

Trends in Collaborative Ecosystem Management

**A preliminary report of
EM 2003 survey results**

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Background

In 1995, faculty and students at the University of Michigan's School of Natural Resources and Environment began research efforts to better understand and assess ecosystem management efforts in the United States. The goal of this research was to report on how projects were undertaking ecosystem management and to educate practitioners on the types and breadth of experiences seen. The research focused on defining characteristics of ecosystem management, the reasons projects were started, challenges faced, successes achieved, and factors facilitating project progress. The experiences of 105 projects across the United States were captured through written surveys and phone interviews and published by Island Press in *Ecosystem Management in the United States: An Assessment of Current Experiences* (Yaffee et al., 1996).

This research continued with a second survey in 1999. The goal of this research was similar to the 1995 survey in that it attempted to assess ecosystem management experiences. However, this second survey also assessed how projects moved forward and progressed over time to determine if any trends in ecosystem management were emerging. It focused on tracking and evaluating the ecological and institutional accomplishments of these projects and understanding changes in strategies, monitoring techniques, process and ecological outcomes, and factors impeding/facilitating project success. This research was reported as a masters' project report and can be accessed at: <http://www.snre.umich.edu/ecomgt/pubs/emtrends.htm>.

In 2003 a third survey of cases was conducted with the support of the William and Flora Hewlett Foundation. The cases studied included the majority of those surveyed in 1995 and 1999 as well as additional projects, many of which had become established more recently. In addition to exploring the characteristics of ecosystem management projects addressed in the previous two surveys, the 2003 survey focused on understanding project lifecycles and how project outcomes relate both to the collaborative process and evaluation efforts. The preliminary analyses of responses to the 2003 survey are reported here.

EM 2003 Dataset

The em03 dataset consists of **92** cases (projects).

How were they selected?

- ◆ 66 are cases from the em1999 survey
- ◆ 26 are new
- ◆ Of the new cases, 12 were selected specifically for the 2003 survey and 14 were Resources for Community Collaboratives (RCC) grantees that took the web survey and met the criteria, to be included in the em03 dataset.
- ◆ 58 projects had more than one respondent per project (from 2 to 14) but because of the sometimes large within-project variation in responses (see 8/28/03 summary of em2003 results), each project has only *one* respondent, the 'coordinator' in the data reported here.

Where are they located?

- ◆ A range of states were represented (see map for states included in each region) though more of the projects are in the west than along the east coast.

Northwest	Southwest	Midwest	Northeast	Southeast
24	23	22	14	9

How old are they?

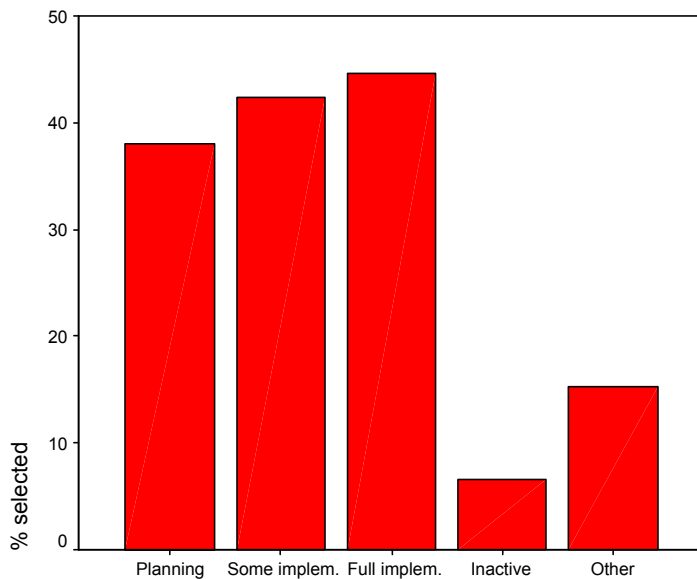
- ◆ The start year of a project was determined for 89 of the 92 projects based on information in the Green Book (em1995) and on web sites.
- ◆ Projects start years ranged from 1971 to 2003, thus projects responding to the em2003 survey ranged from being in their first to 32nd year.
- ◆ Most projects were 10-15 years old. Mean and median project age of the dataset is 12 years.

Project phase

What is the current status of projects?

- ◆ Almost half of the respondents (48.4%) indicate that they are currently fully implementing their projects.
- ◆ 7 projects are currently only planning
- ◆ 2 are inactive

The below chart shows the percent of respondents that selected each of the different status options.

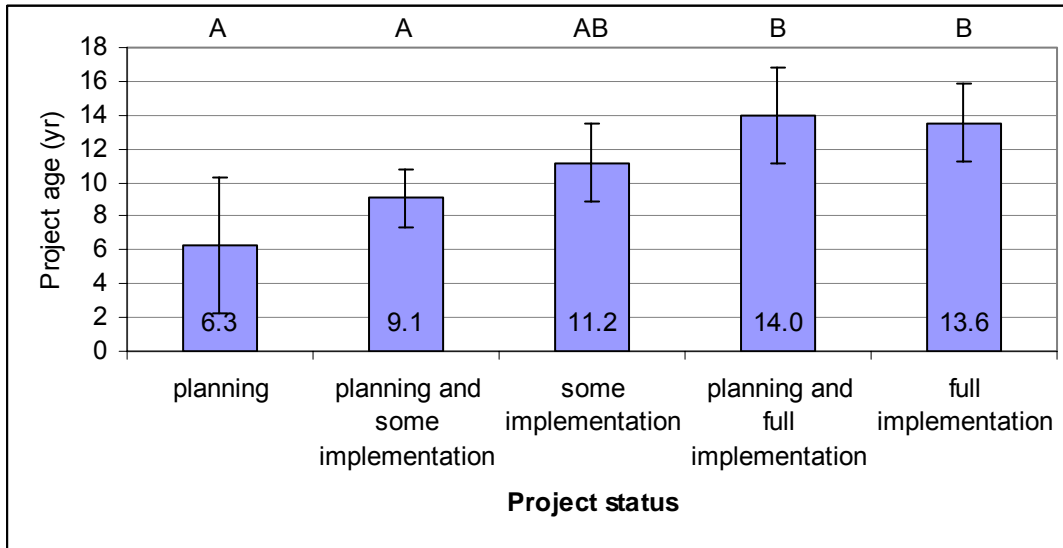


Based on the combination of above responses, each project was given a status rating using the system developed for em1999.

Project Status	0	1	2	3	4	5
	Inactive	Planning	Planning and some implementation	Some implementation	Planning and full implementation	Full implementation
Percent of respondents	2.2%	7.9%	16.9%	24.7%	16.9%	31.5%

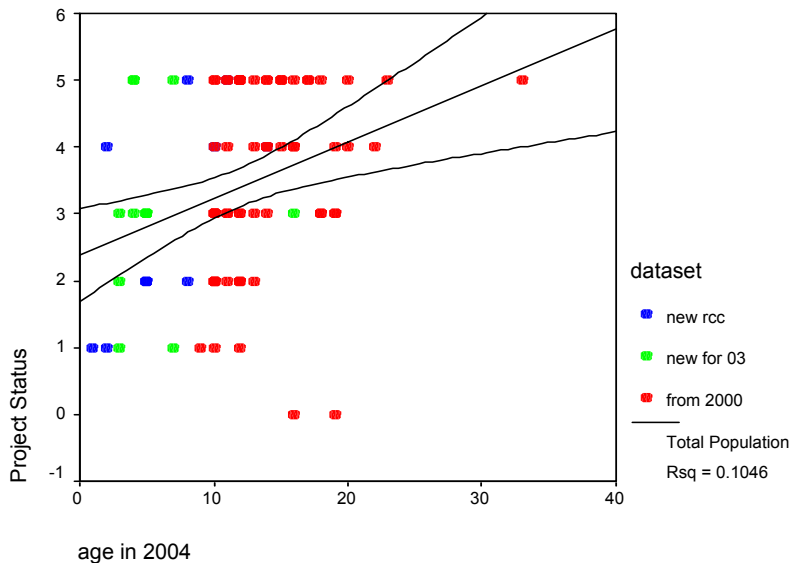
How does planning/implementation status relate to project age?

- ◆ Projects that are planning or that are planning and partially implementing are significantly younger than those that are fully implementing.
- ◆ Projects that only selected “some implementation” are not significantly older or younger than projects in the other status levels.



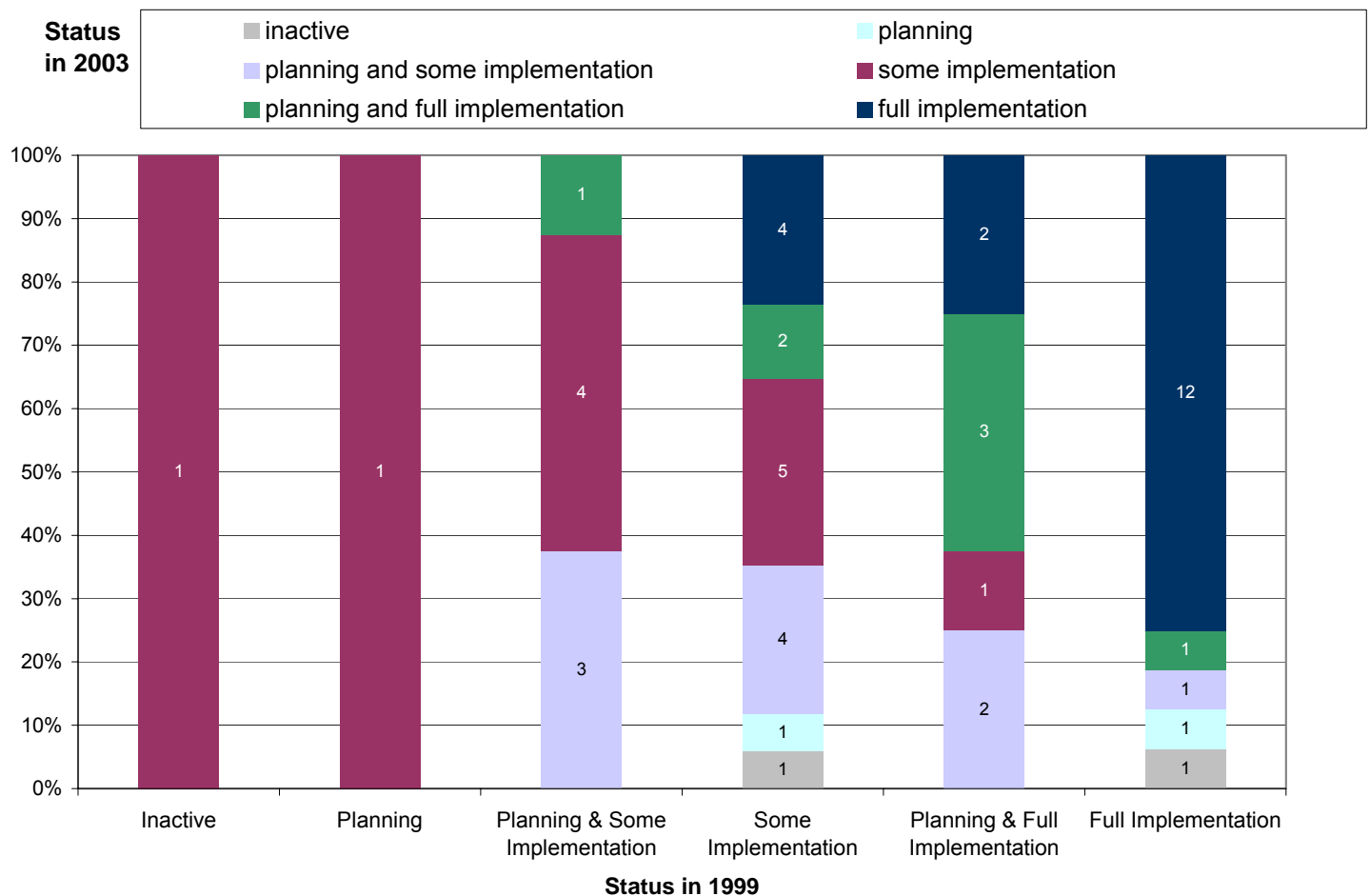
Note: Unless otherwise indicated, all graphs in this report show means +/- 95% confidence intervals.

