Measuring the Effects of Stakeholder Participation on the Quality of Local Plans Based on the Principles of Collaborative Ecosystem Management

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Abstract

While theorists and practitioners consistently call for widespread participation in ecosystem management and environmental planning in general, few studies have empirically tested the assumption that community representation and stakeholder participation during the planning process will lead to stronger, more durable management plans. This article examines the impact of stakeholder representation and participation on ecosystem management strategies. It tests the relationship between community participation in the planning process and the quality of local plans associated with the long-term management of ecological systems. Besides the overall breadth of stakeholder groups involved in planning, the effects of specific stakeholders are tested and discussed to determine which has the greatest impact on the quality of an adopted plan. Statistical results indicate that the presence of specific stakeholders does in fact significantly increase ecosystem plans' quality. Policy implications are discussed to more effectively link the planning process to high-quality ecosystem planning outcomes.

Keywords: *stakeholder participation; ecosystem management; plan quality; Florida*

In response to the increasing decline of critical natural resources across the United States, public decision makers are abandoning the traditional species-by-species approach to regulation and instead are embracing ecosystem approaches to management. Ecosystem management represents a departure from traditional management approaches by addressing the interaction between biotic and abiotic components within a landscape or seascape, while incorporating human concerns (Szaro, Sexton, and Malone 1998). In this approach, entire ecological systems (e.g., watersheds, ecological communities, etc.), and the ecological structures, functions, and processes within them, become the focus for management efforts rather than a single species or jurisdiction (Grumbine 1994; Christensen et al. 1996).

Local natural resource and land use planners increasingly recognize that while ecosystem management requires looking beyond specific jurisdictions and focusing on broad spatial scales, the approach will in part be implemented at the local level with local land use decisions. Furthermore, ecosystem approaches to management may not be realized solely by structural or engineering approaches to management but by the coordination of local plans and policies across larger landscapes (Kirklin 1995; Beatley 2000). Local-level planning therefore must be considered along with other spatial and jurisdictional scales when it comes to managing entire ecological systems. The factors causing ecosystem decline, such as rapid urban development and habitat fragmentation, occur at the local level and are generated by local land use decisions (Noss and Scott 1997). The vast majority of these decisions affecting large ecosystems will be made at smaller scales, where they make the largest impact on the natural environment (Endter-Wada et al. 1998; McGinnis, Woolley, and Gamman 1999). As a result, some of the most powerful tools that threaten or protect natural habitats are in the hands of county commissioners, city councils, town boards, local planning staffs, and the participating public. Thoughtful policies and actions at the local level can often protect critical habitats of regional significance more effectively and less expensively than the best intentioned state or federal protection schemes (Duerksen et al. 1997). The importance of local ecosystem-based planning is further highlighted by the declining role of

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the federal government in the protection of habitats and associated ecological systems over the past ten years and a future political climate that suggests giving more control to local jurisdictions when it comes to making resource-use decisions.

While much research has been geared toward instituting the broad principles of managing natural systems, comparatively little work has been done to evaluate the specific tools and strategies involved in implementing ecosystem management. To date, little or no research has been conducted to determine how local jurisdictions can incorporate the principles of ecosystem management into their planning frameworks. Furthermore, no empirical work has been done on why plans vary in the attention they give to managing ecological systems.

One of the key factors explaining the variation in the quality of ecosystem approaches to management is public participation during the planning process. Public participation and involvement have been widely identified as essential components of effective ecosystem management but rarely tested quantitatively (Westley 1995; Yaffee et al. 1996; Duane 1997; Lackey 1998; Cortner and Moote 1999; Wondolleck and Yaffee 2000). Since ecosystem approaches to management follow ecological boundaries rather than administrative or political lines, collaboration and the formation of partnerships across land ownership are essential parts of reaching a desirable outcome. While theorists and practitioners consistently call for widespread participation in ecosystem management and environmental planning in general, few if any studies have empirically tested the assumption that the representation and participation of stakeholders during the planning process will lead to stronger management plans.

This article evaluates the variation in local plans on the basis of their abilities to embody and implement the principles of ecosystem management. Specifically, it tests the relationship between community participation in the planning process and the quality of local plans associated with managing ecological systems over the long term in Florida. In addition to the overall breadth of stakeholder groups involved in planning, the effects of specific stakeholders are tested and discussed to determine which has the greatest impact on the quality of the adopted plan. Examining the statistical impact of participation during the planning process on the quality of plans will not only support or contradict the theoretical arguments and case study analyses pervading the literature but also add insight into how plans can be strengthened by considering who specifically is involved in the planning process. Better understanding the relationship between the planning process and planning outcomes will enable communities to more effectively manage their ecological systems and critical natural resources in the future.

