

COMPETITION FOR COMMON PROPERTY SPACE: NEW HAMPSHIRE'S RECREATIONAL FISHERS AND OPEN OCEAN AQUACULTURE DEVELOPMENT

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Abstract: This paper examines the opinions and attitudes of New Hampshire saltwater recreational fishers regarding regulating public access to common property for proposed aquaculture development. Using data collected from in-depth, semi-structured interviews with 16 recreational fishers, I describe the fishers' current perceptions of crowding and spatial conflicts, their methods of adapting to the spatial pressures put on the commons, and their attitudes toward open ocean access and public management issues. I argue that it is the social context of informal rules on the water and the fisher's perceptions of how well these informal procedures are working, coupled with their personal strategies for managing spatial conflict, that shape their attitudes about the future development and management of public ocean spaces.

Introduction

During the last decade, the decline of wild fish stocks has put increasing pressure on fish farming to meet the growing demand for seafood around the world. Aquaculture development often requires placing restrictions on public access to ocean waters where farming operations are constructed. How will current user groups respond to restrictions placed upon their activities when aquaculture is introduced? In this study, I examine the attitudes of one user group, recreational fishers, regarding the introduction of aquaculture to their waters. I argue that the degree to which recreational fishers currently perceive competition and crowding on the water, the degree to which existing informal rules for regulating common property use are working, and the degree to which the fishers' adaptive strategies for managing competition are successful are important factors shaping their attitudes about aquaculture development and open ocean access. These contextual factors are important for resource managers, planners, and water users to consider as they search for ways to meet the growing demand for fish products as wild fish stocks decline.

Declining Stocks, Aquaculture, and Common Property Issues

Wild fish stocks around the world are in trouble. "By recent U.N. estimates, a majority of marine fish stocks and all of the world's primary fishing grounds have reached peak production and are in decline" (McGinn 1998: 6-7). The capture fisheries that depend upon this resource have

been hit hard. Globally, catches have grown only 3% during the 1980s and only 1% during the 1990s (McGinn 1998). New England's fisheries have not been immune to the global decline in fish stocks. George's Bank was closed to fishing in 1994. Commercial groundfishing off Jeffrey's Ledge was closed during the mid 1990s. Most recently, in December of 1998, Maine's commercial fishers called for the closure of the Gulf of Maine.

Meanwhile, the world's growing appetite for fish has increased pressure on fish production. During the past decade, aquaculture has begun to fill the gap between increasing demand and diminished supply. Twenty percent of the fish consumed in 1995 were farm-raised as compared to eight percent in 1984 (McGinn 1998). Most of the world's aquaculture is done in freshwater, in tanks on land, and in protected bay areas. Open ocean aquaculture, the cultivation of certain fish species in containment structures in the open ocean away from the protection of land, is a relatively new development not widely in use. In New Hampshire, a project to test the feasibility of farming mussels and flounder in the open ocean is underway. The University of New Hampshire received funding from the U.S. Department of Commerce, through a special appropriation to the New Hampshire Sea Grant College Program, to develop an open ocean aquaculture demonstration project off the Isles of Shoals. The project will initially block off an area in the open ocean 74 meters by 332 meters for the aquaculture operation.

The blocking off of open ocean for a commercial aquaculture operation raises a number of issues. As McGinn points out, "the areas best suited for cultivating fish often coincide with ones already used by wild fish stocks" (1998:49). Not only does this create a potential problem for the wild fish stocks in the immediate area, it poses potential problems for the people who fish for those wild stocks. This, of course, includes commercial capture fishers, but it also impacts recreational fishers. Fishers, both commercial and recreational, have traditionally viewed the ocean as "common property," a communal resource to which they are entitled access. However, while viewing the open ocean as common property, fishers have also at times developed notions of territorial rights "even to the extent of outright private ownership claims, to valued fishing grounds, species, or techniques" (McCay and Acheson 1996:11). Common property has been seen by a number of scholars, most notably Garrett Hardin (1968), as problematic in that it leads to a "tragedy of the commons" in which self-interested actors exploit the common resource to the point that their collective actions cause the total depletion of the resource. Two methods for restraining the abuse of common property have been proffered by commons theorists: government regulation and privatization.

However, McCay and Acheson (1996) point out that the tragedy of the commons model does not recognize that property rights are social; property rights refer to relations among people. They argue that contextual factors such as notions of territorial rights and the "presence or absence of rules about uses of the commons, alternatives to

exploitation of common resources, [and] ways of monitoring and controlling the behavior of others” must be considered when examining common property activities and regulation (McCay and Acheson 1996:6). This means that understanding how New Hampshire fishers will think about and respond to future common property regulation depends, in part, on their current relationships with other common property users and the informal rules and strategies recreational fishers now use to monitor, control, and adapt to the behavior of competing users.

The Study

This paper examines the opinions and attitudes among New Hampshire saltwater recreational fishers regarding regulating public access to common property for proposed aquaculture development. Using data collected from in-depth, semi-structured interviews with 16 recreational fishers, I describe the fishers’ current perceptions of crowding and spatial conflicts, their methods of adapting to the spatial pressures put on the commons, and their attitudes toward open ocean access and public management issues. Data collection was conducted during November of 1998, by a team of graduate student researchers from the Sociology Department at UNH, funded by the Socioeconomic Component of the Open Ocean Aquaculture Demonstration Project, headed by Dr. Robert Robertson, UNH Department of Resource Economics and Development.

The topics discussed with the fishers in the interviews included their perceptions of how things have changed on the water, including the relationships between water users. They were also asked to comment on the proposed aquaculture site specifically and share their thoughts on ocean management generally, including who owns the ocean and how access should be regulated if and when the ocean off New Hampshire’s coast is developed. In this paper, I describe their current perceptions of crowding, their methods of adapting to the spatial pressures put on the commons, and their attitudes toward issues regarding open ocean access and public management that arise when sections of ocean are blocked off for commercial development.

I argue that some fishers have been little affected by conflicts over space and territory. The social context within which they consider future management of the commons is one where current informal procedures are working. This context shapes their attitudes toward future management issues and they are not overly concerned about regulation of the commons in the future. Other fishers have been directly affected by competition for common space, but have developed their own informal adaptive strategies to avoid conflict. They, too, believe that management of the commons will be worked out satisfactorily in the future. The last group of fishers have been bothered by spatial conflicts and have not developed satisfactory adaptive strategies. This group has more concerns about open ocean management, conflicts over usage of aquaculture sites, and public access to the commons.

Findings

The findings presented here provide demographic information on the fishers as well as a brief description of their fishing practices and territory. I then examine the relationship between the fishers’ perceptions of crowding and competition for space, their strategies for managing competition, and their attitudes about open ocean aquaculture development and future regulation of the ocean.

The Fishers and Their Practices

Our sample of 16 fishers included 14 men and two women. They ranged in age from 28 to 61. Most were in their 40s and 50s. They were a somewhat elite group of fishers. Most were educated, affluent, professionals who fished at least weekly. Some fished as often as daily during the summer months. They owned their own boats and fished in an area that reached from the Great Bay inland estuary out to Jeffrey’s Ledge in national waters, north into Maine and south into Massachusetts. All were familiar with the Isles of Shoals area six miles off the coast of New Hampshire where the proposed aquaculture site will be located. Their target species included tuna, lobster, mackerel, cod, haddock, and a variety of bait fish. However, the target species most often mentioned by these fishers was striped bass.

Striped bass have made a major comeback to New Hampshire waters in the past two or three years, after all but disappearing a few years ago. One of our fishers described the striped bass fishing in New Hampshire as “world class.” Almost all of the fishers mentioned a major increase in boat traffic and fishers on the water, especially since the striped bass have returned. Many attributed the increase to a combination of the striped bass fishery and an improved economy that has enabled more people to buy boats. The recent increase in boats and fishers competing for the same space on the ocean and surrounding tributaries is an important part of the context within which recreational fishers are experiencing and thinking about issues regarding access to the common property of the ocean.

Unaffected Users: “There’s plenty of space”

Seven of the recreational fishers interviewed did not perceive space to be an issue on the water. Although they mentioned the increase in boats and boat traffic, especially in the Piscataqua River, they did not discuss having conflicts over space. In some cases, this is because they have had positive, cooperative interactions on the water. Jill, a 51 year old lab manager, is an example of this type of fisher.¹ She has been fishing all of her life and has certainly noticed that there are more boats on the water. *The biggest difference is that there are a lot more boats out there than there used to be . . . and the very worst thing is these personal watercraft that make all the noise.* While

¹ Pseudonyms are used throughout this paper to protect the privacy of the people who graciously agreed to be interviewed.

Jill complains about the noise made by personal watercraft and says they disturb families that live on the ocean, she doesn't complain about them intruding upon recreational fishing space. Her encounters with other water uses have been positive. *I think that in general everyone's very friendly and they always wave and you always return the wave. I think that after all the hubbub on the roadway and driving and people cutting in front of you, it's kind of refreshing to have somebody wave to you.*

Joe, a 50 year old striped bass fisherman, held similar views. Although he, too, has noticed an increase in users, his interactions on the water have been fairly positive. He told about a trip to the Isles of Shoals to try out a new lure. The "magic" lure proved highly successful, so much so that fishers in nearby boats crowded around him to ask what he was using for tackle. He did not react in a competitive way, but rather was flattered by their interest and admiration, perhaps because his followers did not want his space, but instead wanted information about his tackle. In fact, he shared the information about his magic lure and later was amused to see that this lure disappeared from the shelves of local tackle shops during the next week. These two fishers have had positive interactions on the water and hold positive, cooperative attitudes towards others.

A couple other fishers in this group have seen other people get into conflicts over space, but don't perceive this to be much of a problem for themselves. When asked if there had been an increase in conflict since more people have gotten into the striped bass fishery, Danny replied, *No, it's pretty much stayed the same. I guess, you know, there might be some minor conflicts between, you know, "that's my spot, not your spot" sort of thing. But other than that, no.* He did not relate being personally affected by competition over space.

Others expressing little concern over spatial conflicts were those who employed specialized techniques that put them out of the way of competing fishers. Mark fishes primarily for ground fish, which few recreational fishers have competed for since the crash in ground fish stocks several years ago. Ground fishing takes him farther out into the ocean to Jeffrey's Ledge far beyond the range of striped bass fishers. He did mention that a lot of tuna fishers go out there, but he was fishing the bottom working the humps, not competing for the same water space as the tuna fishers. Similarly, Luke is a spear fisherman who dives in very shallow water, well away from the boat traffic. *There are definitely a lot more recreational power boats out there now and a lot more fishing boats, too. But it's really not bad around here . . . and we stay away from the boat traffic and that's not usually the best fishing spots anyway.*

Michael is primarily a fly fisherman. His technique keeps him somewhat protected from space competition. As a couple of our fishers commented, fly fishers are generally afforded more space and a courteous attitude. *The people that are heavy into fly fishing . . . come with an ethic and an understanding. That you give people a lot of room and a lot of respect. If it's fly fishermen, you're not supposed to be anywhere near 'em. And fly fishermen are much more*

composed about their behavior and give each other a lot more space. Michael was so unaffected by competition for space when fly fishing that he did not even mention the increase in boat traffic.

This group of fishers did not perceive conflict over space to be an important issue since they have been insulated from spatial competition either by virtue of the territory occupied by their target species and their specialized techniques, or by virtue of having had primarily positive encounters with others on the water. Among this group, even those who fish on weekends, the most crowded time, aren't concerned about space. As Joe put it, *There's plenty of space for recreational fishing.*

Their lack of personal concern over space on the water is reflected in their lack of concern about maintaining open ocean and assuring access to ocean space in the future when aquaculture development adds more users to the ocean. Most of the fishers in this group did not mention concern over the positioning of the proposed aquaculture site off the Isles of Shoals. Nor did they express concern about how access to open ocean spaces might be managed in the future. Some were wholeheartedly for aquaculture development, without reservation. Others had reservations, but not about space or access. For example, Jill mused, *There's just a tremendous amount of questions that need to be answered.* But for her those questions concerned long term effects on the ecology and economy and possible storm damage to the pens. Danny had similar concerns about environmental issues but not about space and access issues.

A few of these fishers did raise the question of controlling public access to commonly owned space, but they quickly resolved these issues as they continued to think out loud. Mark raised the issue by commenting, *Controlling access to the ocean, I think you're going to have a real uphill fight if you start saying, well, "You can't go to this area, you can't go to that area."* However, he concluded the interview by commenting, *The only other thing I can tell ya, you know, it's a pretty large ocean out there and certainly commercial fishing, recreational fishing and aquaculture—I see no reason why it can't all coexist.* In a similar line of thinking, Joe asked, *How could you privately own a piece of the ocean?* but in the same breath he continued, *I guess you could, but would you own the surface or the volume or the bottom and not the surface? Could you prevent people from traveling over the surface? Those are things, things to be answered, that's all.*

For this group, there are just some things to be answered, that's all. The unaffected users seem to have faith that issues regarding public space and open access can and will be worked out amicably, much like their current relationships on the water.

Adaptive Strategies: Finding "places where there are less and less boats"

Four of the fishers in this study did perceive problems with competition over space and territory, but had developed adaptive strategies that allowed them to continue fishing for

their target species without too much disruption. These fishers felt the pressure of competing for space, particularly in their "hot spots." Their adaptive strategies required that they do some things differently, perhaps find new territory or find ways to keep others from following them to their favorite spots. However, they did not perceive these changes as diminishing the enjoyment they get out of fishing.

Roy, a 44 year old who is relatively new to recreational fishing, felt enough pressure from competition over space and territory that *one year I took the name off the boat 'cause people were following me around.* Another problem he encountered was *all those racing boats in the river, cigarette boats. And they're just, you know, out of control. So a lot of people are moving out of the river. A lot of people fish at night. I don't—I usually fish low tide or the turn of the tide in the river. You have to fish when it's not the weekend. The weekends are horrible.* Roy is also very cagey about timing his trips to his favorite spots. *I might go out there for a whole day by myself and record the best time that I caught the most fish. And then when I go back, I could be near my hot spot, but I won't go there until I'm ready because it'll attract other boats.* He also fishes spots where other boats won't go. *There's quite a bit of traffic. But a lot of the boats are larger and I like to fish right in on top of the rocks and most people wouldn't be that crazy.*

Another fisher, Rob, told how space negotiation is supposed to work when conditions get crowded. *When it gets like that why then you, you get used to fishing tighter to your boat. You've got to keep the space. You know, it's no problem—well, normally what happens, you do what's called drift fishing. You get in a drift, you drift over a certain area, you take your boat up and around, get back on top of your drift and drift right down it. So while you're going down, another guy's coming in behind you and another guy comes in behind him. And it's just a real friendly chain.* However, conflicts still erupt as he went on to explain. *I went to my favorite spot and there was four other boats there . . . and this guy, I pulled right in behind the drift on him . . . Well he didn't like that. He thought I was too close. He started swearing at me that I was in his space. "Get out of here." And I'm like, "Look you just keep to yourself; I'm not moving."* Problems like this have made Rob adopt a secretive strategy about his fishing. When asked by the interviewer where he goes fishing, he replied, *Do I have to divulge where I fish?* He went on to explain that *it's rare that you find fishermen sharing information.* He referred several times to his "secret spots." However, his strategy changes when he encounters commercial fishers. He defers to lobstermen and to charter fishing boats on the water. With these users, he shares information to build cooperative relationships. He'll tell the small charter boats that come close to him that he is putting chum in the water to draw fish so they will stick around and the two boats can fish amicably side by side. *"So they start recognizing you, if you're, you know, fishing the same spots . . . and they'll start turning you on to little tricks here and there."*

Paul, a 52 year old who fishes frequently, described a huge increase in boats and fishers on local waters. This has made some fishing trips problematic for him, too. *On weekends, you know, it just doesn't work out very well. I'm not going to take—go to a spot that I know there's a lot of fish and show four or five other boats that are following me that spot. A day that would not be so good fishing wise, I would say that would be like a Sunday. There's a tremendous amount of people, a lot of boat wakes.* The crowding has led to altercations. *A boat [will] come along trolling and come right between you and the rock where there's almost—I mean, it's tough to fit . . . And then he'll go by and then I'll say something to the effect like, "Geez, I'm chumming here, I'd appreciate it if you'd just troll somewhere else."* And then immediately they would be, you know, *"You don't own the ocean."* In spite of occasional scrapes, Paul has found ways to adapt. *I keep going farther afield to find places where there are less and less boats . . . I go early in the morning or the evening or when there's less boats around. Go somewhere else. They may catch up with me eventually, I mean there may be enough boats that I can't find spots all by myself. But so far that's, you know, I've been okay.*

Larry, a 50 year old who's been fishing since he was a young boy, also discussed being impacted by other users competing for space on the water. He related the following incident: *We were fishing in this one quiet area and the jet skis came right over and started zipping around in circles around us. So I actually fired up my boat and went after them.* He, too, has developed adaptive strategies to avoid such encounters now. *That's why I go early, so essentially I'm . . . if I go at 5 in the morning or 4:30, by 9:30 I'm ready to come back to the dock. And that's when people are just putting their boats in.*

These fishers have all been bothered by crowding and disputes over space. Yet, they have found ways to adapt their fishing so that they can avoid continuing conflicts over space. These adaptations have required changes in their routines or territory, but the changes have allowed them to continue fishing for their favorite species without sacrificing the pleasure they derive from fishing. Their ability to positively adapt to crowded conditions is echoed in their optimistic stance toward open access to common property and spatial competition. Indeed, Larry's response was similar to the unaffected users. His concerns were with environmental problems; he didn't bring up potential space conflicts or access issues.

Rob expressed more sensitivity to space and access issues in his responses. However, Rob seemed to appreciate the careful selection of the proposed aquaculture site. *That's a big flat area . . . I never would think of fishing there . . . I mean I can see what they're looking for.* He continued to discuss the site and raised the issue of expansion plans. *If they ever wanted to expand on this site—was one of the questions I was going to ask. I mean, you know, obviously if this is successful they're gonna want to expand.* However, Rob's question about expansion was not to express a concern about limited access in the future, but to express a hope. *But in any farm, you know, the bigger the*

farm the more you produce. All the more people that can live off the production of that . . . which I hope is what the goal of this is. Rob was clearly not worried about losing access to open ocean or competing over ocean space; indeed he hopes the space will be commercially developed.

Roy explicitly expressed the adaptive view. He raised some concern about maintaining access to his favorite spots, *but*, he concluded, *there's enough places to fish.* He expanded on this theme in his observation that *There's so much undeveloped fishing area that if a few people are affected by this, they will figure out where else to fish.* He concluded the interview by saying that the ocean is pretty big and there's room enough out there for everybody.

While somewhat more sensitive to potential conflict over space and public access to commonly owned waters, this group expressed optimism that such issues could be worked out, even if it required some adaptation on the part of recreational fishers. However, among this group, Paul was more concerned than the rest about potential conflict over space and access issues arising as aquaculture is developed. He thought that with *the amount of usage that there is now, I don't see any new use coming in that wouldn't compete. Now if something could be done where it wasn't competing with existing users . . . that's fine. But I don't see . . . it would be very difficult to have a fish pen or something that's gonna use habitat that is now being used by other user groups . . . even out in the ocean, you know, I see that that's going to be a problem 'til you get pretty far off shore. I see some potential conflicts there 'cause it's so much usage.* Finally he raises the question, *Who gets to determine who gets to use those waters? I think the public should be making those types of decisions.* Still, Paul thinks development of aquaculture sites is *a great idea if it can be done accommodating the existing user groups.* Paul may have been more sensitized to public access issues and competition for open water than his fellow adaptive fishers because he sits on several recreational fishing advisory boards and commissions and describes his role as being a voice for both recreational and commercial fishermen. It is likely that in this role Paul has been a sounding board for the concerns of other fishers like the next group of fishers who have not been able to adapt successfully to crowded conditions.

Without a Workable Strategy: "You're on my spot."

Five of the fishers interviewed had not developed an adaptive strategy that allowed them to continue fishing for favorite species or in ways that provided the same pleasure. While all continue to fish, they expressed deeper frustration over space conflicts on the water than did the fishers with adaptive strategies. Some of the fishers who did not develop a workable strategy have had to give up fishing for certain species or in certain ways.