- ◆ If we treat status as a continuum from 1) planning to 2) planning and some implementation to 3) some implementation to 4) planning and full implementation to 5) full implementation, then project age increases significantly with status, (Spearman's rho = 0.353, one-tailed $P = 0.0005$).



How has project status changed from 1999 to 2003?

- ◆ Non-missing data on project status in 99 and 03 was available for 51 projects. Although 63% of the projects did not change status, there was a significant overall change in project status ($\chi^2 = 0.458$, $P = 0.001$). Changes in status included 20% of projects that were not planning in 1999 were in 2003, while 16% were no longer planning in 2003. The extent of project implementation increased (from none to some or some to full) for 14% and decreased (from full to some or none) for 7% of projects.

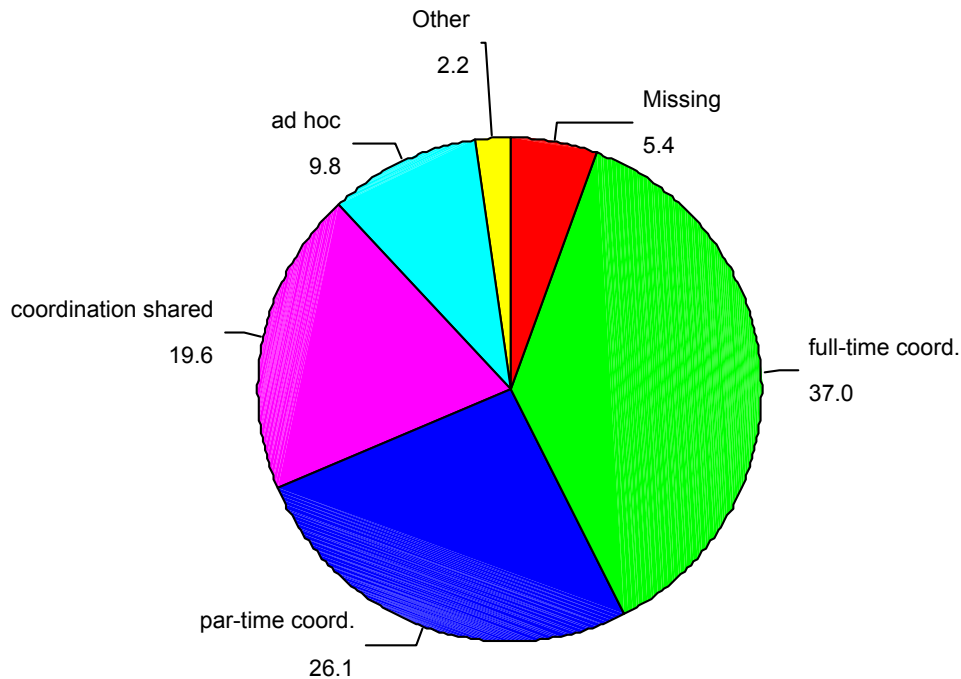


Numbers in bars indicate count of projects.

Project coordination and structure

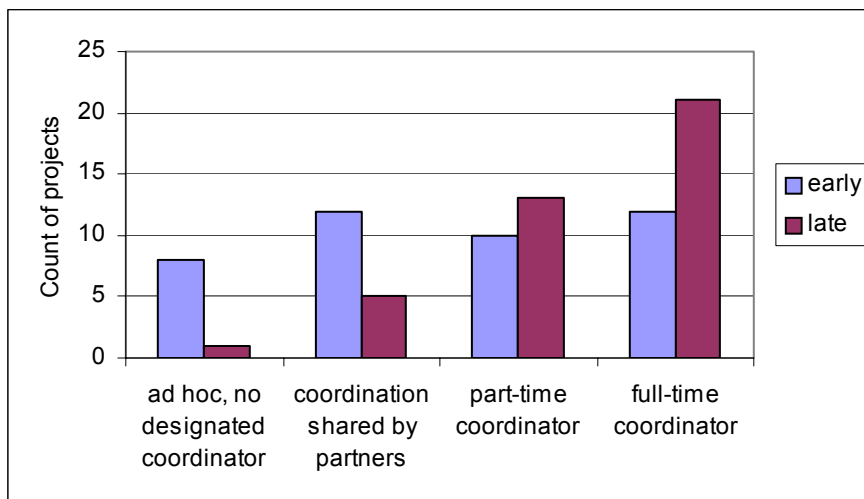
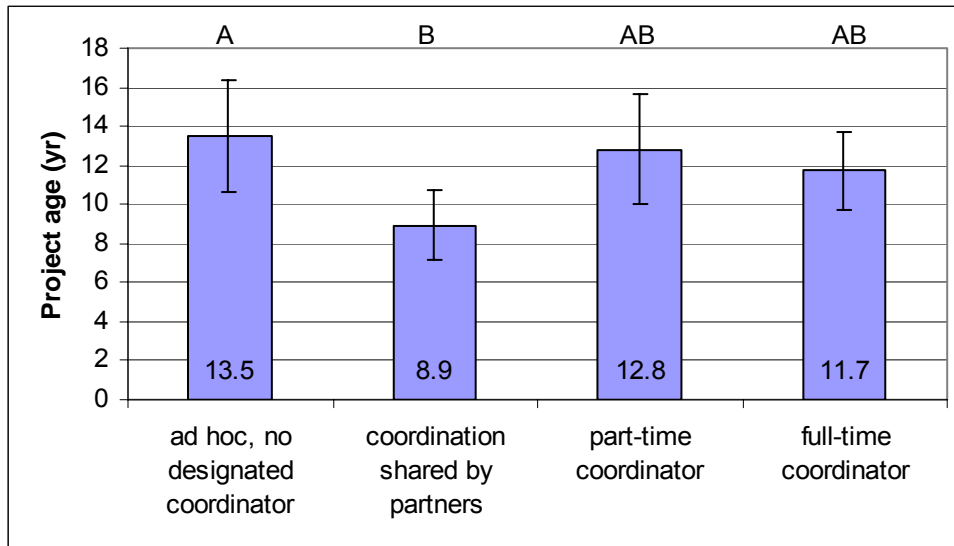
How are the projects managed or coordinated?

- ◆ Only 37% of the projects had a manager or coordinator that was hired for the explicit purpose of organizing or facilitating the effort.
- ◆ For over a quarter of the cases, the project coordinator works for one partner organization and the project is only part of their responsibilities.
- ◆ Almost 20% of the projects share the coordination or management of project activities among multiple partner organizations (either on a rotating or fixed basis).
- ◆ Less than 10% of projects report that they operate in an ad hoc manner, without a designated manager or coordinator.
- ◆ Other coordination scenarios that could not be recoded included: a combination of full and part-time coordinators, coordination plan not finalized, and “ad hoc but with leader”



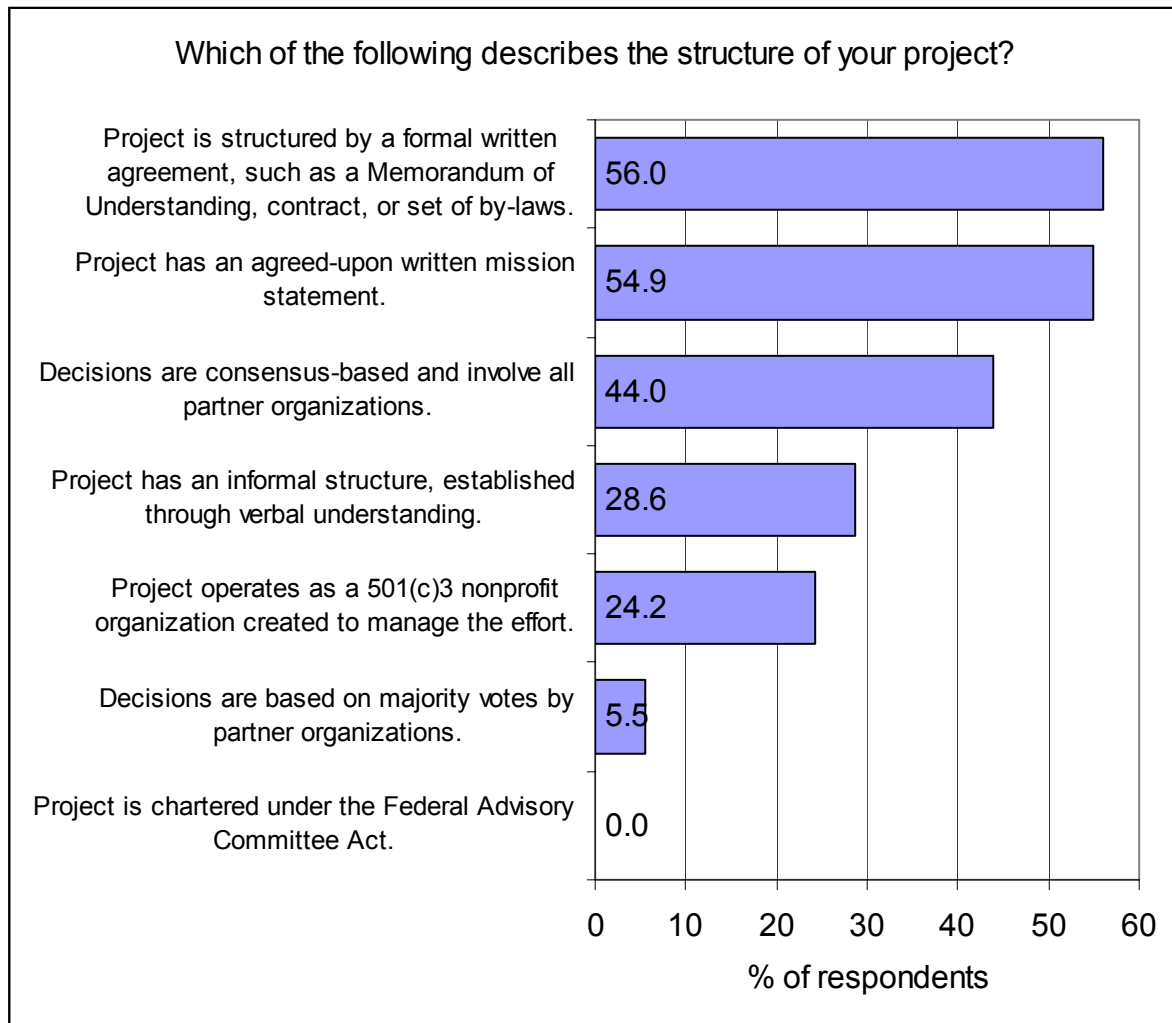
Does coordination relate to project age or stage?