This study principally relies on local city and county comprehensive plans as the unit of analysis. These plans serve as the basis for measuring ecosystem protection. While there are many different types of resource management plans in Florida, comprehensive plans follow a consistent format (in terms of production, element types, and review and updating processes), are institutionalized policy instruments, and most importantly provide bases for city and county land use and resource management decisions. Because these plans need to look beyond jurisdictional boundaries, drive collaborative efforts with other jurisdictions or organizations, and contain policies that seek to protect critical habitats constituting broader ecosystems, they act as strong gauges of how well local jurisdictions will manage ecosystems over the long term. In this sense, comprehensive plans are important tools for accomplishing many of the goals of ecosystem management because they mark the starting point for specific ordinances, land development codes, and environmental policies. They also often incorporate and implement more regional environmental activities, such as National Estuary Programs and other agreements on transboundary resource management.

City and county comprehensive plans in Florida stem from the 1985 Local Government Comprehensive Planning and Land Development Act, which mandated that new local comprehensive plans be written and required that they be consistent with the goals of the state plan. The broad mandates of the growth management legislation (meant to upgrade 1975 legislation) were given shape and substance by Rule 9J-5, which sets minimum standards for judging the adequacy of local plans submitted to the state for approval. Rule 9J-5, adopted by the Department of Community Affairs in 1986, requires that specific elements be included in local plans and prescribes methods local governments must use in preparing and submitting plans. Required elements, among others, include land use, coastal management (where applicable), conservation, and intergovernmental coordination. In each element, the rule lists the types of data, issues, goals, and objectives that must be addressed, using a "checklist" format (May et al. 1996). For example, in the conservation element, objectives must conserve wildlife habitat, while policies must pursue cooperation with adjacent local governments to protect vegetative communities (9J-5.013). Many of the required goals, objectives, and policies contained within a comprehensive plan thus lay the foundation for ecosystem management at the local level. Rule 9J-5 also sets forth requirements on public participation throughout the planning process (9J-5.004). Despite the minimum state requirements, local jurisdictions vary in the attention they give to stakeholder participation and ecosystem management. Some jurisdictions involve the public in drafting strong conservation elements that seek to manage ecological

systems and their components, while others adhere only to the base standards. Still other plans have been found to be in noncompliance and have been denied final approval by the state.

The following section examines the importance of stakeholder participation and collaboration throughout the ecosystem planning process. The specific relationship between participation and environmental plan quality is also discussed. Next, sample selection, variable measurement, and data analysis procedures are described. Results based on multiple regression analysis indicate the degree to which overall representation (breadth) and the presence of specific stakeholders contribute to the quality of local plans when it comes to managing broader ecological systems.

► Stakeholder Representation and Participation in Ecosystem Approaches to Planning

Ecosystem approaches to management often extend across different organizations, agencies, and lines of ownership. Therefore, the planning process necessitates the involvement of multiple and sometimes competing interests. Furthermore, many local comprehensive planning processes geared toward environmental management, such as those in Florida, are by mandate required to develop citizen participation programs. Who is involved and to what degree will inevitably influence the outcome of the planning process: the management plan.

High levels of public participation are often cited as a central component of an effective planning process for ecosystem management and environmental planning in general. Scholars argue that because ecosystem management is by definition a transboundary, multiparty issue, the participation of key stakeholders is widely viewed as the single most important element of a successful outcome (Grumbine 1994; Westley 1995; Yafee et al. 1996; Duane 1997; Duram and Brown 1999; McCool and Guthrie 2001). The participation of stakeholders from the beginning of a project increases trust, understanding, and support for regional or ecosystem-based protection (Yaffee and Wondolleck 1997). Including key parties in the decision-making process also helps build a sense of ownership over a proposal and ensures that all interests are reflected in the final management plan (Brechin et al. 1991; Innes 1996).

Public participation in plan making was initially supported to reflect a commitment to the principles of democratic governance. As discussed by Arnstein (1969), Burke (1979), Day (1997), Fainstein and Fainstein (1985), and others, these principles support the rights of individuals to be informed and consulted and to express their views on governmental decisions. They also include the need to better represent the interests of disadvantaged and powerless groups in governmental decision making and the contributions of participation to citizenship. More recently, it has been argued that citizen participation can act as a powerful lever for generating trust, credibility, and commitment to the adoption of policies (Innes 1996). Furthermore, organizations and individuals often bring to the process valuable knowledge and innovative ideas about their community that can increase the quality of adopted plans (Moore 1995; Duram and Brown 1999; Beierle and Konisky 2001).

For example, Innes (1996) examined the role of consensus building through case studies of environmental problems involving multiple issues that cut across jurisdictional boundaries. She found that collaboration not only increased trust, communication, and the development of public-private networks but also resulted in stronger outcomes or plans that were beneficial to the resource or the natural system as a whole. Furthermore, in the most comprehensive survey of ecosystem management in the United States, Yaffee et al. (1996) found that participation and collaboration of key stakeholders was the single most important factor (cited by 61 percent of respondents) that enabled projects to reach quality outcomes. Specifically, collaboration within and among public agencies and businesses was an important mechanism for increasing cooperation and communication, fostering trust, and allowing for more effective outcomes that met a greater set of interests.