Jake, who enjoys the peace and quiet of fishing, used to fish for tuna recreationally. When the price of tuna rose and more people got into tuna fishing, Jake found he simply couldn't enjoy the experience any longer. *That's why I gave up tuna fishing. There was no tranquility any more. No solitude. To go offshore and find yourself fishing*

in like 250 boats. So I gave that up. He went on to explain what it was like out there. *Oh it's the crowdedness . . . people staking claims. And I understand that there were yelling matches and fist fights and everything else about fishing on spots, "You're on my spot." It's like a stake of claim on an 80 mile stretch of the Atlantic Ocean. Did somebody deed that spot to somebody? I don't need to go out and argue with people when I'm out with the intention of having a good time.*

Dave, a commercial fisher, also used to fish for tuna recreationally in his off season. He, too, found that crowding made tuna fishing unenjoyable. He described the problems created by lack of space in the tuna fishery. *Each one has their own anchor. And you know they'll chum and if they hook up and you know a tuna fish is on, has bit the hook, then the first thing they have to do is cast off their mooring. Because if they try to play the fish while they're still anchored to the moorin', the fish will spit the hook or haul it out. So you have to cast off and let the tuna fish tow you around. And, of course, the fish doesn't know one anchor rope from another, so lots of times it will get all weaved amongst the . . . Oh, it's a hell of a mess. I very seldom go tuna fishing anymore. That's why, because it's, you know, it's just a snarl, that's all.*

Rick, a 61 one year old fisher, gave up fishing one summer when he was particularly troubled by boats following him around. *I changed boats twice 'cause guys were chasing me all over the place. I got aggravated. I just quit. I quit fishing. I'd come in, dump my live wells and come in. I said, Hell, I don't need this. I myself got into arguments over mackerel for cryin' out loud. Right outside the mouth of the harbor for bait. "You're too close to me, get the hell outta here." I just said when you can't have fun fishing you may as well quit.*

Reed has not given up fishing, but he talks with frustration about how difficult fishing has become in some of his favorite places. *There are so many boats anchored on the Maine and New Hampshire shore in the Piscataqua River that it's difficult to stop and anchor and fish. Or difficult to troll or whatever. Because there's just, just about every place that there's calm water there are buoys floating around with great big yachts tied to them or whatever. And some of those were pretty good fishing places, but you just can't go there anymore because it's all loaded with boats.*

Tricia, an avid tournament competitor, also feels frustrated with conflicts over space and has found no way to adapt. *We've had situations happen where we're catching say bait fish and other people can't catch it, so they pull their boat up next to yours, literally . . . I've had guys throw their lines into our boat. Now that's a little absurd, you know? And occasionally you have a run-in with a lobsterman who says, that claims, they own the ocean and you're not supposed to be there. Some of them think they own it, you know. Well, they don't, so too bad.* Tricia has tried to find new places to fish, but her strategy is no longer working. She seems resigned to the situation. *I mean you used to be able to go to certain areas and fish and know that no one*

would be there. There's no place now. They're everywhere.

This group of fishers has felt the competition for space on the water more keenly since they have been unable to find adaptive strategies that enable them to manage spatial conflicts while preserving the elements of fishing that they enjoy. It is probably no surprise that they also express more concern over space and access issues relating to the proposed aquaculture site and future aquaculture development.

Dave, the commercial fisherman, expressed concern over the heavy usage that already exists around the proposed site, including *offshore lobster boats coming and going . . . draggers coming and going . . . purse seiners coming and going, cruise ships going back and forth. Whale watching boats, oil tankers, tugs towing barges.* He thought there was some possibility that disgruntled commercial fishers would cut the anchor lines on the aquaculture pens if access to their fishing bottom was being blocked off.

Jake expressed a very similar opinion. *If there was going to be 300 boats fishing at the Isles of Shoals and you locked them out of a certain area, you'd probably have some problems keeping those buoys in place.* Jake went further to say that he personally would have problems if the area was blocked off to transit fishermen. *Well I don't agree with that. They should find a place that's less populated.* He is uncertain how public access and rights issues could be worked out, saying, *Nobody owns it. There's no boundaries. No stone walls to say "You own this side, I own that side." I'm not sure how that should be dealt with.*

Tricia was also concerned with the issue of public ownership rights, particularly over when and how state, federal, and international jurisdictions would come into play to confuse matters. *I mean are they leasing out something that doesn't belong to you? Can any Joe Blow go set up a mussel farm if he wants?*

Reed comes right out to say that competition over the space would be a definite downside to the project. He, too, raises the issue of who owns the ocean and who should have a say in open ocean space and access issues. *Well we already as U.S. citizens collectively own so far offshore right? And as New Hampshire citizens collectively I believe own offshore, off our state coast. I think it should be managed for all of us. Even the people who don't utilize it should have some input. And I believe the people from inland should be able to say, "There should be open space in the ocean," or "They shouldn't be doing this or they shouldn't be doing that."*

This group of fishers who have been sensitized to space conflicts on the water and have been unable to adapt and resolve those conflicts in a satisfying manner seem less certain that new spatial conflicts raised by future aquaculture development can be resolved. They also talk

more about questions of public ownership and who should have a say about usage of and access to common property. Reed even asserts that inland non-users are common owners who should have a say in ocean management issues. This group has a heightened awareness to these issues and more uncertainty about if and how these issues can and should be resolved. While they may express positive opinions about aquaculture in general, they have some real concerns about another user group gaining access to common space, especially a user group that would bring with it precedents and procedures for fencing off open space and limiting free access to common property.

Conclusion

As aquaculture continues to expand to fill the gap between declining wild fish stocks and increased demand for fish products, issues regarding public access to common ocean property will arise with more frequency. It is too simplistic to expect any group of users to have similar attitudes about public access to common property based on their group interests. This study suggests that interests toward the commons are mediated by the social context within which any user encounters the commons. Current usage of the commons, existing relationships among users, and the effectiveness of informal common property management techniques are an important backdrop against which to consider how individuals will perceive the regulation of common property.

For most of this small group of recreational fishers who ply New Hampshire's coast, the informal monitoring and management mechanisms for controlling who has access to certain spots and how people should behave toward each other seem to be working. They appear to have confidence in both government and individuals' abilities to continue to work out space and access issues amicably and equitably. However, fishers who find that current informal systems of regulation are not working well and who have been unable to adapt satisfactorily to increased competition for common space are more skeptical about successfully regulating access and space issues in the commons when pressure continues to mount from competing uses and users in the future.

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USE OF QUALITATIVE DATA ANALYSIS TO DEMONSTRATE THREE APPROACHES TAKEN BY NEW HAMPSHIRE RECREATIONAL FISHERS TOWARD OPEN OCEAN AQUACULTURE DEVELOPMENT

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Abstract: This paper demonstrates three approaches taken by New Hampshire recreational fishers towards a nearby open ocean aquaculture project at the Isles of Shoals—a favorite fishing area. This in-depth qualitative study was a student designed class project affiliated with one part of the Socioeconomic Component of the Open Ocean Aquaculture Demonstration Project, headed by Dr. Robertson of the UNH Department of Resource Economics and Development. Our primary aim was to assess how the fishers in our sample felt about aquaculture in general as well as how they felt about the particular nearby demonstration project. With the use of a qualitative research tool, we were able to gain a rich sense of what determined their opinions about local aquaculture development. I argue that these fishers' opinions vary by their feelings about the decline of fish stocks and whether or not they hold commercial fishers responsible. In particular, those who are most angry about their belief that commercial fisheries are destroying the ocean's resources are most apt to be in favor of the project and those who are the least upset about commercial fisheries are least apt to be in favor of the project.

Introduction

The majority of the most valuable marine fisheries around the world are on the brink of destruction as a consequence of excessive over fishing and other abuses of the world's oceans. According to the U. N. Food and Agriculture Organization (FAO), nearly all of the world's most important fishing areas and more than half of the major fish species are in decline. It is not readily apparent to the average consumer however, that the world's fish supply is on the verge of collapse, due in large part to the continued increase in aquaculture, or farmed fish production. Fishers and suppliers are increasingly looking to aquaculture to help meet global demands as a result of this decline in natural fisheries in addition to swelling global populations and rising human demand for fish. In 1995, roughly 20 percent of all fish consumed in the world were farm raised, compared to 8 percent in 1984. Aquaculture, if it is done in an environmentally conscious manner, can offer considerable resource benefits over marine fishing. It can help to meet global nutritional needs without depleting natural fish stocks. However, before aquaculture is looked to as a panacea for the world's marine fishery crisis, it must

be remembered that like everything else, it too can be abused and we must proceed with caution (McGinn, 1998).

The future development of sustainable aquaculture will rest on maximizing its production efficiency, assuring product quality and safety, while simultaneously improving its environmental compatibility. At present, the United States plays a small part in the world's farmed fish production, but has the potential to become a world leader by effectively utilizing science and technology in the process of developing a sustainable and competitive industry. Complex questions arise with this development however, such as: How will sustainable aquaculture be developed, who will benefit from the new technologies, and what are the environmental and social impacts (Keeler, 1998)?

The University of New Hampshire is currently involved in an offshore marine aquaculture demonstration project, as a necessary intermediate step between development and commercial application, in order to answer questions such as these. U.S. Senator Judd Greg, at a check presentation for the development of this project on December 3, 1997, announced that, "*Aquaculture will play an increasingly important role in meeting the global demand for fisheries products as the world population continues to expand and fish stocks approach their biological limits. Aquaculture will also contribute to economic and community development, particularly in areas like New England, where wild capture fisheries are experiencing a crisis of unparalleled proportions. It is extremely important for folks in New Hampshire to understand the importance of the ocean and coastal science research that is taking place at the University. I support the aquaculture project because it will blend the concerns of coastal communities, entrepreneurs, and UNH scientists. I see this as seed money for the creation of a new industry, with New Hampshire at the helm* (press release)" As Senator Gregg alludes to in his announcement, the support of the coastal community is a necessary component for the success of this project. Do folks in New Hampshire understand the importance of the ocean and coastal science research? To what extent are folks aware of aquaculture? What do they think about it? How do they think this project will affect them and others in their community? This paper is written to discuss a small piece of this project that was designed to look at the social dimensions of fishing and aquaculture in order to assess what some of the "concerns of the coastal communities" may in fact be.

Research Project

This study of New Hampshire Recreational Fishermen was begun as a class project affiliated with UNH Resource and Economics Development Professor Rob Robertson's larger study of Northern New England's Commercial Fishermen. The project was student designed and implemented with the guidance of Professor Robertson, along with our Qualitative Methods Class Professor, Mil Duncan. It was an in depth study of 16 fishers from the area. While our primary aim was to assess how the fishers in our sample felt about aquaculture, we, as sociologists, were interested in *why* these fishers may have these opinions. That is, in

what ways did these fishers' opinions vary by their social contexts? As qualitative researchers in particular, we were looking for the nuances of how they think and a richer sense of what goes into their answers than can be derived from survey data. Hence, we designed an interview guide that would enable us to understand who these people are so as to contextualize their aquaculture opinions. We asked open ended questions about their family backgrounds, their fishing backgrounds, what they liked and didn't like about fishing, what motivated them to get up in the morning and go fishing, changes they'd experienced over their years fishing, where they get their information on fishing, their feelings about fishing regulations and ocean management issues, and finally, what did they know about aquaculture, how did they feel about it, and how might they feel about a nearby open ocean aquaculture project at the Isles of Shoals? What we received in return was a very rich sense of who these fishers are.

Sample

There were fourteen men and two women. They range in age from twenty-eight to sixty-one, although most of them are in their forties and fifties. Their years of fishing experience range from four to sixty years, though most of them have between twenty and forty-five years of experience. They are all boat owners whose boats range from sixteen to thirty-two feet in length. This is evenly split between over and under twenty feet. More than half of the respondents are college educated. Approximately half of the sample are from blue-collar backgrounds. Income ranges are from \$20,000 to over \$50,000 per year. Most respondents are married, two are single, and three are divorced. The majority have children; many of them grown. Nearly all began fishing as children with their fathers, but a few were introduced to fishing by friends. All but a few of the fishers fish for striped bass in addition to other species such as cod, tuna, blue fish, mackerel, and flounder. They use a variety of fishing techniques, from fly-fishing to spear fishing. The range of fishing frequency or rather, how often they fish, is from 12 times a year to daily, depending on the season. Reasons for fishing include: being outdoors, solitude, fun, the challenge, adventure, relaxation, personal competition, excitement, and romance. They are not a particularly political group, although most vote in presidential elections. A few are involved in fishing organizations.

Clearly, this is a fairly homogeneous group. In sorting through the data, it became apparent that there were no obvious patterns between variables such as age, income level, years of fishing experience, family backgrounds, fishing techniques, education, or motivation and opinions about regulations, ocean management issues, and aquaculture. After extensive sorting however, I did finally discover some patterns regarding fishers' aquaculture opinions in general as well as their feelings about the Isles of Shoals project in particular. This paper will focus specifically on my interpretation of the patterns I discovered.

Findings

Surprisingly, everyone was aware of aquaculture in some capacity. Most everyone knew about farm raised salmon and there were several others who were aware of mussels, clams, and oysters. A few people mentioned cod, catfish, sea bass and tilapia. People's level of awareness ranged from, "[they had] heard about it, not much else," to, "[they had] seen several operations." A majority of the group had eaten farm raised salmon, mussels, or sea bass. Many of the fishers spoke about what a sensible idea it is to raise fish and how good it is. One fisher commented about all the farm raised sea bass that was available in local restaurants when he was vacationing abroad. When asked if he'd tried any, he answered, "Oh yeah, I ate a lot of it. It was delicious." Another fisher said, "Farm raised salmon is the best. It's better than the stuff in the ocean because it's cultivated. It's terrible to say, but they know what they're feeding it. The meat's good."

In a different vein, several fishers responded, to what they perceive as over fishing by commercial fishermen and the depletion of fish stocks. Many believe that aquaculture may actually be a necessity due to the depletion of fish. As one fisher put it, "What do I think about aquaculture? I guess it's a necessary thing. Because human beings want to eat fish, and we're wiping out all the fish stocks all over the world." This general idea was repeated quite often. One fisher said that he is absolutely in favor of aquaculture as he sees it as something that would help to ensure that we don't continue to abuse the ocean. Others view aquaculture as a "step in the right direction"; a necessary step "that will take the pressure off of the fish resources." Stemming from these feelings was the idea that aquaculture is the "wave of the future." This phrase was used by a couple of respondents. Some pointed out that there is a growing population and aquaculture will provide a needed food source. One fisher said, "[We're] only going to bring [fish] stocks up so much. The population is growing. At what point do we have to start substituting stuff in like aquaculture?"

In addition to the benefit of aquaculture providing a needed food source for feeding the population in the future, several respondents believe that aquaculture will provide jobs and business opportunities. As one fisher put it, "[Aquaculture] seems to work. It seems to be a good way for people to make a living and provide a product that people use. I think it serves very good purposes." And another said, "Well, you're gonna create some jobs, which the fishermen need—these commercial fishermen that are slowly growing out of their work. You're going to create seafood that we have a need for. So those are both very positive. From that standpoint, it's great." Overall, the response to the concept of aquaculture in general was overwhelmingly positive.

Upon broaching the idea of open ocean aquaculture—specifically, the Isles of Shoals project, which is getting underway—the fishers responded differently. Whereas, prior to introducing the specific project, responses were pretty similar from each of the fishers, now, they seemed to

vary. In fact, there seem to be three fairly distinct approaches taken by these fishers in response to the Isles of Shoals project. I will refer to these three approaches as the conflict approach, the NIMBY (Not In My Backyard) approach, and the negotiating approach. The conflict approach, taken by several fishers, is the tendency to see aquaculture as a way of solving, what they consider to be the problem of exploiting the natural fish resources by big commercial fisheries. The NIMBY approach, also taken by several fishers, is the response to aquaculture in general as favorable, but the response to the Isles of Shoals project specifically, is not. Finally, the negotiating approach taken by several other fishers is the tendency to be in favor of the Isles of Shoals project, contingent upon certain conditions.

First, I will begin with the conflict approach taken by roughly a third of the respondents. As noted above, these fishers tend to see open ocean aquaculture as a solution to the problem of exploitation of natural marine resources by commercial fishers. They believe that big commercial fisheries are taking unfair advantage of their positions by stripping the ocean of its resources for their own gain, with no thought to the havoc being wreaked. Many of these fishers were particularly vehement in their denunciation of commercial fishers, and are as apt to blame individual fishers as industries. Some describe commercial fishers as “nasty” and “cut throat.” Luke (pseudonyms used for all fishers) is perhaps one of the most outspoken on this issue. Very early into the interview, while discussing his early fishing experiences, he brought up the issue of draggers and over fishing. He said, “*There aren't any bottom fish now because of the draggers and the over fishing...You know how a dragger works? It scares up all the bottom fish and they, as they rise up to get away from the thing on the bottom, the net right behind 'em, the huge net takes 'em. But it takes all sizes of fish—young ones, small ones, big ones—plus ones they're not even fishing for. See, that's the real problem is the draggers. That's why there's no fish anymore. And once they get fish out of an area, they just keep going back and forth and they ruin the bottom—all the seaweed gets... [There are] areas way out in the middle of the ocean where there's nothing, it's desolate now because draggers have gone back and forth—[areas] that used to have all that life in it.* Luke believes that he is particularly aware of this problem because he is a diver and can actually see the damage that has been done by over fishing.

Throughout the entirety of his interview, Luke keeps coming back to over fishing by commercial fisheries. He explains how gill netting works and describes the damage that he perceives has been done by the gill netters as well as the draggers. He talks about a “processing ship” being built in Maine that he'd heard about, that he claimed, “*could literally clean the Gulf of Maine of fish in probably a year and a half to two years [because] it could process and instantly freeze so many tons a day.* He continued, “*I think stuff like this is bad. I think it's really bad.*” When asked about the comeback of the striped bass, whereas many fishers attribute their remarkable recovery to the regulations placed on recreational fishermen, Luke sees it a little differently. He claims that the reason that the striped bass have come back is because they shut down the

commercial fishery for years in the Chesapeake Bay. He claims that the closing of this fishery is what put the “*striped bass [on the] road to recovery.*” While he believes that the regulations placed on recreational fishermen have definitely helped, they cannot make-up for the “*millions of pounds*” taken by commercial fishers. The only way to make up for that, in Luke's opinion, was to shut down a commercial fishery.

Luke's strong negative feelings about the damage that he believes has been done by commercial fishers, seem to be commensurate with the strong positive feelings he has about aquaculture—both in general and site specific. He was very enthusiastic when asked what he thought about the whole idea of aquaculture. He repeated several times that he thought it was just a great idea. He said it was great in terms of the “*other reasons he told [me],*” by which he was referring to the over fishing by commercial fisheries (this was one of my interviews) and he also said it was “*good for the whole eco-system.*” By this he meant that it would take the pressure off of the fish resources, thereby improving the ocean's balance. Insofar as the Isles of Shoals project, Luke believes that the site couldn't be in a better spot because the current running through this area is particularly strong—a “*cleansing current*” he calls it—which will take care of potential problems such as excess food and waste. He goes on to describe “*the green waters of Maine.*” Again, because he is a diver, Luke believes that he is particularly in tune with what is happening below the water's surface, unlike other fishers. He said, “*You know they're called the green waters of Maine for a reason. It's because there's so much plankton. You know, there's so much life and the thing is, we (divers) go out and see the life. We see the huge schools of pollack, huge schools of herring, huge schools of mackerel...the schools of minnows next to the shore, and it's just incredible. And you realize how healthy this area really is and what it can support...*” Luke's only “concern” about this project is “*that there ought to be more of them than just one...*”

Several other fishers echoed Luke's feelings about commercial fishers. For example, Rick claims that 10 years ago, codfish were plentiful, but no longer. He attributes this change in fish stocks to commercial fisheries and the increase in technology used to target fish. He too brings this up early in the interview. He said, “*If they had to drag [like they did] in the olden days or gill net [like they did] in the olden days—by sight and nothin' else—you'd still have fish around. But when you got a guy with a LOWRAN and whatever, and he come back with the same numbers, make a drag and pick up so much fish and then make another drag and just tear the bottom completely up, it's gone. It's gone. There's no ifs, ands, or buts about it. Technology ruined everything as far as I'm concerned. Look at the flounders. You don't even have flounders around here anymore...you can't get ten fish in New Hampshire now. You try to find 'em. I've fished all day, might come up with two or three flounders. Fifteen years ago, you could fill a thirty gallon barrel. One stock disappears and they start to target another stock...they're gone, they're gone. They're over harvesting everything. Next thing, they'll be targeting the mackerel.*” Throughout

this interview, like Luke, Rick kept coming back to the idea of commercial fisheries destroying the fish stocks. He used very strong language with words like “decimated” and “annihilated” and “the ocean’s gone to hell.” In his opinion, cod, flounder, tuna, sea urchins, and swordfish, have all been over fished by commercial fisheries. He believes that with all of the sophisticated electronics nowadays, used day in and day out, “you’re gonna have to deplete something.”

