooga went from estimates of 800 in 1971 to 21,000 in 1973 and over 36,000 in 1979 with most use occurring from May to September. The figures prior to about 1973 can be characterized as estimates. After that time, numbers were based on actual counts by river rangers, then in 1975 the figures were gathered via a mandatory self-registration system (Craig et al 1979).

This preparation for future demand was also helpful. Facility capacity for the river was reportedly adequate into the late 1970's, as there were enough parking lots, trails, etc. to accommodate existing recreational use. Regular site maintenance also appeared to mitigate the negligible amounts of site damage and compaction from foot traffic at trails and camps. According to most documents and interviewees, most capacity concerns focused on social or experiential issues such as encounters or conflicts (Craig et al 1979).

The 1985 Land Management Plan adopted more formalized recreation planning concepts, developing three Recreation Opportunity Spectrum (ROS) classes for land within the Chattooga River corridor (semi-primitive non-motorized, semi-primitive motorized, and roaded natural).

ROS is a land classification system that categorizes national forestland into classes being defined by its setting and by the probable recreational experiences and activities it affords. Boating above Highway 28 remained prohibited and that section of the river was managed as semi-primitive (USDA Forest Service 1985).

As stated in several interviews, the USFS was concerned with capacity issues throughout early planning efforts, particularly social impacts that affect solitude. This led to substantial education/regulation programs among lower river boaters, which made up the bulk of the use on those segments. These actions were generally effective because most use occurred via three outfitters whose trips were limited. Throughout the 1980s, there was also more river staff than at present.

On the upper river, management attention was lower. While angling creel surveys and occasional university studies addressed aspects of use and impacts in these areas, there was no systematic use or impact monitoring.

### **1.2.6 Public Involvement**

As part of this 1971 study, the Forest Service held several public forums to discuss proposed changes in the management of the river and to receive input from the public (USDA Forest Service 2006). In the study two public meetings (see timeline) were conducted where the public had an opportunity to express their opinions concerning future management of the Chattooga River as a WSR (USDA Forest Service 1971).

During the Wild and Scenic River study process there were additional public meetings in the tri-state area. Of all the public involvement, in the recorded mail, oral statements, and written meeting notes only three individuals and one private hunt club opposed including the river as a WSR. Support for the designation came from 12 governmental agencies, 50 private organizations, 15 petitions, and over 900 individuals (USDA Forest Service 1971). In support of this documentation, all of the interviewees remember public involvement before and after the WSR designation, and during the time of the boating ban.

## **1.3 CONCLUSION**

The major points of interest are consistent between the literature review and the interviews. The river was not heavily used and was truly 'wild and scenic' prior to 1968, although road-accessible areas may have had some impact problems. The river gained exposure because of the Wild and Scenic Rivers Act recommendation in 1968, the 1970's boom in whitewater rafting, and the movie "Deliverance" in 1972. After that point there was an influx in users on the river. Conflicts developed between 'outsider' floaters and local users, some of whom were probably displaced by the increasing use.

At the same time use was increasing, the amount of unskilled users unfamiliar with the Chattooga's wild nature and inexperienced in white water rafting was also increasing. Deaths resulted, conflict continued, and managers began to seek a way to mitigate both.

The solution above Highway 28 presented itself in two parts. First, closing the section of the river that was most dangerous helped with safety concerns. Second, it fostered a higher quality fishing experience and provided users with an experience of solitude on portions of the river not especially suited for floating.

Other management decisions that assisted with mitigation for safety, user displacement, and capacity concerns above and below Highway 28 included:

- The use of outfitter guides to provide instruction and proper equipment,
- The use of outfitter guides to assist in controlling the amount of commercial floaters, and
- Closing of the roads to limit access.

Information on stocking changes and public involvement was sought during the interviews and the literature review. There is no written evidence or personal reference to any official stocking bans or stocking changes based on moving multiple-use management away from fishing above Highway 28. There is, however, evidence that stocking changes were made due to road closures and fisheries management changes. There are multiple written references and personal recollections of public meetings during the 1971 suitability study. Information on public involvement during the development of the 1976 plan was not found.

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**Appendix A** Individual Interview Responses

**Monte Seehorn, USDA Forest Service, Fish Biologist**  
**Interviewed on Wednesday, July 12, 2006 from 3:05-4:05 p.m.**

Monte can't remember when w&s designation came about – probably at the same time [1976]. He wrote the fish and wildlife [and scenic?] portion even though it had someone else's name on it.

He started the Chattooga Coalition in 1986. It came about because people started talking about soil sediment running into the water. He worked with them to improve the overall fish habitat. The coalition was made up of the 3 USFS offices, 3 DNR offices, and Trout Unlimited (in the states of GA, SC, and NC). There was a lot of fighting between boaters and anglers, and basically a part came from the recommendation by the coalition to keep it as it was (the same as the 1976 designation). There are a lot of boaters there, but not as many when the ban first started in 1976. The coalition has no power make decisions, except make recommendations to USFS and that's how the rules came about. Some concessions were made by giving those recommendations.

USFS made its determination and it [the river] was closed that way when it was set up as w&s. It may have been strictly USFS with outside groups. USFS made the recommendation because there were problems with boaters and fishermen back then. It was recommended just because the fishermen get teed off because when you have a lot of boats going down [the river] there are a lot of conflicts.

***What is your connection to the Chattooga River Closure?***

1. – I wrote the fish and wildlife section, though it was under someone else's name. I prepared recommendations for the w&s designation and at that time there were already conflicts between the fishermen and boaters, especially at the time they designated it w&s.

***What was the condition of the river prior to the closure in 1976?***

2 – The closure really didn't have anything to do with the [biophysical characteristics of the] river. It was a lot better for the fishermen when they didn't have boaters on the river. The water quality of the river didn't change without boating. It did improve the aesthetics of fisheries for the fishermen. The only difference is some fishermen were having conflicts, but with no boats they had better views. The boaters didn't change the basic water quality, but then there was not as much boating back then.

***Why were the roads closed?***

4 – The roads closed basically because of the w&s designation more than anything else.

***What were the reasons for developing the boating ban above Hwy 28?***

5 – There was a boater and fishermen conflict. The fishermen didn't like to fight the boats. USFS took this into consideration and agreed with DNR that DNR would deemphasize below Hwy 28 (to keep for boaters) and emphasize fish above Hwy 28. Of all 3 states in the coalition, all are opposed to boating above 28, even DNR. SC and GA affected the most because the river is on both sides of the bank in each state for about 15 miles, and only includes the headwaters in NC. USFS people in the coalition are pretty much unanimous that it is better not to have boats up there [Hwy 28]. It was pretty much unanimous at that time too [in 1976]. USFS was just taking input. Most of USFS that he knew agreed that it would be a problem if they allowed boating above Hwy 28, but if they didn't allow it then they wouldn't have to deal with the problem. Nobody was pushing for boating back then, but I'm not speaking for the boaters now. From 1986 on, they basically made a coalition recommendation to USFS to not allow boating above Hwy 28. They recommended that USFS keep the same boundary.

***What issues were you addressing prior to the closure?***

6 – Frankly, the Chattooga River was sort of ignored back then until it was designated w&s. USFS tried to get the state to do some fish surveys. But there were no real issues before the closure. One of the guys who helped initiate the coalition had issues with sediment from roads into the river. Burrell's Ford Road was probably the biggest issue with significant contribution to sediment. This was a main road and was not closed anyway. He was not sure what roads were closed, probably the smaller roads with good views of the river (as part of the w&s designation). If a road was not used then it would be closed to become only a viewing area of the river. The roads are still a major issue. Trout Unlimited doesn't want them paved because it may bring in more fishermen and this is an issue now.

***Where any decisions made based on capacity concerns?***

7 – You could say that because that's why they put the boating below and the fishermen above. When you got conflicts then somebody's going to think too much boating use. The states (DNRs in all 3 states) did creel surveys but back then the only decision was that there was conflict and this would deal capacity. I don't know how many fishermen and boaters were out there. They are just now trying to get a handle on the boating use, but they already have some data on the fish. When they designated the Ellicot area wilderness, the trails started getting a lot of heavy use. Anytime you designate an area as special, it does the opposite and brings people in.

***In your opinion, was the river approaching capacity at the time?***

8 – I'm not sure how to answer this question. There was obviously less boating and fishing on the river then than there is now. It hadn't reached capacity on fishing and boating. Some of the fishermen don't want to see 3-4 fishermen and if there is 1 boater, then it has exceeded capacity. It was not approaching capacity for fish use, but not sure what to say for boating use. For some reason or other they had it closed to exclude boating because it was interfering with the fishing. It doesn't mean there was a whole lot of boating back then, but they knew it was going to get heavier. The lower portion of Hwy 28 was obviously more suited to boaters with the bigger water and along this stretch, the fishermen only had on choice (put/take). So, not as much choice below Hwy 28 and the big water handled boaters better. Below Hwy 28 there was bigger water, better rapids, and most suited for boating. Above Hwy 28 they managed the fish better (more put/take areas).

In 1986 they determined where they can depend on natural reproduction – have natural fisheries. They found that there was not much of a fish population from Burrell Ford Road downstream so were stocking small fish to supplement the fishery down below the road where they had a put/take program. The put/take program was at 2 main river crossings (bridges). They monitored to make sure the population was OK. Stocking today is very successful. They have a delayed harvest area from Hwy 28 to Reed Creek. This area is used heavily enough by fishermen that boating there would really mess it up for fishing. Nobody in that coalition wants to see boaters above Hwy 28. Changes were made on stocking decisions based on fish reports. It is based now strictly on science. This is different to 1976 when stocking was limited to Burrell Ford Road, and Hwy 28. There was some stocking at Bullpen Bridge in NC (all put/take type stocking). Below Hwy 28 there were some put/take places, but based on the info they have now, they don't stock at bullpen anymore. You have Hwy 28, then Burrell Ford Road, then Bullpen, then Girmshawes crossings. There was stocking at all 4 in 1976, but then they quit stocking at 2 places in NC (Bullpen and Girmshawes). The two bridges in GA/SC (Hwy 28 and Burrell) are still stocking.

The only management in 1976 (the states active management) was the put/take points along the 4 bridges. I don't remember any limitations on boating until the ban was put on. But now they have better fish management. They do water quality monitoring, invertebrate monitoring, etc. to help the

fisheries and overall water conditions. From 1986 to present it is specific scientific management. The boating ban [of 1976] is part of the management. So in 1976 it was the first attempt to manage the river and that was to separate boaters and fishermen. The prime management was put/take prior to 1976 and up until 1986. There was not that much boating at that time – it was just getting started. They had some interest with some people but now it's a problem. There have been discussions about allowing boating just during certain times of the year and with certain water flows. But they haven't come up with a good plan yet. They are allowing a certain amount of boating above Hwy 28 to see at what level the fishermen will complain. I can tell you now that the first boater a fishermen sees is unreasonable.

***How was the public involved and/or consulted during the decision-making process?***

11 – Just like any congressional designation, it goes out to the public just like any other. USFS came up with a proposal, put it in the Federal Register, asked to comment – when they put it in the FR whoever looks at it can send in comments. I'm sure there was some local USFS meetings, but not to the extent that they have these days. I can't remember who initiated the w&s proposal. The notice was probably placed in all local papers – I'm sure it was placed in the local papers.

***What impacts were believed to occur from river use above Hwy 28?***

12 – It goes back again to the conflict with fishermen and boaters. It was just aesthetics, that's why they selected Hwy 28. It was a reasonable place make a break.

***What impacts were believed to occur from river use below Hwy 28?***

13 – There were conflicts below Hwy 28 and that's the reason for the hassle before. There was real heavy use at the put/take areas. There was some conflict between 2 downstream (below Hwy 28) at that time near the put/take areas. USFS' solution was to give up something to get something else. This made USFS decide to get a reasonable point. Before the closure most boating was below Hwy 28 anyway. There was some boating above Hwy 28 but more below. Plus, it was a long way to get to the river from above Hwy 28 so that had good fishing. It was a long rough stretch and of course in low water, it's not that good (and not that many boaters went in the low water). And there was heavy stocking above, so some of the boaters probably didn't want to get in a fight. There was some boating even after the ban, but I'm not sure how they came through.

It's pretty simple. Trout Unlimited brought it up most of the time. DNR managed for fishermen primarily. USFS was trying to come up with a reasonable experience to give both the boaters and fishermen a quality experience.

**Charlie Huppuch, USDA Forest Service, Recreation Planner  
Interviewed on Thursday, July 13, 2006 from 3:35-4:15 p.m.**

***What is your connection to the Chattooga River Closure?***

1 - Prior to 1976, USFS didn't own a lot of land around the river in the 60s and 70s. It was owned by a power company who later traded land with USFS. At that point (sometime in the late 60s, early 70s) the river was opened up to management by USFS. Charlie tried to survey/explore Section 1 of the river (above Hwy 28) when he first started there in the 60s. It was terrible and we almost didn't come back. It was very rugged, more so than in other sections. Before the WSR designation, it was so rugged – there was no organized trail system. It was wonderful because hardly anyone went up there, there was good fishing – that's the way at first before it became designated as a WSR. Then the movie came out and all kinds of people wanted to explore sections 2-4 (below Hwy 28). They started having a lot of drownings, especially when people were half drunk. The number of drownings got to be where they really needed to do some management. They started putting more restrictions on it and the number [of drownings] dropped off too. They left the area alone and then in the 70s when they were making the plan, they decided that the river could be zoned very well by closing the top portion above Hwy 28 because it was dangerous. They never thought the kayakers would go up there, and little did they know that some people were still trying it. So the supervisor and planner at the time (Charlie had already left) thought about zoning because of the danger – below Hwy 28 it was easier for people not so skilled. The river kind of zoned itself – with the top being wild, no rafting, and just fishing. So the supervisor and planner thought it zoned itself nicely because they didn't think rafters would do the hard part. In the 80s-90s Charlie worked with this forest again (from Atlanta) to continue managing the trails, outfitters, etc. But they never thought about opening the upper portion because it was too rugged and too wild and there was good fishing there. So, you wouldn't have the conflict if zoned. The only thing that's changed is now you have kayakers who want more challenging experiences. So the whole thing was to keep it wild and keep the conflict at bay. At the time, they didn't think the kayakers would ever want to do the harder part. From Section 2-4, the river also gets worse going down, but Sect 4 is still not as bad as Section 1.

***What was the condition of the river prior to the closure in 1976?***

2 – It wasn't too much but people were beginning to think about it, then the movie came out. In the 70s, section 1 wasn't used for boating, even in the 80s, until recently.

***Why were the roads closed?***

4 – There is wilderness in a portion of WSR so all of those roads were closed. Then small USFS roads along the ¼ mile boundary were also closed. People used to camp, etc right near the river (and drive up to it and wash their vehicles in the river). Then the roads closed and people had to start walking in taking their rafts.

***What were the reasons for developing the boating ban above Hwy 28?***

5 – It was dangerous in Section 1 and it was a wonderful idea to keep it for the fishermen and reduce conflicts. Of course they didn't think there would be a lot of conflict at that time.

***What issues were you addressing prior to the closure?***

6 – Well, I wasn't really privy to it because I moved away to another forest. I wasn't involved in the public process, but that was before other acts made it necessary to have more public involvement. So the supervisor at that time made the decision and he liked to fish there too.

***Where any decisions made based on capacity concerns?***

7 – No I don't think so. Like I said, they didn't think anyone would canoe section 1. They didn't think anyone would run it because it was so bad. They thought it was a wonderful section for fishermen.

***In your opinion, was the river approaching capacity at the time?***

8 – It was lightly used by fishermen back then. Not a case of over-capacity. Sections 2-4 were not overrun in 1976 but after the movie it started to pick up. USFS said they would go with 3 outfitters to do real management (the outfitters set up how many runs/day, how many people on the river, etc). That was contested by other outfitters too. Use really built up after the movie then it just continued to grow. But they kept the capacity down by allowing the outfitters only x number of people per day. I assume it was good fishing below Hwy 28 – people would drive to the river and the natives fished there. The tourists were mainly boaters. In 1976, it wasn't that big a deal for fishing. Sections 3-4 still had conflicts with anglers.

***What stocking decisions were made and why?***

9 – Doesn't know.

***In your opinion, was the river being managed for boating or angling?***

10 – Before 1976, it was pretty light management, not that intensive. USFS started to do some management techniques. Got a lot more intensive after the management plan and it was designated WSR (mainly later in the 80s).

***How was the public involved and/or consulted during the decision-making process?***

11 – I wasn't involved in that – more decisions after that in the late 80-90s. Bill Craig, the recreation planner at that time died.

***What impacts were believed to occur from river use above Hwy 28?***

12 – I don't think there was anything – just light use – nothing heavy, maybe some dispersed camping. That was the only use before 1976. I camped there in the late 80s and it was still light camping and fishing.

***What impacts were believed to occur from river use below Hwy 28?***

13 – All kinds. Management reduced impacts driving to the river. They were having conflicts seeing groups on the river so started managing that. The river was being managed very well in the 80s and 90s. Today USFS doesn't have the personnel to manage it like it did back then. They used to have wilderness and river rangers – not sure if they have those anymore. It came from a rugged area because of no management to something nice. It will be a travesty if they allow it to disintegrate.

**Jeff Durniak, Georgia DNR, Regional Fisheries Coordinator  
Interviewed on July 14, 2006**

***What is your connection to the Chattooga River Closure?***

1 – Jeff came on in 1985 and is working with Cleeves on issues, providing technical stuff. He doesn't have any direct relation to the closure of the river in 1976. But his agency is one of two agencies (GA and SC DNR) that is affected by the river.

***What was the condition of the river prior to the closure in 1976?***

2 – Personally, he doesn't know.

***What user conflicts occurred prior to the closure in 1976?***

3 – As I understand from other river and wildlife managers, the conflicts were between several users. Boaters and anglers and equestrian users and non-equestrian users. In other words, the competition for space at access roads is increasing. Just driving to the river can create problems – you can still drive to the river at some areas.

***Why were the roads closed?***

4 – Some roads were closed and created competition for that space with competing/conflicting recreation types. WRS designation closed roads because they were within a ¼ mile corridor with scenic and wild classifications – the roads were severely limited. The recreation classification is more liberal, the scenic classification tightens up, and the wild classification is practically wilderness.

***What were the reasons for developing the boating ban above Hwy 28?***

5 – It appeared to be, from USFS documents. The documents in the Federal Register creating it included strongly zoned uses. This promoted boating and the quality of boating on the lower river. Also, this promoted fishing and the quality of fishing on the upper river. It [zoning] is a valid management tool based on USFS's written narrative. DNR supports the existing zoning and existing management plan for the river.

***What issues were you addressing prior to the closure?***

6 – n/a

***Where any decisions made based on capacity concerns?***

7 – I think all the documents were made on capacity concerns. In some of the specific access points, it was the only access point in several river miles. The users were dumping out at those points. It was the perception of the USFS river corridor at the time and their perceptions of capacity.

***In your opinion, was the river approaching capacity at the time?***

8 – Not qualified to answer

***What stocking decisions were made and why?***

9- Refer to SC DNR because they do the vast majority of stocking. The stocking decisions were dictated by USFS. Basically, SC DNR was asked to cease stocking of trout on the lower river and encouraged to stock it up higher (i.e., zoning). The whole crux of the matter is the zoning.

***In your opinion, was the river being managed for boating or angling?***

10 – Based on history record, it was managed for both. That’s what USFS does – they manage multiple uses. I think they tried to zone and manage it better.

***How was the public involved and/or consulted during the decision-making process?***

11 – Based on written record, had public meetings and a chance to call or send a note to USFS. I think that’s in the public record for USFS management plan based on my secondhand knowledge through USFS and DNR it was an extensive process. There was ample public opportunity.

***What impacts were believed to occur from river use above Hwy 28?***

12 – Unaware of any at that time

***What impacts were believed to occur from river use below Hwy 28?***

13 – Unaware of any at that time

**Dillard Barron, USDA Forest Service, Law Enforcement Officer  
Interviewed on July 11, 2006**

Dillard Barron did not want to be interviewed, fearing that his involvement with the Chattooga River was not significant enough to cover management issue questions. He did, however, consent to giving me his opinion on any law enforcement issues and users on the river.

Dillard Barron was a law enforcement officer on the Tallulah District of the Francis Marion and Sumter National Forest in the 1970s. He remembers that the locals were largely supportive of the Chattooga being designated as a Wild and Scenic River. He also remembers that once the tourist floaters began angering local fisherman confrontations between those to communities of place became common. He believes that by 1975 a lot of the conflicts had died down.

**Max Gates, USDA Forest Service, District Ranger  
Interviewed on July 12, 2006**

Maxie Gates consented to a recorded interview.

***What is your connection to the Chattooga River Closure?***

1 – Andrew Pickens District Ranger from 1961 to 1972.

***What was the condition of the river prior to the closure in 1976?***

2 – The river was very wild. Not many users besides local fisherman, and perhaps a stray floater or inner tuber.

***What user conflicts occurred prior to the closure in 1976?***

3 – After Deliverance and the 1971 WSR study there were conflicts. Before that time, there were no conflicts. With the influx of people coming to float the river, the locals and the “outsiders got into conflicts. There were no outfitters to help control the crowds and to guide people on how to use the river. There were deaths, 17 – 19 drownings.

***Why were the roads closed?***

4 – The roads were closed due to the WSRA direction that roads within a ¼ mile corridor.

***What were the reasons for developing the boating ban above Hwy 28?***

5 – There was not a lot of stocking going on prior to 1971.

***What issues were you addressing prior to the closure?***

6 – Boating ban was to control the use of the river to some extent. The river was divided into zones, and section 1 (above Hwy. 28) was arbitrarily chosen to close to floating. That part wasn't as suitable for floating because of the flows.

***Where any decisions made based on capacity concerns?***

7 – Besides user conflicts, no issues before the ban of boating.

***In your opinion, was the river approaching capacity at the time?***

8 – They were concerned with the solitude experience. They decision was made to allow no more than three outfitters. The outfitters had a limit to how many rafts they could take on the river, to avoid crowding. The limit was close to 6 rafts an hour apart.

***What stocking decisions were made and why?***

9 – No stocking ban was in place before 1972

***In your opinion, was the river being managed for boating or angling?***

10 – The river was being managed for both floating and fishing, and any other applicable use.

***How was the public involved and/or consulted during the decision-making process?***

11 – There were public meetings held in Walhalla, Clemson, Highlands, and Clayton.

***What impacts were believed to occur from river use above Hwy 28?***

***What impacts were believed to occur from river use below Hwy 28?***

12/13 – They were concerned with both resource and social impacts. They wanted to provide a wilderness experience, but the river got crowded easily when groups of floaters encountered other groups of floaters on the river. The resource impacts did not seem to be occurring, so they were primarily concerned with social impacts. Fisherman tended to feel pushed out, and looking for other places to fish because of the floaters.

**Jim Barrett, USDA Forest Service, District Ranger**  
**Interviewed on July 13, 2006**

Jim Barrett did not consent to be recorded.

***What is your connection to the Chattooga River Closure?***

1 – District Ranger for the Francis Marion and Sumter National Forest.

***What was the condition of the river prior to the closure in 1976?***

2 – Little use until WSRA study and the release of Deliverance, which increased use and conflict.

***What user conflicts occurred prior to the closure in 1976?***

3 – Before the closure no significant conflicts, the river was low and that made for good fly fishing.

***Why were the roads closed?***

4 – The roads were closed to limit access as directed in the WSRA.