- ◆ Projects with *shared* coordination are significantly *younger* than projects with ad hoc or undesignated coordination.
- ◆ While projects in an *early* phase of implementation (planning and some implementation) *vary* in their structure, projects in *later* phases (full implementation) have a full or part-time coordinator more often than they have shared or ad-hoc coordination ($\gamma = -0.542, P < 0.001$).



How are the projects structured and decisions made?

- ◆ More than half of projects are structured by a formal written agreement and/or have an agreed-upon mission statement.
- ◆ It is much more common for projects to base decisions on consensus (44% of projects) than on majority votes by partner organizations (5.5%).



Does structure relate to project age or stage?

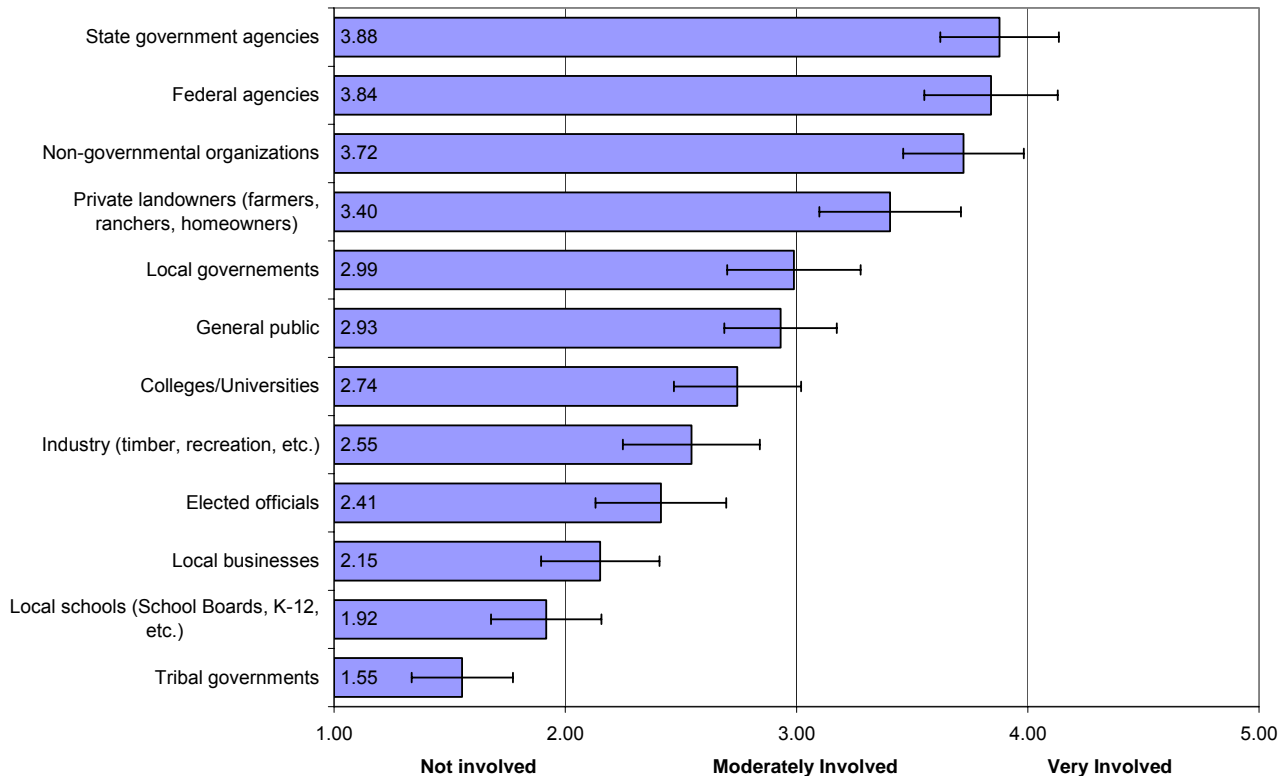
- ◆ Projects that indicated they are operating as a 501(c)3 nonprofit (24% of projects) are more often in a planning and/or some implementation phase than in full implementation ($\chi^2 = 0.655$, $P = 0.003$).
- ◆ Projects with an agreed-upon written mission statement are significantly younger than those without ($U = 714.5$, $P = 0.039$; mean difference 2.15 years).
- ◆ Other aspects of project structure did not relate to age or level of implementation.

Involvement

What groups are involved in projects?

- ◆ State and federal agencies and NGO's tend to be more involved than other groups; they are *very* involved in 43%, 47% and 36% of projects, respectively.
- ◆ Groups that are commonly *not* involved include tribal governments (69% of projects selected "not involved"), local schools (48%), and local businesses (41%).

What is the current level of involvement of the following groups?



Does the level of involvement of different groups relate to project region?

- ◆ No, except for *tribal governments*, which are only involved in north- and southwestern projects, group involvement does not vary significantly across the five regions (Kruskal Wallis tests, $P > 0.05$).

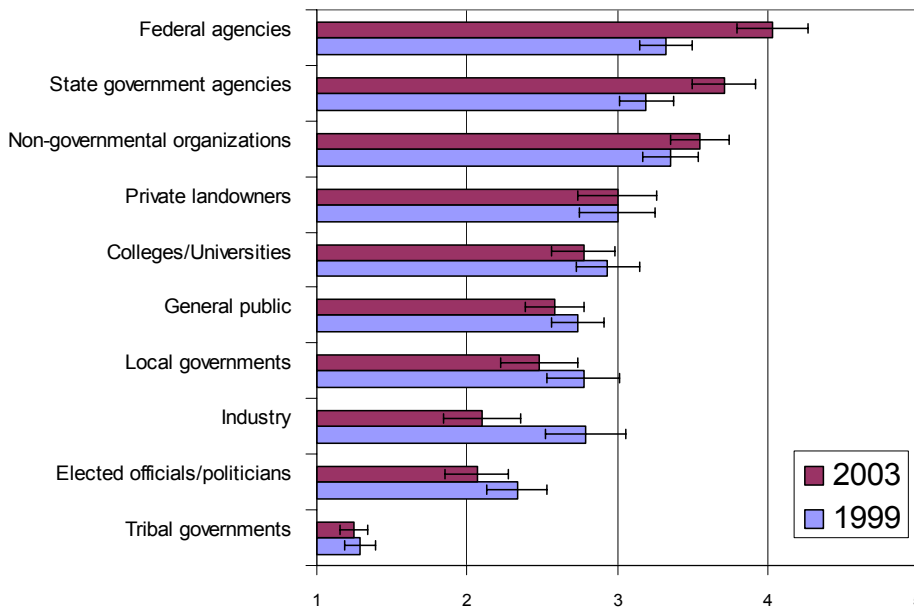
Does the level of involvement of different groups relate to the age or stage of a project?

- ◆ *Local governments* are significantly more involved in projects in the *planning* phase than those in some or full implementation ($\chi^2 = 13.4$, $P = 0.009$). They are also more involved in *younger* than in older projects (Spearman's rho = -0.275 , $P = 0.011$).

- ◆ *Industry* has a higher involvement in *younger* projects (Spearman's rho = -0.231, P = 0.034). This may be because industry fails to be a successful participant and so is not involved in more mature projects.
- ◆ *Local schools* are significantly more involved in projects that are *in full implementation* (Mann Whitney U = 607, P = 0.027).
- ◆ *State governments* also tend to be involved more in projects in *full implementation* (Mann Whitney U = 708.5, P = 0.050).
- ◆ Later involvement of local schools and state governments suggests they are more involved in on-the-ground implementation (such as schools assisting in restoration projects) than in project planning.

How has involvement of groups changed from 1999 to 2003?

- ◆ When only those projects with the same respondents in both years are considered (N ≤ 32 projects): *Federal and state agency* involvement has significantly *increased*, while *industry* involvement has significantly *decreased*.
- ◆ When all projects (N=60) are analyzed, the same results apply, in addition to the following significant differences which are also apparent in the graph below: involvement of *elected officials*, *local governments* and *colleges/universities* all significantly *decreased*.
- ◆ *The decrease in involvement of local governments and increase in state agencies over time matches the results for age and level of implementation (above).*

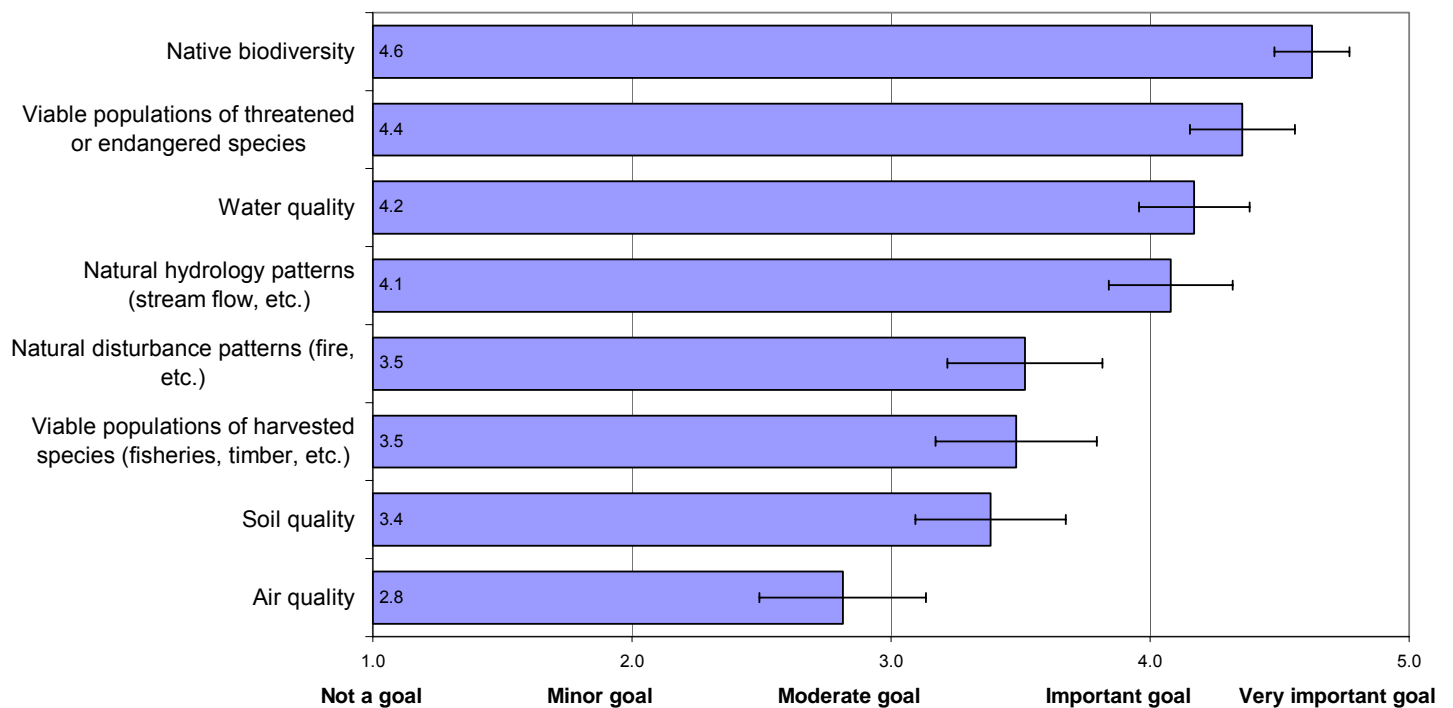


Goals

What are important ecological goals?