Rick’s vehement negative feelings about the depletion of fish stocks at the hands of commercial fishers, similar to Luke, seem proportionate to his positive feelings about aquaculture. When asked if he’d heard anything about aquaculture, he replied, “Oh yeah, I believe in it very much.” He spoke of tilapia and salmon and referred to what a great product is being brought in by farming fish. He sees aquaculture as something that can be done to stop depleting fish stocks. When asked if he had any problems with the Isles of Shoals project, he said, “none, I believe in it.” He also said, “I just hope they get off their fanny and straighten things out before they get real bad. If they get worse, we’re in trouble. We’re definitely in trouble now unless they straighten things out. They’re wiping everything out.” By this, Rick meant that commercial fishers are responsible for the ocean going to hell and something needs to be done or all of the fish will soon be gone. He sees aquaculture as a potential solution to this horrendous problem of monumental proportions. He does not foresee any problems with the Isles of Shoals site.

Other comments from fishers who have taken the conflict approach in response to the Isles of Shoals project are of a similar nature to what was said by Luke and Rick, though perhaps not as lengthy. Mark believes that “commercial draggers have come into shore and worked the humps off of the Isles of Shoals and wiped ‘em (fish) out.” David, who doesn’t want to point fingers, but said, “miles limitations enabled them (commercial fishers) to drag in close. [Just] a small boat would work very close off the back of the shoals and wipe those areas out.” And finally, Michael claims that commercial fishers are “getting deadly efficient—to the point where they’re taking, not only the fish they’re targeting, but all the other fish in the ocean too.” Each one of these fishers brought up the idea of over fishing by commercial fishers with no prompting from the interviewers and each one feels that big commercial fisheries are responsible for depleting fish stocks. Each of them, just like Luke and Rick, are also in favor of aquaculture—both in general and at the Isles of Shoals.

It appears that those fishers who seem to be most against commercial fishers are accordingly, most in favor of aquaculture, in general, as well as the Isles of Shoals project. Aquaculture is looked upon by these fishers as a solution to the global problem of over fishing and their concern is not *where* it’s done but *that* it’s done, in order to begin taking pressure off of the remaining fish stocks. Michael thinks that the demand for fish could be offset by aquaculture and then possibly natural species could “get a foothold again.” He said, “there’s not any fish left, so we have to do something—quickly.” When asked specifically

about the Isles of Shoals project, he said that he could not see anything wrong with it. David, who claims that he is a big fan of aquaculture, believes that the only potential problem with the Isles of Shoals project is that commercial fishers might “mess with it.” He feels that a lot of commercial fishers think that they own the ocean and tend to be very territorial. In his opinion however, despite what he thinks some commercial fishers may attempt, he thinks this project will work and that it will help to solve the problem of the decline of flounder in the bay. Mark did not specifically address the idea of aquaculture as a solution but he did say “somebody’s going to have to be doing it”, alluding to the idea that aquaculture is indeed necessary. These fishers are jumping onto the fish-farm bandwagon, which McGinn (1998) cautions against. She claims that aquaculture, like commercial fishing, can just as easily be transformed into a resource-intensive industry, with species being raised for quick cash with little thought to what environmental costs are incurred in the process.

In marked contrast to the conflict approach taken by the fishers noted above, is the NIMBY approach, which is taken by approximately, another third of the fishers. What is meant by this approach is that there are several fishers who are in favor of aquaculture in general—but in response to the particular project site, none of these fishers want to see this project in their own backyard or rather, in their own fishing spot. For example, Lawyer said, “I think [aquaculture] is good. People have to eat protein—fish are protein.” As the interview progressed however, Lawyer, who is perhaps the most negative of any of the respondents in regard to the Isles of Shoals project, went on to say, “[there’s] disease--and then all the waste--what happens to all the waste? ...I guess my concern is more from a, a...How’s it going to impact my fishing and what’s the long term effect going to be?” As it turns out, the only way that Lawyer is in favor of aquaculture at all is if it is done in tanks, on shore.

Paul too, sounded positive at first. He said that he believes that “[aquaculture] is going to be an important component for replacing the groundfish.” However, like Lawyer, he is also concerned about disease and waste. His biggest concern is that this particular project will compete with existing user groups who fish this area, such as tuna fishers, ground fishers, and lobster fishers, and as a consequence will create conflicts. In addition, he is concerned that because this is a demonstration project, if it is a successful venture, it may become more of an issue as it requires more space. He asked, “...if you’re going to do it commercially, do you need ten times that size or twenty times that size or one hundred times that size?” While he understands that the benefit of this type of expansion may be that jobs are created for commercial fishers, which they sorely need in his opinion, the Isles of Shoals just isn’t the spot because it’s not far enough off shore. He thinks that it needs to be far enough off shore where no one will care.

DAT, in response to the question of whether aquaculture would be beneficial, said initially, “yeah, I think it would be [beneficial]—yeah, you know, it probably would.” However, as the interview continued he also said, “I’m not

against fish farmin.' *I think it's a great thing and it may be a thing of the future. But I mean, there's a place for everything and that, that just doesn't seem like a very good place.* DAT is particularly concerned with navigation. He thinks that with off-shore lobster boats, commercial draggers, cruise ships, whale watching boats, oil tankers, tug boats, and towing barges going back and forth, that it will be a "hazard to navigation" and may be the reason that somebody loses a lot of money.

Rob is also somewhat concerned with issues of navigation, though his first response to aquaculture was, "I can't see any reason why not to support something like that." More important than navigation issues however, Rob, like Paul, is concerned with expansion if this project is successful. He wonders whether this project is going to turn into "a big business thing or is going to be designed in terms of a local solution." He said, "...it seems pretty high tech in the sense of the way it's laid out...and so when something becomes real high tech, it starts becoming less and less a local operation and more and more a corporate operation...I want to see something that's more grass roots--something that's more for the local guys--for the friendly lobstermen with less and less catches and, you know, the guys that have been out drag netting and things like that. This is the way they can produce something without harming the bottom. Finally, Howie claims at first that he understands that we need aquaculture because the fish stocks are down. However, he is also concerned with expansion if this project is successful, particularly if the expansion will entail further sites at the Isles of Shoals. He is hoping to do some tuna fishing at the Isles of Shoals next year and does not want this project to interfere with that. He believes that recreational fishers will feel the greatest impact with this project because this is an area that they tend to frequent.

The fishers who take the NIMBY approach in response to the Isles of Shoals project seem much more sympathetic to the plight of the commercial fishers than the fishers who take the conflict approach. In addition to concerns about their own fishing, these fishers tend to be concerned that this project is going to get in the way of commercial fishers, in terms of both fishing and navigating. As a result, one concern is that it will somehow end up costing commercial fishers money. An additional concern is that this project may not provide commercial fishers with the jobs that are being touted as a potential benefit of this venture. These recreational fishers are also not so quick to point to the commercial fishers as being solely responsible for changes in fish stocks. Neither Rob nor Howie did any more than make brief mention of the commercial fishers. Howie said that he understands their plight, though he realizes that they have no regard for trying to maintain the fish population. Rob only brought them up in the context of aquaculture insofar as he thinks it should be for the local commercial fishers rather than a corporate operation (noted above). DAT didn't have much to say on the subject at all other than to explain how difficult it is for commercial fishers to make a living because costs have tripled and revenues have only increased by fifteen or twenty percent. (DAT may be somewhat biased however as he is a

commercial lobsterman. He does other saltwater fishing recreationally, which is how he came to be included in this study, but he makes his living as a lobsterman.)

Paul spoke much more about the commercial fishermen than the other fishers who take the NIMBY approach, but he is clearly sympathetic and speaks about them in the context of these poor guys trying to eke out a living. He blames the New England Fisheries Management Council for the depletion of fish stocks rather than pointing his finger at the commercial fishers themselves. As he puts it, "...there's no groundfish left and that's as a result of the New England Fisheries Management Council not stepping up to the plate. [They] tend to put it off, put it off, put it off. They won't make the hard decisions and no one wants to put anyone out of work. The fishing fleet is over capitalized and we have much more ability to catch fish than we can grow 'em. Therefore, you got to under capitalize it and nobody wants to do it. No one wants to say you're not fishing anymore. So until we do that, we're going to be in desperate shape. So I think we've done a horrible job of the management of the groundfish. It's going to be worse and it's going to be forever coming back. It's going to take years and years and years because they still haven't taken steps to...I mean they just gradually go down this path where these poor fishermen are slowly squeezed out of making a living...And we just continue to squeeze these fishermen, so everybody makes less and people slowly go out of business and the fishery stock never recovers." Paul obviously believes that the commercial guys are at the effect point of poor management, which has resulted in declining fish stocks, rather than the actual cause of the crisis themselves.

It appears that fishers who are least in favor of the Isles of Shoals demonstration project, are much less inclined than the fishers who take the conflict approach, to denounce commercial fishers. They are very sympathetic to the plight of local commercial fishers and worry mostly, that this project won't result in jobs for them after all. The fishers who take a NIMBY approach are primarily concerned with matters close to hand, as well as others in their community. They are concerned about the Isles of Shoals in particular as well as the immediate surrounding area if this project should be successful and expand. They are concerned about various boats being able to navigate through the area, as well as the idea that this particular fishing spot will no longer be available to them. They are also concerned about excess waste and diseases infecting the fish stocks in this particular area. They do not want this project to compete with existing user groups who fish the Isles of Shoals. Although they say they are in favor of aquaculture as a concept, their feelings about the Isles of Shoals project would dictate otherwise. It appears that they tend toward McGinn's (1998) point of view regarding the environmental threats posed by aquaculture. While they may be willing to eat farm-raised fish raised elsewhere, they are not willing to risk an area so close to home.

The negotiating approach taken by close to another third of the fishers is somewhat different from either of the other two approaches in that these fishers are in favor of

aquaculture in general as well as the Isles of Shoals project specifically, *contingent* upon certain conditions. These fishers are at the least in favor of experimenting to see how it all works out and seemingly more moderate in most of their opinions, including their feelings about commercial fishermen. For example, when Reed was asked why he thought fish stocks had declined, he replied, "*Commercial problems, I'm sure. It's not why do I think, it's why do I know. Yeah, it's pretty well publicized.* But then he goes on to say, "*...in my years on the water, I've seen stock drastically change. Up and down and up and down and I can't think of any other environmental conditions that would cause it, other than fishing pressure--commercial and recreational. Well, and I suppose its things like pollutants too. And you know, losing striped bass for a while because of poisons or something.*" Reed looks at the possibility of other factors, besides commercial fishing, that may have contributed to the decline in fish stocks. He also includes recreational fishers as a possibility.

When asked what he thought about aquaculture, Reed replied, "*Oh, it's fantastic. Yeah, I like the price of farm raised Atlantic fish. Really, I think it's very sensible.* However, he makes sure to add, "*Only thing is if it doesn't infringe on somebody else's use of the same water.*" When asked about the specific project site, Reed expressed concern. He said, "*...when I read the location [in the newspaper], I was concerned about where it might be and what it might interfere with recreationally [because] that's a pretty big fishing area...and it's also very popular for duck hunting.*" When asked if he would have a problem seeing aquaculture all over the place if this project is successful, he replied, "*Absolutely.*" As the interview continued however, he alluded to the idea that he has no problem with this demonstration project. He said, "*But this one demonstration project, that's not all that big, you know...That's not bad for starters to see how it works.*" And when asked if he thought this project might be beneficial, he reflects on the plight of commercial fishers and expresses that he would like to see these guys be able to do these kind of projects. He also said, "*...as long as they could make a living at sea...then projects like this--yeah, I'd be 100% in favor of it.*" As far as Reed is concerned then, the demonstration project is fine and, in the event that it is successful--*as long as* it benefits commercial fishermen, he is all for it.

Joe is similarly in favor of aquaculture in general as well as the Isles of Shoals project—*as long as* the public is kept current and are able to voice their opinions *and* everything is "*kept on the up and up.*" By this he means that as long as the site is closely monitored—for disease and excess food and waste—and "*everybody knows what's going on and [is] doing what's right [no one tries to pull anything over on anyone].*" Regarding his feeling about commercial fishers, at one point during the interview he said, "*Yeah, they're [fish] not there—cod or haddock or anything. They just don't seem to be there. So, I'd like to see that controlled. I think they ought to stop...they ought to do something about draggers—bottom draggers. I think bottom draggers are just strip mining the bottom of everything that's there you know.*" Later on however, he

expresses positive feelings about the potential of putting commercial fishers to work and concern about commercial fishers being "*shut off from the ocean.*" Like Reed, Joe's attitude toward commercial fishers is more moderate than the fishers who take either the conflict or the NIMBY approach. He, like many of these fishers, sits somewhere in the middle—sort of a "yes they do over fish, but on the other hand, they have to make a living, and there are other reasons for the decline in fish stocks" attitude.

Tricia, another fisher who takes the negotiating approach also attributes the decline in some fish stocks to be the result of a combination of factors as opposed to the sole responsibility of commercial fishers. She believes that blue fish have declined because of a change in water temperature as well as the idea that striped bass and blue fish don't like to co-habitate, and with the increase in striped bass, it has caused the blue fish to decline. She attributes the decline of cod and flounder to over fishing by commercial fishers but makes brief mention of it. She attributes the decline of several species (didn't specify) at a particular point in time a few years back to a decline in water salinity due to an abundance of rain. She is in favor of the Isles of Shoals project *as long as* commercial fishers are put to work. Her comment reflects her "somewhere in the middle" attitude regarding commercial fishers: "*...so the commercial guys don't have a problem with [Isles of Shoals project]? Cause I would have thought they would, you know? They'd give you the 'we own the ocean' routine. [Aquaculture] would solve their problem. So many commercial guys are going out of business. It's so difficult for them because they pillaged already and now, you know, they gotta let the resource regenerate.*" She seems to move back and forth between feelings of sympathy and disdain.

Danny is in favor of the Isles of Shoals project *as long as* there is no negative environmental impact and there is a real potential to put commercial fishers to work. He, like the others has a "somewhere in the middle" attitude toward commercial fishers in that he believes they have "*raped the resource*" but he is also sympathetic to their plight because he realizes how hard it is for them to make a living. His feeling toward the project is guarded but positive, contingent on the noted concerns. Judy also has a similar attitude toward the project. She thinks we need to "*...try it, see what works and doesn't work and adjust accordingly.*" She too is concerned with the potential of harming the environment and hopes that it will put commercial fishers to work.

It is apparent that the fishers who take the negotiating approach are absolutely in favor of the demonstration project and are also in favor of additional sites in the area, if the project is successful, *as long as* certain criteria are met. Though they think the commercial fishers have definitely over fished the area, they also attribute declining fish stocks to other possibilities. Overall, they feel that if this project can be done well, i.e. no negative environmental impacts, that it will solve two problems--commercial fishers can be put to work and thereby stop depleting fish resources. They also tend to believe, like

McGinn (1998), that this project and any others that result from this project, must be regulated and closely monitored in order to minimize aquaculture's impact on the environment.

Conclusion

In sum, it appears that those who are most angry about commercial fisheries destroying the ocean's resources—those fishers who take the conflict approach—are also the most in favor of aquaculture as a potential solution to what they perceive as a global problem of enormous magnitude. Their enthusiasm for this project is without restraint. Conversely, those who are least upset about commercial fisheries—those who take the NIMBY approach—seem to be the least in favor of the Isles of Shoals project, though they have no problem with aquaculture in general. In other words, they don't mind eating farm raised fish. They do not however, want to see this project in their backyards. In addition to the negative environmental impacts that they foresee, they are concerned with existing users in the community. Those in the middle—those fishers who take the negotiating approach—recognize and are angry about the fact that commercial fishers are in large part responsible for declining fish stocks but they also tend to blame other factors as well. In addition, they realize that commercial fishers have to make a living, and one of their contingencies for being in favor of the Isles of Shoals project is that, if it is successful, it puts commercial fishers to work. They also want to see the project monitored to ensure the least negative environmental impact possible. Their enthusiasm for this project is much more circumspect than the fishers who take the conflict approach. Perhaps—as according to McGinn (1998)—it should be.

Although this was a class project with a very small sample, it should not be dismissed lightly. I think we genuinely tapped into some real concerns and with the quality of our data we have a much richer understanding of why recreational fishers may feel the way they do than would have been possible with survey data. Overall, these fishers were very knowledgeable about problems with the ocean's resources and potential problems with aquaculture. They have many interesting things to say on a number of issues, although I only touched on one for the purpose of this essay. We definitely interviewed fishers who have spent, and continue to spend, a lot of time on the water. All told, though few in number, their voices deserve to be heard, if in fact we care about the concerns of the coastal community.

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THE USE OF GIS IN RECREATION PLANNING: AN APPLICATION OF SPATIAL ANALYSIS TO FIND SUITABLE LOCATIONS FOR RECREATIONAL TRAILS

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Abstract: Geographic Information Systems have used spatial analysis on a variety of projects for some time now. Using this method in recreation planning, specifically finding suitable locations for recreational trails has not been common. Cortland and Chenango Counties have the highest density of State forests in New York State outside the Adirondaks and Catskill parks. Connecting the State forests with a recreational trail will increase recreational opportunities for a variety of user groups. New trails also have the potential to increase tourism in the region. One alternative location for the trail links Five State forests, crossing only thirty-eight private properties.

I. Introduction

A. Project Description

The highest concentration of State owned lands (State Forests, Wildlife Management Areas, and State Parks) outside the Adirondack and Catskill Parks are located in Western Cortland and Eastern Chenango Counties in New York. Most of the lands in this area are State forests. The traditional use of State forests is to provide forest products. Management efforts focus on timber management. Recreational use is limited and dispersed. Hunting is currently the most wide spread activity occurring in this area.

Trail oriented recreational activities, such as hiking, mountain biking, and horse back riding, have increased nationally for the last fifteen years (Warmick, 1995; National Outdoor Recreation Survey 1993; Clawson 1985). The result has been to include recreation in the management plans for State lands by the Department of Environmental Conservation (DEC). The DEC is

currently drafting a new recreation plan for Region 7, which includes most of Central New York.

New recreation groups, such as mountain bikers, add to the demand for 'trail time' and increase conflict with equestrians and hikers. The addition of new trails and trail systems will provide opportunities to satisfy user demand. Additional trails will allow users to spread out and reduce potential conflicts between groups.

The Genny Green Trail is a new trail system proposed for Eastern Cortland and Western Chenango Counties, that can provide additional recreation opportunities, disperse users, and increase recreation as one component of tourism in the area. A trail system differs from a single linear trail or loop trail. A trail system is a number of individual trails that are interconnected as a network. This area of the State is being considered for a recreational trail because:

- i. The large percentage of State owned lands found here
- ii. The rural character of the landscape
- iii. A low population density 52,000 in Chenango County
- iv. The close proximity to urban tourist markets (see Fig. 1.).

A majority of this new trail system will be located on state lands, but connecting state lands will require crossing private land. The intent is to gain permanent access across private land by purchasing easements. Currently, Four major trails exist in the area: the Finger Lake Trail, the Link Trail, the Onondaga Hill Trail, and the Snowmobile Trail. These trails cross private lands and were created without State intervention. They exist because of the goodwill of landowners and hard work of recreationist groups. Changing land use and property owners put these trails in danger of fragmentation, but without long-term legal protection.

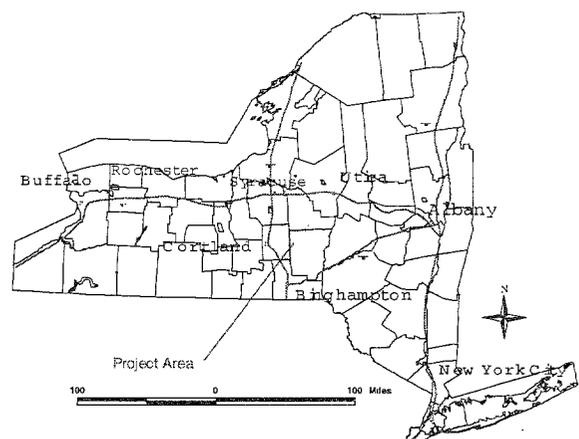


Figure 1. Location of the Project Area.