***What were the reasons for developing the boating ban above Hwy 28?***

5 – Remembers that safety was a large part of the decision because of the rugged sections that were difficult for beginners to navigate. They also wanted to manage that area of the river for fishing because of the pristine nature of it. The section above Hwy 28 was best suited for fishing and hiking.

***What issues were you addressing prior to the closure?***

6 – Road closures were a major issue. The locals were being limited from historically used roads and that caused a lot of controversy.

***Where any decisions made based on capacity concerns?***

7 – Capacity was thought of in terms of the wilderness experience. Capacity limits were studied so as not to overload the resource, but to manage for a solitude experience was the emphasis as that time.

***In your opinion, was the river approaching capacity at the time?***

8 – At that time the managers knew that too many users would detract from a good experience, and that was exactly what was happening.

***What stocking decisions were made and why?***

9 – Remembers that in sections designated as wild there was no stocking, so above that section in NC there was stocking (in the headwaters). Does not remember any ban on stocking.

***In your opinion, was the river being managed for boating or angling?***

10 – The river was managed for both, and more under the multiple use approach.

***How was the public involved and/or consulted during the decision-making process?***

11 – There were public sessions where people were given the opportunity to express their opinions.

***What impacts were believed to occur from river use above Hwy 28?***

***What impacts were believed to occur from river use below Hwy 28?***

12/13 – Social impacts were more prevalent than any resource impacts above and below Highway 28. Once access was limited, the visual aspect of the river corridor improved.

**Dan Rankin, South Carolina DNR, Regional Fisheries Coordinator  
Interviewed on July 18, 2006**

Dan was happy to participate in the interview process but wanted to be sure that we knew his involvement with the Chattooga is current, and what he knows about the closure history he learned from his trainers and supervisors at DNR who were there when the ban was initiated.

***What is your connection to the Chattooga River Closure?***

1 – Department of Natural Resources Regional Fisheries Coordinator for 14 counties surrounding the Chattooga River. Has experience on the river as a resource manager and user, and was trained by the Fisheries Biologist of the 1970s and 80s.

***What was the condition of the river prior to the closure in 1976?***

2 – n/a

***What user conflicts occurred prior to the closure in 1976?***

3 – From his former supervisor, Randy Geddings, he learned that there were conflicts below Highway 28 between boaters and anglers. No recollections of much use by boaters or conflicts above Highway 28.

***Why were the roads closed?***

4 – The road closures were directed by the Wild and Scenic River Act (WSRA).

***What were the reasons for developing the boating ban above Hwy 28?***

5 – From what he was told, conflicts were the main reasons.

***What issues were you addressing prior to the closure?***

6 – n/a

***Where any decisions made based on capacity concerns?***

7 – n/a

***In your opinion, was the river approaching capacity at the time?***

8 – n/a

***What stocking decisions were made and why?***

9 – DNR stocked put/take trout at several locations along the river. Once roads were closed some stocking ceased because the stations were inaccessible (Thrifts Ferry, Sandy Ford, Earls Ford, Big Island, and Battleground).

Highway 76 was a particular stocking site that DNR was asked, by letter from the District Ranger, to stop stocking in order to control conflicts between boaters and anglers. Dan believes that the ranger

thought as long as the trout were scarce, fishing would cease in that area and conflicts would be cut down.

Stocking above Highway 28 was never an issue, as boating was limited there so fishing was supported.

***In your opinion, was the river being managed for boating or angling?***

10 – Both, in different sections.

***How was the public involved and/or consulted during the decision-making process?***

11 – n/a

***What impacts were believed to occur from river use above Hwy 28?***

12 – n/a

***What impacts were believed to occur from river use below Hwy 28?***

13 – n/a

**James Culp, USDA Forest Service, River Ranger  
Responded to questionnaire sent to him on August 10, 2006**

***What is your connection to the Chattooga River Closure?***

1 - I worked for the USFS as the "River Ranger" between 1974 - 1980. As such, I was the primary author of the first Wild & Scenic River Management Plan.

***What was the condition of the river prior to the closure in 1976?***

2 - This is too vague to really answer. Essentially, river usage of all categories was increasing (boating, fishing, hiking, off-road vehicles, horse-back riding, etc.). Consequently, adverse environmental impact was increasing, more in some places than others.

***What user conflicts occurred prior to the closure in 1976?***

3 - There had been several reports of incidents of verbal confrontations between users. Occasionally, it was reported that guns were waved but there is nothing other than anecdotal evidence. The majority of the confrontations were between anglers and boater/innertubers on the portion of the river commonly referred to as Section II (HWY 28 - Earles Ford). I frequently had run-ins with innertubers and canoeist while I was fishing. Most had no real control over their crafts and I was expected to get out of their way. In their defense, once committed to a rapid your ability to maneuver becomes limited.

***Why were the roads closed?***

4 - Road access was closed to protect the river from undue erosion. Also, within those sections of the river classified as "Wild," the management philosophy was to manage similarly to a wilderness area (e.g. no motorized equipment or access).

***What were the reasons for developing the boating ban above Hwy 28?***

5 - During that time (early 1970's) most rigid watercraft were made of either aluminum, fiberglass or ABS. Kayaks were longer (13'2" typically) and (arguably) less maneuverable. The upper Chattooga is the most suitable portion of river for sustaining trout, as most of the river is too warm and too turbid. The upper river would be navigable only during periods of high run-off and, even then, be a very dangerous section for all but the most capable boater. The inaccessibility of the gorge would make rescue difficult and dangerous for the S&R personnel. The steepness of the river combined with the narrow and very technical channels and lack of established portages made it generally not suitable for boating. By restricting boaters to the area below HWY 28 Bridge, we provide to the hiking/angling public an area where they can go to experience a wilderness environment without concern about conflict with boaters. Our approach was to recognize that "the needs of the many outweigh the needs of the few" and to provide "the greatest good for the greatest number over the longest time." The number of times the section could be navigated SAFELY is very small; the number of boaters who could SAFELY run the section during those flows is also very small. The blanket restriction precludes those boaters who overestimate their ability and/or underestimate the water flow. It also precludes the "Macho" effect.

***What issues were you addressing prior to the closure?***

6 - Prior to the closure, I lived in a house owned by the USFS near what is now the HWY 28 Access Site. It was almost normal for me to be awakened to a pounding on my door to either go pull some jeep driver out or go look for some overdue tube rider above HWY 28. It happened many times a summer. We were addressing the environmental impacts of the ORV, the adverse impact that ORV have on a "wilderness experience," the safety of the S&R personnel and the safety of the visitor.

***Where any decisions made based on capacity concerns?***

7 - Not that I can recall. Most of the river use was concentrated to the summer months, which allowed significant recovery time for the resource.

***In your opinion, was the river approaching capacity at the time?***

8 - No, not overall. There were times at very specific locations where it may have been (e.g. HWY 76 bridge over July 4th) but those were isolated events.

***What stocking decisions were made and why?***

9 - Trout populations on the Chattooga are essentially a Put and Take proposition. Stockings were done on a regular basis at road access points although we did conduct helicopter stocking once or twice between HWY 28 and Burrell's Ford. To my knowledge, all stocking decisions were made by the SC Dept of Natural Resources. Perry Shatley (wildlife technician for the APRD during that time) could be of more help. I think he still lives in the Walhalla area.

***In your opinion, was the river being managed for boating or angling?***

10 - The river was being managed for the protection of the resource and the safety of the visitor. Efforts were being made to accommodate ALL users. The area with the best fishing was available for fishermen; the area best suited for boating was available for boaters.

***How was the public involved and/or consulted during the decision-making process?***

11 - Yes. Prior to going to publication, I talked with representatives from the commercial outfitters, the Georgia Canoe Association, the Sierra Club, Trout Unlimited, SC Dept. of Natural Resources, US Fish & Wildlife Service (who formerly ran the Fish Hatchery), Oconee County Sheriff's office, Rabun County Sheriff's office, the State Office of the USFS, and the RO of the USFS. After that, there were the "normal" public hearings prior to implementation. As I recall, there were three public hearings. Interestingly, most of the outcry was about the road closures. The USFS really caught hell about that.

***What impacts were believed to occur from river use above Hwy 28?***

12 - Erosion, degradation of water quality, litter, loss of "wilderness experience," and incompatible uses (boating/fishing). It was felt that the reduced access resulting from restrictions on ORV use would alleviate most of those impacts while the boating restriction would resolve the last.

***What impacts were believed to occur from river use below Hwy 28?***

13 - Similar to above but the area below HWY 28 Bridge, down to Earle's Ford at least, is managed in a different context. Consequently, the loss of "wilderness experience" was considered acceptable. The reduced access again would resolve most of the impacts.

# Exhibit B



Figure 1: A fallen tree spanning the water in the “Rock Gorge” of the Chattooga North Fork. Photo by Doug Adams.



Figure 2. Large wood jam on the upper Chattooga River, North Carolina, November 2007

Figure 2: Executive Summary, *Large Wood in the Upper Chattooga River Watershed*, United States Department of Agriculture, Forest Service, Southern Research Station, Center for Aquatic Technology Transfer, prepared January 2008.



Figure 3: Photograph taken in the area upriver of the Bull Pen Road Bridge and illustrative of conditions along the majority of the Upper Chattooga. The grey trees are all dead-and-dying hemlocks. Photo by Georgia ForestWatch.



Figure 4: Large woody debris along edge of Upper Chattooga in the Ellicott Rock Wilderness, approximately 0.5 miles upriver from the Burrell's Ford Bridge. Photo by Georgia ForestWatch.

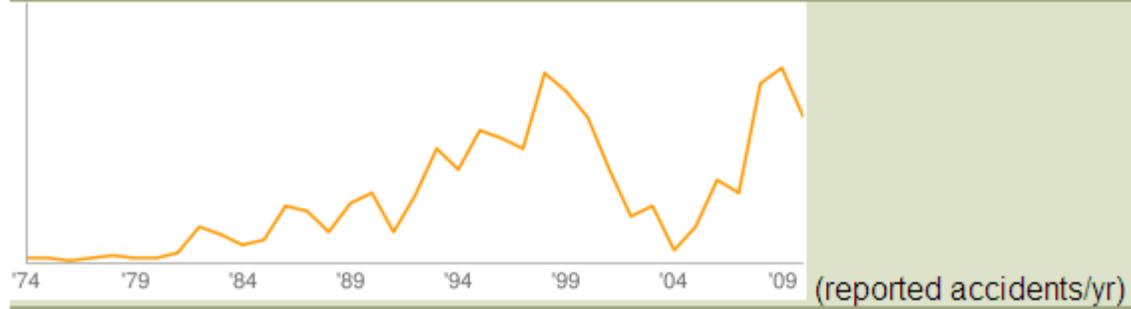
# Exhibit C

## American Whitewater Accident Database

### Accident Database

[List Recent Accidents](#) | [Show All Public Submissions](#) | [Report an Accident](#)

### Accidents Since 1973



Available online at <http://www.americanwhitewater.org/content/Accident/detail/accidentid/3257/>  
(last visited January 21, 2011).

# Exhibit D

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## Article

# Adaptive Management in the Courts

J.B. Ruhl<sup>†</sup> and Robert L. Fischman<sup>††</sup>

### INTRODUCTION

Adaptive management has become the tonic of natural resources policy. With its core idea of “learning while doing,”<sup>1</sup> adaptive management has breathed life and hope into a policy realm beset by controversy, uncertainty, and complexity. It offers what many believe is needed most in a world bombarded by ecological deterioration of massive scales—expert agencies exercising professional judgment through an iterative decisionmaking process emphasizing definition of goals, description of policy decision models, active experimentation with monitoring of conditions, and adjustment of implementation decisions as suggested by performance results. This ideal has become infused into the natural resources policy world to the point of ubiquity, surfacing in everything from mundane agency per-

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1. Professor Holly Doremus explains:

[A]ctive learning is rarely incorporated into the resource management process. For iterative or related decisions, where there is no “safe” choice, precaution and science are not in tension. Both point us toward an incremental framework for decision making that emphasizes learning. We might call that framework adaptive management, but . . . I prefer the more descriptive phrase “learning while doing.”

Holly Doremus, *Precaution, Science, and Learning While Doing in Natural Resource Management*, 82 WASH. L. REV. 547, 550 (2007). For more detail on what “learning while doing” entails, see *infra* Part I.

mits<sup>2</sup> to grand presidential proclamations.<sup>3</sup> Indeed, it is no exaggeration to suggest that these days adaptive management *is* natural resources policy.

But is it working? Does appending “adaptive” in front of “management” somehow make natural resources policy, which has always been about balancing competing claims to nature’s bounty, something more and better? Many legal and policy scholars have asked that question, with mixed reviews.<sup>4</sup> Their

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2. For example, the U.S. Fish and Wildlife Service (FWS) has proclaimed it will use adaptive management in administering habitat conservation plan (HCP) permits it issues pursuant to the Endangered Species Act (ESA). This will be done as a means to “examine alternative strategies for meeting measurable biological goals and objectives through research and/or monitoring, and then, if necessary, to adjust future conservation management actions according to what is learned.” Final Handbook for Habitat Conservation Planning and Incidental Take Permitting Process, 64 Fed. Reg. 11,485, 11,486 (Mar. 9, 1999). As one FWS official explained:

We will continue to incorporate contingency planning within all types of HCPs. In the future, HCPs will have improved structure in their adaptive management strategies . . . . Increased structure in adaptive management strategies will require increased vigilance on the part of permittees and the Service during implementation of long-term plans; this reflects the nature of the conservation partnership created by HCPs.

Marj Nelson, *The Changing Face of HCPs*, 25 ENDANGERED SPECIES BULL. 4, 7 (2000).

3. See, e.g., Exec. Order No. 13,508, 74 Fed. Reg. 23,099, 23,101–03 (May 12, 2009) (directing the EPA to draft pollution-control strategies for the Chesapeake Bay watershed that are “based on sound science and reflect adaptive management principles,” while also directing the Departments of the Interior and Commerce to use “adaptive management to plan, monitor, evaluate, and adjust environmental management actions” in the Chesapeake Bay watershed).

4. See Mary Jane Angelo, *Stumbling Toward Success: A Story of Adaptive Law and Ecological Resilience*, 87 NEB. L. REV. 950, 951–52 (2009) (detailing the theory of adaptive management through a case study based in Florida); Alejandro Esteban Camacho, *Can Regulation Evolve? Lessons from a Study in Maladaptive Management*, 55 UCLA L. REV. 293, 294–99 (2007) (critiquing the use of adaptive management in the ESA); Holly Doremus, *Adaptive Management, the Endangered Species Act, and the Institutional Challenges of “New Age” Environmental Protection*, 41 WASHBURN L.J. 50, 50–52 (2001) (identifying challenges for adaptive management in the administration of the ESA); Robert L. Glicksman, *Ecosystem Resilience to Disruptions Linked to Global Climate Change: An Adaptive Approach to Federal Land Management*, 87 NEB. L. REV. 833, 871 (2009) (proposing the broad use of adaptive management in public land management); Bradley C. Karkkainen, *Panarchy and Adaptive Change: Around the Loop and Back Again*, 7 MINN. J. L. SCI. & TECH. 59, 70–71 (2005) (examining the theory of active adaptive management); J.B. Ruhl, *Regulation by Adaptive Management—Is It Possible?*, 7 MINN. J. L. SCI. & TECH. 21, 33–34 (2005) (identifying disconnects between adaptive management and conventional administrative procedure); Annecoos Wiersema, *A Train Without Tracks: Rethinking the Place of Law and Goals in Environmental and Natural Resources Law*, 38 ENVTL. L. 1239, 1239 (2008)

evaluations, however, have rested on theory,<sup>5</sup> program-specific surveys,<sup>6</sup> and focused case studies.<sup>7</sup> No study has comprehensively explored and extracted lessons from what likely matters significantly to the natural resource agencies practicing adaptive management—how is it faring in the courts? We do so in this Article.

Part I of this Article examines the theory, policy, and practice of adaptive management, focusing on the experience of the federal resource management agencies. From theory to policy to practice, at each step forward in the emergence of adaptive management something has been lost in the translation. The end product is something we call “a/m-lite,”<sup>8</sup> a watered-down version of the theory that resembles ad hoc contingency planning more than it does planned “learning while doing.” This gap between theory and practice leads to profound disparities between how agencies justify decisions and how adaptive management in practice arrives at the courthouse doorsteps.

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(arguing that adaptive management by agencies pays insufficient attention to substantive goals).

5. See, e.g., Karkkainen, *supra* note 4, at 69–74 (examining the theories of passive and active adaptive management).

6. The use of adaptive management to implement ESA programs has received considerable attention. See, e.g., Camacho, *supra* note 4, at 293; Doremus, *supra* note 4, at 50–52; J.B. Ruhl, *Taking Adaptive Management Seriously: A Case Study of the Endangered Species Act*, 52 KAN. L. REV. 1249, 1250–51 (2004).

7. See, e.g., Angelo, *supra* note 4, at 966–90 (Lake Apopka in Florida); Melinda Harm Benson, *Adaptive Management by Resource Management Agencies in the United States: Implications for Energy Development in the Interior West*, 28 J. ENERGY & NAT. RESOURCES L. 87, 92–95 (2010) (Bureau of Land Management energy development on federal public lands in Wyoming); Melinda Harm Benson, *Integrating Adaptive Management and Oil and Gas Development: Existing Obstacles and Opportunities for Reform*, 39 ENVTL. L. REP. 10,962, at 10,962 (2009) (oil and gas development in Wyoming); Alejandro Esteban Camacho, *Beyond Conjecture: Learning About Ecosystem Management from the Glen Canyon Dam Experiment*, 8 NEV. L.J. 942, 944–49 (2008) (Glen Canyon Dam adaptive management project); John H. Davidson & Thomas Earl Geu, *The Missouri River and Adaptive Management: Protecting Ecological Function and Legal Process*, 80 NEB. L. REV. 816, 820–33 (2001) (Missouri River); Alfred R. Light, *Tales of the Tamiami Trail: Implementing Adaptive Management in Everglades Restoration*, 22 J. LAND USE & ENVTL. L. 59, 69–89 (2006) (Florida Everglades); Lawrence Susskind et al., *Collaborative Planning and Adaptive Management in Glen Canyon: A Cautionary Tale*, 35 COLUM. J. ENVTL. L. 1, 7–23 (2010) (Glen Canyon Dam adaptive management project).

8. “a/m-lite” is a stripped-down version of adaptive management that often fails due to management, implementation, and planning problems. See *infra* text accompanying notes 69–70.

In Part II, we review how these disparities have played out in courts. We consider claims that agency practice of adaptive management has not lived up to either its theoretical promise or to the legal demands of substantive and procedural law. Our overall assessment is that, although courts genuinely and often enthusiastically endorse adaptive management theoretically, they frequently are underwhelmed by how agencies implement adaptive management in the field. We extract three key themes from the body of case law in this respect: (1) larger-scale plans are more likely to incorporate adaptive management plans that withstand judicial scrutiny than are smaller-scale ones; (2) the practice of tiering site-specific environmental impact analyses to an earlier, overarching, cumulative study is well suited to adaptive management, and adaptive management can reduce the need for supplemental analyses; and (3) adaptive management procedures, no matter how finely crafted, cannot substitute for showing that a plan will meet substantive management criteria required by law.

The pool of judicial opinions on adaptive management is still limited in scope, leaving many questions unanswered and providing only a partial playbook for how agencies should move forward. In Part III, therefore, we extend from the existing case law to draw lessons for both Congress and agencies about the future practice of adaptive management. The message for Congress is straightforward—provide more funding and clearer standards. With neither option likely in the foreseeable future, agencies cannot as a practical matter hope to practice a fully realized version of adaptive management theory. Our message to agencies, however, is that even compromised adaptive management, in the form of a/m-lite, can be an effective decision method—and one that survives judicial scrutiny. But, in order for that to be the case, agencies must be more disciplined about its design and implementation. This includes resisting the temptation to employ adaptive management to dodge burdensome procedural requirements, committing to substantive management criteria, and engaging contentious stakeholder participation.

#### I. THE THEORY, POLICY, AND PRACTICE OF ADAPTIVE MANAGEMENT

Adaptive management has moved amazingly fast from theoretical drawing board to policy marketing plan to practice production line. Along the way, however, it has been watered

down to a weak lemonade of ad hoc contingency planning. Adaptive management as practiced by the federal resource management agencies just does not seem to have quite the same refreshing appeal as adaptive management in theory. In this Part of the Article, we explore this gap and identify the tensions it poses for adaptive management in the courts.<sup>9</sup>

#### A. THEORY

Over the past two decades, natural resources policy has gravitated to a model of nested, ever-changing, complex ecosystems, the essence of which demands a management policy framework every bit as dynamic as the ecosystems it seeks to manage.<sup>10</sup> This rapidly solidifying framework, known as ecosystem management, focuses on natural resources as ecologically functioning landscape units rather than as disassembled parts—the trees, the water, the grassland, the species, and so on.<sup>11</sup> To achieve this goal, ecosystem management intends to move decisionmaking from a process of setting rigid standards based on comprehensive rational planning to one of experimentation using continuous monitoring, assessment, and recalibration. The dominant of these new decision methods emerged in

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9. This Part builds on themes developed in J.B. Ruhl, *Adaptive Management for Natural Resources—Inevitable, Impossible, or Both?*, 54 ROCKY MTN. MIN. L. INST. 11-1, 11-2 (2008).

10. The development of natural resources law has taken many of its cues from environmental and ecological sciences, which themselves have evolved over time. See Fred P. Bosselman & A. Dan Tarlock, *The Influence of Ecological Science on American Law: An Introduction*, 69 CHI.-KENT L. REV. 847, 847–54 (1994). With ecology in particular, the trend over the past half-century has been increasingly to focus on the complex flux qualities of ecosystems and to place less emphasis on conceptions of stasis and natural stability. See Reed F. Noss, *Some Principles of Conservation Biology, as They Apply to Environmental Law*, 69 CHI.-KENT L. REV. 893, 893 (1994) (“Among the new paradigms in ecology, none is more revolutionary than the idea that nature is not delicately balanced in equilibrium, but rather is dynamic, often unpredictable, and perhaps even chaotic.”); see also Bryan Norton, *Change, Constancy, and Creativity: The New Ecology and Some Old Problems*, 7 DUKE ENVTL. L. & POLY F. 49, 49 (1996); Jonathan Baert Wiener, *Law and the New Ecology: Evolution, Categories, and Consequences*, 22 ECOLOGY L.Q. 325, 326–27 (1995).