On the basis of this line of argumentation, a consensus-building planning process that seeks to generate ecosystem-based policies begins with the representation of key stakeholders (Carpenter and Kennedy 1988; Crowfoot and Wondolleck 1990; Yaffee 1994; Beatley, Brower, and Lucy 1994; McCool and Guthrie 2001). The representation of a broad cross-section of the community includes industry and other private landowners, who in many instances are left out of important local land use decisions. In addition to the breadth of participants (a representative sample of the community) present in the planning process, the active participation of specific stakeholders from the beginning of a project increases trust, understanding, and support for policies that protect natural systems and their subcomponents (Duane 1997; Yaffee and Wondolleck 1997; Duram and Brown 1999).

It should be noted that while a large portion of the literature strongly supports the representation and participation of specific stakeholders in the planning process, few empirical studies exist to support these claims. And there are counterarguments that suggest that participatory processes may not necessarily lead to quality plans. High levels of participation may increase conflict by having disputing parties at the negotiating table, frustrate planners by slowing down the decision-

making process, and most importantly dilute the strength of the final agreement by having to balance competing interests (Alterman, Harris, and Hill 1984; Brody 2001a).

To determine if the representation and participation of stakeholders do in fact strengthen the quality of planning outcomes as applied to ecosystem approaches to management, I propose and test the following two hypotheses. The first tests the general assumption that stakeholder representation leads to a stronger plan. The second is more specific in that it focuses on the effects of specific stakeholders participating in the planning process.

Hypothesis 1: The representation of key stakeholders in the planning process will result in a higher quality plan (breadth).

Hypothesis 2: The participation of specific stakeholders, such as industry, government, and nongovernmental organizations (NGOs), will result in a higher quality plan (activity).

▶ The Influence of Participation on Ecosystem Plan Quality

Further explanation is needed as to why stakeholder participation may lead specifically to stronger local ecosystem plan quality. The participation of stakeholders is often associated with *land ownership*, *resources*, and *knowledge* that, when brought to the planning process, can increase the quality of the final plan. One of the fundamental goals of ecosystem management is to ensure that critical land within a natural system, such as a watershed, is included for management within the targeted planning area. When key landholders are active participants in a comprehensive planning process, areas of high biodiversity, natural habitat, or critical ecosystem components may receive greater consideration in the final plan. If large landholders are not part of the planning process, the final plan may not cover the entire ecosystem, falling short of its intentions to manage the complete natural system. Stakeholder participation can also contribute valuable resources, such as time, personnel, and sometimes funding, which will enhance plan quality by allowing for more expansive data collection, better monitoring programs, more regular plan updates, and so on. Finally, with participation from a range of stakeholders comes knowledge of the resource and technical expertise that will inevitably contribute to higher plan quality. More than ever, private-sector actors, such as industry, are collecting and analyzing their own baseline data to monitor the natural resources on which they depend.

The presence of certain stakeholders in the planning process can thus boost the collective capacity of planning participants, which should enhance each individual component of a plan. For example, it is expected that the factual base would include a more complete resource inventory, whereby impacts to these resources would be better known. Goals and objectives would be more inclusive and better balanced and would reflect a more systemwide approach. Interorganizational coordination elements would be stronger where more collaboration with other parties and jurisdictions is emphasized. Tools and strategies would be more focused and inclusive and include more incentive-based policies and better monitoring tools. Finally, implementation sections of the plan would provide greater accountability, flexibility, and enforcement of policies. The underlying assumption of the positive influence of stakeholder participation is that these groups have valuable knowledge and resources to contribute to plan development.

▶ Research Methods and Data Analysis

Sample Selection

The sample of jurisdictions studied was selected initially for use in an investigation of the quality of the hazards elements of comprehensive plans (see Burby and May 1997) and is used again here to examine the quality of plans with regard to ecosystem management capabilities. The population was based on local jurisdictions in Florida that have completed recent updates to their comprehensive plans. A sampling frame was obtained through a list of local jurisdictions throughout the state and was subjected to the following sampling strategy. First, the sample of local jurisdictions was limited to jurisdictions with populations of twenty-five hundred or more to make certain the sample was not skewed toward small communities (Berke and French, 1994). Second, large cities, such as Miami, were excluded from the sample because it is believed that these jurisdictions have very different contextual factors that may skew the sample (Berke et al. 1996). Third, the sample was limited to coastal jurisdictions to maintain a degree of consistency and comparability in terms of the types of ecosystems assessed. From the sampling frame, a random sample of thirty jurisdictions was drawn and evaluated against a protocol determining plan quality for ecosystem management.