The goal of the Genny Green Trail Project is to develop a large trail network that is not in danger of being fragmented and does not disturb or alter the use of the land by the residents. Purchasing easements will solidify the connections of existing trails and potentially establish new ones. The trail system may use the connections that are already in place or change their route by establishing new links. Connections will consist of three equally important items: (1) the treadway, (2) right of way, and (3) the corridor. The treadway is the actual area contacted by the recreationist, which is usually devoid of vegetation. The right of way is the area cleared of vegetation. The

dimensions vary, but typically are set ten feet high and four to six feet on either side of the treadway. The corridor encompasses the all three items, as it is the area of land protected to create the trail within. Easement will be purchased and written to address land use on all three categories.

In most cases, new corridors are expected to be less than one mile. The high percentage of State Forests in close proximity to Bowman Lake State Park is in many cases literally, 'a stones throw away', making Bowman Lake State Park, a likely site a major trailhead (see Fig. 2).

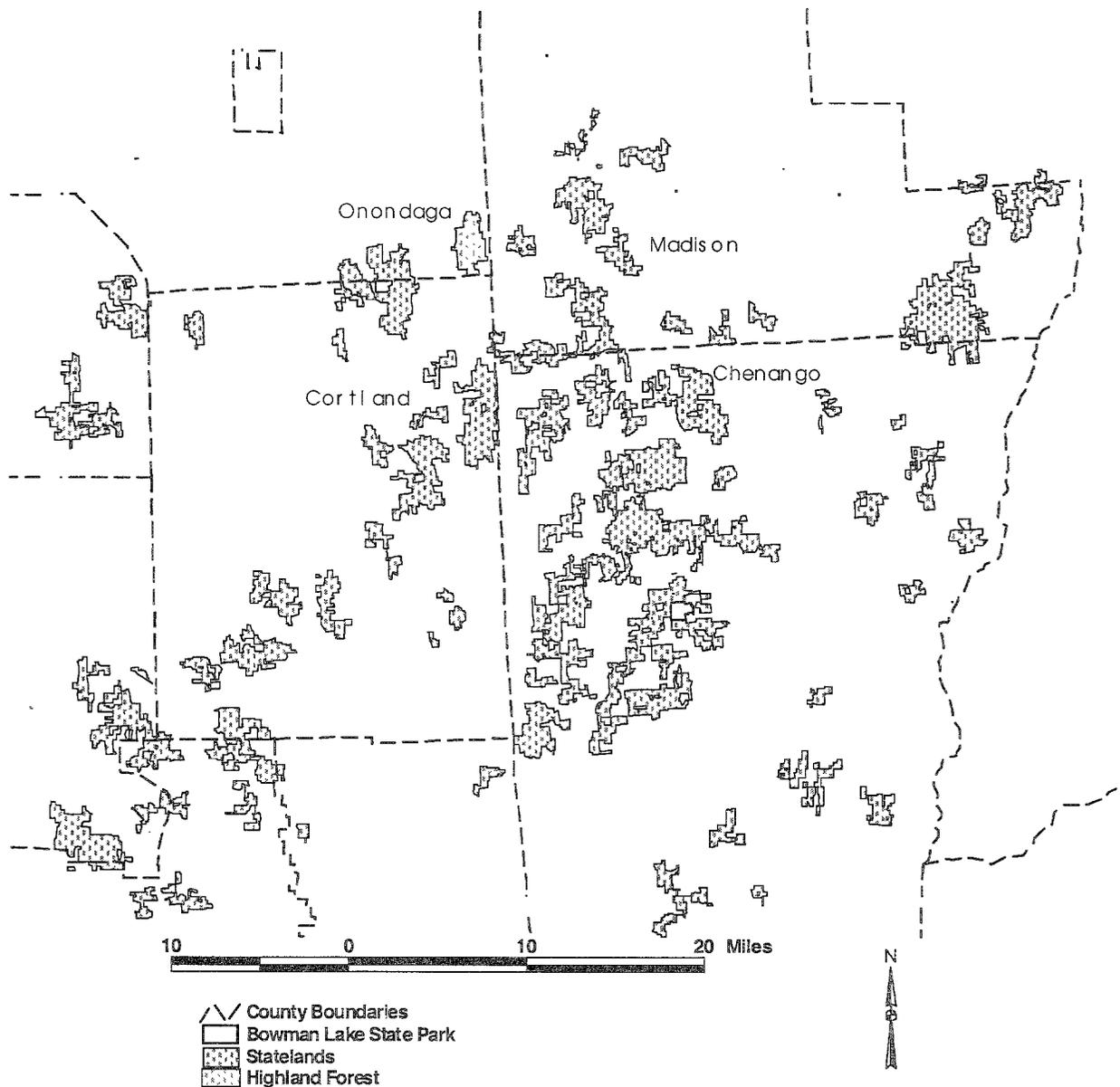


Figure 2. Concentration of State Lands Within the Project Area.

Bowman Lake State Park, in central Chenango County has the potential to become the major hub for the Genny Green Trail. Currently 50,000 annual visitors enjoy the park and the Genny Green Trail would increase its potential as a trail center for the Region. The park is conveniently located in the central southern tier of New York, which, is within a day's journey from urban centers such as Albany, Rochester and New York City and is easily accessible from route I-81. Day trips from Syracuse and Binghamton, sixty miles to the northwest forty miles to the south respectively, are expected to be quite regular.

Other areas in the northeast have experienced positive economic effects from creating trail systems. Users of the Oil Creek State Park Trail, in Pennsylvania, spent an average of \$22.85 per person per day. The total economic impact of this trail was \$1.8 million dollars annually (Holmes, 1995). A majority of the users surveyed were out of state residents, supporting the finding the outdoor recreation is the second top activity for U.S. travelers (Kelly, 1999).

A nation wide survey of State trail administrators identifies the top four growth activities are mountain bicyclists, hikers, other bicyclists, and equestrians (Moore, 1995). Mountain biking and other bicyclists, in the northeast, spend between \$26 and \$115 per person per day (Holmes, 1995). The northeast compares surprisingly similar to other areas of the country. For example, in Summit County Colorado bicycle recreationists spent \$51 - \$100 per person per day (Summit County Colorado, 1991).

B. Objectives

The DEC identified a need in the recreationist community for additional trails, and they also are aware of the need for additional economic development in the region. The DEC sponsored trail system can create a new economic resource currently untapped.

The problem is to identify suitable locations for a recreational trail from an infinite number of possible connections. The objectives of the project to create a large trail network is to locate potential connections that:

- i. Maintain the rural character of the landscape
- ii. Maintain agricultural activities
- iii. Avoid adverse effects on the environment
- iv. Minimize the cost of trail construction and maintenance

II. Methods and Materials

A. Geographic Information Systems: An Explanation.

A geographic information system (GIS) was used for the preliminary evaluation of potential corridors because a GIS allows multiple environmental and land cover characteristics to be interpreted simultaneously. A GIS is a computer-based tool for mapping and analyzing existing features and events in the environment. GIS technology integrates common database operations such as query and statistical analysis with the unique visualization benefits offered by maps. The strength of this technology is its

ability to link tabular data with attributes on maps. These abilities distinguish GIS from other information systems and make it valuable to a wide range of public and private enterprises for explaining events, predicting outcomes, and planning strategies (ESRI, 1999).

B. Spatial Analyst

ArcView is the basic GIS program that is used in this project. Additional tools called 'extensions' can be added on to ArcView to make the program more powerful and able to do specialized functions. ArcView primarily uses data in the vector format called feature themes. The Spatial Analyst extension allows the user to integrated feature themes and raster or grid formats.

Spatial Analyst is a tool of GIS that helps make decisions about the real world by overlaying many digital features in the environment at one time. It can be used to help discover, examine, and better understand relationships in spatial data. The strength of this extension comes in the ability to perform mathematical functions to manipulate the raster data layers in a process called spatial analysis. Spatial analysis is used in the decision making process to answer complex problems where there is not always one answer. (ESRI, 1996).

To help answer complex problems Spatial Analysis uses four basic functions: (1) overlays, (2) buffer and proximity calculation, (3) contouring and surfacing, and (4) classification and display. The overlay function allows two or more themes to be compared at the same time using map algebra

The analysis created for the Genny Green project is a simple and straightforward approach when compared to other analysis schemes. Five data layers: slope, drainage potential of soils, aspect, wetlands, and land cover were transformed into grids of equal dimension (10m) using Spatial Analyst. Each grid cell was normalized based on its characteristics. With the five major data components now as grids of equal size and assigned numeric values, they can be added together, multiplied by a weighting factor or any combination of mathematical functions. Additional feature themes, including the location of roads, streams, existing trails, and property boundaries are overlaid to show their relation to the potential corridors.

It should be recognized that the scores, weights, and analysis are value judgments. The scores and weights in spatial analysis are not standardized. For every project, new weights must be determined. On this project, the Delphi Method was used to determine the scores and weights to be used.

The Delphi method has been widely used in group decision making processes. It can be used to include large groups composed of experts and stakeholders to determine utility of objects, properties of objects, or events. The ideal use of this technique would employ a suite of actors and stakeholders including decision-makers, agency employees, local residents, farmers groups, and recreational user

groups. Due to time and budget constraints, this process was carried out solely with DEC employees.

The DEC Delphi Group (DDG) was composed of three members David Sinclair, Robert Slavicek, and Andrew Blum. David Sinclair is the Regional Forester and head of the Lands and Forests Division of the DEC in region 7. Robert Slavicek is a Supervising Forester in the Shurburn office within Region 7. Andrew Blum is a Senior Forester in the Shurburn office in Region 7.

III. Results.

A. Results of the DEC Delphi Group Meeting

The DEC Delphi Group (DDG) assembled to discuss the impact of slope, land cover, soil drainage, wetlands and aspect have on trail construction, maintenance, and to the environment. Because of the small group size, the participants did not individually assessed intra-criteria weighting scores for characteristics within each grid theme. Instead, the DDG decided to discuss the scores and the importance of each layer in an open format. A few mock runs of the model helped the group refine the scores given within each layer. Refinements in the weighting system continued until all members agreed.

The intra-criteria scores ranged from zero to one hundred. Low scores, in the one to ten range, indicate 'good' conditions. Moderate conditions, fifteen to thirty, are those conditions that require physical inspection or additional information to determine the appropriateness for a recreational trail. High scores, 100 and up, indicate conditions that are nearly impossible or extremely costly to construct and maintain a trail.

The DDG determined that all data layers should have equal weight in this evaluation. After long discussion, the DDG found no evidence to support that any layer was more important than any others layers. In essence, the inter-criteria weight for all layers is one. The DDG determined the intra-criteria weighting system to be adequate in accentuating the differences in the specific characteristics within each layer. Therefore, additional inter-criteria weights are not necessary.

According to the DDG, the best sites have gentle slopes, well-drained soil, and are located within forested cover types. The experience of the group was the main influence on the scores assigned to each grid theme. Aspect was eliminated from the initial evaluation of potential trail locations because aspects ideal for summer use are exactly opposite for winter use trails. Future analysis that focuses on the differences between winter and summer trails will use this information.

B. The Weights and Scores of Each Grid Theme and Composite Map

Wetlands are barriers to trail development and are weighted on their presence or absence. If present, they receive a score of 100, unacceptable conditions. If wetlands are absent in an area, they are equal to zero. This wetland layer is different then the wetland classification in the land cover

evaluation. Tables 1-3 summarize the classifications for each grid layer.

Table 1. A Summary Of The Reclassification Of Slopes Values

Slope Class	Intra-Criteria Weight
0-3%	3
4-6%	1
7-9%	2
10-13%	3
14-17%	4
18-21%	10
20-24%	15
25-30%	25
30+	100

Table 2 Summary of the Reclassification of Land Use

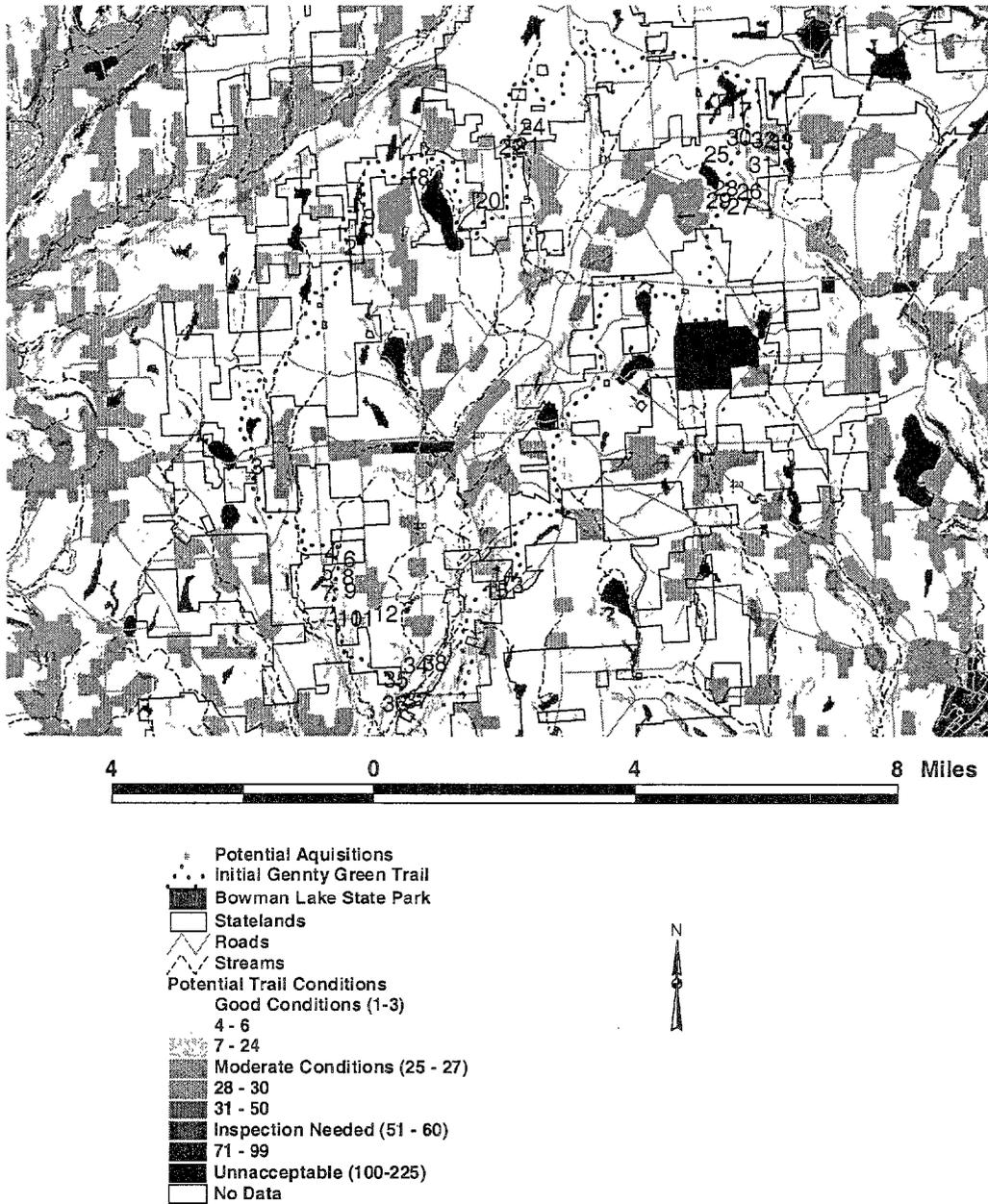
Land Cover Type	Intra-Criteria Weight
Lakes	100
Urban/Built up	75
Residential	50
Wetlands	100
Agriculture	25
Shrub/Brush Range land	1
Forested	1

Table 3 Summary of the Reclassification of Drainage Classes

Drainage Class	Intra-Criteria Weight
Good	1
Moderately Good to Good	1
Moderately Good	1
Moderately Good to Poor	15
Somewhat Poor	50
Poor	75
Very Poor	100

The composite image created through Spatial Analysis shows a number of potential connections, shown in lighter shades (see Map 1). The best conditions make up approximately thirty-percent of the project area, about 16000 acres. The top three classes, scores 1 - 24, make up sixty-percent of the total area. The initial trail is located on the best conditions about ninety-percent of its length and only crosses thirty-eight private lands. The initial location for the trail is also shown with existing trails.

Trails locations should be placed on the most suitable locations whenever possible. The trail can in many cases, weave between poor conditions to create an initial trail location, the backbone of the trail system (see Map 1). Overlaying data from, the Office of Real Property Services identifies landowners in the area and the trail suitability of their property. The real property data, visually represented as a centroid or point, is located in the center of the property owner's land. Each centroid corresponds to a landowner in the database.



Map 1. A Composite of Conditions and a Siting of an Initial Trail Connecting State Forests Around Bowman Lake State Park

C. Conclusion

The Genny Green Trail Project is an example of how state sponsored recreational trails can meet national policy guidelines. In 1988, the Commission on American Outdoors called for the creation of a national network of trails for various uses. President Clinton and bipartisan leaders of

the 106th congress have been advocating for the revitalization of the Land and Water Conservation Fund (LWCF). The LWCF uses off shore oil leasing royalties to fund the purchase of new public lands. Funding through the LWCF would allow the Genny Green Trail to pay potential landowners for easements across private land.

President Clinton announced January 12th 1999 that the Land Legacy Initiative would spend 1 billion dollars in fiscal year 2000 on a variety of land acquisition projects. The future of the Genny Green Trail is hopeful, considering potential federal funding sources such as this and the LWCF.

Recreational trails are important for a variety of reasons. Trails are necessary to promote health and fitness by providing opportunities removed from the hazards of motor vehicles. Trails increase property values, regional tourism and contribute to economic growth and development where they occur. Define zones free of human activities that protect natural resources and open space (American Hiking Society, 1990).

Development of the Genny Green Trail is potentially an educational resource for nature study by people of all ages. The trail will provide access for photography, primitive camping, and small game hunting. The project will create alternatives activities for young people and create an enjoyable retreat from the stresses of today's fast paced society.

Over 150 million people walk for pleasure, ninety three million bicycle, forty one million hike, eleven million Nordic ski, ten million use trails for horse back riding, and five million enjoy backpacking. The Genny Green Trail has the potential to create a public service for many recreationists (National Trails Project 1990).

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STORM CHASING: RISK RECREATION FOR THE NINETIES

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Abstract: Storm chasing has become a popular form of recreation in recent years. Following the popular "Twister" movie in 1995, amateur storm chasers scour Tornado Alley to catch a glimpse of the evasive killer. This paper introduces the reader to this new form of risk recreation, provides a brief background to the weather phenomena, and identifies sources of additional information.

Introduction

Since the movie "Twister" premiered in 1995 there has been an increase in the interest for storm chasing. The activity of storm chasing requires participants to locate and "chase" after a tornado-producing super-cell thunderstorm. Although this is somewhat a risky activity, storm chasing is becoming a popular form of recreation. For example, storm chasing is a sport not unlike rock climbing, in that to participate in either activity you must first have an understanding of basic techniques and safety measures. Further there is some level of danger associated with the activity. Although storm chasing is considered a new recreation activity, it has existed since the late 1940s; only now it is becoming a popular form of recreation.

Risk recreation traditionally has been applied to rock climbing, mountain biking etc. (Ewert 1995, Hollenhorst 1995). This paper explores a new form of risk recreation: storm chasing. First, a history of chasing will be given followed by some basic weather definitions. Safety issues are next explored, then risk recreation is defined and the reader is provided with ways to get more information on the topic.

History

Essentially storm chasing began after World War II. The reason it came about was because an abundance of airplanes and pilots that had a working knowledge or radar technology were given an opportunity to study storms first hand by flying through them. This project, which operated out of Ohio and Florida, became the baseline for understanding tornado producing storms. Along with the beginning of storm study, highways were modified helping to bring the chase from the air to the ground.

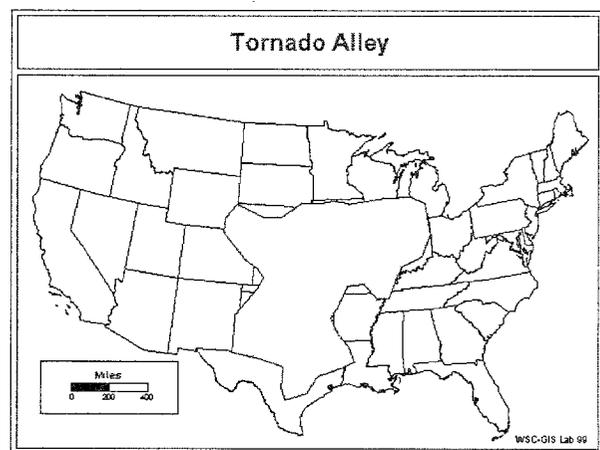
The Tornado Intercept Project based out of Norman, Oklahoma was the first organized ground-based groups of

storm chasers. This project was sponsored by the National Severe Storms laboratory (NSSL) to conduct research about storms that cause tornadoes and the effect they have on communities located in Tornado Alley (See Figure 1). The project was declared a success on May 24, 1932 when the scientists and chasers met face-to-face with a tornado in Union City, Oklahoma. This is where we can see storm chasing being born as a hobby rather than just for scientific reasons (Marshall 1993).