11. For the seminal works developing ecosystem management theory and policy, see Norman L. Christensen et al., *The Report of the Ecological Society of America on the Scientific Basis for Ecosystem Management*, 6 ECOLOGICAL APPLICATIONS 665, 665–66 (1996), and R. Edward Grumbine, *What Is Ecosystem Management?*, 8 CONSERVATION BIOLOGY 27, 27 (1994). The legal contours of ecosystem management are comprehensively explored in JOHN COPELAND NAGLE & J.B. RUHL, *THE LAW OF BIODIVERSITY AND ECOSYSTEM MANAGEMENT* (2d ed. 2006).

the theory of adaptive management C.S. “Buzz” Holling and his co-authors laid out in the influential book from the late 1970s, *Adaptive Environmental Assessment and Management*.<sup>12</sup>

Holling and his fellow researchers found conventional environmental management methods, particularly the environmental impact analysis process that lies at the core of the National Environmental Policy Act (NEPA),<sup>13</sup> at odds with the emerging model of ecosystem dynamics. They focused on the basic properties of ecological systems to provide the premises of a new assessment and management method.<sup>14</sup> Under a dynamic model of ecosystems, they concluded, management policy must put a premium on collecting information, establishing measurements of success, monitoring outcomes, using new information to adjust existing approaches, and a willingness to change.<sup>15</sup> The traditional management approach of natural resources policy was “to attack environmental stressors in piecemeal fashion, one at a time,” and to parcel decisionmaking “out among a variety of mission-specific agencies and resource-specific management regimes.”<sup>16</sup> In contrast, the adaptive management framework is more evolutionary and interdisciplinary, relying on iterative cycles of goal determination, model building, performance standard setting, outcome monitoring, and standard recalibration. Indeed, advanced versions of adaptive management incorporate an experimentalist research element, in which management actions deliberately probe for information to evaluate testable hypotheses about the effects of active intervention in ecological processes, such as evaluating the effects a chosen habitat management action and its alternatives might have on invasive species by running small-scale test plot experiments.<sup>17</sup>

Adaptive management has evolved well beyond an idea. Indeed, from the earliest emergence of ecosystem management

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12. C.S. HOLLING ET AL., *ADAPTIVE ENVIRONMENTAL ASSESSMENT AND MANAGEMENT* (C.S. Holling ed., 1978); Kai N. Lee & Jody Lawrence, *Restoration Under the Northwest Power Act: Adaptive Management: Learning from the Columbia River Basin Fish and Wildlife Program*, 16 ENVTL. L. 431, 442 n.45 (1986) (tracing the term “adaptive management” to Holling’s book).

13. NEPA is explored in more detail *supra* Part III.

14. HOLLING ET AL., *supra* note 12, at 25–37.

15. *Id.* at 1–21.

16. Bradley C. Karkkainen, *Bottlenecks and Baselines: Tackling Information Deficits in Environmental Regulation*, 86 TEX. L. REV. 1409, 1439 (2008).

17. See CARL WALTERS, *ADAPTIVE MANAGEMENT OF RENEWABLE RESOURCES* 232 (1986); Karkkainen, *supra* note 4, at 70–71.

policy, there has been broad consensus among resource managers and academics that adaptive management is the only practical way to implement ecosystem management.<sup>18</sup> Recently, for example, the National Research Council branch of the National Academy of Sciences convened a committee of scientists to explore how adaptive management might be used to improve resource agency decisionmaking for ecosystem management in the Klamath River Basin, which straddles southern Oregon and northern California.<sup>19</sup> The basin had been beset for decades with water management conflicts pitting farming, fishing, tribal, recreational, and species interests in constant battle.<sup>20</sup> Noting there had been “little effort to implement adaptive-management strategies in the Klamath basin,”<sup>21</sup> the committee synthesized the theoretical formulations to date to outline eight key steps of adaptive management: (1) definition of the problem, (2) determination of goals and objectives for management of ecosystems, (3) determination of the ecosystem baseline, (4) development of conceptual models, (5) selection of future restoration actions, (6) implementation and management actions, (7) monitoring and ecosystem response, and (8) evaluation of restoration efforts and proposals for remedial actions.<sup>22</sup> The committee’s description of the last stage provides some flavor of how adaptive management differs from conventional natural resources management in the way Holling and his fellow researchers deemed most important:

After implementation of specific restoration activities and procedures, the status of the ecosystem is regularly and systematically reassessed and described. Comparison of the new state with the baseline state is a measure of progress toward objectives. The evaluation process feeds directly into adaptive management by informing the implementation

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18. See Ronald D. Brunner & Tim W. Clark, *A Practice-Based Approach to Ecosystem Management*, 11 CONSERVATION BIOLOGY 48, 56 (1997); Anne E. Heissenbuttel, *Ecosystem Management—Principles for Practical Application*, 6 ECOLOGICAL APPLICATIONS 730, 732 (1996); Paul L. Ringold et al., *Adaptive Management Design for Ecosystem Management*, 6 ECOLOGICAL APPLICATIONS 745, 745–46 (1996). Indeed, the Ecological Society of America’s comprehensive study of ecosystem management treats the use of adaptive management methods as a given. See Christensen et al., *supra* note 11, at 670.

19. See COMM. ON ENDANGERED & THREATENED FISHES IN THE KLAMATH RIVER BASIN, ENDANGERED AND THREATENED FISHES IN THE KLAMATH RIVER BASIN: CAUSES OF DECLINE AND STRATEGIES FOR RECOVERY 1–3 (2004). In the interests of full disclosure, Professor Ruhl served on the so-called Klamath Committee.

20. See *id.* at 17–45.

21. *Id.* at 335.

22. See *id.* at 332–35.

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team and leading to testing of management hypotheses, new simulations, and proposals for adjustments in management experiments or development of wholly new experiments or management strategies.<sup>23</sup>

By contrast, the committee observed that “[e]cosystem management in the Klamath basin typically has pursued the widely recognized alternatives to adaptive management: deferred action and trial and error involving crisis management.”<sup>24</sup> These approaches magnify losses to resources, undervalue information, and overvalue action for action’s sake.<sup>25</sup> While an adaptive management approach would need to adhere to legal constraints of the Endangered Species Act (ESA) and established water rights, the committee identified a number of management innovations that could take pressure off the water management conflicts, such as water banks and reoriented agency management structures and processes.<sup>26</sup>

## B. POLICY

Federal resource management agencies have had difficulty translating the theoretical descriptions of adaptive management into policy. Rather than elaborating on the theoretical framework by providing details for implementation of the eight steps of adaptive management, agencies adopting adaptive management have gone in the reverse direction, condensing the policy of adaptive management into the bumper-sticker sized slogan of “learning while doing.”<sup>27</sup>

For example, one of the first movers on adaptive management, the U.S. Fish and Wildlife Service (FWS), has employed this definition of adaptive management in its policy guidance for the ESA permit program since 2000:

Adaptive management is an integrated method for addressing uncertainty in natural resource management. It also refers to a structured process for learning by doing . . . . Passive adaptation is where information obtained is used to determine a single best course of action. Active adaptation is developing and testing a range of alternative strategies. The Services believe that both of these types of adaptive management are appropriate to consider when developing a strategy to address uncertainty. Therefore, we are defining adaptive manage-

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23. *Id.* at 335.

24. *Id.* at 336.

25. *See id.*

26. *See id.* at 340–43. For a thorough history of the basic controversy in the Klamath basin dispute, including the impact and aftermath of the Committee report, see HOLLY DOREMUS & A. DAN TARLOCK, WATER WAR IN THE KLAMATH BASIN (2008).

27. *See supra* note 1 and accompanying text.

ment broadly as a method for examining alternative strategies for meeting measurable biological goals and objectives, and then, if necessary, adjusting future conservation management actions according to what is learned.<sup>28</sup>

Similarly, the Department of the Interior (DOI), in its *Adaptive Management Technical Guide*, defines adaptive management using a long-winded version of the “learning while doing” theme adopted from the National Research Council:

Adaptive management [is a decision process that] promotes flexible decision making that can be adjusted in the face of uncertainties as outcomes from management actions and other events become better understood. Careful monitoring of these outcomes both advances scientific understanding and helps adjust policies or operations as part of an iterative learning process . . . . It is not a “trial and error” process, but rather emphasizes learning while doing.<sup>29</sup>

The mantras of “learning while doing” and “learning by doing” may capture the essence of adaptive management, but these phrases hardly convey how to do it. The picture gets no clearer as one moves from policy guidance to formal regulatory definitions. For example, the joint regulation for compensatory wetland mitigation—promulgated in April of 2008 by the U.S. Army Corps of Engineers (Army Corps) and the Environmental Protection Agency (EPA)<sup>30</sup>—defines adaptive management as

the development of a management strategy that anticipates likely challenges associated with compensatory mitigation projects and provides for the implementation of actions to address those challenges, as well as unforeseen changes to those projects. It requires consideration of the risk, uncertainty, and dynamic nature of compensatory mitigation projects and guides modification of those projects to optimize performance. It includes the selection of appropriate measures that will ensure that the aquatic resource functions are provided and involves analysis of monitoring results to identify potential problems of a compensatory mitigation project and the identification and implementation of measures to rectify those problems.<sup>31</sup>

The U.S. Forest Service’s 2008 rule on national forest planning,<sup>32</sup> which drips with references to adaptive management, provides even less definitional detail:

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28. Notice of Availability of a Final Addendum to the Handbook for Habitat Conservation Planning and Incidental Take Permitting Process, 65 Fed. Reg. 35,242, 35,252 (June 1, 2000) (internal citations omitted).

29. BYRON K. WILLIAMS ET AL., *ADAPTIVE MANAGEMENT: THE U.S. DEPARTMENT OF INTERIOR TECHNICAL GUIDE*, at v (2009).

30. See *Compensatory Mitigation for Losses of Aquatic Resources*, 73 Fed. Reg. 19,594 (Apr. 10, 2008).

31. 33 C.F.R. § 332.2 (2009).

32. *National Forest System Land Management Planning*, 73 Fed. Reg. 21,468 (Apr. 21, 2008).

Adaptive management: A system of management practices based on clearly identified outcomes and monitoring to determine if management actions are meeting desired outcomes; and, if not, to facilitate management changes that will best ensure that outcomes are met or re-evaluated. Adaptive management stems from the recognition that knowledge about natural resource systems is sometimes uncertain.<sup>33</sup>

The point is that these and other legal definitions of adaptive management have done little to pin down what makes natural resources management “adaptive” for purposes of measuring and evaluating agency decisions. Further content is not generally supplied in agency substantive and procedural regulations. For example, section 404 of the new Clean Water Act’s wetland compensatory mitigation program regulations requires applicants to develop adaptive management plans as part of a larger, permitting process and use it to guide decisionmaking over relevant permit time frames.<sup>34</sup> Thus, among

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33. 36 C.F.R. § 219.16 (2009) (emphasis removed). This rule is currently enjoined by *Citizens for Better Forestry v. U.S. Department of Agriculture*, 632 F. Supp. 2d 968, 980 (N.D. Cal. 2009), and the Forest Service has requested public input on what direction the planning rule should take. See National Forest System Land Management Planning, 74 Fed. Reg. 67,165, 67,166 (Dec. 18, 2009). The Forest Service adopted the same definition in its August 2007 proposed rules updating its procedures for NEPA compliance. See National Environmental Policy Act Procedures, 72 Fed. Reg. 45,998, 46,003 (Aug. 16, 2007). States do little better. California defines adaptive management, in the context of wildlife conservation planning, as “us[ing] the results of new information gathered through the monitoring program of the plan and from other sources to adjust management strategies and practices to assist in providing for the conservation of covered species.” CAL. FISH & GAME CODE § 2805(a) (West 2010). A Minnesota statute implementing the Great Lakes compact defines it as “a water resources management system that provides a systematic process for evaluation, monitoring and learning from the outcomes of operational programs and adjustment of policies, plans and programs based on experience and the evolution of scientific knowledge concerning water resources and water dependent natural resources.” MINN. STAT. § 103G.801(1.2) (2010). Adaptive management in Oregon means “applying management or practices over time and across the landscape to achieve site specific resource goals using an integrated and science based approach that results in changes over time in response to feedback or monitoring.” OR. REV. STAT. § 541.351(1) (2010). In Washington it means simply “reliance on scientific methods to test the results of actions taken so that the management and related policy can be changed promptly and appropriately.” WASH. REV. CODE ANN. § 76.09.020(1) (West 2010).

34. Section 404 of the Clean Water Act, jointly administered by the Army Corps of Engineers (Army Corps) and the EPA, establishes a program to regulate the discharge of dredged or fill material into waters of the United States, including wetlands. Activities in waters of the United States regulated under section 404 include fill for development, water resource projects (such as dams and levees), infrastructure development (such as highways and airports), and mining projects. Section 404 requires a permit before dredged or fill material may be discharged into waters of the United States, unless the activity is exempt from section 404 regulation (e.g., certain farming and forestry activities).

the regulatory requirements for “planning and documentation” in mitigation plans, the rule requires compilation of an “adaptive management plan” to “guide decisions for revising compensatory mitigation plans and implementing measures to address both foreseeable and unforeseen circumstances that adversely affect compensatory mitigation success.”<sup>35</sup> With the requirement of adaptive management plans in hand, however, the rule does not go much further in explaining how they are to be designed and implemented, leaving it to the local Army Corps “district engineer, in consultation with the responsible party (and other federal, tribal, state, and local agencies, as appropriate), [to] determine the appropriate measures.”<sup>36</sup> The upshot of the rule is that the adaptive management plan will be used when needed, at which time the district engineer and regulated party will figure out how to adapt.

This wait-and-see approach hardly seems what Holling and his adaptive management theory progeny have in mind. Rather than require plans that build in the objectives, hypotheses, models, standards-information flows, and transparency of adaptive management, these rules leave the actual content of plans undetermined and the practice of adaptive management up to the opaque post-permit contacts between local Army Corps officials and permittees. This is indicative of how an elaborate theory has descended into a vague promise of future adjustments without clear standards. The litigation described in Part II provides many other examples of this devolution from theory to *a/m-lite*.<sup>37</sup>

Some of the open-ended qualities of the Army Corps’ adaptive management policy could be explained as necessary given the nature of section 404 as regulating primarily private lands and actions<sup>38</sup>—meaning the Army Corps takes proposed actions as they come and cannot know ahead of time how adaptive management can be effectively designed. But the story is little better for federal public land management agencies. There is no shortage of stakeholders interested in how public lands are managed and plenty of opportunities exist for them to chal-

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See *Wetland Regulatory Authority*, U.S. EPA OFF. WATER, [http://water.epa.gov/type/wetlands/outreach/upload/reg\\_authority.pdf](http://water.epa.gov/type/wetlands/outreach/upload/reg_authority.pdf) (last visited Sept. 26, 2010).

35. 33 C.F.R. § 332.4(c)(12) (2009).

36. *Id.* § 332.7(c)(3).

37. See *infra* Part II.

38. Jason Scott Johnston, *The Tragedy of Centralization: The Political Economics of American Natural Resources Federalism*, 74 U. COLO. L. REV. 487, 620 n.361 (2003).

lenge agency decisions. The U.S. Forest Service and the DOI have led the way toward adaptive management among federal land management agencies. The Forest Service positioned adaptive management as the driver in its 2008 “environmental management systems” (EMS) rules for national forest planning,<sup>39</sup> and the DOI adopted a broad adaptive management policy for all its agencies in March 2007.<sup>40</sup> Still, details are lacking.

The Forest Service’s 2008 rule, for example, touts adaptive management over twenty times in the preamble,<sup>41</sup> but only twice in the rule text: once to define it,<sup>42</sup> and once to proclaim it is the essence of land management planning,<sup>43</sup> but never to explain how it is implemented. Instead, the agency adopted the concept of “environmental management systems” to, in theory (according to the preamble), capture all that is part of adaptive management and more.<sup>44</sup> The agency said it “believes incorporating EMS in the planning rule better integrates adaptive management and EMS in Forest Service culture and land management planning practices.”<sup>45</sup>

The DOI approach is in one sense more substantive but in others more indirect. The DOI has proposed, as part of its rules implementing NEPA, that all its agencies adopt adaptive management, but does not therein define adaptive management or prescribe the contents of adaptive management plans.<sup>46</sup> Rather, the March 2007 DOI policy mandates use of a “technical guide” to define what adaptive management is and how an agency is

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39. National Forest System Land Management Planning, 73 Fed. Reg. 21,468, 21,469 (Apr. 21, 2008) (emphasizing the need for a forest system management rule that “[p]romotes the use of adaptive management”).

40. See Secretary of the Interior, Order No. 3270, § 2 (Mar. 9, 2007) (“Consideration of [adaptive management] is warranted when: (a) there are consequential decisions to be made; (b) there is an opportunity to apply learning; (c) the objectives of management are clear; (d) the value of reducing uncertainty is high; (e) uncertainty can be expressed as a set of competing, testable models; and (f) an experimental design and monitoring system can be put in place with a reasonable expectation of reducing uncertainty.”).

41. National Forest System Land Management Planning, 73 Fed. Reg. at 21,469–505.

42. 36 C.F.R. § 219.16 (2009).

43. *Id.* § 219.3(a) (“Land management planning is an adaptive management process that includes social, economic, and ecological evaluation; plan development, plan amendment, and plan revision; and monitoring.”).

44. *Id.* § 219.5.

45. National Forest System Land Management Planning, 73 Fed. Reg. at 21,475.

46. Using Adaptive Management, 43 C.F.R. § 46.145 (2009).

to implement it.<sup>47</sup> The DOI adaptive management website presents a series of case studies to illustrate the technical guide in action, with contexts including multiple use lands, wildlife refuges, national forest restoration projects, and the Glen Canyon dam.<sup>48</sup> The guidance and the case studies do provide useful practical suggestions for adaptive management, but they do not aggregate into a coherent policy. The DOI nonetheless believes this approach “has great promise as an effective means to address significant resource management challenges under conditions of uncertainty.”<sup>49</sup> That, of course, will depend on how it is put into practice.

### C. PRACTICE

Natural resource law is as much the management of conflict as it is the management of public lands, waters, or species. The first generation of litigation over adaptive management highlights two key disparities that are likely to exacerbate conflict and misunderstanding as agencies attempt to translate theory into action. One disparity arises from the different values evident in law and management. The other disparity separates scholarly adaptive management theory<sup>50</sup> from actual federal agency practice.

#### 1. Perspectives on Agency Decisionmaking: Law Versus Management

Modern U.S. administrative law and many of the environmental statutes enacted over the past forty years value the transparency and certainty of two-step decisionmaking. The first step is the pluralist debate during which groups comment on draft documents and debate various alternatives. The second step is the final agency action, when the government throws the switch and makes the decision it will implement and defend if challenged in court. The legal system regards the point of final agency action as a phase change when the fluid

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47. See WILLIAMS ET AL., *supra* note 29, at v.

48. See *Adaptive Management In Use*, U.S. DEPARTMENT INTERIOR, <http://www.doi.gov/initiatives/AdaptiveManagement/casestudies.html> (last modified Sept. 14, 2010).

49. Secretary of the Interior Order No. 3270, *supra* note 40, § 2.

50. For a discussion of adaptive management theory, see *supra* text accompanying notes 12–17.

period of deliberation ends and implementation/defense of a fixed record and plan of action begins.<sup>51</sup>

This decision method relies on two central attributes: (1) use of “front-end” analytical tools comprehensively conducted *and concluded* prior to making the decision final, and (2) the assumption of a robust capacity to predict and assess environmental impacts and overall costs and benefits of a proposed action.<sup>52</sup> For example, regulations promulgated under the ESA provide for consultations between the FWS and other federal agencies about the impacts of actions on protected species. These regulations require the FWS to “[e]valuate the effects of the action and cumulative effects” and decide “whether the action, taken together with cumulative effects, is likely to jeopardize the continued existence of listed species.”<sup>53</sup> In other words, the FWS must decide, once and for all, whether an action taken today will jeopardize a species at some point in the future. The agency may revisit its decision only if the action remains subject to continuing federal control and either new information or modifications of the action present effects that were not previously considered.<sup>54</sup>

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51. See *Citizens to Preserve Overton Park v. Volpe*, 401 U.S. 402, 419–20 (1971) (holding that a record contemporaneous with agency deliberation must document the consideration of relevant factors supporting the decision—justifications offered after the final agency action cannot provide the legal support to uphold an agency action).

52. Professors Sidney Shapiro and Robert Glicksman have produced a rich body of scholarship exploring the “front-end” prediction approach to environmental agency decisionmaking. See SIDNEY A. SHAPIRO & ROBERT L. GLICKSMAN, *RISK REGULATION AT RISK: RESTORING A PRAGMATIC APPROACH*, at x (2003) (suggesting that pragmatism, rather than utilitarianism, is the “appropriate baseline from which to design and implement risk regulation”); Sidney A. Shapiro & Robert L. Glicksman, *Improving Regulation Through Incremental Adjustment*, 52 U. KAN. L. REV. 1179, 1179 (2004) (advocating a shift in focus from “front-end” regulatory adjustment to “back-end” regulatory improvements, including use of adaptive management); Sidney A. Shapiro & Robert L. Glicksman, *The Missing Perspective*, ENVTL. F., Mar.–Apr. 2003, at 42, 42 (“Instead of the increased ‘front end’ examination of regulations, such as cost-benefits analysis, that is pushed by the critics—and is causing stagnation of rulemaking—a pragmatic approach would look at a regulation’s actual ‘back end’ effects after promulgation and make incremental adjustments as needed.”).

53. 50 C.F.R. § 402.14(g)(3)–(4) (2009). The agency defines cumulative effects as “those effects of future State or private activities, not involving Federal activities, that are reasonably certain to occur within the action area.” *Id.* § 402.02.

54. See *id.* § 402.16.

As shown above, adaptive management in theory employs a much more complicated, multistep approach, which values the honing of predictive models and outcomes more than the fairness of the process.<sup>55</sup> Adaptive management theory regards decisionmaking as more of a series of fine-tuning steps that are continually and perpetually reevaluated.<sup>56</sup> The legal view of a resource management plan is that it comprehensively evaluates all rational considerations at once and then flips a toggle switch; the adaptive management approach twiddles the dial as information trickles in.

Adaptive management squares up much better with the needs of many contemporary resource management problems.<sup>57</sup> The comprehensive, front-end assessment methods of conventional resource management will likely face significant challenges in addressing problems such as climate change. The impacts of climate change necessitating human and environmental adaptation are excruciatingly difficult to predict.<sup>58</sup> Nonlinearities in change dynamics, environmental feedback properties, and the interactions of social and ecological responses will soon exceed the boundaries of knowledge and experience that have allowed environmental impact assessment and cost-benefit analysis to maintain what reliability and credibility they have.<sup>59</sup> Indeed, even before climate change adapta-

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55. See *supra* text accompanying notes 12–17.

56. See *supra* text accompanying notes 12–17.

57. See *supra* Part I.A (discussing how ever-changing ecosystems require management policies that can adapt to new and uncertain climate conditions).

58. Many ecologists believe we face a “no-analog” future—one for which we have no experience on which to base projections of ecosystem change, and for which models designed to allow active management decisions as climate change takes effect are presently rudimentary and imprecise. See Peter Cox & David Stephenson, *A Changing Climate for Prediction*, 317 *SCIENCE* 207, 207 (2007); Matthew C. Fitzpatrick & William W. Hargrove, *The Projection of Species Distribution Models and the Problem of Non-Analog Climate*, 18 *BIODIVERSITY & CONSERVATION* 2255, 2255 (2009); Douglas Fox, *Back to the No-Analog Future?*, 316 *SCIENCE* 823, 823 (2007); Douglas Fox, *When Worlds Collide*, *CONSERVATION*, Jan.–Mar. 2007, at 28, 31.

59. The scientific literature exploring these complex dynamics and exposing our lack of understanding about what lies ahead as temperature rises is legion. See, e.g., U.S. CLIMATE CHANGE SCI. PROGRAM, *THRESHOLDS OF CLIMATE CHANGE IN ECOSYSTEMS* 74–84 (2009), available at <http://downloads.climate-science.gov/sap/sap4-2/sap4-2-final-report-all.pdf> (examining numerous positive feedback properties leading to nonlinear thresholds in climate change dynamics); Almut Arneth et al., *Clean the Air, Heat the Planet?*, 326 *SCIENCE* 672, 672–73 (2009) (examining the feedback effects between conventional air pollution control and climate change mitigation, and concluding that complex positive and negative feedback links exist and that, on balance, the

tion became a pressing need, the challenges of front-end environmental impact assessment were evident in ecological contexts that were increasingly understood to be exceedingly complex.<sup>60</sup>

For example, a 1997 guide on considering cumulative effects under NEPA explains that “[d]etermining the cumulative environmental consequences of an action requires delineating the cause-and-effect relationships between the multiple actions and the resources, ecosystems, and human communities of concern. Analysts must tease from the complex networks of possible interactions those that substantially affect the resources.”<sup>61</sup> The guide advises analysts to “gather information about the cause-and-effect relationships between stresses and resources” and to develop “a conceptual model of cause and effect . . . [with] [n]etwork[] and system diagrams [as] the preferred methods of conceptualizing cause-and-effect relationships.”<sup>62</sup> Adaptive management seems more in tune with this approach than does conventional front-end decisionmaking.