Most of the selected jurisdictions are located on the east coast of the state, where the majority of urban development has taken place. Jacksonville, Martin County, and Fort Lauderdale are major population centers on the east coast. Pinellas County, Naples, and Sarasota are major urban areas on the west coast. Smaller jurisdictions, such as Destin and Niceville, were also selected in the panhandle region of Florida, which has yet to undergo major development. Three jurisdictions

(Pinellas, Sarasota, and Fort Lauderdale) were chosen for site visits and case study analysis because of their strong participation programs. Descriptions from the case studies are provided to support the quantitative findings of this study.

Measuring Ecosystem Plan Quality

Ecosystem plan quality was defined and measured by adding ecosystem considerations to existing conceptions of what constitutes a high-quality plan. Plan quality has been conceptualized for other issues, such as natural hazards (Godschalk, Kaiser, and Berke 1998; Berke et al., 1998; Godschalk et al. 1999), but never for ecosystem management capabilities. This study builds on and extends previous conceptions of plan quality, which identify factual basis, goals, and policies as the core components, by adding two additional plan components: interorganizational coordination and capabilities and implementation. The first additional component captures more accurately the aspects of collaboration and conflict management inherent in ecosystem approaches to management. The implementation component captures, among other issues, the concepts of monitoring, enforcement, and adaptive management. The addition of these components to original conceptions enables the definition of plan quality to more effectively capture the principles of ecosystem management (for a more detailed explanation on measuring ecosystem plan quality, see Brody forthcoming).

Ecosystem plan quality was thus conceptualized through the following five components: (1) Factual basis refers to an understanding and inventory of existing resource issues, environmental policies, and stakeholders' interests within the ecosystem. It takes both a written and visual form and serves as the resource inventory and problem identification instrument on which policy decisions within the plan are made. (2) Goals and objectives guide the implementation of ecosystem management. They contain both general statements of long-term goals regarding clarity and consistency as well as specific measurable objectives, such as a 40 percent reduction in nutrient runoff to reduce impacts on an estuarine system. (3) Interorganizational coordination and capabilities capture the ability of a local jurisdiction to collaborate with neighboring jurisdictions and organizations to manage what are often transboundary natural resources. This plan-quality component addresses joint fact finding, information sharing, intergovernmental agreements, and integration with other plans in the region (e.g., higher order ecosystem plans, National Estuary Programs, etc.). (4) Policies, tools, and strategies represent the heart of a plan because they set forth actions to protect critical habitats and related natural systems. Policies include regulatory tools, such as buffer requirements, as well as incentive tools, land acquisition programs, and educational efforts. (5) Finally, for comprehensive plans to be effective, implementation must be clearly defined and specified for all affected parties. This plan component includes the designation of responsibility, a timeline for actions, regular plan updates, and the monitoring of resource conditions and policy effectiveness.

Together, these five plan components constitute the ability of a local plan to manage and protect the integrity of ecological systems. Indicators (items) within each plan component further "unpack" the conceptions of plan quality. A "plan coding protocol" listing each plan component and its indicators is provided in Appendix A. I used this protocol to evaluate and measure plan quality for the random sample of local comprehensive plans in Florida. Each indicator was measured on an ordinal scale ranging from 0 to 2, where 0 is not identified or mentioned, 1 is suggested or identified but not detailed, and 2 is fully detailed or mandatory in the plan. In the factual basis component of the protocol, several items have more than one indicator. For example, habitats can be mapped, catalogued, or both. In these cases, I created an item index by taking the total score and dividing it by the number of subindicators (i.e., an item that received a 1 for mapping and a 1 for cataloging was given an overall issue score of 1). This procedure assured that items remained on a scale ranging from 0 to 2 and favored plans that support their descriptions with clear maps. Together, these indicators capture the principles of effective ecosystem management and translate them into elements that can be identified, measured, and compared across each plan.

I derived an overall measure of ecosystem plan quality by creating indices for each plan component and overall plan quality (as done by Berke et al. 1996, 1998). Indices were constructed for each plan component on the basis of three steps. First, the actual scores for each indicator were summed within a plan component. Second, the sum of the actual scores was divided by the total possible score for each plan component. Third, this fractional score was multiplied by 10, placing the plan component on a scale ranging from 0 to 10. A total plan quality score was obtained by adding the scores of each component. Thus, the maximum score for each plan is 50.

Measuring Stakeholder Groups

Stakeholder participation variables were measured through a survey on public participation and planning conducted in the summer of 1999 as part of a National Science Foundation research project. In each jurisdiction, personal interviews with planning directors and citizen participation staff members were conducted to measure characteristics of

the participation processes. Information was obtained on the level, timing, and extent of thirteen different stakeholder groups, ranging from environmental NGOs to local neighborhood groups. The presence of these thirteen different stakeholders in the planning process was recorded as a dichotomous or "dummy" variable. The representation variable was measured as the percentage or breadth of these stakeholders present during the planning process (total number of groups present in the process divided the total number of groups recorded). The participation variable was created by grouping a subset of the thirteen stakeholders into the following five core participant categories: resource-based industry (agriculture, forestry, marine, etc.), business (development associations, commercial development groups, homeowners associations), environmental NGOs, local government, and others (neighborhood groups, elected officials, affordable-housing groups, representatives of special districts, etc.). The construction of these categorical variables enabled me to examine the effects of the active participation of specific groups rather than simply an overall measure of representation.