- ◆ Restoring or maintaining biodiversity was an important or very important goal for 91% of the projects and was for most projects more important than natural disturbance patterns, harvest species, and soil or air quality.
- ◆ Protecting threatened or endangered species and restoring or maintaining water quality and natural hydrology patterns were also important goals.
- ◆ Projects were split on the importance of restoring or maintaining viable populations of harvested species: it was a very important goal for 31% of projects, but not a goal for 18%.
- ◆ Three-quarters of the projects were to some extent concerned with air quality, but it was considered a very important goal by only 21% of the projects.

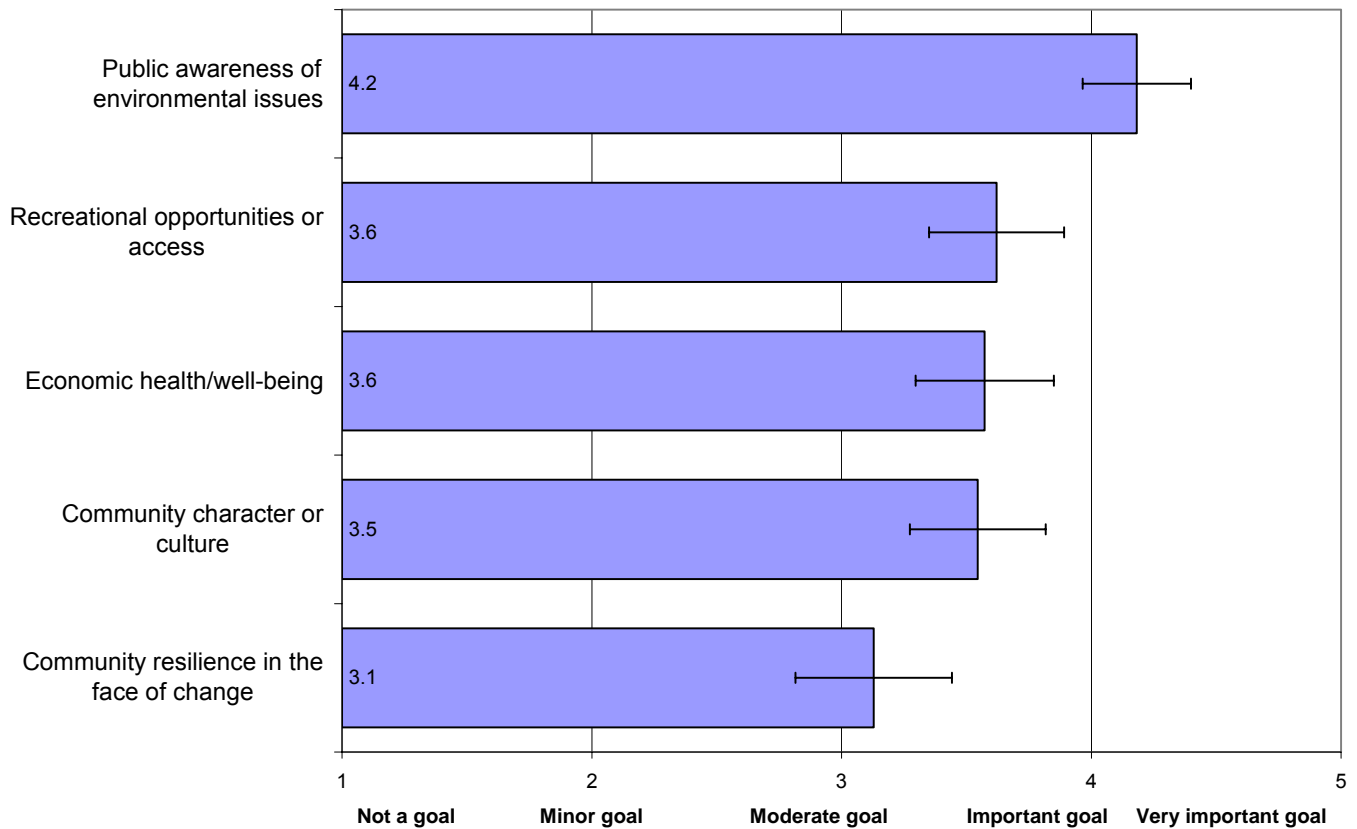
To what extent is it a significant goal of your project to *restore or maintain* the following?



What are important social and economic goals?

- ◆ Increasing or maintaining public awareness of environmental issues was an important or very important goal of 58.4% of projects.
- ◆ Increasing or maintaining recreation, economic health and community character were on average moderate to important goals.
- ◆ Projects were split on the importance of community resilience. While 47.7% rated it as an important or very important goal, 32.4% rated it as a moderate or minor goal and 21% as not a goal.

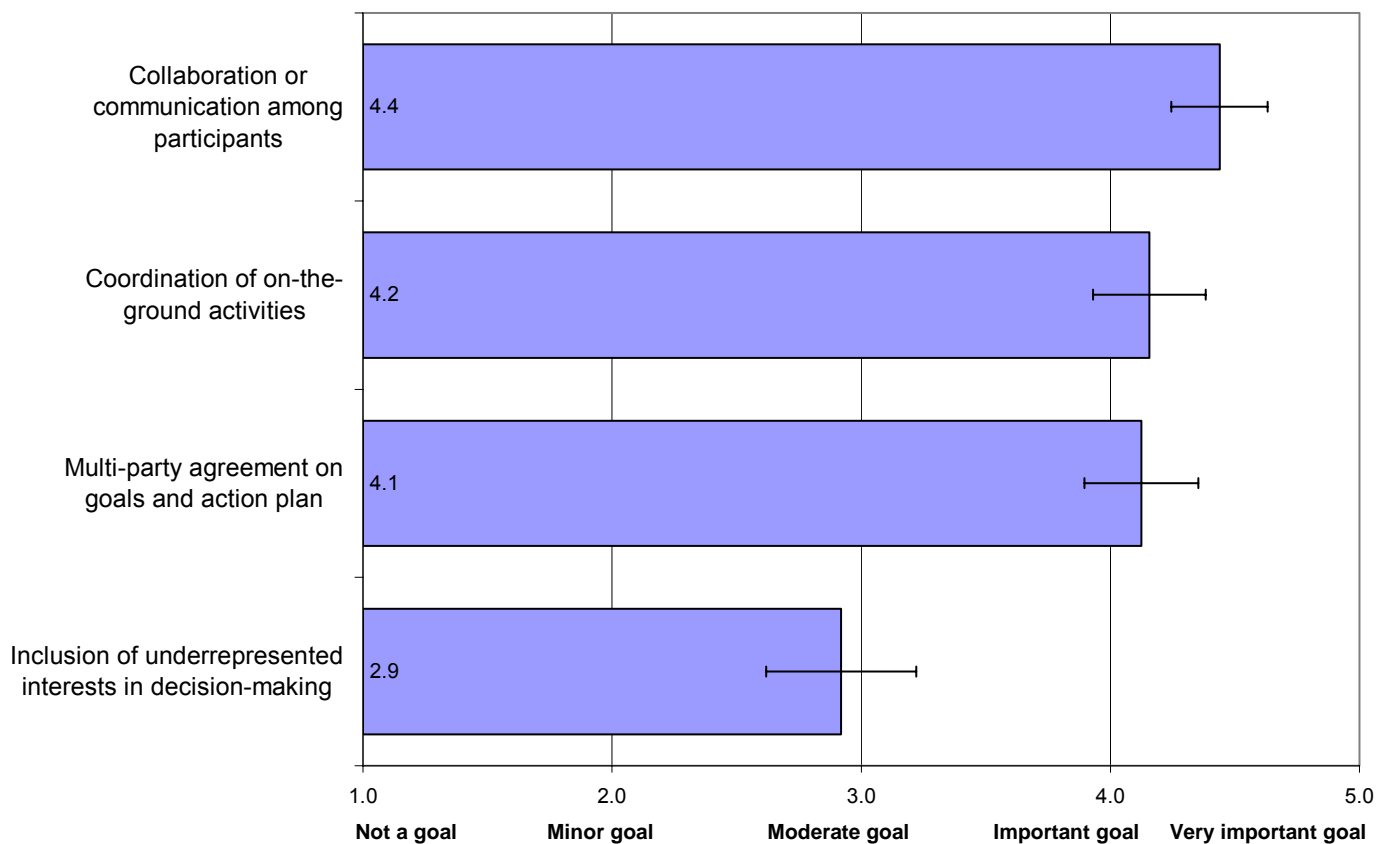
To what extent is it a significant goal of your project to *increase or maintain* the following?



What are important collaborative process goals?