The problem with adaptive management is that courts are better equipped to review toggle switching than dial twid-

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evidence and models suggest that “air pollution control will accelerate warming in the coming decades”); Gordon B. Bonan, *Forests and Climate Change: Forcings, Feedbacks, and the Climate Benefits of Forests*, 320 SCIENCE 1444, 1444 (2008) (“[C]omplex and nonlinear forest-atmosphere interactions can dampen or amplify anthropogenic climate change.”); I. Eisenman & J.S. Wetlaufer, *Nonlinear Threshold Behavior During the Loss of Arctic Sea Ice*, 106 PROC. NAT’L ACAD. SCI. 28, 28 (2009) (describing the nonlinear “tipping points” in the ice-albedo feedback effect); Jerome Gaillardet & Albert Galy, *Himalaya—Carbon Sink or Source?*, 320 SCIENCE 1727, 1727–28 (2008) (explaining the uncertainties of the sinks and sources of the carbon geological cycle); Steven W. Running, *Ecosystem Disturbance, Carbon, and Climate*, 321 SCIENCE 652, 652–53 (2008) (explaining the uncertainties of ecological sinks and sources and how they might be impacted by episodic disturbances such as fires and insect epidemics).

60. See generally Daniel A. Farber, *Probabilities Behaving Badly: Complexity Theory and Environmental Uncertainty*, 37 U.C. DAVIS L. REV. 145 (2003) (discussing environmental complexity theory, which suggests that environmental events do not follow typical statistical distributions and are, thus, extremely difficult to plan for or predict); J.B. Ruhl, *Thinking of Environmental Law as a Complex Adaptive System: How to Clean up the Environment by Making a Mess of Environmental Law*, 34 HOUS. L. REV. 933 (1997) (explaining how the subject matter of environmental law consists of “interlinked complex adaptive systems,” the existence of which pose unique problems in terms of environmental management and regulation).

61. COUNCIL ON ENVTL. QUALITY, *CONSIDERING CUMULATIVE EFFECTS UNDER THE NATIONAL ENVIRONMENTAL POLICY ACT*, at vi (1997).

62. *Id.* at 38.

dling.<sup>63</sup> As the previous section demonstrated, agency policies for implementing adaptive management arose in a statutory vacuum and are themselves largely devoid of legal details.<sup>64</sup> While judges might generally understand the rationale for adaptive management and worry about discouraging experimentation that will lead to better conservation outcomes, the absence of clear statutory authority and well-defined regulatory standards will likely make evaluating agency adaptive management plans a struggle.<sup>65</sup> There are no statutory standards for oversight, no concrete legal definitions for determining what qualifies as adaptive management, and few binding steps in adopting adaptive management.<sup>66</sup> In rejecting “cookbooks” for adaptive management, agencies have failed to fill in the gaps left by statutes that either predate, ignore, or simply mention adaptive management in passing.<sup>67</sup> Agency policies support adaptive management as “learning while doing,” but courts are bound to review agency behavior in accordance with laws premised on a different paradigm. Part II of this Article reviews the court decisions relating to this disparity between agency policies and traditional administrative law and describes how judges attempt to reconcile it.

## 2. Adaptive Management: Theory Versus Practice

If one disparity in judicial interpretation arises from the disconnect between adaptive management and conventional administrative law, the second key disparity arises from the gap between the theory of adaptive management as explored in the scholarly literature and the practice as manifest in the actual plans agencies label as “adaptive management.” The “learning while doing” policy approach to adaptive management, although formless in substance, could have accommodated agencies’ implementation of adaptive management by adopting plans that fulfill the theory of adaptive management. But the fiscal realities of natural resources management in the field demand bare-bones approaches to project planning and

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63. See *infra* Part II (discussing how courts have analyzed the legality of adaptive management).

64. See *supra* Part I.B (describing how adaptive management lacks a concrete definition or framework of statutory guidance and, thus, is difficult to implement in practice).

65. See *supra* Part I.B.

66. See *supra* Part I.B.

67. See *supra* Part I.B.

conservation.<sup>68</sup> In this lean environment, the incentives for field-level resource managers are to get the doing done through triage and to save the learning for better times.

Indeed, as the agency policies discussed above and the cases explored in Part II illustrate, agencies in practice have employed what we call “a/m-lite,” a stripped-down version of adaptive management that almost always neglects to develop testable hypotheses as the basis for management actions.<sup>69</sup> Often a/m-lite fails even to structure a learning procedure, whether through experimentation, historical research, or modeling.<sup>70</sup> Furthermore, lack of follow-through plagues implementation. As the cases show, there are other dimensions to the agency plans that depart from adaptive management theory because of limited funding.<sup>71</sup> This a/m-lite approach, in its most extreme form, is open-ended contingency planning or “on-the-fly” management that promises some loosely described response to whatever circumstances arise. Some a/m-lite implementation can fairly be considered a passive form of adaptive management, suitable to circumstances where the range of possible variations in actions and outcomes are small.<sup>72</sup> But a/m-lite may also slip into “basic trial and error learning in which explicit hypotheses are absent or vague,” or there may be

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68. See Robert L. Fischman, *Predictions and Prescriptions for the Endangered Species Act*, 34 ENVTL. L. 451, 471–75 (2004) (explaining how many environmental laws do not allocate the funds necessary to operate at optimum levels); see also OUTDOOR RES. REVIEW GRP., GREAT OUTDOORS AMERICA 4 (2009), available at [http://www.orrgroup.org/documents/July2009\\_Great-Outdoors-America-report.pdf](http://www.orrgroup.org/documents/July2009_Great-Outdoors-America-report.pdf) (finding appropriations to be “woefully inadequate to meet identified needs for land and water conservation and outdoor recreation”); Caitlin A. Burke et al., *Policy News: Natural Resource Agency Funding*, 32 WILDLIFE SOC’Y BULL. 260, 262 (2004) (“Working to achieve enhanced funding and sound policies for wildlife conservation has always been important for wildlife professionals, but now—in this time of budget shortfalls—it is essential.”).

69. See Doremus, *supra* note 1, at 562 (“The potential for learning has too often been ignored in environmental regulation and natural resource management.”).

70. See *id.*

71. See, e.g., *S. Fork Band Council v. U.S. Dep’t of the Interior*, 588 F.3d 718, 725–26 (9th Cir. 2009) (*per curiam*) (describing a hastily prepared EIS that the court held inadequate due to its lack of detail).

72. See R. Gregory et al., *Deconstructing Adaptive Management: Criteria for Applications to Environmental Management*, 16 ECOLOGICAL APPLICATIONS 2411, 2412 (2006) (distinguishing active adaptive management, which hews closely to the theoretical model, from passive adaptive management, which retains some of the benefits of the theoretical approach while sacrificing some scientific rigor).

a complete lack of monitoring and meaningful adjustments.<sup>73</sup> At its worst, a/m-lite may be a pretext for postponing difficult, but important, decisions in order to dodge the constraints of budgets, politics, or scientific uncertainty.<sup>74</sup>

The difference between adaptive management, as practiced, and the adaptive management concept universally praised as essential for dealing with the complexities of natural systems does not illustrate a disagreement about how adaptive management should work as much as it reveals the budgetary and political limitations of agencies responsible for implementation.<sup>75</sup> After all, we cannot expect agencies to carry out projects for which they have no funding. Moreover, adaptive management cannot dissolve the political conflicts that surround competition for scarce resources.<sup>76</sup>

Nonetheless, the gap between theory and practice raises an important concern about bait and switch. Agencies base their departure from the conventional, comprehensive rationality model on the literature arguing that adaptive management is a superior approach.<sup>77</sup> But as the examples in Part II show, the policies and rules agencies have adopted leave them plenty of room to implement something different from the adaptive management approach supported by the management literature. Our concern is whether the agency-implemented a/m-lite is enough of an improvement over the comprehensive rationality assumption of front-end decisionmaking to justify the loss of certainty and transparency. This concern is particularly important because adaptive management is most often invoked as a tool to handle decisionmaking in the face of uncertainty.<sup>78</sup> Theoretical adaptive management reduces uncertainty over time, as experiments yield insights about how ecosystems re-

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73. *Id.*

74. *See id.* at 2411.

75. *See id.*

76. *See* Carol Hirschon Weiss, *The Experimenting Society in a Political World*, in *VALIDITY & SOCIAL EXPERIMENTATION* 283, 284 (Leonard Bickman ed., 2000) (discussing the view that politics play an important role “in influencing how feasible . . . advocacy of experimental reform [can] be”).

77. *See supra* Part I.A (discussing the theories that have caused adaptive management to become a popular modern approach to environmental regulation).

78. *See supra* Part I.A (describing how ever-changing ecosystems demand management policies that can keep pace with changing conditions).

spond to various interventions.<sup>79</sup> But a/m-lite, which typically neglects hypothesis testing, does not help in this manner.<sup>80</sup> Even when it does specify a hypothesis to test, management practice often shortchanges evaluation. Part II of this Article examines this disparity by analyzing cases that have engaged the courts in disagreements about what constitutes legal adaptive management.

## II. LITIGATION OVER ADAPTIVE MANAGEMENT

In a relatively short time, the adaptive management label for agency resource management plans has become ubiquitous. Since 1993, each of the major federal resource management agencies has made a policy commitment to employ adaptive management.<sup>81</sup> At one time, a casual reader of a draft Environmental Impact Statement (EIS) could predict which alternative an agency would likely prefer by identifying the one that included “balanced approach” in its title.<sup>82</sup> Over the past decade the tip-off has become “adaptive.”<sup>83</sup>

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79. See Doremus, *supra* note 1, at 549 (“[I]t is possible to reduce uncertainty over time in ways that are relevant to subsequent iterations or related decisions.”).

80. See *id.* at 569 (discussing how adaptive management is often used as a means to “muddle through” and act in the face of uncertainty “without any enforceable requirements for learning or incorporating new knowledge”).

81. Many of these are discussed *infra* in Part II.B. The Northwest Power Planning Council was the most important early adopter when it employed “adaptive management” in its 1982 Columbia Basin Fish and Wildlife Program to address pervasive scientific uncertainty regarding salmon recovery. See *Nw. Res. Info. Ctr. v. Nw. Power Planning Council*, 35 F.3d 1371, 1380 (9th Cir. 1994). Adaptive management continues to be the organizing principle for fish conservation in the Columbia Basin today. See NAT’L OCEANIC & ATMOSPHERIC ADMIN. ET AL., FCRPS ADAPTIVE MANAGEMENT IMPLEMENTATION PLAN: 2008–2018 FEDERAL COLUMBIA RIVER POWER SYSTEM BIOLOGICAL OPINION (2009), available at [http://www.salmonrecovery.gov/Files/BiologicalOpinions/AMIP\\_091009.pdf](http://www.salmonrecovery.gov/Files/BiologicalOpinions/AMIP_091009.pdf) (purporting to strengthen the agencies’ 2008 biological opinion—which the U.S. District Court in *National Wildlife Federation v. National Marine Fisheries Service*, 524 F.3d 917 (9th Cir. 2008), remanded for being structurally flawed under the ESA—by, inter alia, establishing new biological triggers to activate short- and long-term responses, and providing a rapid response to any detected significant decline in fish populations).

82. See, e.g., *Or. Natural Desert Ass’n v. Singleton*, 47 F. Supp. 2d 1182, 1195 (D. Or. 1998) (stating that the preferred alternative is one which articulates an intention to provide a “balanced approach” to protecting Oregon’s rivers); *Am. Motorcyclist Ass’n v. Watt*, 534 F. Supp. 923, 928 (C.D. Cal. 1981) (demonstrating that the Bureau of Land Management takes a balanced approach to conservation planning).

83. See, e.g., U.S. DEPT OF THE INTERIOR, RECORD OF DECISION: FINAL

Therefore, it was inevitable that courts would be called upon to evaluate how well the “adaptive” alternatives selected by agencies meet legal requirements. Every year, more and more published federal court decisions employ the term “adaptive management.” However, most cases using or even discussing the term “adaptive management” focus on issues peripheral to the key disparities at the heart of this analysis. Because an increasing majority of new federal resource management decisions use an adaptive management framework, a steady stream of challenges to federal resource management decisions need to discuss the framework to set the stage for evaluating the unrelated legal challenges.

A May 13, 2010, search of Westlaw and LexisNexis reported 120 federal court decisions containing the phrase “adaptive management.”<sup>84</sup> That group can be distilled to sixty-nine cases involving a challenge to adaptive management of the environment or natural resources.<sup>85</sup> In most of those cases, courts

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BISON AND ELK MANAGEMENT PLAN AND ENVIRONMENTAL IMPACT STATEMENT 4 (2007), available at <http://www.fws.gov/bisonandelkplan/ROD.pdf> [hereinafter BISON AND ELK PLAN] (choosing the “Adaptively Manage Habitat and Populations” alternative). Increasingly, however, it can be difficult to find an alternative in a resource management EIS that does not purport to be adaptive. See, e.g., Cal. Res. Agency v. U.S. Dep’t of Agric., No. C 08-1185 MHP, 2009 WL 6006102, at \*16 (N.D. Cal. Sept. 29, 2009) (rejecting a challenge to a forest-plan EIS in which all alternatives employed adaptive management because the Forest Service is not compelled to evaluate alternatives incompatible with its “basic policy objectives” or its “fundamental policy choice”).

84. Our focus is on identifying and analyzing judicial decisions in which the court directly evaluates the legality of an agency’s use of adaptive management to implement a regulatory program. We recognize that there are likely many pieces of litigation involving disputes over, among other things, an agency’s use of adaptive management that does not produce a judicial opinion directly assessing its legality. Some judicial opinions might also evaluate the legality of a specific agency action designed to implement adaptive management without ever mentioning adaptive management as the agency’s fundamental guiding motivation; though our impression is that as much as agencies advertise their purported use and implementation of adaptive management in policy documents, they would be no less eager to do so in court filings. Identifying and analyzing cases in both of these categories of cases would be important to gain a complete understanding of how adaptive management has fared in the judicial forum. The most important cases for our purposes, however, are those in which a court speaks directly to the use and legality of adaptive management. The language of these judicial opinions most substantively forms the jurisprudence of adaptive management.

85. The disparity between “decisions” and “cases” represents the fact that thirteen disputes (i.e., cases) produced more than one court decision. E.g., Pac. Coast Fed’n of Fishermen’s Ass’ns v. Gutierrez, 606 F. Supp. 2d 1122 (E.D. Cal. 2008). No single case produced more than one decision applying the law directly to adaptive management.

did not directly apply law to the adaptive aspect of the agency action. Instead, the courts employed the term to describe the action before getting to the legal issues dispositive to the case.<sup>86</sup>

Nonetheless, thirty-one federal court decisions do grapple with the legality of adaptive management. The United States lost more than half of these cases,<sup>87</sup> a poor record given the deference accorded to agencies under administrative law.<sup>88</sup> It is these cases that reveal the most about the two key disparities highlighted previously: (1) between the principles underlying law and adaptive management, and (2) between adaptive management in theory and a/m-lite in practice. This study of the first round of litigation emerging from the federal consensus that natural resources agencies should practice adaptive management yields three key lessons about how those disparities have worked out in the courts: (1) larger-scale plans are more likely to incorporate successful adaptive management plans than smaller ones;<sup>89</sup> (2) the practice of tiering site-specific environmental impact analyses to an earlier, overarching, cumulative study is well suited to adaptive management, and adaptive management can reduce the need for a supplemental EIS;<sup>90</sup> and (3) adaptive management procedures, no matter how finely crafted, cannot substitute for showing that a plan will meet the substantive management criteria required by law.<sup>91</sup>

To set the stage for the analysis of these three themes, three sweeping observations are in order. First, it is worth not-

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86. See, e.g., *Se. Conference v. Vilsack*, 684 F. Supp. 2d 135, 139 (D.D.C. 2010) (mentioning that the plan in question employs adaptive management, but recognizing that the disposition of the case actually turns on the definition of “withdrawal” under 16 U.S.C. § 3213(a), rather than the legality of adaptive management).

87. Not all of the government losses were due to problems with adaptive management. For instance, the Ninth Circuit overturned the 2004 Sierra Forest Framework for NEPA violations while upholding its adaptive management component. See *infra* notes 130–41 and accompanying text (discussing the analysis of the 2004 Sierra Forest Framework and the legitimacy of adaptive management techniques).

88. While the loss record for the United States is poor in these cases compared to administrative litigation overall, natural resource challenges generally fair better for plaintiffs in court than one would expect given the deferential standard of review. See Denise M. Keele et al., *Forest Service Land Management Litigation 1989–2002*, 104 J. FORESTRY 196, 198 (2006) (discussing how, of the 729 cases challenging Forest Service resource management decisions, the agency won only 57.6 percent).

89. See *infra* Part II.A.

90. See *infra* Part II.B.

91. See *infra* Part II.C.

ing that a court upholding an a/m-lite approach does not necessarily endorse the practice as advancing the goals of either law or conservation policy. It simply means that the use of a/m-lite did not run afoul of any specific legal requirement or substitute for a required finding or procedure.<sup>92</sup> While courts may approve agency actions that involve terrible applications of adaptive management, it is fair to say that the most vague and incomplete plans have a greater likelihood of remand.<sup>93</sup>

Second, many decisions applying the administrative law standards of deference to agency expertise do not involve adaptive management, but are relevant to understanding how courts regard it. For instance, the rigor with which an agency should explore the effects of similarly situated actions before committing to a new one is central to many natural resource cases.<sup>94</sup> The active learning component of adaptive management makes these cases relevant even if they did not review plans that purported to apply adaptive management. Therefore, we bring to bear on the question of how courts apply law to adaptive management cases beyond the relatively small sample of decisions that have already evaluated specific challenges to adaptive management.<sup>95</sup>

Third, regardless of the particular outcome of judicial review, courts generally wish to support the trend toward adaptive management.<sup>96</sup> They seem to understand that arguments

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92. See, e.g., *Env'tl. Prot. Info. Ctr. v. U.S. Fish & Wildlife Serv.*, No. C 04-04647 CRB, 2005 WL 3021939, at \*7 (N.D. Cal. Nov. 10, 2005) (demonstrating that the court did not pass judgment on the wisdom of an adaptive management approach, but still found that the approach satisfied NEPA planning requirements).

93. See, e.g., *Klamath-Siskiyou Wildlands Ctr. v. Bureau of Land Mgmt.*, 387 F.3d 989, 997 (9th Cir. 2004) (holding that a general discussion of an environmental problem across a large area did not satisfy NEPA).

94. See *Lands Council v. McNair*, 537 F.3d 981, 991–92 (9th Cir. 2008) (refusing to analyze whether the agency incorporated adaptive learning from prior logging projects before beginning another, similar project); see also *infra* note 243 and accompanying text (discussing the implications of the *Lands Council v. McNair* case in greater depth).

95. E.g., *S. Fork Band Council v. U.S. Dep't of the Interior*, 588 F.3d 718 (9th Cir. 2009) (per curiam) (providing an example of how courts deal with resource management plans that are relatively vague and general in scope); see also *infra* note 227 and accompanying text (discussing the problems of open-ended contingency planning).

96. See, e.g., *Cal. Res. Agency v. U.S. Dep't of Agric.*, No. C 08-1185 MHP, 2009 WL 6006102, at \*16 (N.D. Cal. Sept. 29, 2009) (accepting a limitation on the range of alternatives considered in a national forest plan's EIS to exclude strategies other than adaptive management).

in the conservation management literature all regard adaptive management as the best-suited decisionmaking technique for ecosystems.<sup>97</sup> Indeed, at least one court has come close to *requiring* adaptive management in holding that ESA HCPs must contain some provision to respond to unforeseen circumstances.<sup>98</sup> Courts sometimes explicitly state that they do not wish to create disincentives for using adaptive management.<sup>99</sup> Even where adaptive management plans have run afoul of judicial review, courts are careful to state that only the particular application in the case at hand is illegal, not adaptive management itself.<sup>100</sup> It is fair to conclude from this litigation that courts, despite their roots in the conventional administrative law model of a phase change at the time of final agency action, generally give agencies wide berth within statutory constraints to alter traditional planning approaches to accommodate adaptive management.

#### A. BIGGER IS BETTER

Spatial and temporal scale is a critical component of adaptive management.<sup>101</sup> Applying adaptive management through larger area, longer time frame plans has tended to produce better outcomes for agencies in the courts.<sup>102</sup> Though this may be due to the larger budgets associated with developing (and to a lesser extent, implementing) the plans, the primary advantage

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97. *See id.*

98. *Sw. Ctr. for Biological Diversity v. Bartel*, 470 F. Supp. 2d 1118, 1144 (S.D. Cal. 2006); *see also* discussion *infra* note 215.

99. *See, e.g.,* *Envtl. Prot. Info. Ctr. v. U.S. Fish & Wildlife Serv.*, No. C 04-04647 CRB, 2005 WL 3021939, at \*7 (N.D. Cal. Nov. 10, 2005) (holding that the agency's implementation of an adaptive management plan does not constitute a "major federal action" under NEPA, therefore sparing it from the requirement of preparing a supplemental EIS and making the plan easier to put into place).

100. For example, *see Northwest Resources Information Center, Inc. v. Northwest Power Planning Council*, 35 F.3d 1371, 1380 n.18 (9th Cir. 1994), where the court described adaptive management as "scientifically sound," but rejected particular aspects of the government's implementation of the plan.

101. *See* Robert L. Fischman & Jaelith Hall-Rivera, *A Lesson for Conservation from Pollution Control Law: Cooperative Federalism for Recovery Under the Endangered Species Act*, 27 COLUM. J. ENVTL. L. 45, 146-48 (2002) (summarizing the benefits of large-area plans).

102. *See, e.g.,* *Seattle Audubon Soc'y v. Lyons*, 871 F. Supp. 1291, 1311 (W.D. Wash. 1994) (suggesting that compliance with environmental protection statutes requires planning on a scale that considers the entire ecosystem), *aff'd sub nom.* *Seattle Audubon Soc'y v. Moseley*, 80 F.3d 1401, 1404-06 (9th Cir. 1996) (per curiam).

enjoyed by large-scale plans is slack.<sup>103</sup> The larger the plan, the more room there is for trade-offs between competing interests, zones with different dominant uses (including control areas for experiments), and flexibility for revising management guidelines to reflect lessons learned.<sup>104</sup> Larger plans tend to employ a version of adaptive management that comes closer to the model in the scholarly literature than do smaller-scale plans.<sup>105</sup> The literature addressing how conservation can adapt to climate change also highlights the greater utility of larger spatial and temporal scale planning.<sup>106</sup>

The litigation over adaptive management discussed in the remainder of Part II.B also reflects the advantages of the larger-scale plans. Four major adaptive management efforts constitute about half of the federal litigation grappling with the concept. With a few notable exceptions, discussed below, federal agencies in these four areas have experienced success in persuading courts to defer to their management choices and adaptive plans. Two of the efforts deal with forest management: the Northwest Forest Plan, covering 24.4 million acres in Washington and Oregon, and the Sierra Forest Framework, covering 11.5 million acres in California. The other two deal with water infrastructure: management of the Sacramento-San Joaquin River Delta (and its related infrastructure supplying water to the Central Valley) and operation of the Missouri River works controlled by the Army Corps.