Tornado Formation

Many prospective tornado recreationists need to have a rudimentary understanding of tornadoes and how they work. Here is a brief scientific description of what a storm chaser should at least know about tornadoes. Tornadoes are produced as a thunderstorm develops an organized internal structure of sufficient strength to extend the vortex from the cloud base to the ground. The severe thunderstorm that develops a tornado is normally the largest thunderstorm in a squall line or a very large isolated thunderstorm. These storms are able to produce tornadoes because they have the organized internal structure that can support a tornado.

The warm, moist air of the thermal updraft flows in between the double vortex structure at low levels. The thunderstorm interacts with the jet stream, which provides a suction over the top of the storm, especially over the cyclonic vortex that has become better developed. The cyclonic vortex then forms a link between the cloud base and upper atmosphere by providing a tubelike connection up to the jetstream level. The dynamic updraft then develops through the core of the cyclonic vortex to combine with the rotation of the cyclonic vortex to generate a vortex of sufficient strength to reach the ground. This, then, is a tornado funnel (Eagleman 1990).



Safety

Storm chasing is an activity that can be dangerous if a person does not know what precautions to take. The three main threats to a person during a storm chase are: being on the highways, lightning, and the storm itself. Highway

driving presents its own set of obstacles that adds to the difficulty of chasing a storm. The storm can create dangerous driving conditions such as torrential rains, hail, and strong winds that are subject to change direction at any given moment. There is also the danger of running into stopped cars in or along the road. Since visibility is low and the chaser is usually trying to keep up with the storm, he will not have quick maneuvering capabilities if needed. Another problem with highways are underpasses. Many people congregate in these areas to get out of the fury of the storm. This has the potential for causing serious accidents if a driver is not paying attention while going under these bridges.

Lightning also poses a potential threat to storm chasers. Most chasers do not spend their entire chase experience in their vehicles. Time is also spent outside in the storm itself, trying to capture that "perfect" picture or gathering scientific measurements. Being outside unprotected with a metal tripod and camera in hand is not exactly the safest way to avoid being struck by lightning. Many prime tornado viewing areas also happen to be on top of hills, which is yet again, not the safest place to be when lightning is involved, but this is a risk that many chasers take.

The storm is another threat to a chaser, although it is the least likely to get you. There are however two aspects of the storm that can affect people's lives. First, it is thought that the ultimate danger to a chaser is not the physical storm that is being chased, but those dangers that come as a surprise. There is another threat that a storm chaser must be careful of, but it does not involve the chase itself. Psychologically the storm can affect a person as well. Chasing can become a dangerous psychological obsession. There are some people that enjoy storm chasing so much that they begin to devote more and more time to this activity rather than to their life responsibilities. Some leave their professions and try to make a living selling pictures and videos that they have gathered during their chasing expeditions (Doswell 1998).

Risk Recreation Defined

Unlike traditional risk recreation, storm chasing uses its own definition that is geared towards just the act of storm chasing. Traditionally, risk recreation is a self-initiated activity in a natural environment that people partake in due to the activity's uncertain and potentially harmful nature and its cognitive and affective involvement (Robinson 1992). In terms of storm chasing, the following definition is utilized: the recreational pursuit of an uncontrollable meteorological event.

Storm chasing is an activity that is associated with many risks, and those that chase storms should be aware of these risks. There have not yet been any media frenzies concerning the death of a storm chaser, but many think that when this happens, regulations and sanctions will be put into effect that will alter one's ability to chase a storm effectively (Doswell 1998). For example, climbing Mount Everest is an activity that people participate in, and there are many recorded deaths of such attempts. This fact has

not discouraged a lot of people from climbing the mountain, and similarly, any fatalities that may occur during a storm chase should not effect the way that chasers conduct themselves while hunting a storm.

Storm chasing can be considered a recreational activity. Although it was initiated for scientific purposes, there are many that chase simply for the joy of the chase. "The thrill for storm chasers is tracking nature out of control, finding themselves eye-to-eye with...the great grand-sucking twisters of Tornado Alley" (Paddy 1994:32). As with any recreational activity, there is a challenge to chasing, and it seems as though there is more challenge and frustration to chasing than a lot of other activities. Storms are not spawned on command. Nature acts in mysterious ways and there has yet to be a method of knowing exactly when and where a tornado will hit. Tornado chasing is basically a guessing game with some help from scientific information to make these guesses educated. Besides the thrill of the chase, "what compels storm chasers to drive tremendous distances across the plains?... You can see forever...the sky and the air are clear, and what you see is tremendous—it's simply awe-inspiring" (Wolkomir 1994:52).

Another way that storm chasing is a recreational activity is that there has been an increase in those interested in storm chasing, causing a noticeable influx in traffic on prime chase days. According to research by Wolkomir (1994), there are so many storm chasers out there that on prime chase days there are too many cars on the roads to drive. If storm chasing was not a popular recreational activity, there would not be such a demand for space for these chasers.

Storm Chasing Tour Groups

This section about storm chasing tour groups gives some minimal information about what exactly is entailed in a storm chasing package, and web sites are provided for those that wish to seek out additional information. Many people wish to try such a thing and joining with one of these groups is the perfect way to enjoy an experience of a lifetime.

Storm chasing in the past has mainly been done for scientific reasons rather than for pleasure or recreation. Now that more people have become interested in storm chasing, it has opened a door leading to a new hobby. Since it is not a hobby that you can pick up very easily, there are experts that you can seek out to join their storm chasing groups. They consist of expert storm chasers that do not mind having a novice along for the ride. Their territory ranges all throughout Tornado Alley looking for storms. Being difficult to chase and dangerous to do, these tours are expensive; a two-week tour costs anywhere from \$1,800 to \$1,900. These tours include room and board, and sometimes even a video of your experience. Minimal packing is necessary, as chasers are on the road all the time and never know what state they will end up in next. Of course tornado activity is not guaranteed, however during own time, the chasers will bring the groups to various sightseeing areas. Many people find these tours to be a good basis from which to start their own storm chasing careers.

Storm Chasing Groups To Contact on the Web

Cloud 9 Tours
Silver Lining Tours
Storm Chasing Adventure Tours
Tornado Alley Tours
Tornado Research and Defense Development (TRADD)

<http://www.pair.com/storms/cld9.html>
<http://silverlining.pair.com/chase.html>
<http://www.storm-chaser.com>
<http://www.pair.com/talley/tours.html>
<http://www.abilene.com/tradd>

Conclusion

With movies such as "Twister," interest has increased in the activity of storm chasing. This is apparent as seen through the increased traffic along the roads of Tornado Alley and with the institution of many storm chasing groups. Although storm chasing in real life is nothing like the movies, there is still a real rush that come from seeing one of Mother Natures's most destructive forces. People will pay outrageous amounts of money to have the opportunity to chase after something that most people would flee. True storm chasers are into this form of risk recreation for many reasons, to learn about tornadoes as much as possible, to help create warnings systems, but mainly to experience the thrill of the hunt.

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**WHO OWNS THE OCEAN? A QUALITATIVE
STUDY OF SALTWATER RECREATIONAL
FISHERS AND OPEN OCEAN AQUACULTURE IN
NEW HAMPSHIRE**

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Abstract: During the last decade, the decline of wild fish stocks has put pressure on fish farming to meet the growing demand for seafood around the world. Aquaculture development often requires placing restrictions on public access to ocean waters where farming operations are constructed. This paper examines the attitudes of saltwater recreational fishers toward open ocean aquaculture using data collected from sixteen in-depth, semi-structured interviews. We argue that the fishers' perceptions of crowding and spatial conflict, methods of adapting to the pressures put on common resources, and attitudes toward existing users shape their opinions about aquaculture development and the management of ocean resources and spaces.

Introduction

Wild fish stocks around the world are in trouble. "By recent U.N. estimates, a majority of marine fish stocks and all of the world's primary fishing grounds have reached peak production and are in decline" (McGinn 1998: 6-7). New England's fisheries have not been immune to the global decline in fish stocks. George's Bank was closed to fishing in 1994. Commercial groundfishing off Jeffrey's Ledge was closed during the mid 1990s. Most recently, in December of 1998, Maine's commercial fishers called for the closure of the Gulf of Maine.

However, it is not readily apparent to the average consumer that the world's fish supply is on the verge of collapse, due

in large part to the continued increase in aquaculture. Fishers and suppliers are increasingly relying on fish farming to help meet rising global demands as wild fish stocks decline. In 1995, roughly 20 percent of all fish consumed in the world were farm raised, compared to 8 percent in 1984 (McGinn, 1998). Most of the world's aquaculture is done in freshwater, in tanks on land, and in protected bay areas. Open ocean aquaculture, the cultivation of certain fish species in containment structures in the open ocean away from the protection of land, is a relatively new development not widely in use.

Presently there is a project underway in New Hampshire, designed to test the feasibility of farming mussels and flounder in the open ocean. The University of New Hampshire received funding from the U.S. Department of Commerce, through a special appropriation to the New Hampshire Sea Grant College Program, to develop an open ocean aquaculture demonstration project off the Isles of Shoals. U.S. Senator Judd Greg, at a check presentation for this project on December 3, 1997, announced that, "Aquaculture will . . . contribute to economic and community development, particularly in areas like New England, where wild capture fisheries are experiencing a crisis of unparalleled proportions. It is extremely important for folks in New Hampshire to understand the importance of the ocean and coastal science research that is taking place at the University. I support the aquaculture project because it will blend the concerns of coastal communities, entrepreneurs, and UNH scientists" (University of New Hampshire News Bureau 1997).

As Senator Gregg alluded to in his announcement, the support of the coastal community is a necessary component for the success of this project. Blocking off an area of open ocean for a commercial aquaculture operation raises complex questions, such as: Who will benefit from the new technologies and what are the environmental and social impacts? (Keeler, 1998). The Socioeconomic Research Component of the demonstration project was designed to assess the social impacts on current users of the marine resource and to determine their attitudes toward local aquaculture development. McCay and Acheson argue that, when trying to understand attitudes toward ocean management and development, "What is required . . . is careful examination of the ways people understand and relate to their environments and of the ways ownership – common or exclusive – works in specific cultural and ecological settings" (1996:15).

Fishers, both commercial and recreational, have traditionally viewed the ocean as "common property," a communal resource to which they are entitled access. However, fishers have also at times developed notions of territorial rights "even to the extent of outright private ownership claims, to valued fishing grounds, species, or techniques" (McCay and Acheson 1996:11). Common property has been seen by a number of scholars, most notably Garrett Hardin (1968), as problematic in that it leads to a "tragedy of the commons" in which self-interested actors exploit the common resource to the point that their collective actions cause the total depletion of the

resource. However, McCay and Acheson (1996) point out that the tragedy of the commons model does not recognize that property rights refer to relations among people. They argue that contextual factors such as common notions of territorial rights and the “presence or absence of rules about uses of the commons, alternatives to exploitation of common resources, [and] ways of monitoring and controlling the behavior of others” must be considered when examining common property activities and regulation (McCay and Acheson 1996:6). This means that understanding how New Hampshire fishers will think about and respond to both declines in wild fish stocks and future common property regulation in the wake of aquaculture development depends, in part, on their current relationships with other common property users and the informal rules and strategies now used to monitor, control, and adapt to the behavior of competing users.

In this project we examined the social dimensions of saltwater sport fishing and aquaculture development to assess some of the concerns of New Hampshire’s saltwater recreational fishers regarding aquaculture development and future regulation of the ocean. This project was one part of the Socioeconomic Component of the Open Ocean Aquaculture Demonstration Project headed by Dr. Robert Robertson of the UNH Department of Resource Economics and Development. A team of graduate students, under the direction of Dr. Cynthia Duncan of the UNH Department of Sociology, conducted the research. One objective of the project was to develop a portrait of New Hampshire’s saltwater recreational fishers—who they are, why they fish, and the fishing activities in which they participate. Another objective was to determine how the fishers felt about aquaculture development in general and development at the Isles of Shoals in particular. We also wanted to develop an understanding of their attitudes and concerns about ocean management more generally. Finally, we wanted to know how the social context within which fishers considered ocean management and aquaculture development shapes their attitudes and opinions.

Methods

We developed a qualitative research design that combined participant observation with in-depth interviews to capture the complexity of the fishers’ experiences and thoughts. Initially, we conducted participant observation in sites where sport fishers congregate—marinas boat launches, and waterfront bars where they swap fish stories—to observe first-hand the context within which the fishers’ operated. Each member of the research team took extensive field notes after every field visit and entered them into a database management program adapted for qualitative analysis by UNH faculty (Duncan 1998). We used contacts made during participant observation to identify 16 interview candidates. We restricted our purposive sample to fishers who owned boats and fished in the ocean near the Isles of Shoals. Our intent was to tap the more frequent, dedicated recreational fishers who have made a greater investment in the sport and may, therefore, have more of a stake in the use of the ocean.

We also used the data from preliminary field work to identify factors that might influence the fishers’ opinions and attitudes about aquaculture and ocean management, out of which we developed the conceptual framework for the study. We decided that, in addition to learning the fishers’ opinions about this specific aquaculture project, we wanted to know where they stood on the larger issues raised by the demonstration project such as: public vs. private rights and responsibilities for development of marine resources and ownership of the ocean. We then identified three broad categories of contextual factors that might influence their ideas about ocean development and management: their relationships with other users of the resource, their attitudes about fishing regulations and political involvement in fishing management issues, and the characteristics of the fishers themselves such as their family background, fishing practices, and changes they’ve seen on the water. We then refined the broad categories of factors identified in the conceptual model to develop a detailed interview guide. The following is an abbreviated version of the four page guide:

- Background—Age; Occupation; Family; Education; Incomes; How got started fishing?
- Fishing Practices and Experiences—Frequency; Gear; Species; Tell about a recent fishing trip, your best trip, and your worst trip.
- Changes and Relationships—Is fishing different from when you started? Kinds of encounters with other users on the water; Relationships with other resource users.
- Regulations—Views on current fishing regulations; Involved in meetings or discussions on regulations? Active in political organizations?
- Aquaculture—Thoughts about aquaculture development; How will Isles of Shoals project affect you? Will it be beneficial? For whom?
- Managing resources—Who should have input? Who should be responsible? Who should/will benefit from development of public resources? Who owns the ocean?

Using the interview guide, each team member conducted two in-depth interviews, usually in the fishers’ homes or places of business. The 16 one hour interviews were taped and then transcribed into specially designed data base forms. In addition, each team member wrote field notes after the interview which were also entered into the data base. The data management program, by networking users through a server, allows a number of researchers to simultaneously view the data, work on analysis, and share thoughts and observations about emergent patterns. Following the analytical strategies of Lofland and Lofland (1995), Miles and Huberman (1994), and Weiss (1994), we worked together to systematically identify patterns and themes using propositional framing, descriptive codes and summaries, analytical codes and memos, and visual displays of the data.

Findings

The findings presented here provide a demographic profile of the fishers in the sample followed by an analysis of the

relationship between their attitudes toward competing users, commercial fishers, and open ocean aquaculture development. Finally, we examine the relationship between the fishers' experiences of crowding and competition for space on the water and open ocean aquaculture development. Names and identifying details used in the text have been changed to protect the privacy of the fishers who participated in this study.

Who Are New Hampshire's Saltwater Sport Fishers?

The first objective of the project was to develop a demographic profile of New Hampshire's saltwater recreational fishers. We interviewed 14 men and two women. They ranged in age from 28 to 61. The mean age was 45; most were in their 40s and 50s (Table 1). They were a somewhat elite group of fishers. Most were educated, affluent, professionals (Tables 2 and 3) who had many years of fishing experience (Table 4). Their boats ranged from sixteen to thirty-two feet in length, evenly split between those over and under twenty feet (Table 5).

Table 1. Age of Respondents

Age Group	% of Respondents
under 40	25.00% (4)
40-49	31.25% (5)
50+	43.75% (7)
Mean Age = 45	
Mode = 50	
N=16	

Table 2. Family Income

Income	% of Respondents
20-29k	12.50% (2)
30-39k	18.75% (3)
40-49k	6.25% (1)
50k +	62.50% (10)
Mean Income = 45k	
Mode = 50k +	
N=16	

Table 3. Educational Level

Education	% of Respondents
High School	18.75% (3)
Some College	25.00% (4)
College Degree	50.00% (8)
Professional Degree	6.25% (1)
Mode = College Degree	
(N=16)	

Table 4. Years of Fishing Experience

Years of Experience	% of Respondents
under 20	12.50% (2)
20-29	25.00% (4)
30-39	6.25% (1)
40-49	31.25% (5)
50 +	25.00% (4)
Mean = 35	
Mode = 40/50	
N=16	

Table 5. Boat Size

Length in Feet	% of Respondents
15-19 feet	43.75% (7)
20-29 feet	50.00% (8)
30 +feet	6.25% (1)
Mean = 21 feet	
Mode = 20 feet	
N=16	

These recreational fishers have been fishing for a large part of their lives. Fourteen started fishing as small children with their families or friends. Only two began fishing as adults. When interviewed, many fished at least weekly. Some fished as often as daily during the summer months and traveled south to fish during the winter. They fished for the challenge and adventure of fishing, mentioning the skill needed and the excitement of "playing a big fish on the line." Peace, solitude, and a love of the outdoors also inspired their dedication to sport fishing. Their fishing territory extended from the Great Bay inland estuary out to Jeffrey's Ledge in national waters, north into Maine and south into Massachusetts. Most had some general knowledge of what aquaculture is, but few were familiar with specific aquaculture projects. Their knowledge of aquaculture practices was limited.

Opinions about Aquaculture Development and the Isles of Shoals Demonstration Project.

Many fishers believed that aquaculture may actually be a necessity due to the severe depletion of fish stocks. Indeed, several fishers responded to the concept of aquaculture as a potential solution to the problem that they perceived as over-fishing by commercial fishermen. As one fisher put it, *What do I think about aquaculture? I guess it's a necessary thing. Because human beings want to eat fish, and we're wiping out all the fish stocks all over the world.* This general idea was repeated quite often. Another fisher said that he is absolutely in favor of aquaculture as he sees it as something that would help to ensure that we don't continue to abuse the ocean. Others view aquaculture as a *step in the right direction; a necessary step that will take the pressure off of the fish resources.* Stemming from these feelings was the idea that aquaculture is the *wave of the future*, a phrase that was used by several respondents. Indeed, the response to the concept of aquaculture in general was overwhelmingly positive. Yet, upon broaching the subject of the Isles of Shoals project the fishers responded differently. In fact, three fairly distinct approaches taken by these fishers in response to the Isles of Shoals project emerged.

The conflict approach, taken by roughly a third of the respondents, is the tendency to see open ocean aquaculture as a solution to the problem of exploitation of natural marine resources by commercial fishers. These fishers believed that big commercial fisheries are taking unfair advantage of their positions by stripping the ocean of its resources for their own gain. Many of these fishers were particularly vehement in their denunciation of commercial fishers, and are as apt to blame individual fishers as

industries. Some describe commercial fishers as *nasty and cut throat*. Luke was one of the most outspoken on this issue. Very early into the interview, he brought up the issue of draggers and over-fishing. He said, *There aren't any bottom fish now because of the draggers and the over-fishing . . . they take all sizes of fish—small ones, big ones—plus ones they're not even fishing for. See, that's the real problem is the draggers. That's why there's no fish anymore. And once they get fish out of an area, they just keep going back and forth until they ruin the bottom . . . [There are] areas way out in the middle of the ocean where it's desolate*. Luke said that he is particularly aware of this problem because he is a diver and can actually see the damage that has been done by over-fishing.