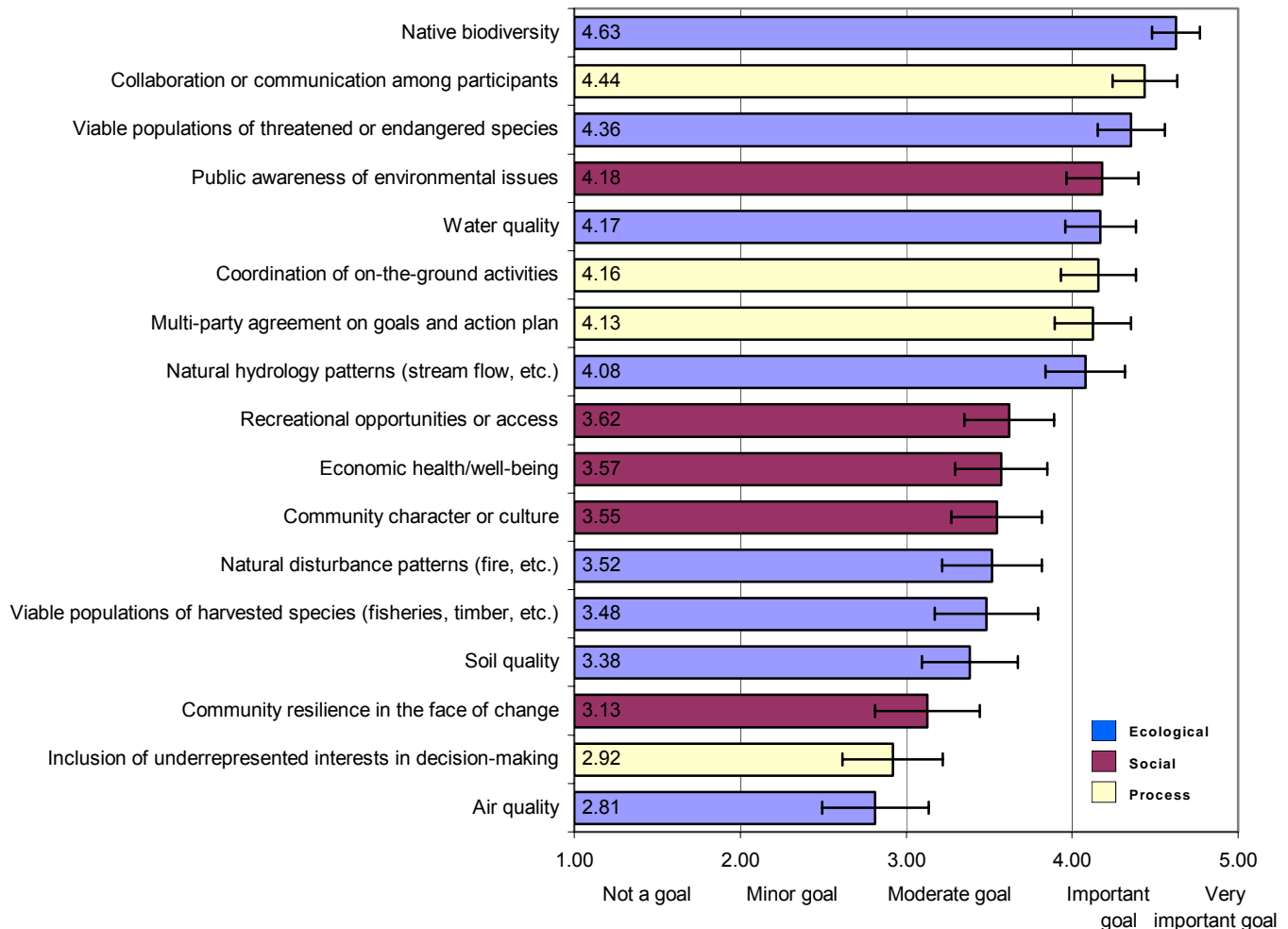
- ◆ Increasing or maintaining collaboration, coordination and agreement were important or very important goals for over 75% of the projects.
- ◆ Projects were split on the importance of including underrepresented interests in decision-making. It was not a goal for 23% of projects, but a very important goal for 17.2%.

To what extent is it a significant goal of your project to *increase* or *maintain* the following?



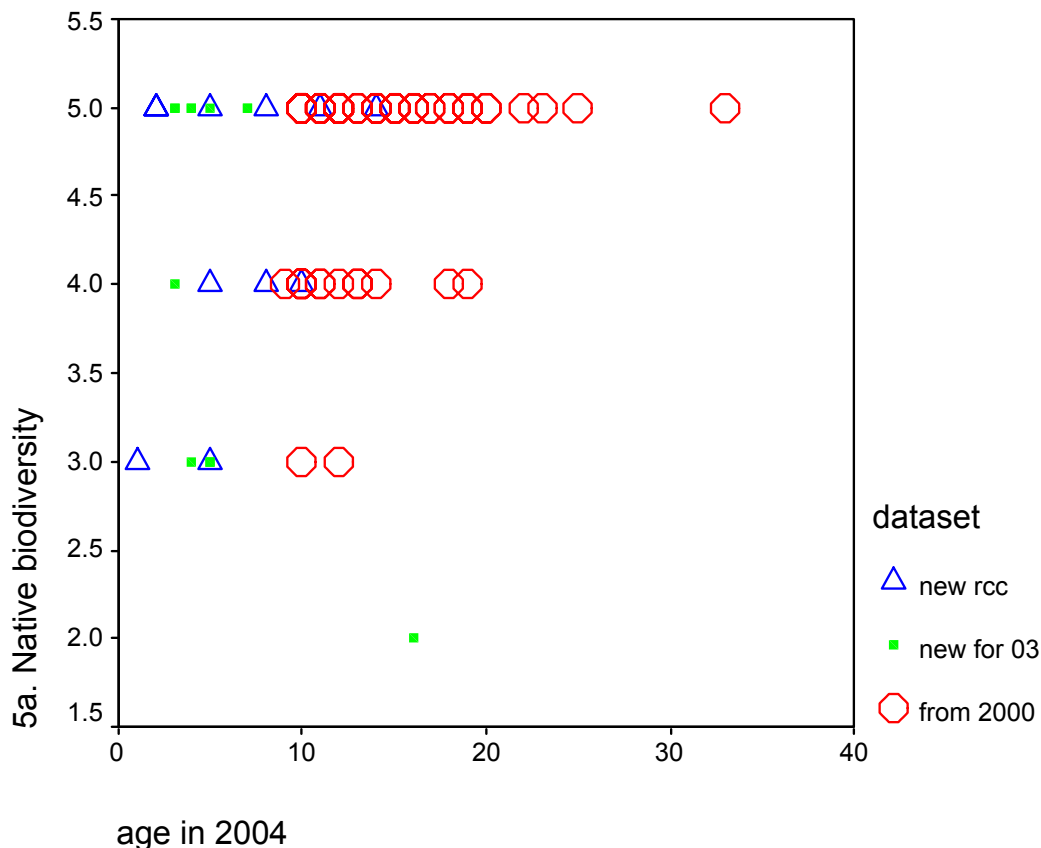
How do ecological, social and process goals compare in importance?

- ◆ Increasing or maintaining biodiversity, threatened or endangered species, and collaboration are on average especially important goals, whereas increasing or maintaining community resilience, underrepresented interests and air quality are generally rated as less important.
- ◆ Although on average social goals tend to be rated as less important than ecological and process goals, they do not differ significantly from one another ($F_{2,14} = 0.346$, $P = 0.714$).



How do project goals relate to a project's stage or age?

- ◆ For projects in planning and some implementation, restoring or maintaining biodiversity and threatened or endangered species are significantly *less important goals* than projects in full implementation ($U = 603$, $P = 0.001$ and $U = 648.5$, $P = 0.018$, respectively). [note graph below – this does seem to be the confounding effect of young collaboration-focused projects, such as RCC]
 - ◆ Biodiversity is also a more important goal of *older* projects ($\rho = 0.251$, $P = 0.021$).
 - ◆ Several social and process goals are more important in *younger* projects:
 - economic health ($\rho = -0.357$, $P = 0.001$),
 - community character ($\rho = -0.412$, $P < 0.001$)
 - community resilience ($\rho = -0.277$, $P = 0.011$), and
 - collaboration or communication among participants ($\rho = -0.292$, $P = 0.007$).
- Note that if I exclude RCC cases the first two remain significant, and the second two are still trends ($P = 0.53$, 0.58). This increased importance of social, economic and process goals in projects that began more recently may reflect adoption of a whole-ecosystem approach, including the need to work with partners and consider the social context.

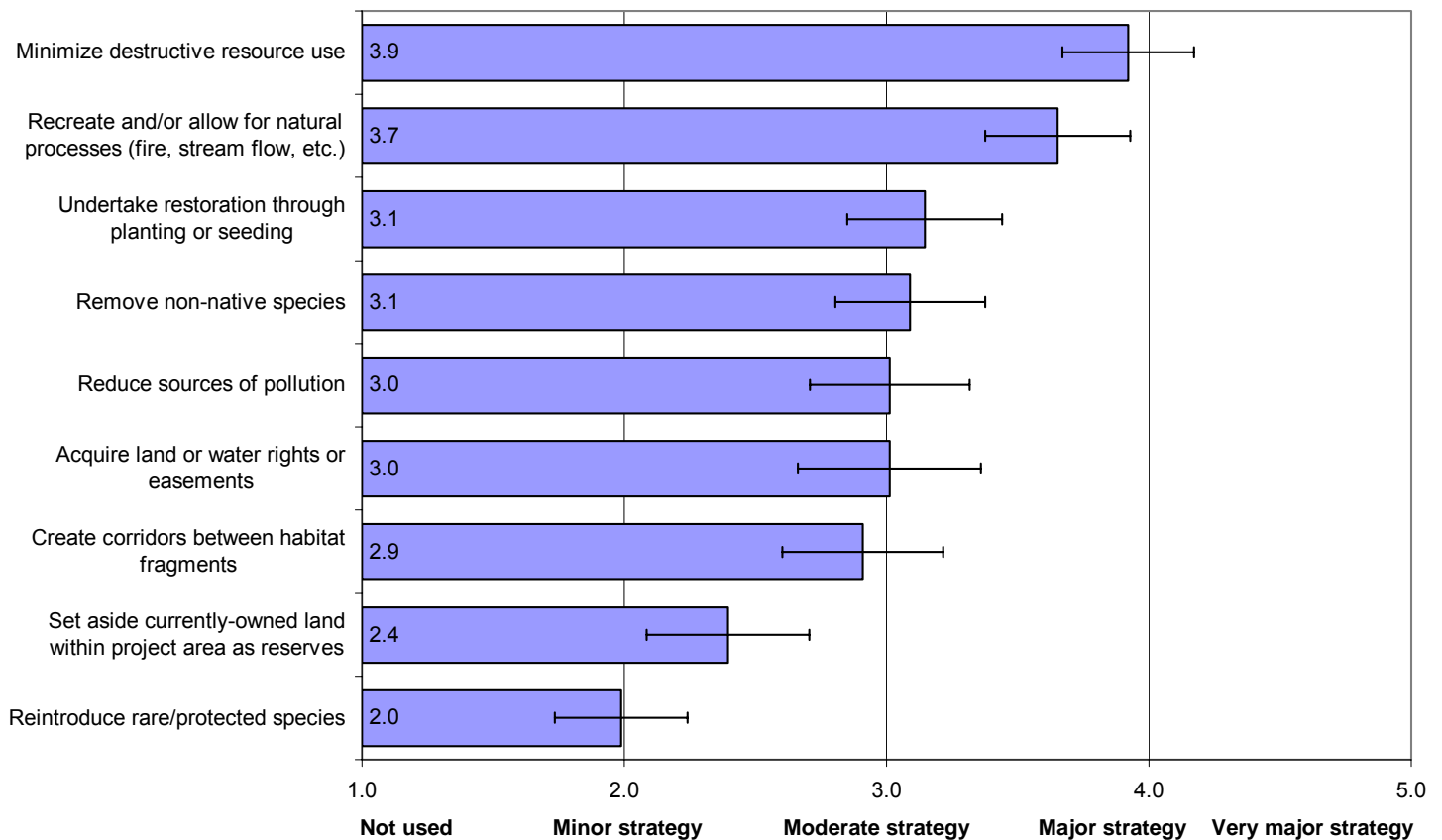


Strategies

What resource management strategies are projects using?

- ◆ Especially major strategies include minimizing destructive resource use and recreating or allowing for natural process such as fire and stream flow.
- ◆ Reintroducing rare or protected species is not a commonly used strategy (not used by 50% of projects and a very major or major strategy of only 14% of projects).