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103. See Fischman & Hall-Rivera, *supra* note 101, at 147 (noting that larger-scale plans are “more flexible because [they disperse] the burden of preservation or restriction of development over a broad area to allow for more trade-offs”).

104. This mirrors the experience of habitat conservation planning under the ESA. See *id.* at 147–48 (“Just as flexibility to trade off between habitat conservation and degradation shrinks with the geographic size of the plan, it also diminishes over time as a species becomes more imperiled.”). *But see* Gregory et al., *supra* note 72, at 2423 (highlighting the problems of large-scale, long-term experimental design, and noting the failures in applying adaptive management to the Columbia River Basin and the Everglades).

105. See Fischman & Hall-Rivera, *supra* note 101, at 147 (suggesting that larger plans more closely follow adaptive management techniques because they are more comprehensive, and less piecemeal, than smaller plans).

106. See, e.g., Brad Griffith et al., *Climate Change Adaptation for the US National Wildlife Refuge System*, 44 ENVTL. MGMT. 1043, 1043 (2009) (noting that “[g]eographic isolation and small unit size compound the challenges of climate change,” which means that “strategic response requires system-wide planning”).

The Northwest Forest Plan (NWFP) is one of the earliest large-scale adaptive management efforts,<sup>107</sup> and one of the most successful in attracting support from the courts for the adaptive management concept. Its age and scope make it the champion survivor of dozens of rounds of litigation. The NWFP resulted from a compromise brokered by President Clinton, who played an unprecedented (and, to date, unemulated) personal role in shaping the contours of the compromise it represented between timber and environmental interests.<sup>108</sup> The immense plan is strikingly complex, but in general outline it consisted of four elements: land allocation, aquatic conservation strategy, survey and monitoring requirements, and adaptive management.<sup>109</sup>

The goal of the NWFP, originally completed in 1994, is to allow for substantial timber harvesting while maintaining the forest characteristics that support viable populations of northern spotted owls, salmon runs that breed in forest streams, and hundreds of other species sensitive to logging operations.<sup>110</sup> Adaptive management plays a leading role in two aspects of the plan: administration of lands specially designated for adaptive management experimentation, and as a general principle for implementation and revision of the overall set of management

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107. The Northwest Power Planning Council was an agency that sought to use adaptive management in a large-scale plan early on with the 1982 Columbia Basin Fish and Wildlife Program. See *Nw. Res. Info. Ctr., Inc. v. Nw. Power Planning Council*, 35 F.3d 1371, 1380–83 (9th Cir. 1994) (discussing the implementation of the 1982 plan and subsequent adaptations).

108. See U.S. DEP'T. OF AGRIC. ET AL., RECORD OF DECISION FOR AMENDMENTS TO FOREST SERVICE AND BUREAU OF LAND MANAGEMENT PLANNING DOCUMENTS WITHIN THE RANGE OF THE NORTHERN SPOTTED OWL 1 (1994) [hereinafter ROD NORTHERN SPOTTED OWL], available at <http://www.reo.gov/library/reports/newroda.pdf> (identifying the conference held by President Clinton as a catalyst for the NWFP); STEVEN L. YAFFEE, THE WISDOM OF THE SPOTTED OWL 141–43 (1994) (describing the conference and its surrounding circumstances).

109. Both a Record of Decision and an EIS were based on FOREST ECOSYSTEM MGMT. ASSESSMENT TEAM, FOREST ECOSYSTEM MANAGEMENT: AN ECOLOGICAL, ECONOMIC, AND SOCIAL ASSESSMENT, at II-3 to II-4 (1983) [hereinafter FEMAT REPORT] (discussing the general approach of the plan). See generally U.S. DEP'T OF AGRIC. ET AL., FINAL SUPPLEMENTAL ENVIRONMENTAL IMPACT STATEMENT ON MANAGEMENT OF HABITAT FOR LATE-SUCCESSIONAL AND OLD-GROWTH FOREST RELATED SPECIES WITHIN THE RANGE OF THE NORTHERN SPOTTED OWL (1994) (demonstrating that two documents based on the FEMAT report were similarly complex and focused).

110. See FEMAT REPORT, *supra* note 109, at II-1 to II-2 (outlining numerous goals of the FEMAT Report).

prescriptions for the NWFP.<sup>111</sup> As we later discuss, it is this second aspect of adaptive management in the NWFP that has generated litigation.

The land-allocation zones fall into three categories.<sup>112</sup> Some seventy-eight percent of the lands covered by the NWFP are designated late-successional reserves, where maintaining and encouraging the development of old-growth forests is the primary aim.<sup>113</sup> Some logging consistent with this aim, such as thinning to promote or enhance old-growth attributes, occurs in this category.<sup>114</sup> Most of the timber output, however, comes from the second category, the matrix lands between the reserves. The third category designates ten zones ranging from 84,000 to 400,000 acres to serve as “adaptive management areas,” where experiments with adaptive management would be the primary purpose.<sup>115</sup> Though the track record of the adaptive management areas does offer some general lessons for improving adaptive management generally, the unique mandate limits their application.<sup>116</sup> The true test of NWFP adaptive management is its success in guiding the vast majority of lands designated matrix or reserve, where balancing timber production against environmental values generated—and continues to generate—enormous controversy.<sup>117</sup> It is the lands not specifi-

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111. See *id.* at II-4 (discussing the development of long-term management alternatives); *id.* at II-11 to II-12 (identifying adaptive management areas as places used to test and develop management approaches).

112. The Record of Decision actually identifies seven different types of land allocations, but those allocations fit into categories of reserves, land allowing for timber output, and land for adaptive management. See ROD NORTHERN SPOTTED OWL, *supra* note 108, at 6–7.

113. See *id.* at 29.

114. See *id.* at 62–63 (discussing the importance of thinning).

115. FEMAT REPORT, *supra* note 109, at III-24, III-30 to III-33 (identifying the regions to be used as adaptive management areas).

116. For discussions on the track record of adaptive management areas, see generally, GEORGE H. STANKEY & BRUCE SHINDLER, ADAPTIVE MANAGEMENT AREAS: ACHIEVING THE PROMISE, AVOIDING THE PERIL (1997), available at [ftp://ftp.blm.gov/pub/blmlibrary/BLMpublications/AdaptiveManagement/AdaptiveMgmtTechGuide/CDReferences/Stankey\\_1997\\_Adaptive%20Management%20Areas%20-%20Achieving%20the%20Promi.pdf](ftp://ftp.blm.gov/pub/blmlibrary/BLMpublications/AdaptiveManagement/AdaptiveMgmtTechGuide/CDReferences/Stankey_1997_Adaptive%20Management%20Areas%20-%20Achieving%20the%20Promi.pdf); Andrew N. Gray, *Adaptive Ecosystem Management in the Pacific Northwest: A Case Study from Coastal Oregon*, CONSERVATION ECOLOGY (Nov. 23, 2000), <http://www.ecologyandsociety.org/vol4/iss2/art6/>; Forest Fleischman, *Bureaucracy, Collaboration and Co-production: A Case Study of the Implementation of Adaptive Management in the U.S.D.A. Forest Service* (Apr. 15, 2008) (unpublished manuscript), available at [http://www.indiana.edu/~workshop/publications/materials/conference\\_papers/fleischman.pdf](http://www.indiana.edu/~workshop/publications/materials/conference_papers/fleischman.pdf).

117. The leading analysis of how well the NWFP modeled actual adaptive

cally set aside for adaptive management experiments where the NWFP experience most closely resembles routine federal conservation policy challenges.

The overarching NWFP mandate for adaptive management through monitoring and evaluation involved multiple levels of planning to restrict disturbance to riparian areas in an “aquatic conservation strategy” (ACS) and “survey and manage” (S&M) requirements for over 400 species, with some triggering population surveys before ground-disturbing activity, such as logging. Courts rejected challenges to the original NWFP, including its adaptive elements.<sup>118</sup> Subsequently, the ACS and S&M provisions of the NWFP were common bases for judicial remands overturning timber sales.<sup>119</sup> Appropriations and political will never fully supported implementation of these components of adaptive management, but the framework for forest management remains a workable process for some projects.<sup>120</sup> Still, the adaptive management requirements and the degraded conditions of the forests in the NWFP resulted in far less logging than promised.<sup>121</sup>

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management is B.T. Bormann et al., *Adaptive Management of Forest Ecosystems: Did Some Rubber Hit the Road?*, 57 *BIOSCIENCE* 186, 186 (2007), who explore “the concepts of adaptive management as they were developed [through FEMAT] and applied on federal lands through the Northwest Forest Plan.”

118. *E.g.*, *Seattle Audubon Soc’y v. Lyons*, 871 F. Supp. 1291, 1310–17 (W.D. Wash. 1994), *aff’d sub nom.* *Seattle Audubon Soc’y v. Moseley*, 80 F.3d 1401, 1404–06 (9th Cir. 1996) (per curiam).

119. *See, e.g.*, *Pac. Coast Fed’n of Fishermen’s Ass’ns v. Nat’l Marine Fisheries Serv.*, 265 F.3d 1028, 1037–38 (9th Cir. 2001) (emphasizing the ACS’s short-term protections that work to ensure the habitat will support the migration cycles of salmon, while also finding that the long-term recovery of the aquatic habitat may not be sufficient to comply with the NWFP); *Or. Natural Res. Council Action v. U.S. Forest Serv.*, 59 F. Supp. 2d 1085, 1093–94 (W.D. Wash. 1999) (emphasizing the importance of S&M to the NWFP process because finding new populations of sensitive species before logging allows for the placement of protections).

120. *See* K. Norman Johnson et al., *Forest Ecosystem Management Assessment Team Assessments*, in *BIOREGIONAL ASSESSMENT: SCIENCE AT THE CROSSROADS OF MANAGEMENT AND POLICY* 85, 107–11 (K. Norman Johnson et al. eds., 1999) (discussing measurements for success and support of adaptive management in the NWFP). Nonetheless, new circumstances, including the incursion of aggressive barred owls and climate change, have prompted the Obama Administration to begin a revision of the recovery plan for the Northern Spotted Owl in the NWFP. *See* April Reese, *New Threats Could Undermine Obama Administration’s Plan for Northern Spotted Owl*, *LAND LETTER* (Apr. 9, 2009), <http://www.eenews.net/Landletter/print/2009/04/09/2>.

121. *See* Johnson et al., *supra* note 120, at 107–09 (discussing the failure to meet goals for forest outputs).

In response to the underperformance of the NWFP in producing cut timber, the George W. Bush Administration adopted amendments in 2004 that unsuccessfully attempted to relax two key elements of adaptive management: the ACS and the S&M rules.<sup>122</sup> The issues with both actions are similar, but the court more thoroughly explored the issues in the context of S&M. A district court overturned the 2004 amendments to the NWFP that removed the S&M requirement for insufficient environmental analysis in the EIS.<sup>123</sup> The original 1994 EIS for the NWFP justified the S&M standard as needed to gain information to ensure viability for a host of species, a core adaptive function.<sup>124</sup> The court agreed with the government that it could change its opinion about the best way to balance goals in the NWFP, but it found that a change eliminating a fundamental standard of adaptive management requires thorough analysis and disclosure of the environmental consequences.<sup>125</sup> In other words, the adaptive framework of the NWFP depends on certain fundamental monitoring tools, such as S&M, that cannot be reversed without revisiting the original charter and analysis (in this case, the NWFP and its EIS). A similar effort by the Bureau of Land Management to eliminate pre-logging surveys for the red tree vole (prey for spotted owls) met the same fate for failure to revise the underlying, large-scale adaptive management plans.<sup>126</sup>

The Sierra Forest Framework is smaller, younger, and subject to fewer lawsuits. Still, it offers a useful contrast with the NWFP in the use of adaptive management to modify a multi-forest management charter. In 2004 the Bush Administration significantly amended California's Sierra Forest Framework, which governs administration of eleven national forests in the Sierra Nevada Range.<sup>127</sup> The changes shifted the "management emphasis from biodiversity conservation and prescribed fire to

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122. *Pac. Coast Fed'n of Fishermen's Ass'ns v. Nat'l Marine Fisheries Serv.*, 482 F. Supp. 2d 1248, 1251–53 (W.D. Wash. 2007) (overturning the Bush administration's ACS amendments); *Nw. Ecosystem Alliance v. Rey*, 380 F. Supp. 2d 1175, 1197–98 (W.D. Wash. 2005) (overturning the Bush Administration's S&M amendments).

123. *Nw. Ecosystem Alliance*, 380 F. Supp. 2d at 1192–93.

124. *Id.* at 1192.

125. *Id.* at 1193.

126. *Klamath Siskiyou Wildlands Ctr. v. Boody*, 468 F.3d 549, 560–61 (9th Cir. 2006).

127. *Sierra Forest Legacy v. Rey*, 577 F.3d 1013, 1018 (9th Cir. 2009).

aggressive mechanical thinning” and timber production.<sup>128</sup> One particularly contentious aspect of the 2004 framework expanded the number of trees that could be logged from those twelve to twenty inches in diameter to those up to thirty inches in diameter.<sup>129</sup> Although the Ninth Circuit found the 2004 framework flawed because its environmental impact analysis failed to consider a reasonable range of alternatives,<sup>130</sup> a district court evaluating a challenge to the adaptive management provisions endorsed the approach.<sup>131</sup> The adaptive management amendments were able to take advantage of the large scale of the Framework to employ different “modules” in different areas to comprise an “integrated research project.”<sup>132</sup> This, along with the use of modeling projections, is a principal reason why the 2004 Framework survived the allegation that the Forest Service deferred taking the required “hard look” at wildlife impacts of more logging.<sup>133</sup> Along with the NWFP, the 2004 Framework is one of the only adaptive management plans considered by courts that explicitly employed different management regimes in different areas to create experiments testing hypotheses about effects on forest fires and old-growth dependent species. In upholding the adaptive management approach, the district court fairly characterized the 2004 Framework as providing “more flexibility to strategically locate treatments across the landscape.”<sup>134</sup> The large area covered by the Framework made these elements of the plan easier to employ.

On the other hand, monitoring and mitigation modules do not necessarily lead to learning that can or will be applied to reshape projects. Indeed, the State of California complained that the Forest Service had increased the logging intensity in 2004 without having applied data from the earlier, more conservative adaptive management approach in the 2001 framework.<sup>135</sup> A federal district court recently upheld individual for-

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128. Robert B. Keiter, *Breaking Faith with Nature: The Bush Administration and Public Land Policy*, 27 J. LAND RESOURCES & ENVTL. L. 195, 231 (2007).

129. *Sierra Forest Legacy*, 577 F.3d at 1018, 1020.

130. *Id.* at 1021–22.

131. *California ex rel. Lockyer v. U.S. Dep’t of Agric.*, No. 2:05-cv-0211-MCE-GGH, 2008 WL 3863479, at \*16–17 (E.D. Cal. Sept. 3, 2008).

132. *Id.* at \*19.

133. *Id.* at \*4, \*17–21.

134. *Id.* at \*8.

135. State of California’s Memorandum of Points and Authorities in Support of Motion for Summary Judgment at 2, *California ex rel. Lockyer*, 2008 WL 3863479 (No. 2:05-cv-0211-MCE-GGH).

est plan amendments in the Sierra region against a challenge that reduced monitoring of sensitive species created a foreseeable risk of degradation through the activities, such as logging, authorized by the plans.<sup>136</sup> The court wrote that “it presumes too much to argue that [the previous, more detailed monitoring] obligations would have turned up information that would have inclined the Forest Service to significantly alter or modify a particular project.”<sup>137</sup> Though one can view the court’s decision as skepticism about the value of the additional monitoring, it also speaks to the absence of enforceable commitments in most a/m-lite to revise projects in light of monitoring.<sup>138</sup>

It is also worth noting that big plans often enjoy special appropriations associated with congressional support of adaptive experiments.<sup>139</sup> In the case of the Sierra forests, the Herger-Feinstein Quincy Library Group Forest Recovery Act authorized specific funding for pilot projects.<sup>140</sup> Combined with the national priority to address fire risk and forest health, the high-profile Framework was able to secure funds for monitoring and response of management experiments.<sup>141</sup> This funding is a rare, but reassuring, element of adaptive management practice that ameliorated the loss of certainty in management criteria occasioned by the 2004 amendments.

The most cited litigation endorsing the notion that adaptive management is compatible with NEPA and administrative

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136. *Sierra Forest Legacy v. U.S. Forest Serv.*, 652 F. Supp. 2d 1065, 1088–91 (N.D. Cal. 2009).

137. *Id.* at 1090.

138. See, e.g., Alejandro E. Camacho, *Adapting Governance to Climate Change: Managing Uncertainty Through a Learning Infrastructure*, 59 EMORY L.J. 1, 47–48 (2009) (describing the problems with adaptive management implementation for portions of the Colorado River that flows downstream of the Glen Canyon Dam).

139. See, e.g., Act of Feb. 12, 1994, Pub. L. No. 103-211, ch. 3, 108 Stat. 3, 16 (1994) (earmarking funding for the NWFP). The Northwest Forest Plan program reported that it spent \$50 million for monitoring. VALERIE RAPP, NORTHWEST FOREST PLAN—THE FIRST 10 YEARS (1994–2003), at 11 (2008).

140. Herger-Feinstein Quincy Library Group Forest Recovery Act, Pub. L. No. 105-277, § 401, 112 Stat. 2681, 2681-307 to -308 (codified as amended at 16 U.S.C. § 2104 (1998)). Funding for the pilot projects totaled \$25.3 million in 2008, more than three times the amount appropriated in 1999. U.S. DEP’T OF AGRIC. ET AL., STATUS REPORT TO CONGRESS FISCAL YEAR 2008: HERGER-FEINSTEIN QUINCY LIBRARY GROUP FOREST RECOVERY ACT PILOT PROJECT 4 (2009), available at [http://www.fs.fed.us/r5/hfqlg/monitoring/report\\_to\\_congress/2008/fy08\\_report\\_to\\_congress\\_letter.pdf](http://www.fs.fed.us/r5/hfqlg/monitoring/report_to_congress/2008/fy08_report_to_congress_letter.pdf).

141. *California ex rel. Lockyer v. U.S. Dep’t of Agric.*, No. 2:05-cv-0211-MCE-GGH, 2008 WL 3863479, at \*19 (E.D. Cal. Sept. 3, 2008).

law concerns the Army Corps' management of the Missouri River, which it controls through dams. After the D.C. District Court enjoined a river-operating plan for failing to comply with the ESA,<sup>142</sup> a series of cases beginning in 2004 have upheld the Army Corps' approach of employing adaptive management to balance the needs of wildlife dependent on the natural seasonal variation in flows (especially for the imperiled pallid sturgeon, least tern, and piping plover) with the interests of flood control and navigation.<sup>143</sup> Though the courts did not grapple with the adaptive management approach as deeply in this litigation as in the other examples we discuss, its use on this scale by the Army Corps is a significant step in the spread of comprehensive adaptive management plans beyond the traditional public land and wildlife agencies.

Probably the most complex of all the large-scale plans addresses the vast infrastructure diverting huge volumes of water coming down the Sacramento River, around the delta it shares with the San Joaquin River, and directing it to users further south.<sup>144</sup> The dams and diversions are operated jointly by state and federal agencies, and the environmental issues include wildlife, irrigation, flood risk, and potability of municipal water supplies for tens of millions of people.<sup>145</sup> The litigation challenging the adaptive management regimes pertaining to different species in the water system composes a mixed record.<sup>146</sup> As with the other examples discussed in this section, the large area covered by the watersheds and the large volumes of water certainly permit a wider array of trade-offs than can occur with

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142. *Am. Rivers v. U.S. Army Corps of Eng'rs*, 271 F. Supp. 2d 230, 253–58 (D.D.C. 2003) (finding mere mitigation measures inadequate to meet the ESA, but launching a new biological opinion that triggered subsequent litigation in the Eighth Circuit).

143. *In re Operation of the Mo. River Sys. Litig.*, 516 F.3d 688, 690–94 (8th Cir. 2008) (finding that an EIS was not necessary because adaptive management flexibility was provided for in an earlier Record of Decision); *In re Operation of the Mo. River Sys. Litig.*, 421 F.3d 618, 635–36 (8th Cir. 2005) (allowing for flow adjustment based on subsequent information and providing for a focus on adaptive management).

144. *See Cent. Delta Water Agency v. U.S. Fish & Wildlife Serv.*, 653 F. Supp. 2d 1066, 1073 (E.D. Cal. 2009).

145. *See id.* at 1073–74.

146. *Compare Pac. Coast Fed'n of Fishermen's Ass'ns v. Gutierrez*, 606 F. Supp. 2d 1122, 1193–94 (E.D. Cal. 2008) (upholding adaptive management plan), *with Natural Res. Def. Council v. Kempthorne*, 506 F. Supp. 2d 322, 387–88 (E.D. Cal. 2007) (finding that the adaptive management plan failed to take into account sufficient information).

smaller projects.<sup>147</sup> But, in these Delta cases, the enormous complexity of the statutes, contracts, and governing bodies (both state and federal) likely undermined what would otherwise be a strong candidate for successful adaptive management. We will discuss how a single court approved one Delta adaptive management plan but remanded another in Part II.C, below, when we discuss the relationship between substantive legal standards and the adaptive process.

#### B. NEPA: EFFECTIVE USE OF TIERING AND REDUCED NEED FOR SUPPLEMENTS

The environmental impact analysis required by NEPA is perhaps the grandest expression of the comprehensive rationality worldview rejected by adaptive management.<sup>148</sup> So, it is somewhat surprising to find in NEPA practice a tool well suited to adaptive management: a/m-lite roots well in the soil of NEPA tiering. Tiering, a practice dating to the 1970s, permits agencies to proceed with broad programs without examining site-specific effects.<sup>149</sup> In situations such as the adoption of a forest plan, or a regional methane leasing program, the agency may defer the details of impact analysis until such time as it proposes a timber sale<sup>150</sup> or receives applications for permits to drill.<sup>151</sup> The first NEPA tier concentrates on cumulative impacts of anticipated successive activities without evaluating the peculiar situations that may arise from any particular activity.<sup>152</sup> Tiering relieves an agency from evaluating uncertain contingencies with tenuous connections to the overall impacts.<sup>153</sup>

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147. See *Natural Res. Def. Council*, 506 F. Supp. 2d at 327–47 (discussing the trade-offs that occur when assessing an adaptive management plan for the Central Valley Project).

148. See generally Bryan D. Jones, *Bounded Rationality*, 2 ANN. REV. POL. SCI. 297, 299 (1999) (describing comprehensive rationality).

149. See 40 C.F.R. §§ 1502.20, 1508.28 (2009); Forty Most Asked Questions Concerning CEQ's National Environmental Policy Act Regulations, 46 Fed. Reg. 18,026, 18,033 (Mar. 23, 1981) (describing in question 24(c) the function of tiering).

150. See, e.g., *Klamath-Siskiyou Wildlands Ctr. v. Bureau of Land Mgmt.*, 387 F.3d 989, 992–93 (9th Cir. 2004).

151. See, e.g., *Wilderness Soc'y v. Salazar*, 603 F. Supp. 2d 52, 63–66 (D.D.C. 2009).

152. See Forty Most Asked Questions Concerning CEQ's National Environmental Policy Act Regulations, 46 Fed. Reg. at 18,033.