Table 1.
Representation in the planning process.

Variable	*Coefficient*	*Standardized Coefficient*	*Standard Error*	t *Value*	*Significance*
Representation	7.75	.25	5.77	1.343	.190
Constant	17.21		2.90	5.931	.000
$N = 30$					
$F(1, 28) = 1.80$					
Significance: .1899					
$R^2 = .0605$					

Measuring Contextual Control Variables

Contextual control variables were included in the final model to isolate the effects of environmental factors. Planning agency capacity was determined through the survey of planning directors in each sampled jurisdiction. Planning capacity is usually defined as the amount of professional planning expertise involved in developing a plan. In this case, capacity was measured on the basis of the number of staff members devoted to writing the plan and evaluated on an interval scale. Generally, the more personnel devoted to drafting a plan, the stronger it tends to be. Population and wealth were measured using U.S. census data. The population of each jurisdiction was measured on the basis of 1997 census estimates, the median year the plans were adopted. These data were then logged to reduce skewness and potentially biased results. Similarly, the natural log of the median home value using census estimates measured the relative wealth of a community.

The analysis of the data was based on three phases of ordinary least squares (OLS) regression. First, the impacts of stakeholder representation on plan quality were examined. Second, the effects of the five core stakeholder groups were analyzed. Finally, contextual control variables were added to the model to estimate the influence of the most significant stakeholders in a more fully specified model. Several statistical tests for reliability were conducted to ensure that the OLS estimators were best linear unbiased estimates. Tests for model specification, multicollinearity, and heteroskedasticity revealed no violation of regression assumptions. In addition, a series of diagnostics was performed to test for influential data points or outliers in the data set. Given the small sample size, influential data points may have a significant impact on the interpretation of ecosystem plan quality. Various types of plots, as well as robust regression, uncovered no influential data points affecting the results. (See Appendix B for a list of measured concepts.)

▶ Results

The analysis of stakeholder participation and ecosystem plan quality was conducted through three lenses of focus: the broad representation of a large number of stakeholders, targeted participation focusing on five stakeholder groups, and the addition of participation contextual factors to control for alternative explanations of the variation in plan quality. With each increasing level of focus or specificity, the impacts of stakeholder participation in the planning process become better understood, and the conditions of when participation is most effective in producing high-quality plans become clearer.

Despite a strong theoretical justification for broad stakeholder participation (Crowfoot and Wondolleck 1990; Beatley, Brower, and Lucy 1994; Patterson 1999; McCool and Guthrie 2001), the representation of stakeholders, ranging from the agricultural industry to neighborhood groups, does not have statistically significant influence on plan quality (Table 1). Simply having a wide range of participants present in the planning process does not guarantee higher quality plans. Competing interests and a planning process burdened by multiple groups wanting to voice their opinions may hinder the quality of the outcome. Broad and diverse stakeholder participation can thus lead to a "lowest common denominator" when it comes to

Table 2.
Key stakeholders in the planning process.

Variable	*Coefficient*	*Standardized Coefficient*	*Standard Error*	t *Value*	*Significance*
Industry	10.06	.58	2.60	3.862	.001
Business	3.54	.18	2.60	1.366	.184
Nongovernmental organizations	5.06	.33	2.34	2.166	.040
Government	–3.05	–.177	2.58	–1.185	.247
Constant	13.16		2.81	5.391	.000
$N = 30$					
$F(4, 25) = 7.77$					
Significance: .0003					
Adjusted $R^2 = .4829$					

plan quality because there are fewer opportunities for agreement. For example, in Sarasota, the decision-making process was shackled by the multitude of participating stakeholders because elected officials were so open to citizen concerns and allowed for such lengthy discourse over pertinent issues. Allowing every vocal interest to speak or comment slowed down the planning process, frustrated many participants, and at times diminished the ability of both the Planning Board and the City Commission to make quick decisions (Brody 2001a).

While broad representation does not have a significant impact, the presence of individual stakeholders does statistically affect the quality of comprehensive plans with regard to their abilities to protect natural systems (Table 2). The presence of resource-based industry groups (agriculture, forestry, marine, and utilities) has the strongest positive influence on ecosystem plan quality, with an effect of 10.0, which is statistically significant (compared to the baseline variable others) at the .05 level. A *t* test for the significance of industry irrespective of the "others" baseline dummy is also statistically significant at the .05 level.