Luke's strong negative feelings about the damage that he believes has been done by commercial fishers was commensurate with the strong positive feelings he had about aquaculture—both in general and site specific. He was very enthusiastic when asked what he thought about the whole idea of aquaculture. He repeated several times that he thought it was a great idea and that it would be *good for the whole eco-system*. By this he meant that it would take the pressure off of the fish resources, thereby improving the ocean's balance. In regard to the Isles of Shoals project, Luke claimed that the site could not be in a better spot because the particularly strong current running through this area—a *cleansing current* he called it—will take care of potential problems such as excess food and waste. Luke's only concern about this project was *that there ought to be more of them than just one . . .*

Other fishers who took this approach in response to the Isles of Shoals project are similar to made similar comments. For example, Mark said, *commercial draggers have come into shore and worked the humps off of the Isles of Shoals and wiped 'em [fish] out*. David didn't want to point fingers, but stated, *miles limitations enabled them [commercial fishers] to drag in close. [Just] a small boat would work very close off the back of the shoals and wipe those areas out*. Finally, Michael claimed that commercial fishers are *getting deadly efficient—to the point where they're taking, not only the fish they're targeting, but all the other fish in the ocean, too*. Each one of these fishers claimed that big commercial fisheries are responsible for depleting fish stocks. Each of them was also in favor of aquaculture—both in general and at the Isles of Shoals.

Those fishers who were most against commercial fishers were accordingly most in favor of aquaculture in general, as well as the Isles of Shoals project. Aquaculture was looked upon by these fishers as a solution to the global problem of over-fishing and their concern was not *where* it's done but *that* it's done, in order to begin taking pressure off the remaining fish stocks.

In marked contrast to the approach taken by the fishers noted above, the NIMBY (Not In My Back Yard) approach was taken by approximately another third of the fishers. These fishers are in favor of aquaculture in general—but in response to the particular project site, they felt differently. None of these fishers wanted to see this project in their own

fishing spot. For example, Larry said, *I think [aquaculture] is good. People have to eat protein—fish are protein*. As the interview progressed, however, Larry, who was the most negative of any of the respondents in regard to the Isles of Shoals project, commented, *[there's] disease—and then all the waste—what happens to all the waste? . . . I guess my concern is more from a, a . . . How's it going to impact my fishing and what's the long term effect going to be?* As it turns out, the only aquaculture that Larry favored was that done in tanks on shore.

Paul, too, sounded positive at first. He said that he believes that *[aquaculture] is going to be an important component for replacing the groundfish*. However, like Larry, he was also concerned about disease and waste. His biggest concern was that this particular project will compete with existing user groups who fish this area, and as a consequence will create conflicts. He was also concerned that if it is a successful venture, it may become more of an issue as it requires more space. He asked, *. . . if you're going to do it commercially, do you need ten times that size or twenty times that size or one hundred times that size?* While he understood that the benefit of this type of expansion may be that jobs are created for commercial fishers, which they sorely need in his opinion, the Isles of Shoals just isn't the spot because it's not far enough off shore.

In addition to concerns about their own fishing, these fishers were concerned that this project is going to get in the way of commercial fishers, for whom they feel some sympathy.

For example, Paul was clearly sympathetic and spoke about the commercial fishers in the context of *those poor guys trying to eke out a living*. He blamed the New England Fisheries Management Council for the depletion of fish stocks rather than pointing his finger at the commercial fishers themselves. As he put it, *. . . there's no groundfish left and that's as a result of the New England Fisheries Management Council not stepping up to the plate . . . I think we've done a horrible job of the management of the groundfish. It's going to be worse and it's going to be forever coming back . . . I mean they just gradually go down this path where these poor fishermen are slowly squeezed out of making a living . . . And we just continue to squeeze these fishermen, so everybody makes less and people slowly go out of business and the fishery stock never recovers*. Paul obviously believed that the commercial fishers were the victims of poor management rather than the actual cause of the crisis themselves.

Fishers who were least in favor of the Isles of Shoals demonstration project were much less inclined to denounce commercial fishers. They were very sympathetic to the plight of local commercial fishers and worried that this project wouldn't result in new jobs after all. The fishers who took this approach were primarily concerned with how this project would affect them personally, as well as others in their community. They were concerned about the Isles of Shoals in particular as well as the immediate surrounding area if this project should be successful and expand. They were especially concerned that this fishing

spot will no longer be available to them. And finally, they were also concerned about excess waste and diseases infecting the fish stocks in this area. Although they said they were in favor of aquaculture as a concept, their feelings about the Isles of Shoals project dictated otherwise.

The negotiating approach, taken by another third of the fishers, was somewhat different from either of the first two approaches. These fishers were in favor of aquaculture in general as well as the Isles of Shoals project specifically, contingent upon certain conditions. They were in favor of experimenting to see how it all works out and more moderate in most of their opinions, including their feelings about commercial fishermen. For example, when Reed was asked why he thought fish stocks had declined, he replied, *Commercial problems, I'm sure. It's not why do I think, it's why do I know. Yeah, it's pretty well publicized. But then he went on to say, . . . in my years on the water, I've seen stock drastically change. Up and down and up and down and I can't think of any other environmental conditions that would cause it, other than fishing pressure—commercial and recreational. Well, and I suppose it's things like pollutants too. . . And you know, losing striped bass for a while because of poisons or something.* Reed looked at the possibility of other factors, besides commercial fishing, that may have contributed to the decline in fish stocks. He also included recreational fishers as a possibility.

When asked what he thought about aquaculture, Reed replied, *Oh, it's fantastic. Yeah, I like the price of farm raised Atlantic fish. Really, I think it's very sensible.* However, he made sure to add, *Only thing is if it doesn't infringe on somebody else's use of the same water.* When asked about the specific project site, Reed expressed concern. He said, *. . . when I read the location [in the newspaper], I was concerned about where it might be and what it might interfere with recreationally [because] that's a pretty big fishing area . . . and it's also very popular for duck hunting.* When asked how he would feel about additional development if this project is successful, he replied that he would have a problem *if it interfered with boat operation or maybe if it were in that particular sea duck hunting area . . . [or] if it interfered with anchoring in that vicinity.* As the interview continued however, he alluded to the idea that he has no problem with this demonstration project. He said, *But this one demonstration project, that's not all that big, you know . . . That's not bad for starters to see how it works.* And when asked if he thought this project might be beneficial, he reflected on the plight of commercial fishers and expressed that he would like to see these guys be able to do these kind of projects. He also said, *as long as they could make a living at sea . . . then projects like this—yeah, I'd be 100% in favor of it.* As far as Reed was concerned then, the demonstration project is fine and, in the event that it is successful—as long as it benefits commercial fishermen—he is all for it.

The fishers who took the negotiating approach were absolutely in favor of the demonstration project and were also in favor of additional sites in the area, if the project is

successful, as long as certain criteria are met. Though they thought commercial fishers have definitely over-fished the area, they also attributed declining fish stocks to other possibilities. Overall, they believed that if this project could be done well, i.e. no negative environmental impacts, that it will solve two problems—commercial fishers can be put to work and depleted fish stocks can recover.

In sum, those who are most angry about commercial fisheries destroying the ocean's resources are also the most in favor of aquaculture as a potential solution to what they perceive as a global problem of enormous magnitude. Conversely, those who are least upset about commercial fisheries are the least in favor of the Isles of Shoals project. Though they have no problem with aquaculture in general, they do not want to see this project in their backyards. Those in the middle recognize and are angry about the fact that commercial fishers are in large part responsible for declining fish stocks but they also blame other factors as well. In addition, they realize that commercial fishers have to make a living, and one of their contingencies for being in favor of the Isles of Shoals project is that, if it is successful, it puts commercial fishers to work. They also want to see the project monitored to ensure the least negative environmental impact possible.

Opinions about Open Ocean Management and Access

The degree to which fishers felt a sense of personal ownership toward particular fishing spots, the degree of competition they experienced with other fishers over those favorite spots, and their adaptive responses to competition over favorite spots also shaped their opinions about management of the commonly held ocean. All of the fishers mentioned a major increase in boat traffic and users on the water during the last three years. Many attributed the increase to a combination of the booming striped bass fishery and an improved economy that has enabled more people to buy boats. The recent increase in boats and fishers competing for the same space on the ocean and surrounding tributaries was an important part of the context within which recreational fishers experienced and thought about issues regarding access to the common property of the ocean.

Some fishers have been little affected by conflicts over space and territory. They were not overly concerned about regulation of the commons in the future. Other fishers have been directly affected by competition for common space, but have developed their own informal adaptive strategies to avoid conflict. They, too, believed that management of the commons will be worked out satisfactorily in the future. The last group of fishers have been bothered by spatial conflicts and have not developed satisfactory adaptive strategies. This group had more concerns about open ocean management, development of aquaculture sites, and public access to the commons.

Fishers in the first group did not perceive space to be an issue on the water. Although they mentioned the increase in boats and boat traffic, they did not discuss conflicts over space. For example, Mark fished primarily for groundfish, which few recreational fishers have competed for since the

crash in groundfish stocks several years ago. Groundfishing took him farther out into the ocean to Jeffrey's Ledge far beyond the range of striped bass fishers. Similarly, Michael was a fly fisherman. His technique kept him somewhat protected from space competition. Fly fishers were generally afforded more space and a courteous attitude. *The people that are heavy into fly fishing . . . come with an ethic and an understanding. That you give people a lot of room and a lot of respect. If it's fly fishermen, you're not supposed to be anywhere near 'em.* Michael was so unaffected by competition for space when fly fishing that he did not even mention the increase in boat traffic.

This group of fishers did not perceive conflict over space to be an important issue since they have been insulated from spatial competition by virtue of the territory occupied by their target species and their specialized techniques. Their lack of personal concern over space on the water was reflected in their lack of concern about maintaining access to ocean space in the future when aquaculture development adds more users to the ocean. Most of the fishers in this group did not mention concern over the positioning of the proposed aquaculture site off the Isles of Shoals. Nor did they express concern about how access to open ocean spaces might be managed in the future. Mark summed up the attitudes of this group when he concluded the interview, *The only other thing I can tell ya, you know, it's a pretty large ocean out there and certainly commercial fishing, recreational fishing and aquaculture—I see no reason why it can't all coexist.*

Fishers in the second group did perceive problems with competition over space and territory, but had developed adaptive strategies that allowed them to continue fishing without too much disruption. Roy talked about the pressure from competition and his strategy: *All those racing boats in the river, cigarette boats. And they're just, you know, out of control . . . You have to fish when it's not the weekend. The weekends are horrible . . . a lot of the boats are larger so [in my small boat] I like to fish right in on top of the rocks and most people wouldn't be that crazy.* Paul had also found ways to adapt. *I keep going farther afield to find places where there are less and less boats . . . They may catch up with me eventually, but so far, you know, I've been okay.*

These fishers have been bothered by crowding and disputes over space. Yet, they have found ways to adapt their fishing so that they avoided continuing conflicts over space. Their ability to positively adapt to crowded conditions was echoed in their optimistic stance toward open access to common property and spatial competition. Roy explicitly expressed the adaptive view. He raised some concern about maintaining access to his favorite spots, but, he concluded, *there's enough places to fish . . . There's so much undeveloped fishing area that if a few people are affected by this, they will figure out where else to fish.*

The fishers in the last group had not developed adaptive strategies that allowed them to continue fishing for favorite

species or in ways that provided the same pleasure. They expressed deeper frustration over space conflicts on the water than did the fishers with adaptive strategies. Rick gave up fishing one summer when he was particularly troubled by boats following him around. *I changed boats twice 'cause guys were chasing me all over the place. I just quit. I said, Hell, I don't need this. I myself got into arguments over mackerel for cryin' out loud. "You're too close to me, get the hell outta here." I just said when you can't have fun fishing you may as well quit.*

This group of fishers felt the competition for space on the water more keenly since they have been unable to find adaptive strategies that enable them to manage spatial conflicts while preserving the elements of fishing that they enjoy. They also expressed more concern over space and access issues relating to the proposed aquaculture site and future aquaculture development. Jake voiced his concern: *If there was going to be 300 boats fishing at the Isles of Shoals and you locked them out of a certain area . . . Well I don't agree with that. They should find a place that's less populated.* He was uncertain how public access and rights issues could be worked out. *Nobody owns it. There's no boundaries. No stone walls to say "You own this side, I own that side." I'm not sure how that should be dealt with.* Reed was more emphatic, saying that competition over the space would be a definite downside to the project. He, too, raised the issue of who should have a say in open ocean access. . . . *New Hampshire citizens, collectively, I believe own offshore, off our state coast. I think it should be managed for all of us. Even the people who don't utilize it should have some input. And I believe the people from inland should be able to say, "There should be open space in the ocean," or "They shouldn't be doing this or they shouldn't be doing that."* This group of fishers who have been sensitized to space conflicts on the water, have been unable to adapt and resolve those conflicts in a satisfying manner. They were less certain that new spatial conflicts raised by future aquaculture development could be resolved. While they expressed positive opinions about aquaculture in general, they had some real concerns about another user group gaining access to common space, especially a user group that would bring with it precedents and procedures for fencing off open space and limiting free access to common property.

To summarize, the degree to which the sport fishers' experienced competition for favorite fishing spots, and their abilities to successfully adapt to that competition, influenced their attitudes toward ocean management and regulation of open space. Most of this small group of recreational fishers, those unaffected by competition for favorite spots and those with adaptive strategies to manage spatial competition, have confidence in both government and individuals' abilities to continue to work out space and access issues amicably and equitably. However, fishers who have been unable to adapt satisfactorily to increased competition for their favorite spots were more skeptical about successfully regulating access and space issues in the commons when pressure continues to mount from competing uses in the future.

Conclusion

In this study, we found that the opinions and attitudes of New Hampshire's saltwater sport fishers regarding aquaculture development in particular and the regulation of common space in general were shaped by their feelings toward commercial fishers and the depletion of wild fish stocks. Their ideas were shaped by their personal experiences on the water and the context within which each considers questions such as "Who owns the ocean?" or "What do you think about aquaculture development?"

The results of this study suggest that it is too simplistic to expect individuals in any group of resource users, no matter how homogeneous group members are, to have similar attitudes about resource development and regulation of public spaces based on their group position. Rather, interests toward public resources are mediated by existing relationships among users, the feelings of ownership users have toward specific places and resources, and the effectiveness of formal and informal management techniques. These features provide an important backdrop against which we should consider how individuals will perceive the regulation of common resources.

Future studies seeking to understand how people feel about complex issues such as the commercial development of commonly held resources or the privatization of public spaces might be enhanced by the inclusion of a qualitative component. A qualitative study can help uncover the ways experience, perception, and opinions are interwoven. For example, when we asked the question, straight out, "What do you think about aquaculture?" we got the simple and unanimous answer. "I'm all for it." However, more complex and sometimes contradictory attitudes emerged during the course of the interview. The same person who said open ocean aquaculture development is *great* later said *Controlling access to the open ocean, I think you are going to have an uphill battle.* We argue that in order to make sense of contradictory answers such as this, we must understand the social context within which the individual considers the question.

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MANAGEMENT SESSIONS

MAINTAINING THE QUALITY OF PARK RESOURCES AND VISITOR EXPERIENCES: AN OVERVIEW OF A NEW HANDBOOK FOR MANAGERS

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Abstract: Recreation resource managers provide a public service through conscientious decision making and the intelligent stewardship of the lands that have been entrusted to them. Innovations in the field of recreation resource management such as the Recreation Opportunity Spectrum (ROS) Planning System, the Limits of Change (LAC) System for Wilderness Planning and the Visitor Experience and Resource Protection (VERP) Planning Process have increased the capacity of recreation resource managers to address unacceptable impacts to resources and visitor experiences. However, due to increasing threats to our natural and cultural resources, increasing visitation levels, and an increasingly politicized management arena, managers need decision-making tools that enable them to swiftly and effectively solve their most pressing problems. To meet this need, the authors worked with planners and managers in the National Park Service to develop and field test a decision-making tool to maintain the quality of park resources and visitor experiences. This article provides a brief overview of the handbook that resulted from this effort entitled, *Maintaining the Quality of Park Resources and Visitor Experiences: A Handbook for Managers*.

Introduction

Park and recreation professionals are increasingly challenged to meet a dual mandate—to protect and sustain natural and cultural resources for future generations and to provide high quality recreational experiences for visitors. Many resource areas have been especially hard hit, sustaining numerous recreation-related impacts. For some managers the situation is reaching crisis proportions. The biophysical environment is being damaged beyond acceptable limits and the people visiting these areas are no longer attaining the quality experiences and benefits they seek.

Managers, planners and researchers have long wrestled with ways to effectively address unacceptable visitor-caused impacts, including crowding and congestion; visitor conflicts; trail and campsite deterioration; impacts to vegetation, wildlife, and water quality; and noncompliant visitor behavior. A large body of research exists to support decisions to eliminate or reduce these unacceptable impacts. In addition, managers possess a wealth of first-hand experience regarding how to solve problems on the ground. What is needed is a synthesis of the information and expertise relevant to decision making and a “hands-on” process to guide management decision making.

The National Park Service (Denver Service Center) commissioned the University of Minnesota to (1) identify a decision process that managers can use to address unacceptable impacts, and (2) develop resources to support managers in that process. The handbook complements the Park Service’s efforts in developing the Visitor Experience and Resource Protection (VERP) framework, which was developed to address issues of carrying capacity related to visitor-caused resource impacts and impacts to the quality of visitor experiences USDI, NPS 1997a,b). The handbook may be used by managers who have implemented VERP or other planning frameworks, such as Limits of Acceptable Change (LAC) and Visitor Impact Management (VIM); however, its effectiveness is not conditional upon the use of these frameworks.

The handbook was field-tested in early 1997 in four National Park Service units (Arches, Mesa Verde, Grand Tetons, and Yellowstone national parks). In addition to Park Service managers, representatives from at least one conservation organization as well as managers from the Bureau of Land Management, USDA Forest Service, and several state resource management agencies evaluated the handbook. The authors conducted 2-3 day workshops at three of the study sites, Arches, Yellowstone and Mesa Verde, in which participants used the handbook to address real problems at their site. The participants also reviewed the content of the handbook for clarity and ease of use in a field situation. Significant changes in the handbook followed the pilot-test activities.

The result of this effort is a handbook entitled *Maintaining the Quality of Park Resources and Visitor Experiences: A Handbook for Managers*. The purpose of the handbook is twofold:

- To provide resource managers with a step-by-step, easy to use process for identifying and defining unacceptable impacts to biological and cultural resources and to visitor experiences.
- To identify a range of strategies and tactics managers can use to address unacceptable impacts to resources and experiences.

The Handbook—An Overview

The handbook is a resource for public land managers who have identified unacceptable impacts to resources and visitor experiences and who want to act to eliminate them.

The handbook (1) assists in problem identification, (2) facilitates the identification of a range of possible solutions, (3) encourages an in-depth assessment of alternatives, and (4) enhances the political credibility of decision making through the strength of the process and the way in which decisions are documented. Using the handbook helps managers reduce the range of uncertainty associated with balancing scientific, legal, budgetary, administrative and political factors.

The handbook is divided into three parts. Part one outlines a *decision process* that helps managers analyze problems related to visitor use and options for solving them. The decision process consists of five separate but interrelated stages:

- (1) Problem awareness
- (2) Problem specification
- (3) Strategy and tactic selection
- (4) Plan implementation
- (5) Monitoring

Figure 1 outlines specific decision-making steps for each stage in the process, identifies potential resources for decision making, and indicates which handbook worksheet corresponds to each stage.

Part Two includes the three *worksheets* that are used to implement the decision process. Each worksheet is designed to aid managers at a specific stage in the decision process. The first worksheet assists managers with problem specification. The second worksheet provides a list of possible strategies and tactics to resolve unacceptable impacts for managers to evaluate and consider for implementation. The third worksheet facilitates the development of a work plan listing specific actions for implementation, who is responsible for implementing the action(s), and the time frame within which it is to be implemented.

Worksheet 1 is used for the problem specification stage of the decision process. The worksheet guides managers through each of the following steps. First, managers must write a clear description of the problem. The problem may be stated in very broad or very specific terms at this stage in the process. Next, managers list the impacts they believe to be related to the problem. For each impact listed, managers must determine the acceptable level of that impact. If indicators and standards of quality have been developed for the area, and if these indicators and standards address a specific impact, then the acceptable level of the impact is the prescribed standard. When prescribed

standards do not exist, managers must make their "best educated guess" as to the acceptable level of impact. Past research, colleagues, past and current visitors, and other resources can all be helpful in developing a best educated guess. Next managers are asked to record when the impact occurs, where it occurs, and how much of it is occurring. Monitoring data is extremely helpful in this stage of the process, although information can be drawn from observations made by managers and/or visitors. Once the location, timing and extent of the impact has been identified, managers must assess whether the amount of the impact is acceptable, unacceptable, or approaching unacceptable levels by comparing acceptable impact levels (prescribed standards or best educated guesses) with existing impact levels. If existing impact levels are approaching unacceptable levels, management action may be required. If existing impact levels are at unacceptable levels, management action is required. Finally, managers are asked to identify the root cause of those impacts which they have determined will require management actions to resolve.