153. See 40 C.F.R. § 1508.28 (“Tiering . . . helps the lead agency to focus on the issues which are ripe for decision and exclude from consideration issues already decided or not yet ripe.”).

The subsequent levels of NEPA compliance occur as particular, site-specific projects requiring approval.<sup>154</sup> At that point, the general discussions of the first tier may be incorporated by reference, and the EIS or EA will focus on just those issues specific to the particular activity.<sup>155</sup> In fact, a subsequent EIS will often be unnecessary if a particular project creates only effects already anticipated in the first tier EIS.<sup>156</sup> For site-specific projects, agencies commonly prepare environmental assessments concluding in findings of no significant impacts (FON-SIs) that go beyond those adumbrated by the original program's EIS.<sup>157</sup>

Large-scale adaptive management generally involves a massive EIS intended to serve as an overarching analysis to which subsequent projects and adjustments may be tiered.<sup>158</sup> This is how the adaptive charter works to guide subsequent projects for the NWFP,<sup>159</sup> and the national forests in the Sierra Nevada Range.<sup>160</sup> Indeed, the adaptive elements of the EISs may even reduce the need for a subsequent supplemental EIS. In *Oregon Natural Resources Council Action v. United States Forest Service*,<sup>161</sup> a court remanded a timber sale because it did not include the S&M required by the NWFP.<sup>162</sup> The NWFP created binding law that the court ordered the agency to follow or amend.<sup>163</sup> However, the court rejected a NEPA claim that the United States needed to prepare a supplemental EIS to consider a variety of new information about forests, wildlife and, water quality that had emerged since the adoption of the NWFP.<sup>164</sup> The court rebuffed the claim by relying, in part, on

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154. *See id.* § 1502.20.

155. *See id.* § 1508.28.

156. *See id.*

157. *See* Bradley C. Karkkainen, *Toward a Smarter NEPA: Monitoring and Managing Government's Environmental Performance*, 102 COLUM. L. REV. 903, 909–10 (2002) (explaining that a vast majority of environmental assessments result in a FONSI).

158. *See* Forty Most Asked Questions Concerning CEQ's National Environmental Policy Act Regulations, 46 Fed. Reg. 18,026, 18,033 (Mar. 23, 1981).

159. *See, e.g.,* Seattle Audubon Soc'y v. Moseley, 80 F.3d 1401, 1403–04 (9th Cir. 1996) (per curiam) (noting the overarching EIS process).

160. *See, e.g.,* California *ex rel.* Lockyer v. U.S. Dep't of Agric., No. 2:05-cv-0211-MCE-GGH, 2008 WL 3863479, at \*1–3 (E.D. Cal. Sept. 3, 2008).

161. 59 F. Supp. 2d 1085 (W.D. Wash. 1999).

162. *See id.* at 1091–94.

163. *Id.* at 1093.

164. *Id.* at 1096.

the adaptive management strategy in the NWFP.<sup>165</sup> The court determined that adaptive management anticipated that new information would emerge and provided mechanisms for adjustment.<sup>166</sup> This is an example of how the flexibility of adaptive management can ease the burden for an agency needing to comply with NEPA over the course of a very long-term project, such as restoring late-successional forests. A different judge in the same court later reached the same result in a challenge to a different timber sale after subsequent developments raised doubts about the NWFP's assumptions concerning logging on private land.<sup>167</sup> Again, the court relied on the adaptive management component of the NWFP to establish an assumption that no supplemental study would be needed absent a showing that the information could not be addressed by the adaptive process.<sup>168</sup>

On the other hand, a subsequent decision justified as adaptive modification may go too far in changing the terms of the original framework in the first tier. In that case, courts require a supplemental EIS. In *Klamath Siskiyou Wildlands Center v. Boody*,<sup>169</sup> the Ninth Circuit enjoined timber sales in part because a change in the survey requirements for the red tree vole went too far beyond what the tier one NWFP EIS anticipated, even with adaptive management.<sup>170</sup> The federal government had argued that the decision to change the vole's S&M designation was within the adaptive latitude created by the NWFP.<sup>171</sup> The court examined the NWFP EIS and disagreed.<sup>172</sup> The lesson from *Klamath Siskiyou* is that an agency cannot tier when revising a fundamental standard of an overarching adaptive management plan.<sup>173</sup>

Another risk posed by the attraction of tiering is that an agency will defer making controversial decisions on the basis that it can work out the details of a fairly vague commitment to

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165. *Id.*

166. *Id.*

167. *See Hanson v. U.S. Forest Serv.*, 138 F. Supp. 2d 1295, 1301–04 (W.D. Wash. 2001).

168. *Id.* at 1304.

169. 468 F.3d 549 (9th Cir. 2006).

170. *Id.* at 561.

171. *Id.* at 560.

172. *Id.*

173. *See id.*

goals in subsequent tiers.<sup>174</sup> Unfortunately, the agency may be setting itself up for failure if it is unable to secure the resources to adequately tackle the difficult analysis in subsequent tiers. Also, vague commitments that do not include site-specific criteria may simply allow political momentum to overwhelm the plan's objective. In the EIS supporting the elk and bison management plan for the National Elk Refuge and nearby lands, the agency defined the (ultimately selected) "adaptive management" alternative as a plan implemented through a "structured framework . . . of adaptive management criteria and actions for transitioning from intensive supplemental winter feeding."<sup>175</sup> However, the plan neither describes the "structured framework" nor defines the "criteria." Given the strong local political support for maintaining supplemental winter feeding, opponents are understandably skeptical that such a vague commitment will result in a transition to more natural winter ranging behavior and lower elk populations.<sup>176</sup> The goal of the "adaptive management" alternative is to reduce the winter elk population of the region by nearly twenty percent,<sup>177</sup> but the path to achieve it is not evident in the plan. Deferring a firm decision to take a critical action, such as terminating winter feeding until a subsequent incremental adaptive process, may be a recipe for failure.<sup>178</sup> Yet adaptive management and tiering can make it easier for agencies to yield to the temptation to

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174. Cf. 40 C.F.R. § 1502.20 (2009) (discussing the "broader statement" created in the first tier).

175. BISON AND ELK PLAN, *supra* note 83, at 65.

176. See Robert L. Fischman & Angela M. King, *Savings Clauses and Trends in Natural Resources Federalism*, 32 WM. & MARY ENVTL. L. & POLY REV. 129, 137–41 (2007). Defenders of Wildlife and other environmental groups have challenged the plan for these and other reasons. Complaint for Declaratory and Injunctive Relief ¶¶ 37–43, *Defenders of Wildlife v. Kempthorne*, 698 F. Supp. 2d 141 (D.D.C. 2010) (No. 08-CV-00945).

177. See BISON AND ELK PLAN, *supra* note 83, at 3, 19 (proposing a reduction in elk numbers from 13,000 to 11,000).

178. See Mary O'Brien, *Uneasy Riders: A Citizen, a Cow, and NEPA*, 39 ENVTL. L. REP. 10,632, at 10,633 (2009) (describing environmental impact analysis for Forest Service allotment management plans that respond to degraded conditions with "vague commitments to future adaptive management" without "clear triggers for applying the unspecified adaptive management measures"). Another example of deferring difficult decisions through adaptive management is the decision to adopt grazing allotments in the Sawtooth National Forest. See *W. Watersheds Project v. U.S. Forest Serv.*, No. CV 05 189 E BLW, 2006 WL 292010, at \*2 (D. Idaho Feb. 7, 2006) (stating that the adaptive management strategy "did not define the protocols it would use or describe the monitoring that is the heart of the strategy").

dodge difficult, controversial decisions.<sup>179</sup> It is not surprising, then, that courts frequently reject adaptive management plans as too amorphous.<sup>180</sup> Professor Glicksman has characterized some of this litigation as standing for the principle that agencies may not rely “on adaptive management as an excuse for deferring real planning in favor of” an approach that promises to deal with expected future problems as they arise.<sup>181</sup>

Even if not amorphous, a promise to adaptively manage problems may not fulfill the NEPA requirement that agencies take a “hard look” at the impacts of their action. For instance, *High Sierra Hikers Association v. Weingardt*<sup>182</sup> overturned a Forest Service decision to liberalize the rules limiting campfires in high country parts of a wilderness area.<sup>183</sup> Despite a record raising a number of problems with the decision, including disparate treatment of commercial-pack trips compared to private backpacking, physical impacts from fires and their residues, and potential introduction of exotic seeds and pathogens through packed wood, the Forest Service went forward with the looser rules on the basis that it could monitor and adjust in response to problems.<sup>184</sup> The court ruled that the agency could not rely on adaptive management to overcome an inadequate response to the problems raised in the record.<sup>185</sup>

On the other hand, *Theodore Roosevelt Conservation Partnership v. Salazar (TRCP)*<sup>186</sup> rebuffed a claim that an adaptive management approach to handling site-specific and uncertain impacts violated the NEPA’s requirement to evaluate environ-

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179. See Beth C. Bryant, *NEPA Compliance in Fisheries Management: The Programmatic Supplemental Environmental Impact Statement on Alaskan Groundfish Fisheries and Implication for NEPA Reform*, 30 HARV. ENVTL. L. REV. 441, 450 (2006).

180. See, e.g., *Greater Yellowstone Coal. v. Kempthorne*, 577 F. Supp. 2d 183, 209–10 (D.D.C. 2008); *Natural Res. Def. Council v. Kempthorne*, 506 F. Supp. 2d 322, 387 (E.D. Cal. 2007); *Mountaineers v. U.S. Forest Serv.*, 445 F. Supp. 2d 1235, 1250 (W.D. Wash. 2006); *Natural Res. Def. Council v. U.S. Army Corps of Eng’rs*, 457 F. Supp. 2d 198, 234–35 (S.D.N.Y. 2006). But see *Defenders of Wildlife v. Salazar*, 698 F. Supp. 2d 141, 149–50 (D.D.C. 2010) (upholding the National Elk Refuge’s elk management plan despite its amorphous adaptive management approach to reducing winter elk populations), *appeal docketed*, No. 08-cv-00945 (D.C. Cir. Mar. 26, 2010).

181. Glicksman, *supra* note 4, at 871.

182. 521 F. Supp. 2d 1065 (N.D. Cal. 2007).

183. *Id.* at 1090–91.

184. *Id.*

185. *Id.* at 1091.

186. No. 09-5162, 2010 WL 2869778 (D.C. Cir. July 23, 2010).

mental effects *before* an agency undertakes an action.<sup>187</sup> In contrast to *High Sierra Hikers Association*, which involved site-specific environmental analyses for each special use permittee and lifted an outright ban on campfires above specified elevations,<sup>188</sup> *TRCP* reviewed a broad plan (covering more than 270,000 acres in the Atlantic Rim of Wyoming) for natural gas development that did not yet authorize a specific ground-disturbing activity.<sup>189</sup> The *TRCP* court refused to read the NEPA regulations to require detailed commitments to mitigation for “long-term” plans.<sup>190</sup> Specific activities are subject to subsequent evaluations, tiered to the plan, and “exact application of mitigation measures will be determined on a site-specific basis.”<sup>191</sup> Once again, tiering helped rescue a/m-lite.

Though adaptive management, in and of itself, does not trigger an EIS,<sup>192</sup> adaptive management is not an alternative to NEPA.<sup>193</sup> A district court relied (in part) on NEPA itself to reject a 2005 rule substituting adaptive management for preparing EISs in developing national forest plans.<sup>194</sup> The court found that the administrative record failed to support a judgment that substituting adaptive management would result in no significant environmental outcomes.<sup>195</sup>

#### C. PROCEDURES FOR ADAPTATION CANNOT SUBSTITUTE FOR SHOWING COMPLIANCE WITH SUBSTANTIVE STANDARDS

Another temptation of adaptive management is to lavish attention on the iterative process at the expense of addressing the substantive management criteria required by law.<sup>196</sup> Courts are particularly attentive to substantive management criteria

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187. *Id.* at \*14 (citing 40 C.F.R. § 1500.1 (b)).

188. *High Sierra Hikers Ass'n*, 521 F. Supp. 2d at 1072, 1090.

189. *Theodore Roosevelt Conservation P'ship*, 2010 WL 2869778, at \*3–4.

190. *Id.* at \*16.

191. *Id.* at \*15.

192. *See* *Env'tl. Prot. Info. Ctr. v. U.S. Fish & Wildlife Serv.*, No. C 04-04647 CRB, 2005 WL 3021939, at \*6 (N.D. Cal. Nov. 10, 2005).

193. *See* Julie Thrower, *Adaptive Management and NEPA: How a Nonequilibrium View of Ecosystems Mandates Flexible Regulation*, 33 *ECOLOGY L.Q.* 871, 894 (2006).

194. *Citizens for Better Forestry v. U.S. Dept. of Agric.*, 481 F. Supp. 2d 1059, 1086–87 (N.D. Cal. 2007).

195. *Id.* at 1089–90.

196. *See* Wiersema, *supra* note 4, at 1256 (arguing that adaptive management by agencies pays insufficient attention to substantive goals).

in statutes, such as the “no jeopardy” standard in the ESA,<sup>197</sup> and regulations, such as the “viability” standard for animal populations in national forests.<sup>198</sup> Since the 1970s, courts have required agencies to develop records showing how they will meet substantive standards.<sup>199</sup> The first round of litigation over adaptive management reveals that courts are holding firm to this principle. Promises to plan, collaborate, or manage toward compliance should environmental conditions degrade below the substantive management criterion are insufficient to survive judicial review.<sup>200</sup>

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197. The “no jeopardy” standard explains that each federal agency must ensure that its actions “are not likely to jeopardize” any endangered species or habitats. 16 U.S.C. § 1536(a)(2) (2006). Courts are often attentive to the “no jeopardy” standard. *See Nat’l Ass’n of Home Builders v. Defenders of Wildlife*, 551 U.S. 644, 669 (2007) (“[N]o-jeopardy duty covers only discretionary agency actions and does not attach to actions (like the NPDES permitting transfer authorization) that an agency is *required* by statute to undertake once certain specified triggering events have occurred.”); *Gifford Pinchot Task Force v. U.S. Fish & Wildlife Serv.*, 378 F.3d 1059, 1067 (9th Cir. 2004) (“Because the ESA does not prescribe how the jeopardy prong is to be determined, nor how species populations are to be estimated, we hold that it is a permissible interpretation of the statute to rest the jeopardy analysis on a habitat proxy.”); *Pac. Coast Fed’n of Fishermen’s Ass’ns v. Gutierrez*, 606 F. Supp. 2d 1122, 1167 (E.D. Cal. 2008) (“[A] jeopardy regulation . . . requires . . . agencies to consider both recovery and survival impacts on listed species.” (citing *Nat’l Wildlife Fed’n v. Nat’l Marines Fisheries Serv.*, 481 F.3d 1224, 1237 (9th Cir. 2007))).

198. The “viability standard” is embodied in 36 C.F.R. § 219.19 (2000) (“In order to insure that viable populations [of fish and wildlife] will be maintained, habitat must be provided to support, at least, a minimum number of reproductive individuals and that habitat must be well distributed so that those individuals can interact with others in the planning area.”). Although formally revoked by National Forest System Land and Resource Management Planning, 65 Fed. Reg. 67,514 (Nov. 9, 2000), that replaced it with a less specific “sustainability” standard, the “viability” standard remained in place for forest planning through most of the Bush Administration. *See, e.g., Native Ecosystems Council v. U.S. Forest Serv.*, 428 F.3d 1233, 1237 n.5 (9th Cir. 2005) (“[A]pplication of these [new] regulations was delayed . . . . As a result, the regulations relevant [in the case at bar] are found in the July 1, 2000 Code of Federal Regulations.”).

199. *See, e.g., Citizens to Preserve Overton Park v. Volpe*, 401 U.S. 402, 419 (1971) (affirming the Administrative Procedure Act’s, 5 U.S.C. § 706 (2006), requirement that courts review agency decisions based on the agency’s “whole record”).

200. *See, e.g., Natural Res. Def. Council v. Kempthorne*, 506 F. Supp. 2d 322, 387 (E.D. Cal. 2007) (“Adaptive management is within the agency’s discretion to choose and employ, however, the absence of any definite, certain, or enforceable criteria or standards make its use arbitrary and capricious under the totality of the circumstances.”); *Nat’l Wildlife Fed’n v. U.S. Army Corps of Eng’rs*, 92 F. Supp. 2d 1072, 1078, (D. Or. 2001) (explaining that the Army Corps’ adaptive management approach provided the court with insufficient information to rule on summary judgment); *Fund for Animals v. Babbitt*, 903

The ESA is a prevalent vehicle for placing substantive management criteria on otherwise discretionary management of public lands and waters. The listing of a species often triggers new restrictions on longstanding management regimes, such as water allocations (for example in California's Sacramento Delta)<sup>201</sup> or timber harvests (for example in the Pacific Northwest).<sup>202</sup> The ESA, therefore, often drives adaptive management plans to substitute for older ways of using public resources. Once a management issue triggers ESA compliance, the biological opinion of the Fish & Wildlife or Fisheries Service will essentially establish the boundaries for permissible management options.<sup>203</sup> The biological opinions determine which actions will cross the line into jeopardizing the continued existence of a species, and what measures will be required to protect an agency from liability under the ESA. The litigation reveals that it is these biological opinions that often prompt agency adaptive management.<sup>204</sup>

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F. Supp. 2d 96, 113 (D.D.C. 1995) (holding that a FWS management plan for grizzly bears, which included adaptive management among other schemes, did not meet ESA requirements because "[d]efendants have not met their burden to develop objective, measurable criteria by which to assess present or threatened destruction, modification or curtailment of the grizzly bear's habitat or range"). *But cf.* *Or. Natural Res. Council Action v. U.S. Forest Serv.*, 59 F. Supp. 2d 1085, 1096 (W.D. Wash. 1999) ("The plan's adaptive management approach is adequate to deal with any new information plaintiffs have identified.").

201. *Cent. Delta Water Agency v. U.S. Fish & Wildlife Serv.*, 653 F. Supp. 2d 1066, 1093 (E.D. Cal. 2009) (describing the effects of the decision to list smelt on the water management plan).

202. *Seattle Audubon Soc'y v. Moseley*, 80 F.3d 1401, 1404 (9th Cir. 1996) (per curiam) (noting the effect of listing the spotted owl on the existing forest management plan). *See generally* YAFFEE, *supra* note 108 (describing the history of the listing decision for the spotted owl and its ramifications with respect to politics and environmental regulations).

203. This is particularly true after the action agency has adopted the conditions of the biological opinion. *See* *Delta Smelt Consol. Cases*, 686 F. Supp. 2d 1026, 1043–44 (E.D. Cal. 2009) ("The adaptive management protocol prescribed . . . leaves FWS with the final word on exactly what flow requirements will be imposed.").

204. *See, e.g., In re Operation of the Mo. River Sys. Litig.*, 421 F.3d 618, 626 (8th Cir. 2005) ("The 2000 BiOp RPA also mandated habitat restoration, a comprehensive species and habitat monitoring program, and an adaptive management framework."); *Consol. Salmonid Cases*, 688 F. Supp. 2d 1013, 1025 (E.D. Cal. 2010) ("[In the] 2008 Smelt BiOp . . . the adaptive management protocol [was] prescribed in the RPA."); *Pac. Coast Fed'n of Fishermen's Ass'ns v. Gutierrez*, 606 F. Supp. 2d 1122, 1128 (E.D. Cal. 2008) ("The BiOp was intended to address the potential adverse impacts of ongoing (for the next twenty-five years) CVP and SWP operations on the salmonid species."); *id.* at 1184–85 (discussing the biological opinion's impact on adaptive management).

A pair of decisions by U.S. District Court Judge Oliver Wanger in the Eastern District of California provides a particularly illuminating contrast in the relationship between adaptive management and substantive legal standards.<sup>205</sup> Both cases concerned challenges to adaptive management plans for operating the vast water infrastructure that moves water through and around the Sacramento-San Joaquin River Delta in California. The listing of the Delta smelt by the FWS and salmonid species by the Fisheries Service triggered two different biological opinions in order to fulfill the legal duty not to jeopardize the continued existence of the fishes under the ESA. The water project consulted separately with the two services. This gave rise to two sets of adaptive management plans (one for the smelt and one for the salmonids) that generated two different lawsuits.

Both plans employed adaptive management, but Judge Wanger upheld one and remanded the other under the usual judicial standard that an agency must provide “reasonable certainty” that it will meet a statutory requirement.<sup>206</sup> The explanation for these disparate results hinges on whether the adaptive management framework offered more than mere process. The salmonid adaptive management protocol, approved by Judge Wanger, contained definite, substantive criteria that served as triggers for reinitiating ESA consultation to revise management.<sup>207</sup> Also, the Fisheries Service’s biological opinion imposed “enforceable definite and certain requirements” on the operation of the water works.<sup>208</sup> In contrast, the smelt adaptive management protocol failed to provide enforceable, precise criteria to bind operators of the system.<sup>209</sup> The adaptive manage-

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205. Compare *Pac. Coast Fed’n of Fishermen’s Ass’ns*, 606 F. Supp. 2d at 1194 (remanding the case, but upholding the adaptive management plan), with *Natural Res. Def. Council*, 506 F. Supp. 2d at 387 (remanding the adaptive management plan).

206. See *Pac. Coast Fed’n of Fishermen’s Ass’ns*, 606 F. Supp. 2d at 1184; *Natural Res. Def. Council*, 506 F. Supp. 2d at 353.

207. *Pac. Coast Fed’n of Fishermen’s Ass’ns*, 606 F. Supp. 2d at 1186 (establishing a temperature trigger of fifty-six degrees to reinitiate consultation). Judge Wanger subsequently remanded a later salmonid biological opinion for an arbitrary and capricious formulation of water flow restrictions. See *Consol. Salmonid Cases*, No. 1:09-cv-01053-OWW-DLB, at \*5 (E.D. Cal. May 18, 2010) (Finding of Fact and Conclusions of Law Re: Plaintiffs’ Request for Preliminary Injunction), available at <http://www.endangeredspecieslawandpolicy.com/uploads/file/Salmon%20PI.pdf>.

208. *Pac. Coast Fed’n of Fishermen’s Ass’ns*, 606 F. Supp. 2d at 1185 (imposing mandatory terms and conditions as part of an incidental take statement).

209. *Id.* (comparing cases).

ment protocol for the smelt did not bind the operators, but it was procedurally elaborate. It involved a complex “risk assessment matrix” containing criteria that, if met, would trigger a working group to meet.<sup>210</sup> The group would then “consider” a range of management changes.<sup>211</sup> While the process itself was mandatory, the court faulted the protocol for failing to assure that the result of the process would be some kind of action taken to secure the continued existence of the smelt.<sup>212</sup> Judge Wanger did not assert that the agency meant to disregard its statutory responsibilities, just that the record of decision failed to ensure that they would be met.<sup>213</sup>

In overturning the smelt adaptive management protocol, the court contrasted another ESA case addressing a large-scale HCP that would allow land development in the Natomas Basin of the Sacramento area to proceed notwithstanding harms to listed species.<sup>214</sup> The Natomas Basin HCP employed adaptive management to deal with the uncertainty of where and when development would occur (as well as how effective mitigation measures would conserve the effected species).<sup>215</sup> Judge Wanger distinguished the adaptive adjustment in the Natomas Basin plan as “employ[ing] *well-defined* mitigation measures” such as conservation land purchases, adjustment of conservation re-

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210. *Natural Res. Def. Council*, 506 F. Supp. 2d at 341.