These results support the theory that although resource-based industry is often overlooked as a key stakeholder, it brings to the planning process valuable knowledge and resources regarding its ownership of critical habitats, which in turn increase the quality of adopted plans. Not only does industry have the largest impact on our natural resource base, but also, much of the critical habitats in the United States are located on private lands (Wondolleck and Yaffee 2000). Because public lands do not include many important elements of ecosystem diversity, particularly in the eastern part of the country, and constitute only one third of the land base of the continental United States, protecting biodiversity at all levels of government will rely on industry participation (O'Connell 1996; Vogt et al. 1997).

Case study research of planning processes based on site visits to three jurisdictions supports these statistical results. For example, the participation of the marina industry in the Fort Lauderdale planning process resulted in stronger coastal management policies. Marine trade and recreation representatives met in groups and one on one with planning staff members throughout the development of the comprehensive plan. Since this stakeholder group depends on a healthy natural environment for its growing business, it has a financial interest in ensuring clean waters. The marine industry proposed higher water quality standards and cleanup efforts that were incorporated as policies in the final plan (Brody 2001c). In this instance, industry was a driving force in generating stronger environmental and ecosystem management policies for coastal areas.

Similarly, in Pinellas County, Florida Power, Inc., played a key role in educating planners about existing natural resources and generating policies to manage those resources for the future. As a major landholder and community member, Florida Power was an active participant in the planning process. The company shared information related to critical habitats on its lands and ensured that these areas were considered part of the environmental programs associated with the plan. More specifically, Florida Power allowed critical habitats occurring along utility easements to be incorporated into the existing network of protected lands throughout the county (Brody 2001b).

The presence of NGOs in the planning process also has a significant positive impact on plan quality at the .05 level compared to the baseline dummy variable. This result is expected since environmental groups often provide valuable environmental data and expertise to the planning process. The proenvironmental stance and educational mission of many NGOs should drive ecosystem plan quality higher.

For example, by actively participating in the Pinellas County planning process through a working group, the Audubon Society was able to educate county staff members by sharing its data and environmental knowledge of the region. In this case, communication, information sharing, and a staff receptive to the comments of working-group members led to a stronger, more innovative environmental component of the comprehensive plan. By initiating a two-way exchange of ideas, all parties were able to more effectively meet their environmental management goals and produce a balanced plan reflecting a diversity of interests. Through environmental working-group discussions, it was pointed out by the Audubon Society that existing parks served as migratory bird habitats (Brody 2001b).

Certain activities of park staff members, such as mowing native vegetation, were detrimental to the bird populations. These concerns led directly to a policy in the final plan (policy 3.1.6) that strengthens the level of protection for critical habitats in existing parklands.

Surprisingly, the presence of local government departments in the planning process has a negative effect on ecosystem plan quality. Although the effect is not statistically significant, it would be expected that the participation of government agencies would increase the quality of a plan. Yet aside from environmental departments, government agencies such as transportation or public services departments tend not to have the long-term management of the natural environment in their best interests. Furthermore, the participation of multiple government departments could dilute the strength of the final plan through competing interests or conflicting planning goals.

Table 3.
Key stakeholders and contextual controls in the planning process.

Variable	*Coefficient*	*Standardized Coefficient*	*Standard Error*	*t Value*	*Significance*
Industry	6.82	.40	2.45	2.784	.010
Nongovernmental organizations	5.00	.03	2.13	0.235	.816
Wealth	–0.57	–.011	6.27	–0.091	.928
Population	8.05	.64	1.98	4.049	.000
Capacity	–0.42	–.17	0.32	–1.326	.206
Constant	–13.72		34.76	–0.395	.000
$N = 30$					
$F(4, 25) = 12.77$					
Significance: .0000					
Adjusted $R^2 = .7269$					

Overall, examining the effects of key stakeholders taking part in the planning process, rather than broad representation, is a more effective approach to understanding how participation influences ecosystem plan quality. The model analyzed in Table 2 explains almost 50 percent of the variance on the dependent variable, demonstrating that the land, knowledge, and resources specific groups bring to the planning process can greatly increase the quality of plans. Results also suggest that when specific stakeholder groups whose interests are aligned with the plan evaluation criteria participate in the planning process, ecosystem plan quality will improve. The challenge to planners, then, is to identify which groups will increase the quality and performance of the adopted plan. These findings would be lost if the model analyzed only the breadth of a large number of stakeholders present during the planning process.

Contextual control factors were then analyzed along with the most significant stakeholders to further isolate the effects of industry participation on ecosystem plan quality. Wealth, population, and planning capacity (i.e., the number of staff members devoted to drafting the comprehensive plan) were included to control for extraneous variables that may also drive the plan-quality measure.

In the results of the third regression model, resource-based industry participation remains a powerful predictor of ecosystem plan quality (Table 3). However, the population of each jurisdiction is the most significant variable in the analysis. This effect may be explained by the fact that population levels can often be associated with increased urban development and the decline of critical habitats or overall biodiversity. Growth pressures are associated with higher levels of disturbance to natural ecosystems, resulting in a greater perceived need to protect remaining areas of biodiversity. High levels of population may in this case indirectly drive ecosystem plan quality higher.