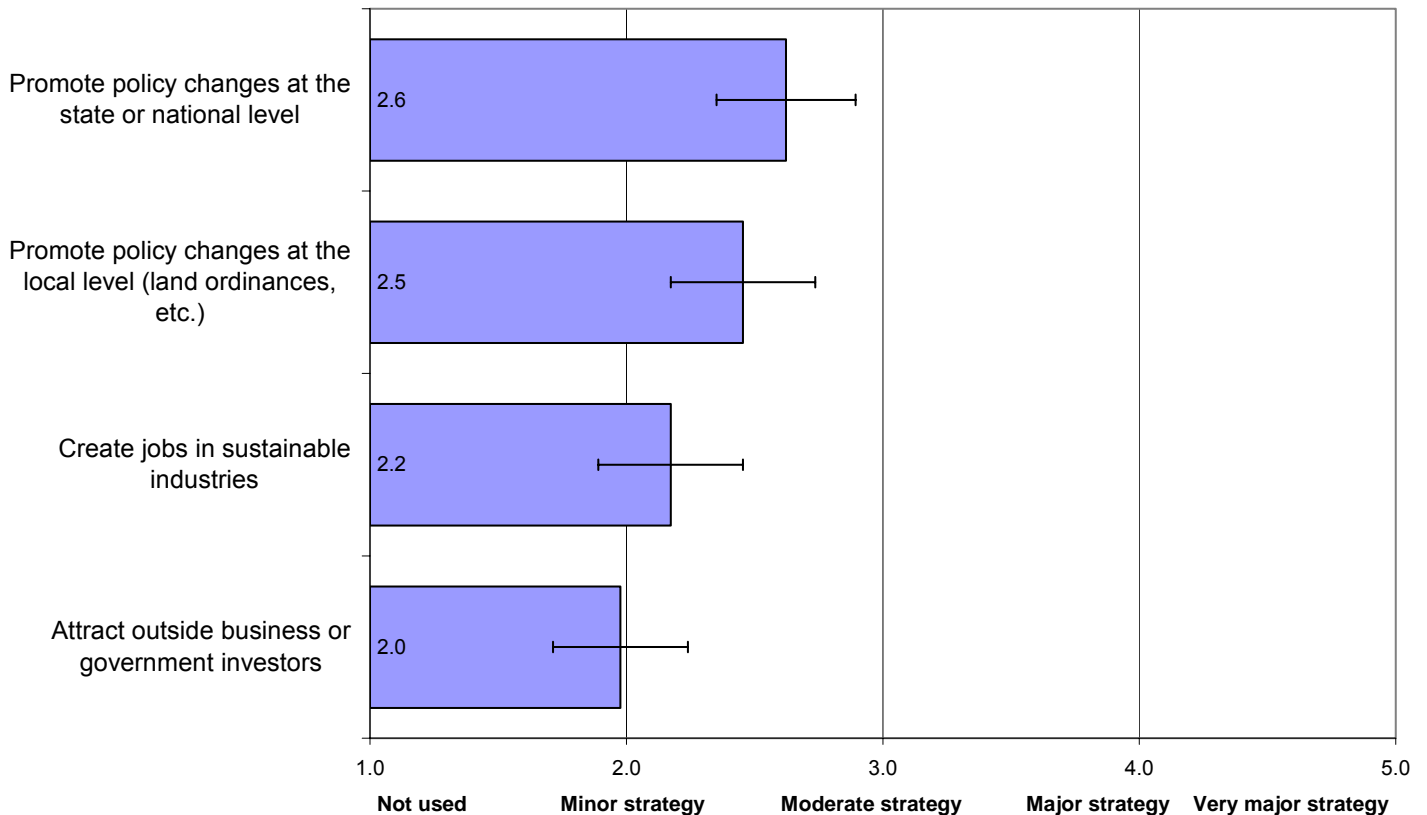
To what extent is your project currently using the following *resource management strategies*?



What socioeconomic or policy strategies are projects using?

- ◆ There is a slight trend for projects to promote policy change more at the state or national level than at the local level.
- ◆ About half of the projects are *not* creating jobs in sustainable industries (44%) or attracting outside business or government investors (50%).

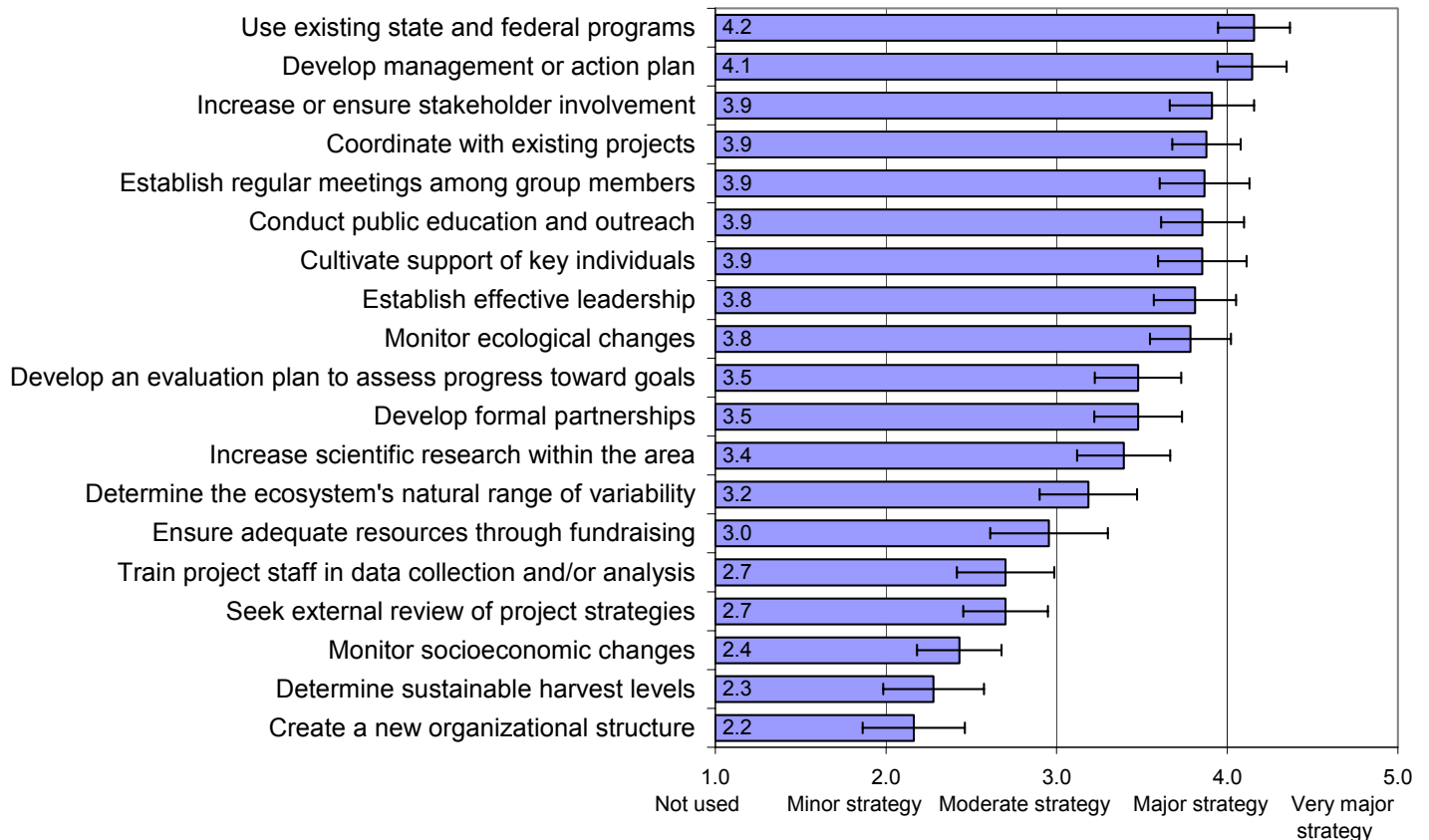
To what extent is your project currently using the following *socioeconomic* or *policy* strategies?



What organizational, planning and information strategies are projects using?

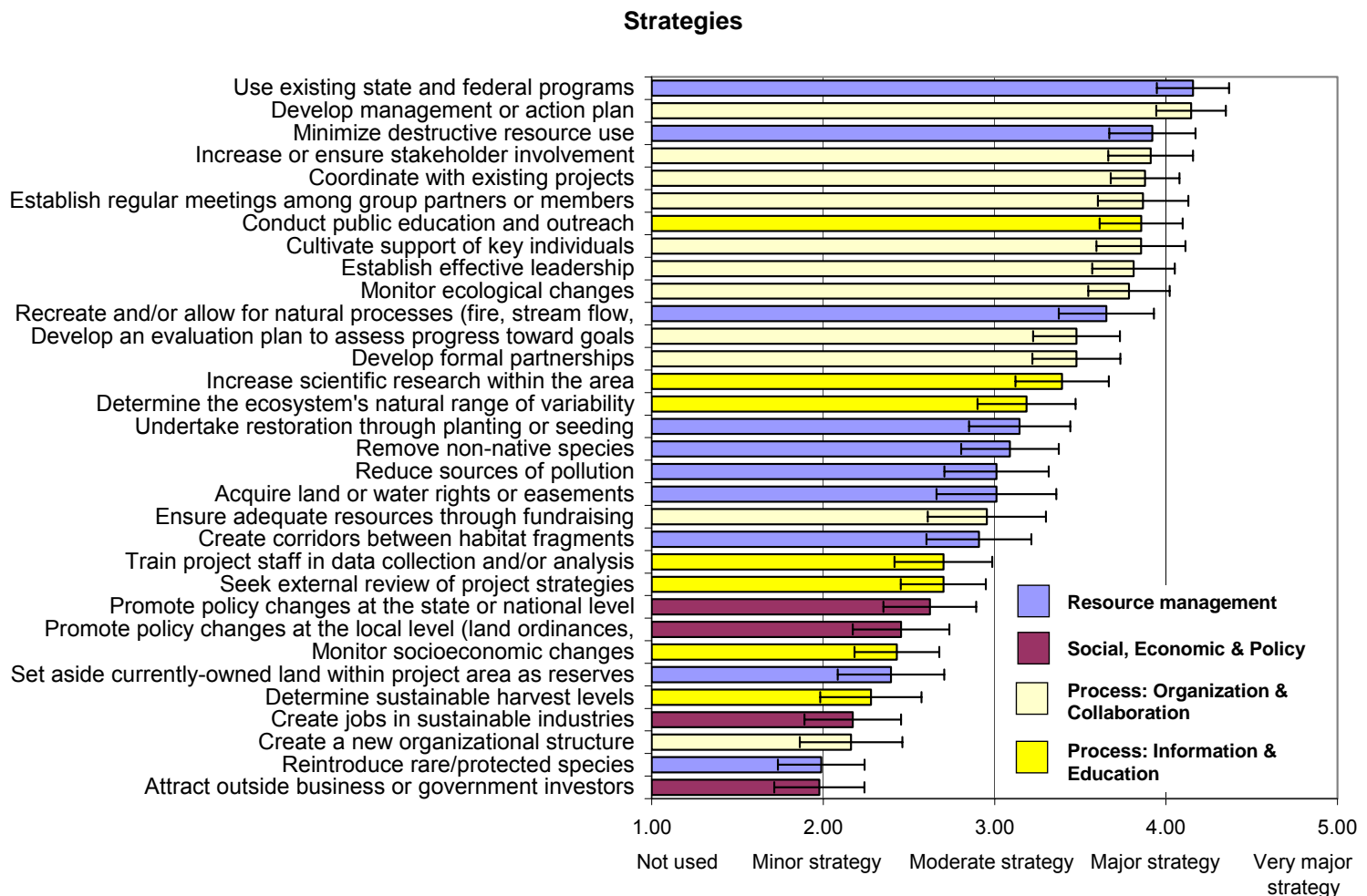
- ◆ For more than 70% of projects it is a major or very major strategy to use existing state and federal programs, develop a management or action plan, increase or ensure stakeholder involvement, and/or cultivate the support of key individuals.
- ◆ Projects monitor ecological changes significantly more than socioeconomic changes.