211. *Id.*

212. *See id.* at 352.

213. *See id.* at 354.

214. *Nat'l Wildlife Fed'n v. Babbitt*, 128 F. Supp. 2d 1274 (E.D. Cal. 2000) (endorsing the adaptive management elements of the HCP/incidental take permit while overturning it on a variety of other grounds related to the misfit between the scale of the plan and the governance/commitment of the program).

215. A subsequent case overturning a HCP found that long-term take permits under the ESA require some procedure to deal with unforeseen circumstances. *See Sw. Ctr. for Biological Diversity v. Bartel*, 470 F. Supp. 2d 1118, 1145 (S.D. Cal. 2006). The court relied, in part, on *National Wildlife Federation* to show that adaptive management may fulfill that necessary role. *See id.* at 1144. The origin of the requirement to address unforeseen circumstances is in the original HCP dealing with development of San Bruno Mountain, which the House Conference Report endorsed with legislation that ultimately authorized incidental take permits. *See* ENDANGERED SPECIES ACT AMENDMENTS OF 1982, H.R. REP. NO. 97-835, at 31–32 (1982), *reprinted in* 1982 U.S.C.C.A.N. 2860, 2872–73. Courts now routinely approve HCPs that rely on adaptive management. *See, e.g., Ctr. for Biological Diversity v. U.S. Fish & Wildlife Serv.*, 202 F. Supp. 2d 594, 598 (W.D. Tex. 2002) (upholding a conservation plan, which included adaptive management, because it was “negotiated and regulated vigorously” by the FWS).

serve size, and modification of agricultural practices.<sup>216</sup> He also distinguished the Natomas Basin plan for its quantified objectives and required mitigation measures, even though those elements could be adjusted.<sup>217</sup> These substantive distinctions allowed Judge Wanger to distinguish the Natomas Basin plan, which was actually more vaguely drawn than the smelt adaptive matrix.

The pair of Wanger opinions are important for two reasons. First, they likely contain the most thorough judicial discussion to date of adaptive management's strengths and weaknesses. They recognize a role for adaptive management within administrative law, allowing a "balance" between "flexibility" (adaptive management) and "certainty" (final agency action).<sup>218</sup> This is the fundamental trade-off that courts will continue to mediate in future adaptive management cases. Second, the opinions are important because they draw a line illustrated by two concrete examples, one on the legal side (salmonids) and one on the illegal side (smelt). This comparison is particularly significant because the smelt adaptive management protocol was not at all vague. It was far more detailed than most a/m-lite plans. Yet, when held against a substantive legal standard, the court could not find the "reasonable certainty" of compliance.<sup>219</sup>

It is not surprising that the ESA, with its famously uncompromising mandate,<sup>220</sup> would establish a boundary limiting

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216. See *Natural Res. Def. Council*, 506 F. Supp. 2d at 355–56 (emphasis added).

217. *Id.* at 356. In contrast, *Animal Welfare Institute v. Beech Ridge Energy*, 675 F. Supp. 2d 540 (D. Md. 2009), enjoined construction of a ridge-top, wind turbine project because of the likely harm to endangered Indiana bats. In language reminiscent of the smelt biological opinion, the state permit required the energy company to "consult" with a technical advisory committee regarding the "potential for adaptive management" and agree to "test adaptive management strategies." *Id.* at 556. The court found the adaptive management scheme too discretionary to overcome the need for an incidental take permit for the bats likely to be harmed. *Id.* at 579.

218. *Pacific Coast Fed'n of Fishermen's Ass'ns v. Gutierrez*, 606 F. Supp. 2d 1122, 1188 (E.D. Cal. 2008).

219. *Id.*; see also *Greater Yellowstone Coal. v. Servheen*, 672 F. Supp. 2d 1105, 1116 (D. Mont. 2009) (holding that a commitment to future monitoring of the agency designation for grizzly bear populations could not substitute for substantive findings required in the statute).

220. *Tenn. Valley Auth. v. Hill*, 437 U.S. 153, 184, 194–95 (1978) (noting that the ESA intends to "halt and reverse the trend toward species extinction, whatever the cost," and thereby strikes a balance "in favor of affording endangered species the highest of priorities").

weak forms of a/m-lite.<sup>221</sup> However, several other types of cases find that adaptive management fails to meet substantive criteria of agency law and policy. Agencies employing adaptive management to sustain FONSI's justifying a decision not to prepare an EIS have seen their efforts overturned by courts unconvinced that vague, a/m-lite will assure that the impacts of a project will not be significant.<sup>222</sup> In this respect, a/m-lite may be better suited to an EIS where mitigation need only be discussed, not assured, than to mitigated FONSI's, which must create a record of decision demonstrating (generally through the mitigation measures) the absence of significant impacts.<sup>223</sup> The mitigation in the record of decision subsequently binds agency action, unlike a mitigation discussion in an EIS, which an agency need not implement.

However, it is possible for an agency to fail to provide enough detail about mitigation under the more flexible standards of an EIS. Mitigation as open-ended contingency planning is not unique to adaptive management. The Ninth Circuit recently found the Bureau of Land Management's (BLM) Final EIS for expansion of a gold mine in Nevada to be inadequate because it failed to assess the effectiveness of mitigation proposed to address possible hydrologic impacts from mine dewa-

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221. An early case grappling with adaptive management's role in meeting substantive legal standards is *Oregon Natural Resources Council v. Daley*, 6 F. Supp. 2d 1139, 1158 (D. Or. 1998), which rejected Oregon's habitat restoration program that included watershed councils, monitoring, and adaptive management, as the basis for not listing coho salmon runs. The court found the program to consist of insufficiently certain "future, voluntary and untested habitat measures." *Id.* at 1159.

222. *E.g.*, *Natural Res. Def. Council v. U.S. Army Corps of Eng'rs*, 457 F. Supp. 2d 198, 234 (S.D.N.Y. 2006) (acknowledging that adaptive management practices "provide no assurance as to the efficacy of mitigation"); *Mountaineers v. U.S. Forest Serv.*, 445 F. Supp. 2d 1235, 1250 (W.D. Wash. 2006) ("[A]daptive management strategies . . . amount . . . to a build-first, study later approach . . . [which is a] violation of NEPA." (internal quotations omitted)).

223. Two recent, very deferential decisions from Judge Leon illustrate how nebulously described adaptive management may support EIS mitigation. *See, e.g.*, *Defenders of Wildlife v. Salazar*, 698 F. Supp. 2d 141, 147-48 (D.D.C. 2010) (upholding an elk management plan with little detail on mitigation measures to reduce harms of winter elk concentrations); *Theodore Roosevelt Conservation P'ship v. Salazar*, 605 F. Supp. 2d 263, 279 (D.D.C. 2009) (citing *Robertson v. Methow Valley Citizens Council*, 490 U.S. 332, 351-52 (1989)) (noting that adaptive management fulfills the EIS mitigation requirement, which only requires discussion of possible measures, not assurance that they will occur), *aff'd*, No. 09-5162, 2010 WL 2869778 (D.C. Cir. July 23, 2010).

tering.<sup>224</sup> Without an assessment of effectiveness, the court determined that mitigation cannot fulfill its purpose as described by the Supreme Court; specifically, to evaluate whether anticipated environmental impacts can be avoided.<sup>225</sup> In this case, the EIS described a monitoring regime and indicated that, if the monitoring showed mitigation measures were necessary, then the mining company would prepare a “detailed, site-specific plan to enhance or replace the impacted perennial water resources.”<sup>226</sup> The absence of detail about the tools employed in such a plan, or on when exactly the plan would be triggered, is common in EISs employing adaptive management to defer some decisions to a later date. Recent draft guidance from the Council on Environmental Quality (CEQ) aims to improve NEPA mitigation by urging agencies to include more specific descriptions of mitigation measures (especially measurable performance standards) and to ensure that mitigation is carried out.<sup>227</sup> Both of these suggestions would significantly improve federal adaptive management, which the CEQ recommends, “in order to minimize the possibility of mitigation failure.”<sup>228</sup>

Outside of NEPA, environmental laws frequently impose substantive standards on agencies that cannot be eluded through adaptive management. For instance, a federal district court found that an adaptive management approach to improving storm water phosphorus abatement did not fulfill the legal requirements of the Clean Water Act, which demand that specific effluent limitations be met.<sup>229</sup> Even the public land organic acts, which grant broad discretion to agencies, including the latitude to manage adaptively, sometimes provide standards

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224. *S. Fork Band Council v. U.S. Dep’t of the Interior*, 588 F.3d 718, 727 (9th Cir. 2009) (per curiam).

225. *Id.* (internal citation omitted).

226. U.S. DEP’T OF THE INTERIOR: BUREAU OF LAND MGMT., CORTEZ HILLS EXPANSION PROJECT: FINAL EIS § 3.2, at 111 (2008), available at [http://blm.gov/nv/st/en/fo/battle\\_mountain\\_field/blm\\_information/national\\_environmental/cortez\\_hills\\_expansion.html](http://blm.gov/nv/st/en/fo/battle_mountain_field/blm_information/national_environmental/cortez_hills_expansion.html).

227. See Memorandum from Nancy H. Sutley, Chair, Council on Env’tl. Quality on Draft Guidance for NEPA Mitigation & Monitoring, 3 (Feb. 18, 2010), available at [http://ceq.hss.doe.gov/nepa/regs/Mitigation\\_and\\_Monitoring\\_Draft\\_NEPA\\_Guidance\\_Final\\_02182010.pdf](http://ceq.hss.doe.gov/nepa/regs/Mitigation_and_Monitoring_Draft_NEPA_Guidance_Final_02182010.pdf).

228. *Id.* at 4.

229. See *Miccosukee Tribe of Indians v. United States*, No. 04-21448, 2010 WL 1506267, at \*8 (S.D. Fla. Apr. 14, 2010).

that a/m-lite fails to meet.<sup>230</sup> Agencies run the risk of relying on adaptive management as an alternative to the harder work of showing how their plans will meet the substantive legal criteria for their land systems.

Moreover, the focus on adaptive management in public land planning may distract agencies from the hard work of establishing substantive objectives that translate statutory and regulatory goals into place-based standards.<sup>231</sup> Richard L. Schroeder's recent study of the comprehensive conservation plans that each unit of the National Wildlife Refuge System must prepare under its organic legislation, revealed that the biological objectives, a key element of the plans required under implementing policy, seldom meet even two of the five criteria in the FWS handbook.<sup>232</sup> The handbook requires each biological objective to be: "(1) Specific, (2) Measurable, (3) Achievable, (4) Results-oriented, and (5) Time-fixed."<sup>233</sup> Schroeder describes the problem with the plans' neglect of substantive benchmarks:

If [the FWS] is to be able to manage in a manner consistent with the plans, and to practice adaptive management by monitoring progress, then the biological objectives in the plan must be specific

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230. *E.g.*, *Klamath Siskiyou Wildlands Ctr. v. Boody*, 468 F.3d 549, 558–59 (9th Cir. 2006) (arguing that adaptive management modifications contemplated in a resource management plan do not shield subsequent management changes from complying with regulations setting out criteria for amending plans); *Greater Yellowstone Coal. v. Kempthorne*, 577 F. Supp. 2d 183, 195 (D.D.C. 2008) (stating that an adaptive management plan for snowmobiles "provides no quantitative standard or qualitative analysis to support" a conclusion of no impairment under the park system Organic Act); *High Sierra Hikers Ass'n v. Weingardt*, 521 F. Supp. 2d 1065, 1091 (N.D. Cal. 2007) (illustrating that an agency may not rely on adaptive management to avoid a showing in the administrative record that it will meet the standards of the Wilderness Act).

231. *See* Refuge Planning Policy Pursuant to the National Wildlife Refuge System Administration Act as Amended by the National Wildlife Refuge System Improvement Act of 1997, 65 Fed. Reg. 33,892, 33,906 (May 25, 2000) (stating that one of the eight goals of unit-level planning is "[to] provide a basis for adaptive management by monitoring progress, evaluating plan implementation, and updating refuge plans accordingly"). Substantive statutory goals for refuges include ensuring "that the biological integrity, diversity, and environmental health of the System are maintained," 16 U.S.C. § 668dd(a)(4)(B) (2006), and sustaining "healthy populations of fish, wildlife, and plants," 16 U.S.C. §§ 668dd(a)(4)(D)–668ee.

232. *See* Richard L. Schroeder, *Evaluating the Quality of Biological Objectives for Conservation Planning in the National Wildlife Refuge System*, 26 GEO. WRIGHT F. 22, 25 (2009).

233. *Id.* at 23 (quoting ROBERT S. ADAMCIK ET AL., U.S. FISH & WILDLIFE SERV., WRITING REFUGE MANAGEMENT GOALS AND OBJECTIVES: A HANDBOOK 8 (2004)).

and measurable, as recognized by [the FWS's] own policy. If the objectives lack specificity and detail, as the majority do, then [the FWS] will be unable to measure progress toward their achievement, and thus, will be unable to know if they are indeed managing refuge lands in a manner consistent with the plans.<sup>234</sup>

In their haste to complete plans and to describe adaptive management procedures, agencies too often neglect the establishment of site-specific standards for measuring compliance with statutory or regulatory criteria.

### III. LESSONS FOR THE NEXT GENERATION OF ADAPTIVE MANAGEMENT

The picture that emerges from the first round of litigation over adaptive management should not surprise observers of conservation conflicts. One reason the ambitions expressed in law and policy exceed the abilities of agencies to implement is inadequate funding.<sup>235</sup> Agencies attempt to maximize their discretion and minimize their exposure to political controversy from unpopular decisions.<sup>236</sup> Interest groups, including environmentalists, seek to lock in promises through binding commitments early in the management process.<sup>237</sup> Courts are attentive to substantive management standards in reviewing agency records for compliance with the law. Most environmental managers and stakeholders approve of adaptive management in theory; disagreements focus on application in practice.<sup>238</sup> Courts cannot directly distinguish legitimate adaptive management from imposters.<sup>239</sup> But in policing compliance with administrative and environmental law, courts can unmask some of the most egregious failures to incorporate the key elements necessary for structured learning during the course of a project, which often get sidelined in the rough and tumble of implementation.<sup>240</sup> Given the limitations of the judicial role, we now offer some lessons for agencies and Congress for further improvement of adaptive management in practice.

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234. *Id.* at 27.

235. *See supra* note 68 and accompanying text.

236. *See Doremus, supra* note 4, at 56.

237. *Id.* at 85.

238. *See* Fred Johnson, *Protocol and Practice in the Adaptive Management of Waterfowl Harvests*, 3 CONSERVATION ECOLOGY 8 (June 30, 1999), <http://www.ecologyandsociety.org/vol3/iss1/art8/>.

239. *See* Gregory et al., *supra* note 72, at 2424.

240. *See id.*; Doremus, *supra* note 1, at 569–70.

## A. LESSONS FOR AGENCIES

Our research confirms the intuition that adaptive management is one of the most difficult tasks for agencies attempting comprehensive ecosystem stewardship.<sup>241</sup> However, the impression in agencies that lawsuits and appeals present a barrier to implementing adaptive management<sup>242</sup> is unfounded. When agencies lose challenges to their adaptive management plans, it is often because their preference for management latitude runs afoul of the need to show they can meet substantive and procedural standards in statutes, regulations, or even their own earlier plans. Several strategies can help agencies avoid that pitfall.

## 1. Shoring Up a/m-lite in Substance

In order to wring the most benefits from a/m-lite, agencies should strive to do their best to create plans that include as many of the elements of adaptive management theory as possible, especially designing management actions as experiments so that they promote learning to reduce uncertainty. However, this crucial element of adaptive management is not generally required by law and courts will not impose it.<sup>243</sup> More structured learning would improve a/m-lite by capturing more benefits of adaptive management theory. This reform will need strong prompting from Congress, agency leadership, and administrative guidance. The courts will, however, impose some discipline on the use of a/m-lite.

The lessons for an agency embarking on a/m-lite require it to restrain its enthusiasm for discretion: the plan must be as detailed as practical. The more vague the a/m-lite, the more likely that a court will find it inadequate.<sup>244</sup> Criteria for measuring success and triggering contingency actions must be clearly articulated in the record of decision.<sup>245</sup> Agencies should commit to monitoring the key criteria and should employ their

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241. Tomas M. Koontz & Jennifer Bodine, *Implementing Ecosystem Management in Public Agencies: Lessons from the U.S. Bureau of Land Management and the Forest Service*, 22 CONSERVATION BIOLOGY 60, 60 (2008).

242. *Id.* at 65–66.

243. *See* *Lands Council v. McNair*, 537 F.3d 981, 988 (9th Cir. 2008) (refusing to take a close look at whether the agency adaptively learned from previous logging before undertaking another, similar logging project).

244. *See supra* text accompanying note 180.

245. *See supra* text accompanying notes 176–80.

data when revising or expanding projects.<sup>246</sup> Most important, adaptive management must have direction—it needs to deploy its procedural tools to home in on specific goals.

Related to this lesson is that adaptive management cannot substitute for a showing of reasonable certainty that substantive criteria will be met. The pageantry of procedures and flow charts may distract agencies from their mandates to achieve specific environmental objectives. Agencies should resist looking at adaptive management as a short cut around the difficult task of compiling a record that substantiates claims about such key tests as viability, nonimpairment, or no jeopardy. Adaptive plans, to be effective, must translate the substantive standards of statutes, rules, and manuals into place-based objectives.

## 2. Improving a/m-lite as Procedure

While substantive standards, where they exist, helpfully constrain and focus adaptive management, there is also a set of lessons for agencies involving the procedural charter established by NEPA, which requires all federal agencies to prepare an EIS for “major Federal actions significantly affecting the quality of the human environment.”<sup>247</sup> Indeed, as the origins of adaptive management are found in Holling’s critique of conventional environmental impact analysis, it is fitting that NEPA recently has been the subject of much thinking about how to promote adaptive management. In 1997, for example, the CEQ echoed Holling’s assessment that under the traditional NEPA model “adequate environmental protection depends solely on the accuracy of the predicted impacts and expected mitigation results” and that NEPA should be reoriented around “[a]daptive environmental management.”<sup>248</sup> Building on that theme, the 2003 NEPA Task Force Report, *Modernizing NEPA Implementation*, contained a full chapter devoted to “[a]daptive [m]anagement and [m]onitoring,”<sup>249</sup> the gist of which was to use NEPA to help move federal agencies from the “predict-

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246. See *supra* text accompanying note 138.

247. 42 U.S.C. § 4332(2)(C) (2006).

248. COUNCIL ON ENVTL. QUALITY, EXEC. OFFICE OF THE PRESIDENT, THE NATIONAL ENVIRONMENTAL POLICY ACT: A STUDY OF ITS EFFECTIVENESS AFTER TWENTY-FIVE YEARS 32 (1997).

249. NEPA TASK FORCE, REPORT TO THE COUNCIL ON ENVIRONMENTAL QUALITY: MODERNIZING NEPA IMPLEMENTATION 44 (2003).

mitigate-implement” model to the “predict-mitigate-implement-monitor-adapt” model.<sup>250</sup>

NEPA, of course, imposes no enforceable substantive duties on federal agencies and thus cannot mandate adaptive management.<sup>251</sup> Moreover, environmental impact analysis performed under NEPA assumes the conventional front-end comprehensive predecisional form, so it cannot incorporate adaptive management as an assessment tool per se.<sup>252</sup> But, the NEPA Task Force identified two avenues in which adaptive management and NEPA can usefully intersect in ways consistent with our evaluation of the adaptive management case law presented in Part II.

First, federal agency actions that employ adaptive management may be in a position to reduce the need for new or supplemental NEPA analyses when changed conditions require changes in resource management.<sup>253</sup> This is one of the lessons manifest in the litigation over the NWFP.<sup>254</sup> Second, federal actions that employ adaptive management may be in a better position to argue that mitigation measures incorporated in the federal action and put into effect through adaptive management justify the decision not to prepare a full EIS (i.e., to mitigate to a finding of no significant impact, or FONSI).<sup>255</sup> Our review of adaptive management litigation bolsters this claim by the CEQ only in circumstances where there is an earlier, comprehensive EIS to which the Environmental Assessment tiers.<sup>256</sup>

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250. *Id.* at 45.

251. The Supreme Court’s oft-repeated observation is that while “NEPA does set forth significant substantive goals for the Nation[,] . . . its mandate to the agencies is essentially procedural.” *Vt. Yankee Nuclear Power Corp. v. Natural Res. Def. Council, Inc.*, 435 U.S. 519, 558 (1978); *see also* *Stryker’s Bay Neighborhood Council, Inc. v. Karlen*, 444 U.S. 223, 227 (1980) (per curiam) (stating that once an agency has complied with NEPA procedures, the courts do not question the choice of action the agency has taken).

252. Agencies must prepare the EIS prior to deciding which action to select, and there is no need for subsequent monitoring and assessment to follow up on the EIS after the agency action has been selected and implemented. *See* David R. Hodas, *NEPA, Ecosystem Management and Environmental Accounting*, 14 NAT. RESOURCES & ENV’T 185, 188 (2000) (describing NEPA’s lack of post-EIS review as inadequate to support ecosystem management).

253. *See* NEPA TASK FORCE, *supra* note 249, at 47.

254. *See supra* text accompanying note 166.

255. *See* NEPA TASK FORCE, *supra* note 249, at 48.

256. *See supra* text accompanying notes 222–27.

Hence, whereas the traditional NEPA model provides no incentive to federal agencies (or the state, local, and private entities sponsoring the projects federal agencies fund or authorize) to incorporate adaptive management in the actions being evaluated under NEPA, the Task Force used the prospect of avoiding having to prepare a full or supplemental EIS as an incentive to do just that. Indeed, in 2007 the Forest Service proposed rules to update its procedures for NEPA compliance with numerous references to adaptive management built around the provision that

[a] proposed action or alternative(s) may include adaptive management strategies allowing for adjustment of the action during implementation. If the adjustments to an action are clearly articulated and pre-specified in the description of the alternative and fully analyzed, then the action may be adjusted during implementation without the need for further analysis.<sup>257</sup>

Similarly, in 2008 the DOI proposed revisions to its NEPA implementation rules directing that “[b]ureaus should use adaptive management as part of their decisionmaking processes, as appropriate, particularly in circumstances where long-term impacts may be uncertain and future monitoring will be needed to make necessary adjustments in subsequent implementation decisions.”<sup>258</sup>

Another theme of NEPA reformers consistent with the case law on adaptive management has been to encourage more attention to large-scale or programmatic EISs.<sup>259</sup> Early-stage analyses can be difficult to perform because activities may still be nebulous. But, early and broad evaluations can steer agencies in more effective and environmentally benign directions.<sup>260</sup> They are the analyses most likely to actually help agency decisionmakers. The bigger temporal and geographic scales representing the greatest agency successes in the adaptive management litigation bolster this general argument of NEPA reformers. Because adaptive management is expensive, agencies should place their highest funding priorities on large-scale efforts, which are most likely to yield useful, incremental adjustments over time.<sup>261</sup>

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257. National Environmental Policy Act Procedures, 72 Fed. Reg. 45,998, 46,005 (Aug. 16, 2007).

258. Implementation of the National Environmental Policy Act (NEPA) of 1969, 73 Fed. Reg. 126, 135 (Jan. 2, 2008).

259. See, e.g., COUNCIL ON ENVTL. QUALITY, *supra* note 248, at 11–13.

260. See *id.* at 12.

261. See *id.* at 14.

Despite fundamentally different assumptions about knowledge and decisionmaking, adaptive management is compatible with NEPA. Adaptive management is well suited to the NEPA tiering that natural resources agencies already use adeptly. An added incentive for agency use of adaptive management in EISs is that it may raise the threshold for requiring a supplemental EIS should new information emerge. Agencies must be attentive to the obligation that mitigated FONSI demonstrate that impacts will fall below the significance threshold. Adaptive management alone, without substantive triggers, may not shoulder the burden.