Worksheet 2 is used for the strategy and tactic selection stage of the decision process. The goal at this stage in the decision process is for managers to think strategically and to consider a wide variety of problem solving options. The worksheet outlines five strategies and 25 tactics for managers to consider implementing to address the unacceptable impacts they identified during the problem specification stage in the process. First managers review the five strategies outlined in worksheet 2. These strategies include approaches such as modifying the location, timing, and type of use or modifying visitor attitudes and expectations. After selecting one or more strategies for implementation, managers brainstorm all the potential tactics that could be used to resolve an unacceptable impact. Worksheet 2 ensures that managers consider a wide variety of tactics, including tactics related to (1) site management, (2) rationing and allocation, (3) regulation, (4) deterrence and enforcement and (5) visitor education. Space is provided for managers to record specific comments or potential applications of individual tactics. After managers identify potential tactics, they must evaluate and select tactics for implementation. The handbook outlines 11 criteria for managers to consider during tactic evaluation and selection. Selection criteria range from determining whether the tactic addresses the root cause of the problem to considering whether the tactic preserves visitor freedom of choice. The strategy and tactic selection stage of the process can be conducted individually or in a group decision-making context.

Figure 1. Stages in the Decision Process for Maintaining the Quality of Park Resources and Visitor Experiences.

Stages in the decision process	Potential resources for decision making	Appropriate handbook worksheets
1. Problem awareness <ul style="list-style-type: none"> Recognize that unacceptable impacts exist and must be addressed 	<ul style="list-style-type: none"> Statements of park purposes, significance, primary interpretive themes, and specific resource conditions and visitor experiences to be achieved and maintained over time Observations of park staff Indicators and standards of quality Public input 	None
2. Problem specification <ul style="list-style-type: none"> Identify impact Describe acceptable impact Describe existing impact Determine if existing impact is unacceptable Identify root cause of impact 	<ul style="list-style-type: none"> Resource condition and visitor experience data available from: <ul style="list-style-type: none"> Research Resource use monitoring Public input Comparison of existing condition with predetermined standard of quality Public input 	Worksheet 1
3. Strategy and tactic selection <ul style="list-style-type: none"> Select appropriate strategy Identify potential tactics Evaluate and select appropriate tactics 	<ul style="list-style-type: none"> This handbook Public input 	Worksheet 2
4. Plan implementation <ul style="list-style-type: none"> Develop implementation plan for selected management tactics Identify specific management actions Identify person responsible for carrying out management actions Implement actions 	<ul style="list-style-type: none"> Supervisors, office staff, and field staff determine appropriate tasks and work loads 	Worksheet 3
5. Monitoring <ul style="list-style-type: none"> Monitor effectiveness of actions If problem arises, return to problem specification stage 	<ul style="list-style-type: none"> Resource condition and visitor experience data available from: <ul style="list-style-type: none"> Research Resource use data Public input Comparison of existing condition with predetermined standard of quality Public input VERP handbook (USDI, NPS 1997a) 	None

Worksheet 3 is used for the plan implementation stage of the process. In this stage managers devise an implementation plan for tactics selected during the previous stage of the process. First managers identify specific management actions they will take to implement each of the selected tactics. Tactics may be implemented in a variety of ways. To increase tactic effectiveness, managers should consider management actions that respond to site-specific factors. After specific management actions are identified, managers then determine who will be

responsible for implementing each management action and the time frame for completion.

Part Three describes 25 different management *tactics* that can be used to address unacceptable visitor-caused impacts. The description of tactics is a reference section or source book to help guide managers in comparing, evaluating, and selecting courses of action to eliminate or reduce unacceptable impacts. The tactics are organized into five different categories: site management, rationing and

allocation, regulations, deterrence and enforcement, and visitor education. Each category represents a distinct approach to resolving unacceptable impacts to resources and visitor experiences. Tactics within each category vary in terms of whether they are direct or indirect, subtle or obtrusive. In addition, their applicability to addressing specific impacts varies on a site-by-site basis.

This handbook builds on previous research and management experience during the past three decades to identify and describe alternative management techniques to address visitor-caused impacts. Our effort has built heavily on the publications by Cole, Peterson and Lucas (1987), *Managing wilderness recreation use: Common problems and potential solutions*; and Cole (1989b), *Low-impact recreational practices for wilderness and backcountry*. While our work has expanded the management topic beyond wilderness to include all types of recreation settings and areas, we think our major contribution may be providing a process in which managers use worksheets to specify their most critical problems and identify alternative management tactics to address problems. The worksheets give users a visual process for evaluating and prioritizing which tactics to implement among those identified during brainstorming.

What Can and Cannot the Handbook Do?

The handbook stimulates the informed consideration of a range of options to address unacceptable use-related impacts to resources and visitor experiences. It does this by stimulating critical thinking and in-depth discussion of a range of strategies and tactics. The handbook provides information that can help managers assess strategies and tactics in light of both general and site-specific factors.

The handbook cannot, however, produce a single right answer. Selecting appropriate management tools is a value judgement. Ultimately, managers are left with the difficult decisions of how much use is appropriate, what kinds of activities are acceptable, and how visitor use is to be managed.

The handbook can:

- Address recreation-related impacts on resources and visitor experiences.
- Provide supporting rationale for informed, defensible decisions.
- Provide an analytical process for selecting for selecting appropriate management actions.

The handbook cannot:

- Provide a quick, easy solution to management problems related to visitor use.
- Solve problems unrelated to visitor use.
- Guarantee 100% scientific accuracy or eliminate the need for good judgement by resource professionals.

Who Should Use the Handbook?

The handbook was developed for use by National Park Service managers. Nevertheless, it can be used effectively by any federal, state, county or local public land manager responsible for managing recreational use and resources. The handbook also has applications in the commercial recreation industry and among private landowners.

Although the handbook was initially designed for use by managers in a group decision-making setting where people brainstorm, discuss options, and make decisions; it can be used in nongroup settings. In fact, during the field testing process managers frequently commented on the usefulness of the handbook for individual managers who want to solve relatively straightforward problems in an area of limited geographical size over which they have jurisdiction.

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FOUNDER'S FORUM

RECONCEIVING RECREATION POLICY IN AN ERA OF GROWING SOCIAL INEQUALITY

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Abstract: Economic inequality has grown rapidly in the United States over the past quarter century. An estimated 85% of the country's wealth is now controlled by only 10 percent of the population. This has led to an increasing emphasis on the production of private, luxury goods at the expense of public goods. Many of the planning and management concepts used in recreation today can be linked to this lack of public-sector funding, and thus influence the way we conceive and attempt to resolve problems in the field.

At the same time, growing social inequality may create opportunities for alert private-sector producers and may highlight the benefits of public/private partnerships. In the public sector, the inequality implies the need to rethink our vision, mission, and guiding principles. Our professional forebears believed in the ability of recreation resources to play a positive role in people's lives. Their vision continues to offer guidance and purpose as we enter the 21st century.

Introduction

That America is a middle-class country has long been one of our most cherished beliefs. The country itself was founded on the idea of the sanctity of the commons--"that all men are created equal," "with liberty and justice for all" -- such that the notion of a middle-class society is descriptive, in a way, of our national sense of ourselves. Yet, an examination of both the historical record and contemporary trends in income and social status suggest that the middle-class ideal is far from reality. In this paper, I contend that the growing social inequality we have been experiencing since the early 1970's has shaped--often in subtle ways--our very conception of recreation planning, management, and research. Recognizing this may lead to new opportunities to provide creative services for profit in the private sector. At the same time, recreation policy in the public sector needs to be rethought to be more reflective of contemporary social trends and to discover a reinvented sense of mission.

Economic Inequality in the United States

Social inequality has many dimensions: there are inequalities associated with gender, race, and ethnicity, with social status and power, in exposure to crime, with mobility and age. The most basic of these may be economic inequality as measured by both income and wealth (total assets including income). As noted above, the United States was founded on the premise of egalitarianism. When Alexis de Tocqueville visited in the 1840's, he was surprised by the level of equality; while there was wealth, no single group monopolized it and

de Tocqueville believed it to be fluid. Unfortunately, contemporary historical scholarship disputes de Tocqueville's observations, finding that wealth inequality was a clear and constant condition in the early United States, particularly between the Revolution and the Civil War (Hurst 1998). Inequality declined somewhat after the Civil War, but peaked during the 1920's. However, the Great Depression and the social programs it spawned, including the growth of the graduated income tax, along with the great industrialization brought about by World War II brought the ideal of a middle-class society closer to reality than ever before. During the 1950's and 1960's, a rapidly growing economy divided the spoils of economic growth remarkably evenly so that, while there might be five classes ranging from rich to poor, the earnings expectations for each class were rising and the corresponding mood was optimistic (Cassidy 1995). People who might not be doing well financially themselves at least were able to believe that their children would be better off than they were. However, by the early 1970's, productivity growth had slowed and economic rewards no longer were shared equally. For example, in the mid 1970's, an average chief executive officer earned about 40 times more than an average worker, but by the mid-1990's this had increased to 190 times more (Cassidy 1995).

Such discrepancies are inevitably reflected in family incomes; between 1973 and 1993, the bottom 40% of American families saw their incomes decline in real terms while the top 20% of the households received 48.2% of aggregate household income. Although education helped ameliorate these effects for some, between 1979 and 1995 the earnings of the median male worker declined by 11.5% and the average high-school graduate's wages declined even more steeply (Cassidy 1995). Since 1987, the wages of college graduates and white-collar employees also have been declining (Hurst 1998).

The booming economy of the late 1990's has partially ameliorated these declines. Median household income rose to \$37,005 in 1997, up from \$34,000 in 1994, returning it to the pre-recessionary levels of the late 1980's (U.S. Bureau of the Census 1999). Perhaps more importantly, the stock market has created \$5 trillion worth of new financial wealth since 1990 (Frank 1999). And more people than ever before own stock--an estimated 43% of all Americans (Burlington Free Press 1998). That's the good news. The bad news is that if 43% own stocks, 57% do not. Additionally, most of the 43% who do own stocks are small holders, owning relatively small amounts through pension plans, 401K's, etc. Thus, the overwhelming beneficiaries of the \$5 trillion boom have been the major stockholders--the wealthiest 10% of the population.

In fact, the gap between rich and poor has now grown so wide that economist Edward Wolfe of New York University estimates that 85% of the wealth of America is currently controlled by the wealthiest 10% of the population (cited in Cassidy 1999, p. 92). Of the world's developed countries, only Australia tops the United States in terms of economic inequality (Frank 1999). Meanwhile, we continue to read news stories of plant closings and downsizings, suggesting that the gap between rich and poor will continue to widen.

Under these circumstances, it makes little sense to speak of America as a middle-class country. Instead there are now four classes, according to Cassidy (1995, p. 18):

"At the top, there is an immensely wealthy elite, which has never had it so good. At the bottom, there is an underclass, which is increasingly divorced from the rest of society. And between these extremes there are, instead of a unified middle class, two distinct groups: an upper echelon of highly skilled, highly educated professionals who are doing pretty well, and a vast swath of unskilled and semiskilled workers who are experiencing falling wages, stagnant or declining living standards, and increased economic uncertainty."

As much as 57% of the U.S. population can be categorized as working class or below (Gilbert and Kahl, summarized in Hurst 1998). Who are these people? Gilbert and Kahl (in Hurst 1998) describe the working class as people with high school degrees in lower level white-collar or blue-collar positions and who earn about \$25,000 per year. The working poor tend to be those with some high school who are service workers or in the lowest paid clerical or blue-collar positions and earn less than \$20,000. The underclass consists of individuals with some high school education who work part-time, are unemployed, or on welfare, and who earn less than \$13,000 (all figures in 1990 dollars).

Perhaps even more descriptive is Lillian Rubin's (1994) analysis of working-class jobs. Rubin interviewed hairdressers, tool and die makers, cashiers, telephone operators, barbers, coal miners, steel workers, truck drivers, waitresses, hotel desk clerks, orderlies in nursing homes, security guards, mechanics, secretaries, UPS drivers, and the like. These are the kinds of people who have not fared well over the past 25 years, and who tend depend on public or low-cost private recreation facilities. Their financial problems are compounded by high-level or persistent credit card debt. In one study not limited to the working class, 89% of the sample reported debts of some kind (excluding mortgages); 66% had persistent credit card debt (Schor 1998). These figures parallel the national averages. Between 1990 and 1996, the volume of U.S. credit card debt doubled (Cassidy 1999).

Thus, over the past quarter century, the United States has been pulling apart socially and the gap between rich and poor has widened substantially. These trends are likely to continue, fostered by factors such as globalization of trade, technological innovations that enable workers to be replaced by machines, declining power of labor unions, immigration, spread of oligopolies (Harris 1987), and growth of "winner take all" markets (Frank 1999) in which small differences in performance can yield huge differences in rewards, e.g., in sports, the arts, and the computer industry. In combination, these factors suggest that things will get worse before they get better--that social inequality will grow and that the wealth of the country will continue to be concentrated in the upper

socioeconomic strata. As wealth is concentrated, there is likely to be an increasing emphasis on the production of private, luxury goods targeted at high-end consumers at the expense of public goods that provide service to everyone (Frank 1999).

This, then, represents the current social environment within which we must conceive recreation services, both public and private. With 57% of Americans now classed as working class or below, we need to understand how these trends affect our understanding of recreation and its concepts and their application to planning and management.

Effects of Social Inequity on Recreation Concepts

Growing social inequality is likely to influence the concepts we use to understand recreation in many ways. A key issue is likely to be confusion over cause and effects. For example, changing family living modes, increasing numbers of single-parent households, frequently are attributed to a decline in family values. However, it is more likely that the new modes of living are a response to economic stresses and that changing values are an outcome rather than a cause of economic inequality (cf., Rubin 1994, Harris 1987). Similarly, I suspect that many of our most central concepts of recreation are a response to declining budgets rather than part of an objective analysis of biological or social conditions. To illustrate, consider a thought experiment involving playgrounds.

The playground movement in the United States began around the turn of the 20th century. It had a simple goal: to get children off the streets and into a safe, stimulating play environment. This goal had two beneficial consequences: it helped make the streets safer for other uses and provided healthy development opportunities for children. Suppose that the first playgrounds were well funded, efficiently run, appropriately maintained, and generally successful. Then suppose a fiscal downturn occurred, perhaps a recession or a series of unfortunate choices, and despite high enthusiasm on the part of users, funding was reduced substantially. What would happen?

The first thing users likely would notice would be signs of deterioration-- grass would no longer be mowed regularly, a broken swing would remain unfixed, new paint would not be applied. They might complain to the administration, but the administration would tell the enthusiasts that it understood and was doing the best it could, and that it too valued playgrounds but times were difficult and its hands were tied, that we needed to work together for a better future. Shunted aside, the playground enthusiasts would not give up, continuing to complain about deteriorating conditions. Some would attribute these to overuse, raising questions about carrying capacity and sustainability. A few enthusiasts might seek solutions in new management techniques, e.g., more durable equipment or genetically improved grass, but many more would call for limits, now and in the future to preserve the benefits of the playgrounds for future generations of children. The call for limits would prompt a discussion of

mechanisms--lotteries, permits, etc.--and someone would propose fees as the ultimate rationing mechanism. Some in the movement would object, raising questions about fairness. Others would counter with concerns about efficiency in playground allocation.

The idea of excluding certain playground users would lead to interesting rationales, some of which would be designed to save the consciences of those who remained in the movement. After all, they might argue, some children really benefit while others are marginal. Why not exclude "low-valued" playground users? They do nothing but cause trouble; they hang around with their boom boxes and bad attitudes--it would be better for everyone if they were gone. Then we finally could achieve a sustainable level of playground use. Only a few people might still puzzle about what had happened to the original goals of the movement--getting the children (all children) off the streets and into safe, stimulating play environments.

The playground in this example is only a metaphor for the American recreation estate as a whole, but it raises interesting questions. First, how many of our most significant recreation concepts are budget driven? Take use as an example. Suppose we had sufficient funds to repair, restore, replant, regrade, redesign, and so on. How much of the effects of overuse could be mitigated? And how much of the importance of concepts like carrying capacity, limits of acceptable change, or visitor impact management would be reduced? To be sure, not all of the effects of increasing use could be mitigated by adequate budgets--more people would create some impacts but many of these impacts could be minimized.

Critics will point out that we have not had adequate budgets in years, nor are they likely in the foreseeable future. The American recreation estate has deteriorated substantially and the amount of deferred maintenance is huge. In fact, some facilities built by the Civilian Conservation Corps in the 1930's are still in use. Agreed. Most public recreation facilities have shared the fate of other public goods, as we have shifted our societal emphasis from them to the production of private luxury goods (Frank 1999). The key point is to understand just how many of our planning and management concepts are budget driven. When we speak of something like sustainability, it is appropriate to ask: Sustainability at what level of budgetary input?

Second, the idea of needing to divide users into groups, possibly excluding some, may have interesting permutations. When you exclude, do you also devalue? In the playground example, I suggested that the "low-valued" users were children who wanted to hang around with their boom boxes, spoiling it for everyone else. It is an easy step from this to exclusion on the basis of race, age, gender, and other personal characteristics. The idea of visitor exclusion has prompted a number of ways to save our consciences. Here are four ways to feel good about excluded users: (1) Focus on agency or organizational well-being, making the welfare of the agency a prominent concern in any decision; (2) Adopt a "customer" approach that emphasizes people in aggregate rather than

focusing on marginal users. Obviously, excluded users are not customers and, therefore, need no consideration; (3) Argue in favor of resource protection--the need to forego present consumption to preserve the resource for future generations; (4) Escape into technocratic management, treating problems as technical rather than moral in nature. Each of these strategies is in full play in recreation planning, management, and research. I only ask that you consider them in relation to the spreading social inequality.

Finally, social class considerations enter into recreation management in multiple ways. For example, our conceptions of what constitutes "proper" behavior in recreation settings may be class related. As Cranz (1982) noted, social reformers can be patronizing by attempting to improve the lower classes to standards set by the upper classes rather than having the upper classes change to accommodate the standards of the poor. Similarly, Walter Kuentzel (Univ. of Vermont, pers. commun., 1999) has suggested that most of the benefits listed in Benefits-Based Management (BBM) reflect the values of upper middle-class white males. Would the same benefits apply to single mothers or to unemployed Chicano men? I do not know the answers to these questions, but it is important that such questions be posed.

Private-Sector Opportunities

Families in the working class and below have always had a multitude of essentially private (if not private sector) recreation opportunities available to them. Visiting, card games, television, civic activities associated with organizations like the church, and, of course, "the street" and all the excitement it provides have been major sources of entertainment in low-income neighborhoods. These opportunities are essentially private, but private in the sense of personal. What about private commercial opportunities? What matters most here is cost. People continue to have the desires to go, to see, to do, but opportunities grow scant as means decrease. For example, a recent Associated Press story described the anger of New York City Council speaker, Peter Vallone, when he described taking his grandchildren to the movies. When all was said and done, the outing cost him over \$100. As a result, he is concerned that people are being priced out of the movies and has asked the city to investigate Lowe's theaters (Burlington Free Press 1999).

At the same time, most low-income people have adjusted to the high price of movies. Working-class families purchase VCR's (often on credit) simply because it is more cost effective to have the entire family watch a rental movie than to pay \$7 to \$9 per person at a theater (Rubin 1994). Similarly, the "second run" theaters in my area (Burlington, VT) that show previously released movies for \$1.50 are continually sold out. In the food realm, the restaurant industry has responded to changing economic circumstances by creating inexpensive "all you can eat" buffets or low-priced, fast-food chain restaurants. Perhaps closer to resource management, entire tourist communities can cater to working-class vacations. For example, Gatlinburg, Tennessee is enormously popular with working-class families (Walter Kuentzel, Univ. of Vermont, pers. commun., 1999). National

Parks provide low-cost, public-sector recreation, while the many inexpensive motels promote competition and keep prices down. This raises the interesting issue of public/private partnerships in recreation investment and planning. Private-sector opportunities are fundamentally governed by supply and demand, but alert producers who recognize the public's changing circumstances may be well positioned to provide valued services in niche markets.