To what extent is your project currently using the following *organizational, planning or information strategies*?



How do resource management, socioeconomic and process strategies compare in importance?

- ◆ Using existing state and federal programs and developing a management or action plan are among the top strategies used overall.
- ◆ Process strategies are significantly more used than strategies addressing social, economic or policy changes ($F_{2,29} = 5.46, P = 0.01$).



How do project strategies relate to a project's stage or age?

- ◆ Although strategies used did not vary significantly between projects in planning vs. full implementation, the following *trends* are apparent:
 - Projects in *full* implementation tend to be more involved in scientific research within the area, developing formal partnerships, and monitoring socioeconomic change.
 - Policy changes tend to be promoted at the *local* level more during the *planning* phase and at the *state or national* level when projects are in *full* implementation.
- ◆ The following strategies are used more as project *age* increases (Spearman rank correlations, $P < 0.05$):
 - Acquire land or water rights or easements
 - Set aside currently-owned land within project area as reserves
- ◆ Creating jobs in sustainable industries and attracting outside business or government are *less* used strategies by older projects (Spearman rank correlations, $P < 0.05$). This may be because these especially difficult strategies were attempted at first, but failed and were dropped.
- ◆ Younger projects were more likely to use what might be thought of as early process strategies: establish regular meetings among group partners/members, establish effective leadership, create a new organizational structure, develop formal partnerships (Spearman rank correlations, $P < 0.05$).

How have strategies changed from 1999 to 2003?

- ◆ In accordance with the results for changes with age (above), projects surveyed in both 1999 and 2003 reveal a significant increase in the strategies of acquiring land or water rights or easements ($Z = -3.82$, $P < 0.001$) and setting aside currently-owned land within project area as reserves ($Z = -2.24$, $P = 0.025$; Wilcoxon Signed Ranks tests). It may be that these strategies are not used until later in a project's life, because adequate funds and organizational support are prerequisites.
- ◆ Ensuring adequate resources through fundraising *decreased* in importance from 1999 to 2003 ($Z = -2.31$, $P = 0.021$). Again, this suggests fundraising precedes other strategies.

Outcomes

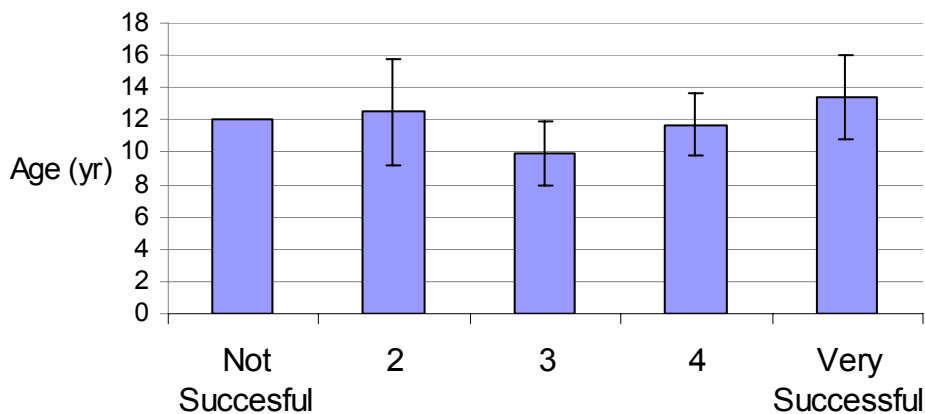
How successful do projects perceive themselves?

- ◆ On a scale from 1 (not successful) to 5 (very successful) 72% of projects rated their project as a 4 or greater. Only 1 project selected 'not successful.' Across all of the projects mean perceived success was 3.98 and median 4.

Does perceived success relate to project age or stage?

- ◆ Projects in full implementation rate their success significantly higher than projects in planning or some implementation ($U = 581.5$, $P = 0.002$).
- ◆ Despite the trend of increasing success (from 3 to 5) with age, projects with different success ratings do not have significantly different ages ($F_{3,82} = 1.52$, $P = 0.22$).

Overall, how successful do you consider the project?



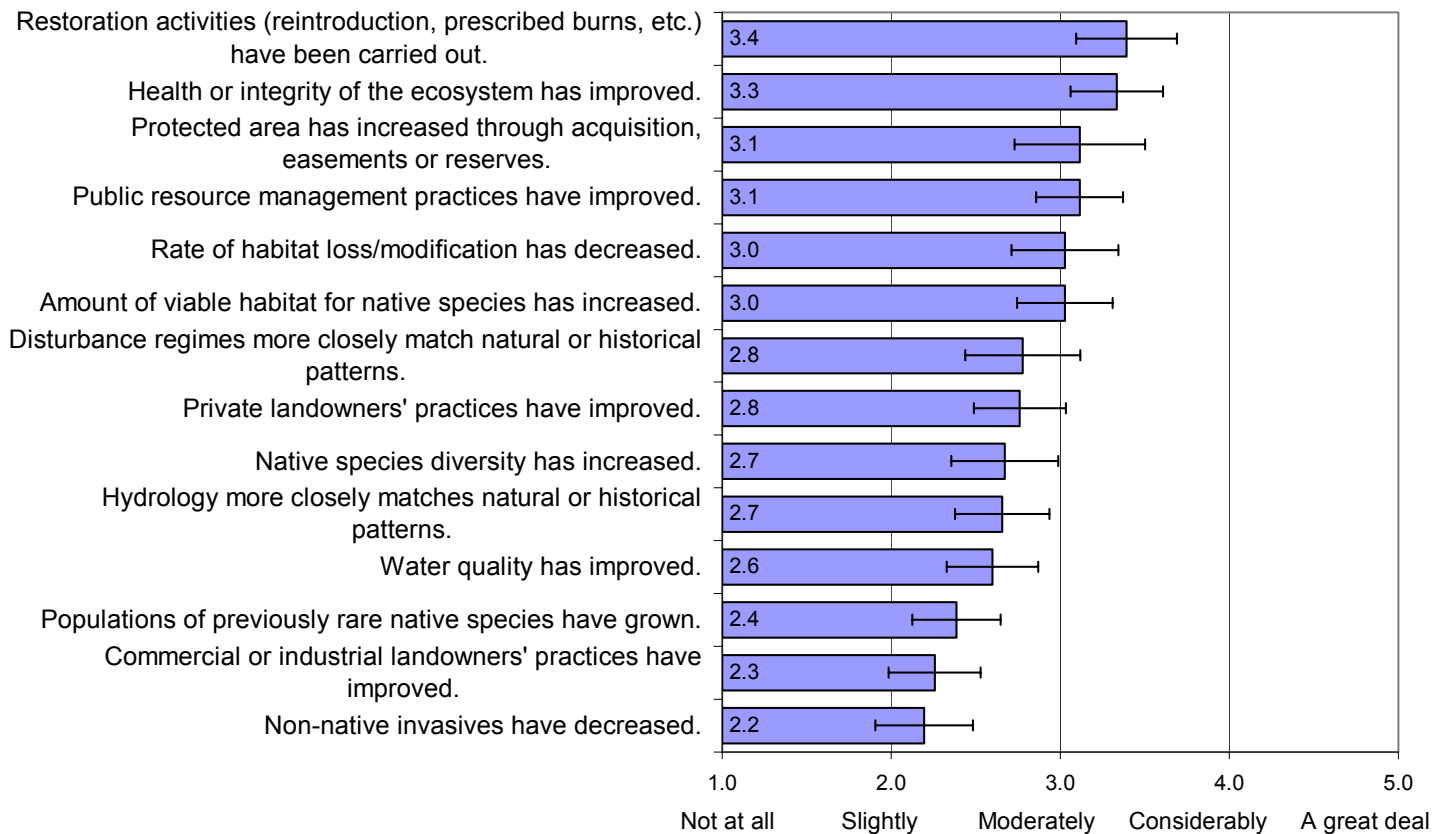
Has perceived success changed from 1999 to 2003?

- ◆ For projects survey in 1999 and 2003, there is a small but non-significant decrease in average self-rated success: 1999= 3.90, 2003 = 3.81 ($t = -.62$, $df = 30$, $P = .54$).

What ecological outcomes or resource management changes are projects reporting?

- ◆ The greatest reported ecological changes include progress in carrying out restoration activities and general improvement of ecosystem health or integrity.
- ◆ Project progress on increasing protected area varies greatly. While 44% report slight or no increase, 46% report considerable to a great increase in protected area.
- ◆ Respondents on average report significantly greater improvement in public resource management than commercial or industrial landowners' practices. Private landowner practice improvements are intermediate.
- ◆ More than half of the projects (52-65%) report slight or no improvement in hydrology, water quality, rare species populations, or invasive species reduction.