### 3. Extending a/m-lite to Pollution Control

The pollution-control side of environmental litigation has not directly addressed adaptive management. The strong “cooperative federalism” structure of pollution-control law introduces the complications of state implementation that go far beyond the Sacramento-San Joaquin Delta example.<sup>262</sup> Pollution control also involves far more regulation of private economic activity than does resource management.<sup>263</sup> But the relatively stronger emphasis on meeting substantive criteria, such as National Ambient Air Quality Standards (NAAQS),<sup>264</sup> in pollution-control law will increasingly provide some lessons for implementing adaptive management. For example, the Fifth Circuit upheld the EPA’s approval of a Texas State Implementation Plan (SIP), which the Clean Air Act requires to demonstrate that the state will be able to attain NAAQS.<sup>265</sup> The SIP at issue purported to demonstrate that the Houston-Galveston area would comply with the NAAQS for ozone.<sup>266</sup> The state was able to devise control measures that would achieve ninety-four percent of the pollution reduction needed to attain the NAAQS.<sup>267</sup> In order to extract the additional six per-

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262. See Robert L. Fischman, *Cooperative Federalism and Natural Resources Law*, 14 N.Y.U. ENVTL. L.J. 179, 207–29 (2005) (contrasting the versions of cooperative federalism in pollution control and resource management).

263. See Robert L. Fischman, *The Divides of Environmental Law and the Problem of Harm in the Endangered Species Act*, 83 IND. L.J. 661, 663 (2008) (discussing the characteristic differences between pollution control and natural resources law). The ESA is a resource management statute that straddles the divide and does regulate some private activities directly. *Id.* at 684.

264. 42 U.S.C. §§ 7408–7409 (2006).

265. BCCA Appeal Grp. v. U.S. Env’t Prot. Agency, 355 F.3d 817, 821–22 (5th Cir. 2003).

266. *Id.* at 822–23.

267. *Id.* at 838.

cent reduction, the EPA accepted the SIP's "enforceable commitment to adopt and implement additional . . . controls."<sup>268</sup> The SIP could not specify what those additional controls would be, but it did provide "a list of soon-to-be-available, cutting-edge technologies."<sup>269</sup> The court upheld the EPA determination under the *Chevron* standard of review.<sup>270</sup> The Texas SIP case illustrates how pollution control benefits from large-scale plans that promise to meet substantive criteria through thousands of small steps. Texas benefited from the large scale in committing to additional reductions (six percent) without specifying the exact sources of contribution to that goal. The court's deferential standard of review afforded the EPA flexibility to approve the experiment of meeting the standard through as-yet-unavailable technology.<sup>271</sup> This is a form of narrowing uncertainty over time that is widely viewed as an attribute of adaptive management.

On the other hand, the EPA recently refused to extend its flexibility in proposing to disapprove a Texas SIP revision employing a "Flexible Permits" approach to meet the Clean Air Act's new source review requirements for industrial sources of pollution.<sup>272</sup> The Texas program would allow individual sources to exceed standards as long as they provided cumulative emissions reductions on a case-by-case basis.<sup>273</sup> The EPA's proposed finding emphasized that the state program does not meet the statutory standards and fails to ensure accountability, compliance, and monitoring.<sup>274</sup> These are familiar criticisms of the a/m-lite plans reviewed in the natural resources litigation.

The EPA recently restructured its Chesapeake Bay Program (CBP) to emphasize adaptive management. The CBP covers a larger area than the Texas SIPs, or even the NWFP. In

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268. *Id.* at 839–40.

269. *Id.* at 841.

270. *Id.* at 842.

271. *Id.* at 841.

272. Approval and Promulgation of Implementation Plans, 74 Fed. Reg. 48,480, 48,480 (Sept. 23, 2009). New source review provides for the "regulation of the modification and construction" of certain stationary sources of air pollution. 42 U.S.C. § 7410(a)(2)(C) (2006).

273. Approval and Promulgation of Implementation Plans, 74 Fed. Reg. at 48,485–86.

274. *See id.* at 48,482. This is consistent with the *Miccosukee Tribe* rejection of adaptive, incremental improvement through best technology in lieu of strictly imposed water-quality based, storm-water effluent limitations for phosphorus in order to meet Clean Water Act substantive requirements. *See Miccosukee Tribe of Indians v. United States*, No. 04-21448, 2010 WL 1506267, at \*8 (S.D. Fla. Apr. 14, 2010).

response to a 2007 congressional mandate, the EPA revised its CBP around four basic components, one of which is adaptive management.<sup>275</sup> In 2009, President Obama ordered the EPA to work with other federal agencies to implement adaptive management in the CBP.<sup>276</sup> However, in contrast to the SIPs, the CBP has few enforceable criteria (but many quantitative goals) and its multistate dimension tends to create adaptive management plans focused primarily on the process of coordination.<sup>277</sup> With diffuse responsibility, an emphasis on monitoring and study, and few interim targets, the new CBP has already received criticism as a helpless giant.<sup>278</sup> Nonetheless, we expect increased use of adaptive management in adjusting water quality standards and total maximum daily loads of pollutants for impaired bodies of water, such as the Chesapeake Bay.

#### 4. Public and Industry Buy-In

The courts are not the only institution reviewing adaptive management. Private regulated interests have expressed concerns about the capacity of adaptive management to add continually to the conditions imposed by resource development authorizations without the security of finality. The Army Corps, for example, heard this complaint as it developed adaptive management provisions in the new wetlands compensatory mitigation rule:

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275. U.S. ENVTL. PROT. AGENCY, CBP/TRS-292-08, STRENGTHENING THE MANAGEMENT, COORDINATION, AND ACCOUNTABILITY OF THE CHESAPEAKE BAY PROGRAM, at ii–iii (2008) [hereinafter CHESAPEAKE BAY PROGRAM], available at [http://cap.chesapeakebay.net/docs/EPA\\_Chesapeake\\_Bay\\_CAP.pdf](http://cap.chesapeakebay.net/docs/EPA_Chesapeake_Bay_CAP.pdf).

276. Chesapeake Bay Protection and Restoration, Exec. Order No. 13,508, 74 Fed. Reg. 23,099, 23,101–03 (May 15, 2009) (directing the EPA in section 301(b) to draft pollution-control strategies that are “based on sound science and reflect adaptive management principles” and noting in section 801 that the DOI is to use “adaptive management to plan, monitor, evaluate, and adjust environmental management actions”).

277. See, e.g., CHESAPEAKE BAY PROGRAM, *supra* note 275, at 26 (listing quantitative goals with adaptive management strategies); *id.* at 34 (providing the CBP management system diagram illustrating a detailed procedural method).

278. See Rena Steinzor & Shana Campbell Jones, *Reauthorizing the Chesapeake Bay Program: Exchanging Promises for Results* 1 (Ctr. for Progressive Reform, Working Paper No. 903, 2009). The detailed management system is reminiscent of the ecosystem management model skewered by Professor Houck for lack of substance and neglect of lawmaking. See Oliver Houck, *On the Law of Biodiversity and Ecosystem Management*, 81 MINN. L. REV. 869, 937–39 (1997) (“Nothing better illustrates the potential benefit and reach of ecosystem management, and its latent danger, than the Inner Columbia Basin story . . .”).

One commenter suggested that if a permittee has made a “good faith effort” to meet performance standards, no additional compensatory mitigation requirements should be imposed other than an extension of the monitoring period. Several commenters said that requiring adaptive management efforts beyond what is currently required as remediation or contingency actions will impose additional financial and resource burdens on mitigation providers.<sup>279</sup>

The agency’s response was a Solomonic mixed bag. On the one hand, the Army Corps acknowledged the reality that “there may be additional costs associated with an adaptive management approach, but we believe that such an approach is necessary to achieve compensatory mitigation project objectives, or to provide comparable or superior ecological benefits.”<sup>280</sup> Yet, the agency did clarify that the scope of adaptive management is not boundless, noting that “adaptive management does not require anticipation of all potential challenges, since that would be impossible to accomplish.”<sup>281</sup> This is unlikely to be of comfort to regulated interests, however, as it leaves much to the details of the adaptive management plan and subsequent implementation. As we conclude from our case law evaluation, courts may find this approach too open-ended if the plan is not sufficiently detailed to assure substantive compliance.

Just as regulated interests are concerned that adaptive management will lead to runaway land management burdens, environmental protection interests are concerned that it will lead to closed-door resource development approvals. For example, as FWS brought adaptive management on line for the HCP permit program under the ESA,<sup>282</sup> environmentalists complained about inadequate access to meaningful public participation in the HCP negotiation process and the lack of an ongoing public role in the implementation of adaptive management over the life of the HCP permit.<sup>283</sup> By the late 1990s, environmental groups had begun to accuse the HCP of making deci-

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279. Compensatory Mitigation for Losses of Aquatic Resources, 73 Fed. Reg. 19,594, 19,647 (Apr. 10, 2008).

280. *Id.*

281. *Id.* at 19,620.

282. *See supra* notes 2, 6 and accompanying text.

283. *See, e.g.*, LAURA C. HOOD, FRAYED SAFETY NETS: CONSERVATION PLANNING UNDER THE ENDANGERED SPECIES ACT, at vi–xiii (1998) (presenting a pessimistic assessment of the HCP program); John Kostyack, *Surprise!*, 15 ENVTL. F., Mar.–Apr. 1998, at 19, 19–24 (presenting an extensive criticism of the HCP program from the perspective of an attorney for the National Wildlife Federation); *cf.* Robert D. Thornton, *Habitat Conservation Plans: Frayed Safety Nets or Creative Partnerships?*, 16 NAT. RESOURCES & ENV’T 94, 95–96 (2001) (describing criticism from other organizations).

sions without following “biological standards” and to demand more public participation as a result.<sup>284</sup> For example, in 1999 the Defenders of Wildlife issued a blistering critique of the HCP program, complaining that, among other things,

[c]itizens from various stakeholder groups have no formal role in the HCP process except through the public comment period and . . . generally have not had a seat at the negotiating table in many major recent negotiations despite the fact that conservationists (in addition to the FWS) represent the public’s interest in protecting endangered species.<sup>285</sup>

Since then, some HCPs have been found by courts to contain robust adaptive management provisions that detail a comprehensive monitoring and adjustment protocol and specify the kinds of events and responses for which adjustments will be made.<sup>286</sup> FWS has also joined other state and federal agencies to develop detailed technical guidance for monitoring protocols to assist adaptive management in large-scale HCPs.<sup>287</sup> Yet, public participation of the kind demanded has yet to be made a component of HCP adaptive management implementation. The pressure for more public input on this and other aspects of HCP

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284. See, e.g., HOOD, *supra* note 283, at 59–61, 80–81 (summarizing the Defenders of Wildlife’s critique of the HCP program).

285. *Id.* at 41; see also Holly Doremus, *Preserving Citizen Participation in the Era of Reinvention: The Endangered Species Act Example*, 25 *ECOLOGY L.Q.* 707, 712–15 (1999) (examining the growing tension between the HCP and other ESA reform programs and public participation values).

286. For an example, see *Center for Biological Diversity v. U.S. Fish and Wildlife Service*, 202 F. Supp. 2d 594 (W.D. Tex. 2002). This case involved a dispute between plaintiff Center for Biological Diversity environmental group and defendant-intervener La Cantera, a commercial development company, regarding 750 acres of land in Bexar County, Texas. *Id.* at 597. The FWS issued an Incidental Take Permit to La Cantera, and the plaintiff challenged virtually every aspect of the permit, including the adequacy of the adaptive management provisions, but lost on every claim notwithstanding the court’s expressed aversion to allowing development in habitat of endangered species. The court’s discussion of the adaptive management provisions emphasized the comprehensive and detailed nature of the monitoring and response protocols. See *id.* at 616. Seven years later, after reviewing an annual report the court required to be filed each year describing management actions under the permit, the court issued an order congratulating the permittee and agency “for coming to this positive result and a fine example of corporate citizenship.” *Ctr. for Biological Diversity v. U.S. Fish & Wildlife Serv.*, No. SA-01-CA-1139-FB (W.D. Tex. May 5, 2009) (order acknowledging annual report on file with author). In the interest of full disclosure, Professor Ruhl served as a consultant to the HCP applicant in the case.

287. See U.S. DEPT OF THE INTERIOR ET AL., *DESIGNING MONITORING PROGRAMS IN AN ADAPTIVE MANAGEMENT CONTEXT FOR REGIONAL MULTIPLE SPECIES CONSERVATION PLANS* 10–40 (2004), available at <http://www.dfg.ca.gov/habcon/nccp/publications.html>.

permits thus continues to build.<sup>288</sup> We expect similar issues to develop in other permitting and approval programs using adaptive management.<sup>289</sup>

Neither the regulated industry certainty nor the public participation concern has surfaced in claims brought against adaptive management in the courts to date, and no court has expressed concern in either respect *sua sponte*. This probably is due more to the hybrid nature of a/m-lite than it is to the underlying justifications for the respective concerns. Agencies practicing a/m-lite do so against the context of conventional natural resources management laws, which tend not to specify conditions for regulated party certainty and which prescribe fairly minimal public participation in the form of notice and comment. So long as an agency satisfies the black-letter requirements of statutes in these respects, courts are unlikely to nullify use of a/m-lite on these grounds. By the same token, however, the black-letter law also constrains how far agencies can go with a/m-lite, as truly iterative “learning while doing” may at some point run afoul of permitting procedures and criteria, as well as the demands of public notice and comment. Our message to agencies in this respect is not to take the absence of these concerns registering in the case law to date as evidence that there is no limit to how far agencies can implement a/m-lite without regard to regulated industry and public interests. Stretch it too far in either respect and the lawsuits are sure to come.

#### B. LESSONS FOR CONGRESS

Even if agencies follow the lessons we have extracted from the existing adaptive management case law, which we believe would reduce adverse judicial reaction, the most they could hope for is to be able to implement a disciplined form of a/m-lite. The courts cannot provide the funding necessary to support true “learning while doing,” and neither can they supply more authority or clearer standards than exist in existing statutory text. Only Congress can let agencies break out of the a/m-lite mold without fear of public, industry, and judicial push-

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288. For a recent evaluation of the HCP program, including a proposal for more public participation, see David Dana, *Reforming Section 10 and the Habitat Conservation Program* 12–17 (Nw. Univ. School of Law & Econ., Working Paper No. 09-44), available at <http://papers.ssrn.com/abstract=1519515>.

289. For example, the public participation issue confronted the NEPA Task Force as well. See NEPA TASK FORCE, *supra* note 249, at 51.

back. Of course, Congress is not bound to follow the lead the courts have given agencies, but we believe Congress would be well advised to codify judicial guideposts for determining when the practical demands on adaptive management warrant departure from the pristine theory and when, on the other hand, the agencies have given themselves too long a leash.

On the funding question, it is time for Congress to consider supporting adaptive management plans through the purchase of annuities that would ensure a steady stream of subsequent funding for the development of management experiments, monitoring, and revision.<sup>290</sup> Current appropriation practice, which provides most funding for the first stage of planning and not for the subsequent iterations, is inadequate to reap significant benefits from adaptive management. Prior efforts, most notably through the Forest and Rangeland Renewable Resources Planning Act of 1974,<sup>291</sup> failed in disciplining Congress to make strategic investments in resource management.<sup>292</sup> The 1974 statute established an elaborate planning regime which viewed forests as capital assets requiring reliable future funding to maintain their value. It required an annual “Statement of Reasons” from the President explaining deviations of proposed budgets from the needed funds projected in long-term plans, but both branches ignored the well-intentioned legislation.<sup>293</sup> Creating endowments or purchasing annuities are more concrete assurances of follow-through and deserve further exploration. This would be a timely project as Congress considers climate change legislation that may provide new revenues from sales of emission allowances.<sup>294</sup> In the absence of congressional

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290. Examples abound of agencies unable to afford the monitoring described in adaptive plans. A common scenario is national forests unable to fund the monitoring of indicator species populations identified in forest plans. *See, e.g.*, *Lands Council v. McNair*, 537 F.3d 981, 999–1001, 1000 n.12 (9th Cir. 2008); *Utah Env'tl. Cong. v. Bosworth*, 439 F.3d 1184, 1190–97 (10th Cir. 2006); *Sierra Club v. Martin*, 168 F.3d 1, 3–8 (11th Cir. 1999); *Inland Empire Pub. Lands Council v. U.S. Forest Serv.*, 88 F.3d 754, 763–65 (9th Cir. 1996); *see also W. Watersheds Project v. U.S. Forest Serv.*, No. CV-05-189-E-BLW, 2006 WL 292010, at \*4–8 (D. Idaho 2006) (identifying inadequate funding for the Forest Service to apply forest plan standards relating to grazing suitability using on-the-ground studies).

291. 16 U.S.C. §§ 1601–1613 (2006).

292. *See Nat'l Wildlife Fed'n v. United States*, 626 F.2d 917, 919–20 (D.C. Cir. 1980); GEORGE C. COGGINS ET AL., *FEDERAL PUBLIC LAND AND RESOURCES LAW* 690 (6th ed. 2007).

293. COGGINS ET AL., *supra* note 292, at 690.

294. *See Glicksman, supra* note 4, at 873. The leading bills in both the House and Senate provide substantial funding for natural resource conservation.

action, agencies should at least use NEPA to disclose funding needs for adaptive management and the environmental effects that would result from failure to find the means for implementation of monitoring, mitigation, or adjustment.<sup>295</sup>

In addition to reforming the appropriations process, Congress could substantially improve the practice of adaptive management in natural resource administration. It is possible to establish clearer standards to ensure that an agency purporting to employ adaptive management actually does an adequate job. Congress should explicitly require adaptive management plans to (1) clearly articulate measurable goals, (2) identify testable hypotheses (or some other method of structured learning from conceptual models), and (3) state exactly what criteria should apply in evaluating the management experiments. These requirements would address the vast majority of nonbudgetary problems with a/m-lite. With explicit learning goals and established measures of success, agencies could retain discretion to adjust their decisions while offering far greater assurances to stakeholders.

Assuring future funding and requiring that the experimental elements of adaptive management be more precisely defined would address both the disparities we noted at the beginning of Part II.C. of this Article. These elements would provide judicially enforceable benchmarks for oversight of natural resources planning and management. They would also rein in the a/m-lite practices that currently serve as open-ended contingency planning by ensuring that all adaptive management plans get the benefit of the scientific method to guide future iterations. In narrowing the disparities, they would wring more benefits from adaptive management by reducing uncertainty as plans move forward.<sup>296</sup> True, adaptive management in practice would remain a somewhat grotesque hybrid of conservation policy's complexity theory and modern administrative law's approach to pluralism and finality. But it would likely achieve more of the benefits we wish to extract from ecosystems with less rancor.

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Clean Energy Jobs and American Power Act, S. 1733, 111th Cong. (2009); American Clean Energy and Security Act of 2009, H.R. 2454, 111th Cong. (2009).

295. See Memorandum from Nancy H. Sutley, *supra* note 227, at 4 (recommending disclosure of these needs and effects relating to mitigation); *id.* at 7 (citing U.S. Army NEPA regulations assuring effective mitigation by barring actions until mitigation measures are fully funded or until lack of funding is addressed in the NEPA analysis, 32 C.F.R. § 651.15(a)(5)(d)).

296. Doremus, *supra* note 1, at 569.

The federal government has noted that “[c]limate change creates new situations of added complexity for which an adaptive management approach may be the only way to take management action today while allowing for increased understanding and refinement tomorrow.”<sup>297</sup> Commentators agree, and there are currently no viable alternative approaches to respond to the increased uncertainties surrounding conservation.<sup>298</sup> Therefore, the stakes are high for public agencies to refine their approach to adaptive management in light of the lessons from the first generation of litigation.

### CONCLUSION

Our review of the first generation of adaptive management litigation provides more than an analysis of how the law applies or the reaction of the judiciary. It also opens a window into the actual practices that agencies have justified under the title adaptive management. Not surprisingly, implementation fails to mirror the finely wrought theory of adaptive management. The litigation reflects the practical and political compromises agencies make, whether applying adaptive management or any other model of natural resources management decisionmaking. It highlights how rarely real learning and reduced uncertainty result, and how haphazardly they feed back into agency programs. But it also points the way toward improved implementation and legislative reform.

The next round of lawsuits over adaptive management will likely focus on how well the procedures developed in large-scale plans have fulfilled their promise. Only the NWFP is old enough to have experienced much second-generation litigation. However, agencies should prepare by being careful about what they promise. The temptation to defer difficult and costly analysis, or punt on politically controversial decisions, may create problems for agencies down the line. What might have been a routine implementation project may explode into an expensive, complex task if the initial a/m-lite failed to commit to a course of action, applied only vague criteria for evaluating actions, or deferred substantial analysis of site-specific effects.

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297. JILL S. BARON ET AL., PRELIMINARY REVIEW OF ADAPTATION OPTIONS FOR CLIMATE-SENSITIVE ECOSYSTEMS AND RESOURCES 25 (Susan Herrod Julius & Jordan M. West eds., 2008), available at <http://www.climate-science.gov/Library/sap/sap4-4/final-report/#finalreport>.

298. See Glicksman, *supra* note 4, at 871.

One must wonder, however, about how much time we have for lessons to come out of the second generation of adaptive management litigation. The pressure on Congress, agencies, the courts, and all natural resources policy stakeholders to further refine, implement, and work within a regime of adaptive management is not about to let up. There is widespread agreement, for example, that the effects of climate change on natural resources will be complex, dynamic, nonlinear, and frequently unpredictable over anything but short time frames, all of which are conditions that demand adaptive management responses.<sup>299</sup> Yet, although the first generation of litigation seems to have laid down some important foundational lessons for this effort, doing so took a span of roughly fifteen years. Adaptive management litigation now risks getting down in the weeds, so to speak, and must avoid letting the perfect be the enemy of the good at a time when decisive action is needed. Our assessment of adaptive management in the courts suggests there is a good model in place. If agencies follow it and courts enforce it faithfully, it may serve as a potent component of climate change policy notwithstanding its flaws.

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299. See Camacho, *supra* note 138, at 64 (calling for “an adaptive methodology for assessing and adjusting government decision making over time”); Robin Kundis Craig, “Stationarity Is Dead”—*Long Live Transformation: Five Principles for Climate Change Adaptation Law*, 34 HARV. ENVTL. L. REV. 9, 65–67 (2010) (“Be serious about using adaptive management—and change both natural resources and administrative laws to allow for it.”); Glicksman, *supra* note 4, at 868 (“The land management agencies, in the planning process as well as in other contexts, must *rely heavily* on the management technique known as *adaptive management*.”); J.B. Ruhl, *Climate Change Adaptation and the Structural Transformation of Environmental Law*, 40 ENVTL. L. 363, 416–23 (2010) (discussing greater need for adaptive management to implement climate change adaptation policy). Experts from environmental organizations, such as the Environmental Law Institute’s Carl Bruch, concur in the important role adaptive management will play in climate change policy. See Carl Bruch, *The End of Equilibrium*, ENVTL. F., Sept.–Oct. 2008, at 30, 32 (“Incorporating adaptive management into laws and institutions can enhance the capacity of governance systems and ecosystems to adapt to changing climactic conditions, to develop and deploy new technologies and techniques.”).