Interestingly, the significant effect of environmental NGOs on ecosystem plan quality is lost with the addition of contextual controls. This result may be explained by the high zero-order correlation between population and the presence of environmental NGOs. On average, most large environmental groups with the ability to boost the collective capacity of the planning process are located in urban areas or jurisdictions with large populations. Thus, with the inclusion of population levels in the model, the positive impact of NGOs on ecosystem plan quality is negated. This result could also reflect stronger environmental values typically present in urban populations that can support the presence of environmental NGOs.

▶ Conclusions and Policy Implications

Although the representation of stakeholders during the planning process may play a role in increasing the likelihood of plan implementation, on the basis of this study, it is not a significant factor when it comes to producing a high-quality outcome within the context of ecosystem or environmental planning. Despite the broad theoretical support for representation as a basis for sound planning, the empirical evidence suggests that having all of the stakeholders and community members present during the decision-making process does not necessarily guarantee the adoption of a strong plan. For practicing planners, then, there is an apparent dichotomy between linking the planning process to outcomes or to plan implementation. If environmental planners are interested in generating

the highest quality plans to manage ecological systems over the long term, then broad stakeholder representation is not necessarily beneficial and, in some cases, can be detrimental to plan quality. It may be that planners could have to make a choice between generating high-quality environmental plans or generating plans that will be supported and implemented in the future. On the other hand, planners should not concentrate on involving fewer stakeholders during the planning process. However, instead of being concerned about the number of stakeholders involved and ensuring that there is complete representation of the public, planners may instead want to focus on incorporating specific groups that will most likely boost the quality of the adopted plan.

While the broad representation of stakeholders in the planning process does not necessarily lead to stronger plans, despite the endorsement of many scholars (Crowfoot and Wondolleck 1990; Beatley, Brower, and Lucy 1994; Beierle 1998; Susskind, McKearnan, and Thomas-Larmer 1999), the presence of specific stakeholders does in fact significantly increase ecosystem plan quality. While environmental NGOs are expected to raise plan quality since their goals are often to protect ecosystems, a significantly positive impact from resource-based industry participation is somewhat surprising considering its historical battles against environmental protection initiatives. This finding is critical because it demonstrates that when engaged in the planning process, resource-based industry has an interest in environmental management and brings to the negotiating table valuable knowledge and resources, which ultimately lead to a stronger comprehensive plan. Increasingly, large resource-based industries, such as forestry and agriculture, are becoming involved in environmental planning processes because (1) they realize that maintaining the economic viability of their operations relies on managing in a sustainable fashion and even protecting their natural resource bases, (2) demonstrating environmental concern can result in favorable media attention and public support for their business activities, and (3) participating in a collaborative process can facilitate information and data sharing that will in turn improve the performance of commercial operations. Given the fact that 90 percent of the more than twelve hundred listed endangered and threatened species live on nonfederal lands and more than 5 percent, including nearly two hundred animal species, have at least 81 percent of their habitats on nonfederal lands (Wondolleck and Yaffee 2000), resource-based industries may provide the missing link in facilitating effective ecosystem approaches to management.

That is not to say that all industries are concerned with ecosystem management and will help raise the quality of plans through active participation. Many organizations in Florida and around the country are staunchly opposed to any type of environmental initiatives since they view them as threats to corporate profitability. However, it is clear from the results of this study that when industry groups want to be part of the planning process, they tend to positively affect the quality of the final plan as it relates to managing ecological systems.

A key recommendation stemming from the results of this study is that planners should target key stakeholders for participation. One of the most statistically powerful findings is that the presence of certain stakeholders, particularly industry, significantly increases local ecosystem plan quality. As previously described, when organizations bring to the planning process valuable knowledge of critical habitats and innovative ideas of how to manage these habitats in a sustainable fashion based on their own experience, it can strengthen the ability of the final plan to achieve the principles of ecosystem management. Planners must recognize the specific contributions each stakeholder can make and aggressively target these groups for participation throughout the planning process. A strategy of targeted participation can make certain that the stakeholders that have the most to contribute are present during the planning process. Targeted participation can, however, become a balancing act because some groups will favor one issue but not another.

Less than 20 percent of the jurisdictions studied targeted (as opposed to actually included) any type of resource-based industry group for participation in the planning process. In contrast, 60 percent of the sample targeted local business groups, such as storeowners, and approximately half targeted neighborhood associations. In this sense, industrial stakeholders represent an untapped planning resource that has the ability to boost the collective capacity of planning participants, resulting in a stronger, better balanced plan that not only meets the interests of the community but is more likely to be implemented over time.