Public-Sector Responsibilities

The implications of growing social inequality for the public sector are far more complex and likely to affect the public agencies in many ways. Perhaps for much of the public, there is likely to be an increasing need for--and dependency on--public-sector opportunities, coupled with a decreasing ability to pay. This touches most directly on the issue of user fees (see More 1999a, b and More 1998). But more crucial is the issue of identifying the public purposes associated with public-sector recreation. The increased emphasis on marketing has led public agencies to ask the question: Who are our customers? But this may be the wrong question for the public sector. Instead, we need to ask: Who should our customers be? or, as Shultz et al. (1998) would ask: What are we in business *for*?

Such questions imply that agencies should have a proactive sense of need and mission rather than a reactive sense of demand. To illustrate the difference, consider the case of public libraries. In their volume on marketing government and social services, Crompton and Lamb (1986, p. 322) advocated pricing for public libraries on the basis that people who visit libraries have above average incomes, so it might be more equitable to charge a service fee than to rely on funding from regressive property or sales taxes. Indeed, if we conducted a library user survey, we would undoubtedly find that most library users have a middle or upper middle-class background. They probably would believe in libraries and be willing to pay to support them. By contrast, if we surveyed the working class and below, we might well find that they have a very limited interest in books. What would be easy to overlook in this case are the small groups of users at the edge-working-class people who try to use the library to improve their lives. Their limited ability to pay might be completely swamped by computing an average willingness to pay for all library users. Yet, this is the very group that the public library is designed to serve! Perhaps the single most critical function of public libraries is to provide access to educational materials for low-income users. Instead of pricing out low-income people, we should be exploring new ways to reach more of them as we search for new more progressive methods for financing libraries.

This also is the problem with our public lands. Have we lost our sense of vision? Of public purpose? Of our reasons for being? Is public-sector recreation a medium for the improvement of people (and hence a genuine public good) or is it a luxury good publicly provided at taxpayer expense to gratify the preferences of a few? Each of us needs to decide this question for ourselves. I believe that over the past 25 years, we have increasingly slipped into the habit of thinking

of many forms of resource-based recreation as essentially private goods--goods that primarily benefit the individual rather than the public at large. This line of thinking has been bolstered by arguments in favor of limiting use for resource protection and by concepts like BBM, which focuses on individual benefits. However, our professional forebears--Olmstead, Muir, even Teddy Roosevelt--believed strongly that parks were public goods capable of improving the lives of ordinary citizens. They would have claimed as key customers the very people we are talking about excluding today. Have we lost this vision during the past 25 years? If so, we need to understand why.

Conclusion

Although in this paper I have been concerned primarily with economic inequality, there are many other forms of inequality, for example, racial, ethnic, gender, status, and political (power) inequalities. All of these are related and all affect a person's life chances. They influence physical health and the way in which a person is diagnosed at a health clinic, family relationships and violence, the ability to obtain justice, mobility, exposure to crime, and a one's overall sense of well-being. Consider the Bardolino family of Antioch, California, a small working-class city north of San Francisco (described by Rubin 1994). Mr. Bardolino has been unemployed for several months; Mrs. Bardolino works nights for the telephone company. They are neither poor nor immobile but they do have a range of concerns that typify today's working-class families. Money is a primary concern; today working-class people are worried about losing their homes in an economic downturn, a situation that would have been unthinkable 25 years ago (Rubin 1994). The financial desperation that many of them feel often leads to second jobs, so time and child care also are concerns, and working-class families are immensely concerned about their children, sensing that there is an abyss beneath them such that, if the children slip, they will never recover (Rubin 1994).

These social conditions are very real for the Bardolinos and for for than half of the U.S. population. Moreover, social inequality is growing, bolstered by a variety of deeply embedded economic trends. Yet, it is precisely these areas that we must look to if we are to discover the new social functions of recreation. Most importantly, it is time we rethought the social purposes of recreation. The free market model so much in vogue today is essentially a reactive, demand-based model. As we approach the 21st century, we need to consider a more proactive role in dealing with social problems, especially for the public sector. I do not suggest that we should patronize people, or thrust our own conceptions of the good upon them. But we need a clear sense of purpose. If we in the public sector are, in any significant way, key purveyors of family recreation opportunities, then our plans, policies, and designs must flow from this. Similarly, if we are the custodians of solitude, this also must be reflected in the management of our resources. We need a renewed sense of vision, mission, and purpose. Frederick Law Olmstead, John Muir, Jane Adams, Gifford Pinchot, Bob Marshall, Jacob Riis, and other forebears all believed that recreation offers the opportunity to intervene in

people's lives for the good. We must recover this sense of positive power of our resources and their management if we are to move forward.

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KEYNOTE ADDRESS

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PARKS HAVE A FUTURE - BUT IT HAS MORE PROBLEMS THAN THE PRESENT.

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Abstract: Parks are as old as human settlement. They seem to reflect something of the very character of being human, and to be based in the psycho-biological evolution of the human species.

There is now abundant evidence that in the contemporary world, they serve a diversity of human values and provide tangible benefits to those who experience them. As the world becomes increasingly urbanised, so there is a growing awareness of, and demand for, park experiences and park-based services.

*I asked professors who teach the meaning of life to tell me what is happiness.
And I went to famous executives who boss the work of thousands of men.
They all shook their heads and gave me a smile as though I was trying to fool with them.
And then one Sunday afternoon I wandered out along the Desplaines river
And I saw a crowd of Hungarians under the trees with their women and children
and a keg of beer and an accordian.*

Carl Sandburg, 1916.

A park is a living living-room in which to do anything and nothing - rest your fallen arches, or roam through the wilder parts exercising your imagination, or simply breathing - most important the breathing. And it will become increasingly important as this reckless anti-civilisation gathers momentum.

Patrick White, 18 June, 1972.

But the ideology of economic rationalism, driven by the global financial system, has had a pervasive impact upon human society. At local, national and world levels, people are increasingly being polarised into rich and poor, while a decreasing proportion of the wealth of the world is available for the production of goods and services. The new public sector managerialism which has emerged in the wake of this financial crisis has led to the increasing industrialisation of recreation opportunities with some very negative impacts.

This means that park professionals face a new series of ethical and practical challenges. If we continue to act as if these challenges do not exist, then the future of parks will be indeed dim for many of the global population. But we can confront the issues in a positive way, and if this is done widely enough, the human values attached to parks will make possible a much brighter future.

A long tradition

Parks have been with us for a very long time indeed ; so long that their importance to the human species probably

needs no further justification. Formal gardens existed as long as 3,500 years ago, gardens feature in the beliefs of most religions, and both public and private gardens are recorded in the earliest cities of Asia., the Middle East and Europe. The evidence is that town squares or other open spaces are as old as the history of urban settlement.

I want to take this idea even further back into our ancestry. Some 4,000 years ago, the inhabitants of Malta left behind a truly enigmatic series of parallel grooves in the rock, often known as cart-ruts, and demonstrating the existence of a primitive transport system before there was any significant urban development. The greatest confluence of these cart-ruts (popularly known as 'Clapham Junction') is immediately adjacent to the Buskett Gardens - a wondrous park where the festival of St. Paul is chanted each year. Like many of the Christian festivals, this one certainly predates St. Paul by many centuries. Taken together, we have reasonable circumstantial evidence that the Buskett Gardens have been an important gathering place since the Neolithic, which is a very long time indeed - perhaps we might call them a pre-urban park.

Similarly, if we look at the life-style of non-urban societies, time and time again we will discover the importance of beautiful natural places - the oasis, the sacred grove or the beautiful campsite. For instance, I can see again in my mind an Australian site where a truly lovely lagoon is surrounded by a ring of rock-shelters, all overlooking the lagoon, all blackened with the smoke of innumerable campfires and decorated with murals in red and yellow ochre. One can envisage what a delight it would have been to sit in one's own shelter, enjoying the twinkling lights of neighbouring campfires along and across the lagoon. So we start from the position that the appreciation of beautiful places, which we express today through parks, is as old as the human species - and perhaps even older!

The Contemporary Situation

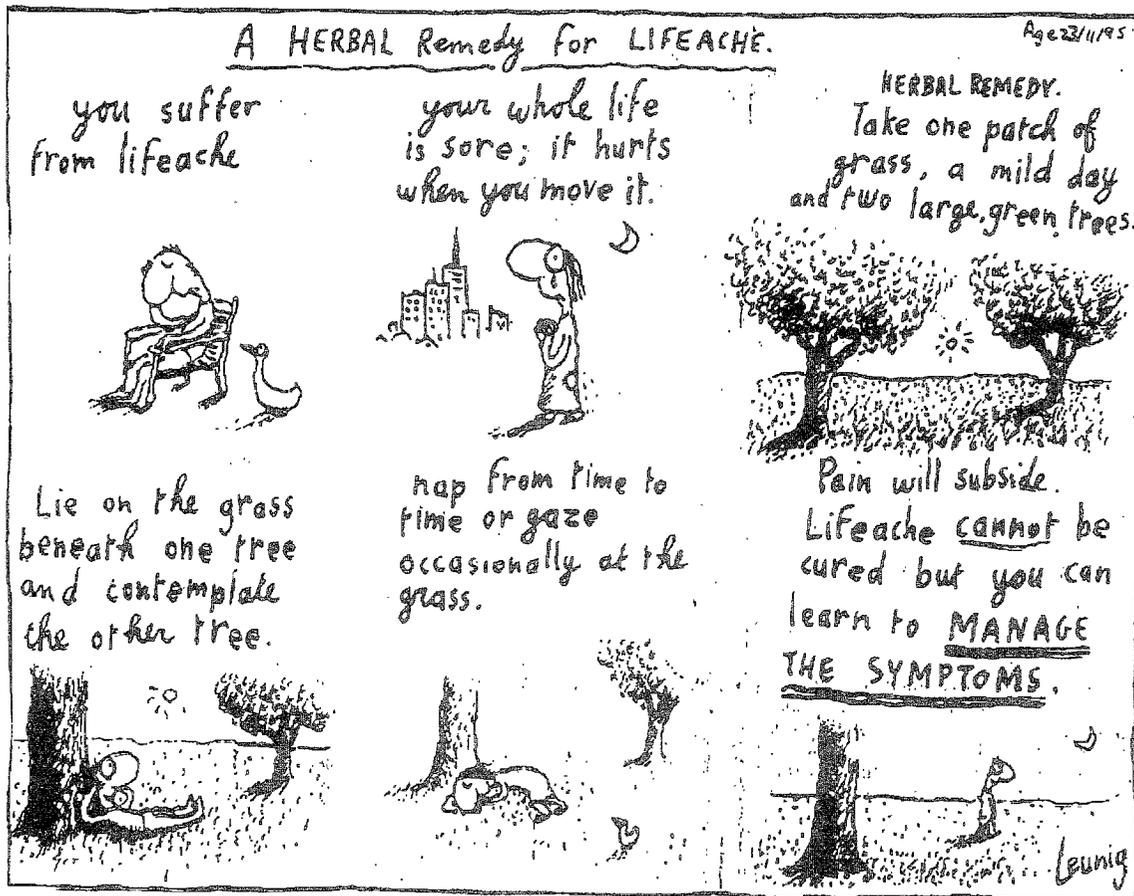
Today, parks are important for a whole range of reasons. Probably four major themes emerge when we look broadly at the current political meaning of parks as a key element in:

- social renewal of our major cities
- heritage conservation and hence in national identity

- the social well-being of people, particularly families
- and in particular, the provision of health and other benefits

The current widespread interest in recreation benefits probably excuses me from devoting a great deal of attention to the nature and remarkable scope of potential benefits. Suffice it to say that they are demonstrably immense. However, I must sound some caution about assuming too

much about benefits. The first is that like all human behaviour, the extent to which we derive benefits from any element of our social and bio-physical environment is indeed complex. Thus, we must recognise in research and management that no phenomenon ever has a single cause and no action ever has a single effect. Regrettably, when you look at the extent of simplism in research and management, this universal truth is all too often ignored.



The second is that it is not helpful to claim benefits for parks per se. Parks merely provide an opportunity; the extent to which any opportunity is actually realised is entirely dependent upon the way in and extent to which we utilise the opportunity. To take the example of the health benefits which may be provided through parks, these probably divide into three groups: relief from psycho-physiological stress, and hence improved functioning of the immune system; space for hobbies and other personal interests, or what we often know as 'serious leisure'; and space for physical activity, exercise and sport. Just to take the last of these, physical activity may or may not produce health benefits - certainly, moderate physical exercise on a regular and consistent basis is health producing, but over-strenuous exercise produces coronary illness and a range of other health problems, costing society many billions of dollars per annum.

A Problematic Future

The ideology of economic rationalism, driven by the global financial system, has had a pervasive impact upon human society. At local, national and world levels, people are increasingly being polarised into rich and poor. The two countries where the greatest polarisation occurs are Australia and the United States. This is not simply in terms of income, but also in terms of access to life quality and satisfaction. The current operation of the capitalist system means that a decreasing proportion of the wealth of the world is available for the production of goods and services, and so what we have always assumed to be readily available public goods are now no longer available, or have been transformed into private goods which are bought and sold in the market-place. So at the simplest, parks are

increasingly subject to user fees or other charges, at least to the point where the poorer members of society cannot use them. I am particularly appalled when I hear politicians or managers say that the public have a high acceptance of park fees as their data is virtually always based upon site surveys of existing park visitors !

The new public sector managerialism which has emerged in the wake of this financial crisis has led to the increasing industrialisation of recreation opportunities. It brings into play not only the emphasis upon user fees, but mass production of opportunity (the Macdonaldisation of everything ?) and on pseudo-accountability reflected in such simplistic technology as customer satisfaction measurement.

Although parks have probably not been hit as hard as some other public sector services, it is here that the challenge lies. If we do not find positive responses to the new problems and challenges, then the future of parks (and people) will indeed be increasingly dim.

Ethical and Practical Challenges

The first and most obvious problem is that of injustice. If we accept, as the evidence tells us we must, that parks can provide important health and other benefits to all people, then surely it is unjust to exclude some people from access to them. We must constantly examine the impact which managerial practices have upon the access to parks, and seek to eliminate barriers. At a simple level, this may mean developing a range of concessions on user fees. This in turn leads to a new set of practical challenges in finding a simple low-cost way to implement any concession system. There are solutions to the practical problems, and many countries have utilised them - what appears to be missing in our countries is a compelling sense of social justice or even compassion.

Then there is the further practical challenge of the extent to which political priorities and declining national budgets combine to produce severely tightened park budgets. This, of course, is seen as the reason for more emphasis upon visitor fees and other direct charges - which in itself is a pretty poor bit of reasoning. Some level of visitor fees may well be justifiable - but it essentially needs to be a socially just fee system. A colleague of mine has developed what he calls the Robin Hood system of park funding - offering a range of high quality exclusive services, e.g., special tours with a gourmet meal and quality wines included, for very high prices indeed; then using the profits to eliminate entry fees, fund development of free experience options, and to subsidise other mainstream tours and services.

The corresponding solution is to look at our budgets. Recent years have seen a remarkable increase in administrivia: more and more exchanges of paper, largely providing only a sort of pseudo-accountability. We need to constantly review expenditure and time allocation and subject each item to the test of whether it improves the quality of the park environment and/or the quality of the visitor experience. Anything that doesn't pass the test is probably totally un-necessary !

This leads me back to ethics. Park Managers need to be much clearer as to the game in which they are playing. If we are in the game of helping people to appreciate the environment, that provides one specific kind of ethical framework; if, on the other hand, we are in the entertainment business, then we have a very kind of different framework. But I see all too many park managers who have a superficial rhetoric about the environment and the human appreciation of it, yet behave as if they are in the entertainment game. But as I have emphasised above, the enduring values of parks and the benefits which accrue from visiting them are nothing to do with entertainment.

I conclude with another quotation, written in relation to education, but absolutely relevant to quality in parks management

Boredom is so familiar that we rarely recognise that we are trained in it, addicted to a consumerism of the spirit, jaded to need ever more vivid diversions. . . we sometimes attempt to alleviate boredom by making bits and pieces of education entertaining, instead of discovering and supporting those modes of activity to which the experience of boredom is simply irrelevant.

Mary Catherine Bateson 1994.

This is our central challenge - at least in parks, let's escape the trivialisation of experience and help visitors find true meanings and values in their park experience.

Index of Authors

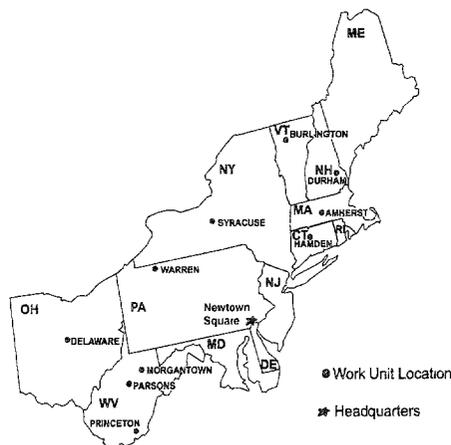
Author	Page(s)	Author	Page(s)
Abrams, E.	67	Luloff, A.	51, 219
Absher, J.	73, 323	Lynch, J.	199
Alzheimer, A.	366	Marsinko, A.	106, 164, 287
Anderson, D.	409	McLean, D.	257, 317
Avgoustis, S.	141	McNally, M.	78
Bassage, D.	86	Merriam, J.	397
Bentley, S.	347	Monk, K.	352
Bloom, K.	347	More, T.	295, 415
Booker, J.	366	Mowen, A.	336
Bristow, R.	35	Mueller, A.	67
Buckley, R.	86	Mullens, J.	78
Burns, A.	17	Murdy, J.	3
Burns, R.	73, 186	Naughton, C.	397
Cantillon, H.	397	Nelson, C.	199
Capozzi, S.	373	Newman, P.	120
Chavez, D.	194, 257	Nichols, R.	177
Che, D.	30	O'Leary, J.	129
Chen, J.	11	Palmer, J.	62
Chen, W.	340	Patterson, R.	366
Confer, J.	323	Ramthun, R.	194, 285
Cordell, K.	129	Ricciardo, J.	304
Dawson, C.	120, 157, 373	Rickenbach, M.	215
Dennis, D.	215	Robertson, R.	67
Dingman, L.	352	Robertson, R.	17, 242, 272, 361
Doble, S.	157	Robinson, R.	86
Dwyer, J.	98	Roenke, K.	162
Finn, K.	232	Salz, R.	227
Fletcher, S.	67	Sasidharan, V.	57
Fuller, C.	120	Schadler, C.	67
Garpow, W.	23	Selin, S.	86
Germain, R.	373	Sheaffer, A.	129
Gleason, M.	347	Shuart, J.	3
Gomez, E.	93	Sinton, D.	366
Graefe, A.	73, 186, 275, 323, 336	Slack, T.	219
Gratzer, M.	391	Smith, E.	172
Grimes, J.	378, 400	Starr, M.	391
Guadagnolo, F.	115	Stevens, T.	215
Hamilton-Smith, E.	82, 423	Stracuzzi, N.	384, 400
Hendricks, W.	194	Strauss, C.	251, 264
Hoffman, R.	157	Tango-Lowry, T.	242
Hong, S.	150	Tarrant, M.	172
Howell, D.	67	Thapa, B.	41, 57, 323
Hronek, B.	190	Theodori, G.	51, 219
Kerstetter, D.	115, 332	Todd, S.	309
Kittredge, D.	215	Tzilkowski, W.	251
Knapp, J.	257, 317	Vander Stoep, G.	205
Kraje, J.	86	Vogelsohn, H.	275
Kuentzal, W.	295	Wang, T.	340, 409
Kyle, G.	115	Warnick, R.	134
Lankford, S.	272	Wickham, T.	332
Larsen, D.	340	Williams, A.	272
Lee, R.	186	Wright, A.	361
Lewis, A.	391	Yiannakis, A.	3
Lime, D.	409	Yoon, Y.	11
Loomis, D.	227, 232	Zawacki, W.	287
Lord, B.	251, 264		

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Contains articles presented at the 1999 Northeastern Recreation Research Symposium. Contents cover tourism, environmental attitudes and values, water resource issues in recreation, gender, ethnicity, and special populations, visitor experiences and satisfaction, demographic trends, recreation planning and management, historic preservation in recreation, forest resource issues in recreation, human dimensions of fisheries, economics of outdoor recreation and tourism, contemporary issues in recreation and the environment, visitor experiences and participation, and place attachment.

Keywords: tourism, environmental attitudes, gender, ethnicity, historic preservation, fisheries





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