While this study tests some assumptions about broad stakeholder representation and which specific stakeholders have the most impact on producing high-quality environmental plans at the local level, additional research is necessary to determine under which circumstances these groups have the greatest impact on plan quality. For example, the choices planners can make regarding the stage of participation during the planning process and the specific participatory techniques used to engage stakeholders might be critical in determining their impact on the quality of management plans. These choices should be evaluated not only for their ability to attain participation (as done in Brody, Godschalk, and Burby forthcoming) but also for their impact on the quality of the adopted plan.

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▶ Appendix A
Ecosystem plan coding protocol.

Factual basis

A. Resource inventory

Ecosystem boundaries/edges	Ecological zones/habitat types	Ecological functions
Species ranges	Habitat corridors	Distributions of vertebrate species
Areas with high biodiversity/ species richness	Vegetation classified	Wildlife classified
Vegetation cover mapped	Threatened and endangered species	Invasive/exotic species
Indicator/keystone species	Soils classified	Wetlands mapped
Climate described	Other water resources	Surface hydrology
Marine resources	Graphic representation of transboundary resources	Other prominent landscapes

B. Ownership patterns

Conservation lands mapped	Management status identified for conservation lands	Network of conservation lands mapped
Distribution of species within network of conservation lands		

C. Human impacts

Population growth	Road density	Fragmentation of habitat
Wetlands development	Nutrient loading	Water pollution
Loss of fisheries/marine habitat	Alteration of waterways	Other factors/impacts
Value of biodiversity identified	Existing environmental regulations described	Carrying capacity measured
Incorporation of gap analysis data		

Goals and objectives

Protect integrity of ecosystem	Protect natural processes/ functions	Protect high biodiversity
Maintain intact patches of native species	Establish priorities for native species/habitat protection	Protect rare/unique landscape elements
Protect rare/endangered species	Maintain connection among wildlife habitats	Represent native species within protected areas
Maintain intergenerational sustainability of ecosystems	Balance human use with maintaining viable wildlife populations	Restore ecosystems/critical habitat
Other goals to protect ecosystems	Goals are clearly specified	Presence of measurable objectives

Interorganization coordination and capabilities for ecosystem management

Other organizations/stakeholders identified	Coordination with other organizations/jurisdictions specified	Coordination within jurisdiction specified
Intergovernmental bodies specified	Joint database production	Coordination with private sector
Information sharing	Links between science and policy specified	Position of jurisdiction within bioregion specified
Intergovernmental agreements	Conflict management processes	Commitment of financial resources
Other forms of coordination		

▶ Appendix A (continued)

Policies, tools, and strategies		
A. Regulatory tools		
Resource use restrictions removal	Density restrictions	Restrictions on native vegetation
Removal of exotic/invasive species	Buffer requirements	Fencing controls
Public or vehicular access restrictions	Phasing of development	Controls on construction
Conservation zones/overlay districts	Performance zoning	Subdivision standards
Protected areas/sanctuaries	Urban growth boundaries to exclude habitat	Targeted growth away from habitat
Capital improvements programming	Site plan review	Habitat restoration actions
Actions to protect resources in other jurisdictions	Other regulatory tools	
B. Incentive-based tools		
Density bonuses	Clustering away from habitats	Transfer of development rights
Preferential tax treatments	Mitigation banking	Other incentive-based tools
C. Land acquisition programs		
Fee simple purchase	Conservation easements	Other land acquisition techniques
D. Other strategies		
Designation of special taxing districts for acquisition funding	Control of public investments and projects	Monitoring of ecological health and human impacts
Public education programs		
Implementation		
Designation of responsibility	Provision of technical assistance	Identification of costs or funding
Provision of sanctions	Clear timetable for implementation	Regular plan updates and assessments
Enforcement specified	Monitoring for plan effectiveness and response to new information	

▶ Appendix B
Concept measurement.

Name	*Type*	*Measurement*	*Scale*	*Source*	*Mean*	*Standard Deviation*
Plan quality	Dependent	Sum of five plan components: Factual Basis + Goals and Objectives + Interorganizational Coordination + Policies + Implementation	Interval; 0-50	Sample of plans	20.62	7.76
Representation	Independent	Breadth or percentage of thirteen possible groups participating in the planning process	Interval	Survey	0.441	0.247
Industry	Independent	Presence of stakeholder in planning process	Dichotomous; 0 or 1	Survey	0.3	0.466
Business	Independent	Presence of stakeholder in planning process	Dichotomous; 0 or 1	Survey	0.8	0.407
Nongovernmental organizations	Independent	Presence of stakeholder in planning process	Dichotomous; 0 or 1	Survey	0.433	0.504
Government	Independent	Presence of stakeholder in planning process	Dichotomous; 0 or 1	Survey	0.733	0.450
Capacity	Independent	Number of planners devoted to drafting the plan	Continuous	Survey	2.833	3.13
Population	Independent	Natural log of the population estimate for a jurisdiction for 1997	Interval	U.S. census	4.513	0.620
Wealth	Independent	Natural log of the median home value	Interval	U.S. census	4.931	0.157

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