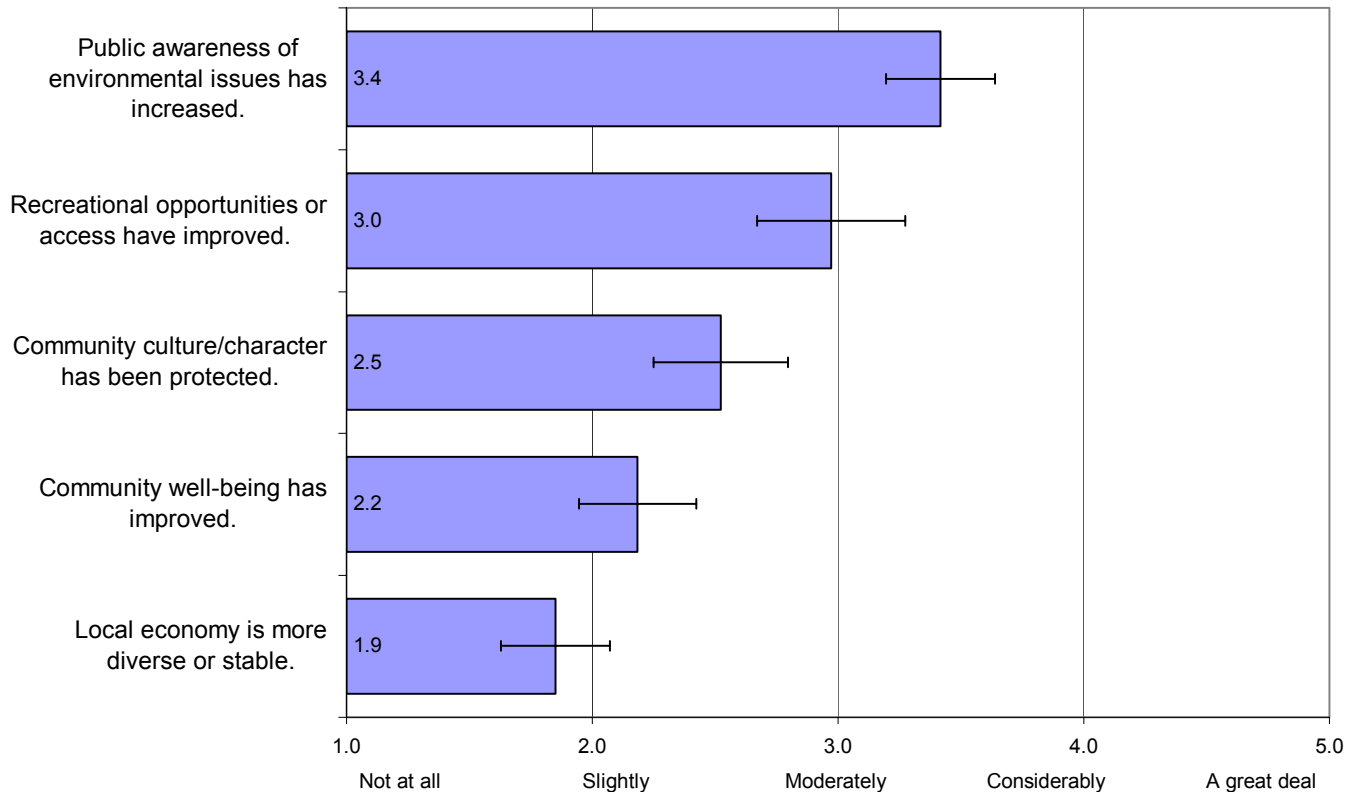
To what extent have the following *ecological outcomes or changes in resource management* resulted from the efforts of your project?



What social or economic outcomes are projects reporting?

- ◆ Almost half of the projects report considerable to a great increase in public awareness of environmental issues as a result of project efforts.
- ◆ The majority of projects report slight or no improvement in the stability of the local economy (82%) or community well being (63%).

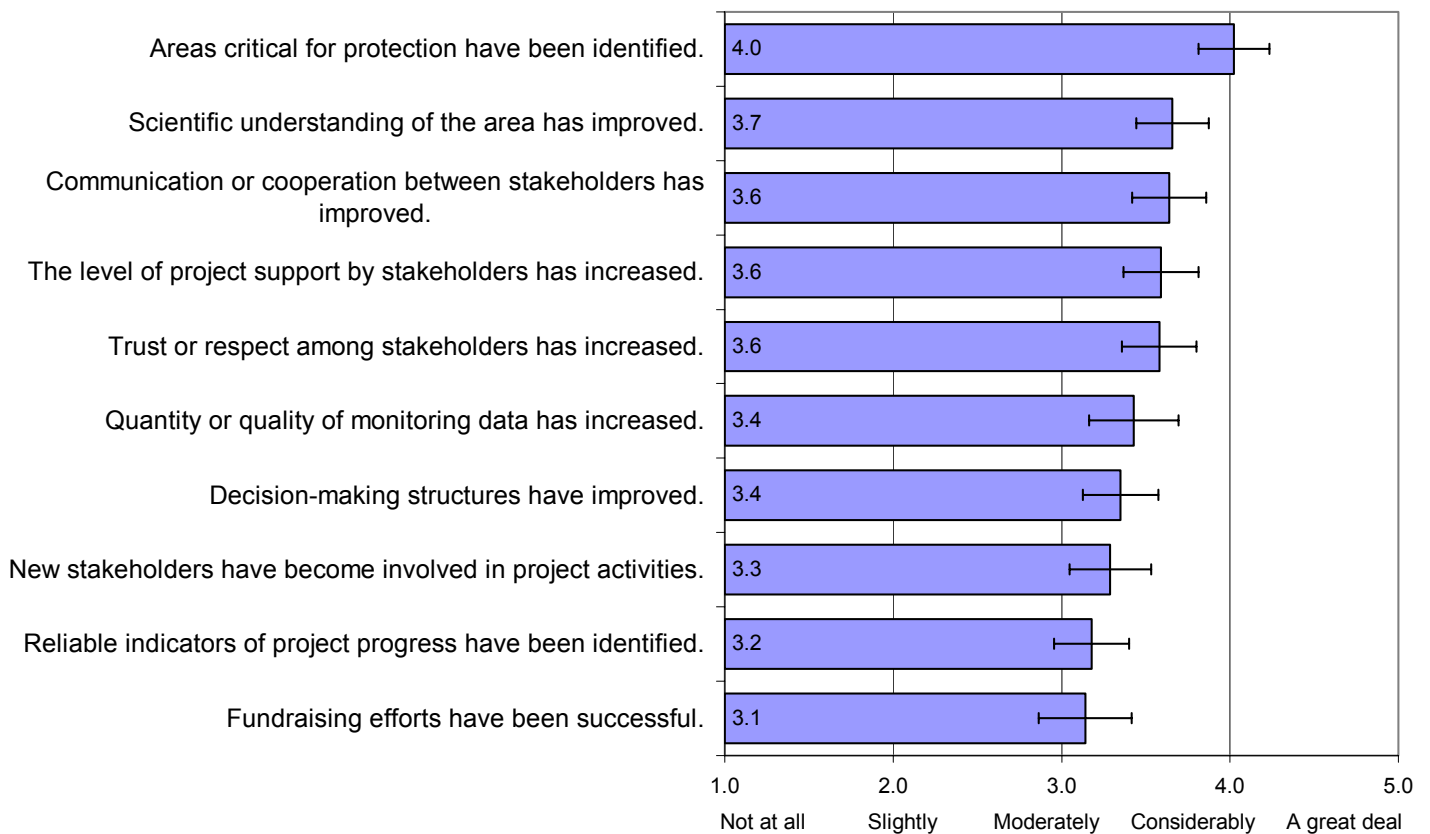
To what extent have the following *socioeconomic outcomes* resulted from the efforts of your project?



What planning, organization or informational changes are projects reporting?

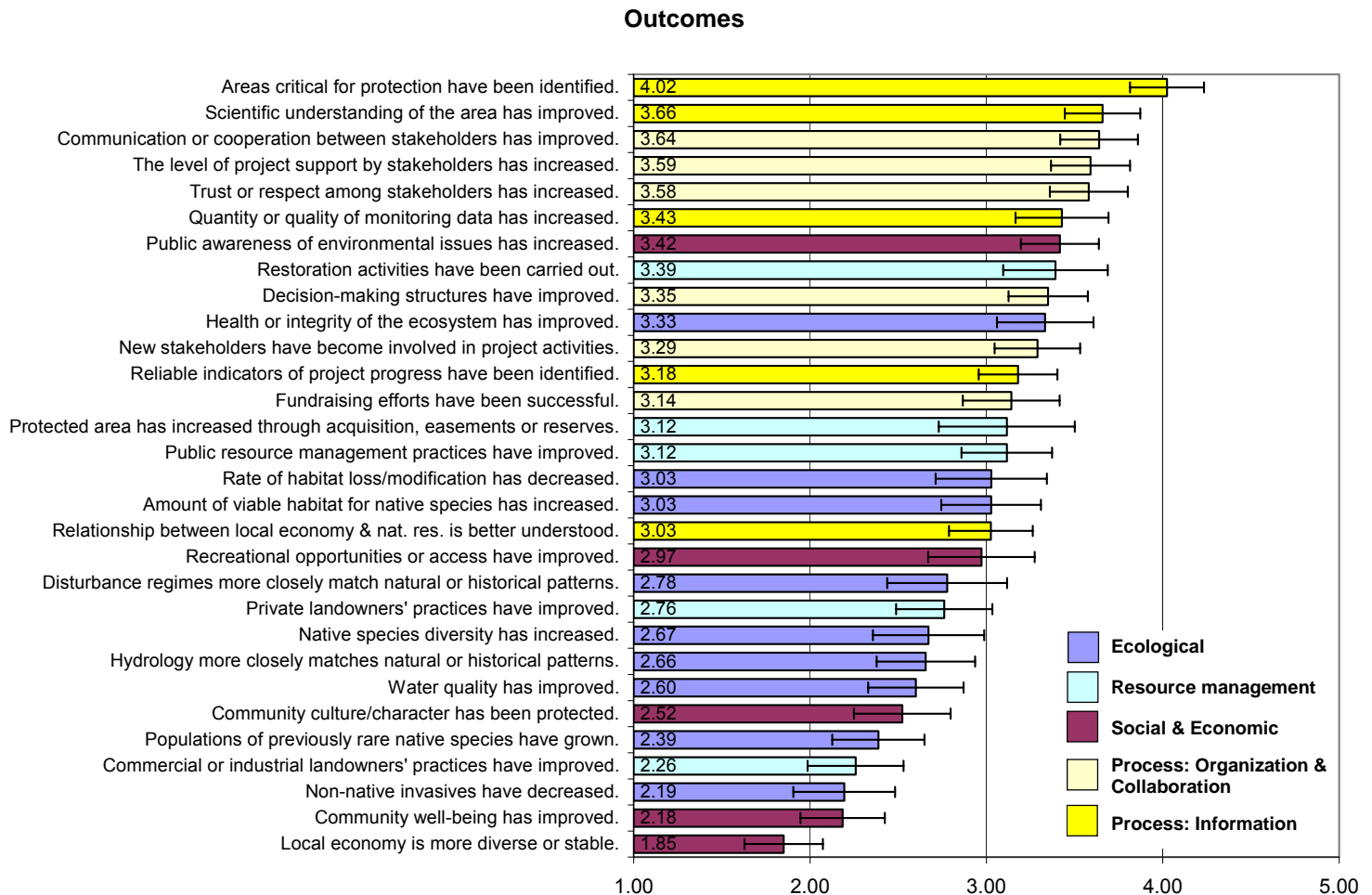
- ◆ There is considerable to a great deal of progress in knowledge, such as identification of areas for protection (74%) and improved scientific understanding of the area (54%).
- ◆ The majority of projects also report considerable to a great deal of progress in the collaborative process, including stakeholder communication or cooperation (57%), support (55%), and trust or respect (57%).
- ◆ Reliable indicators of progress have been identified a great deal by only 7% of projects, considerably by 33%.

To what extent have the following *planning, organizational or informational changes* resulted from the efforts of your project?



How do the levels of ecological, social and process improvements compare?

- ◆ Overall, process outcomes are rated significantly higher than social or ecological outcomes ($F_{2,27} = 11.67, P < 0.001$).



How does self-rated success compare to success based on reported outcomes?

- ◆ Self-rated success is highly correlated with outcome ratings, both by ecological, social and process outcomes separately and by overall outcomes (Spearman rank correlations, $P < 0.01$).

Do project outcomes relate to project age or stage?

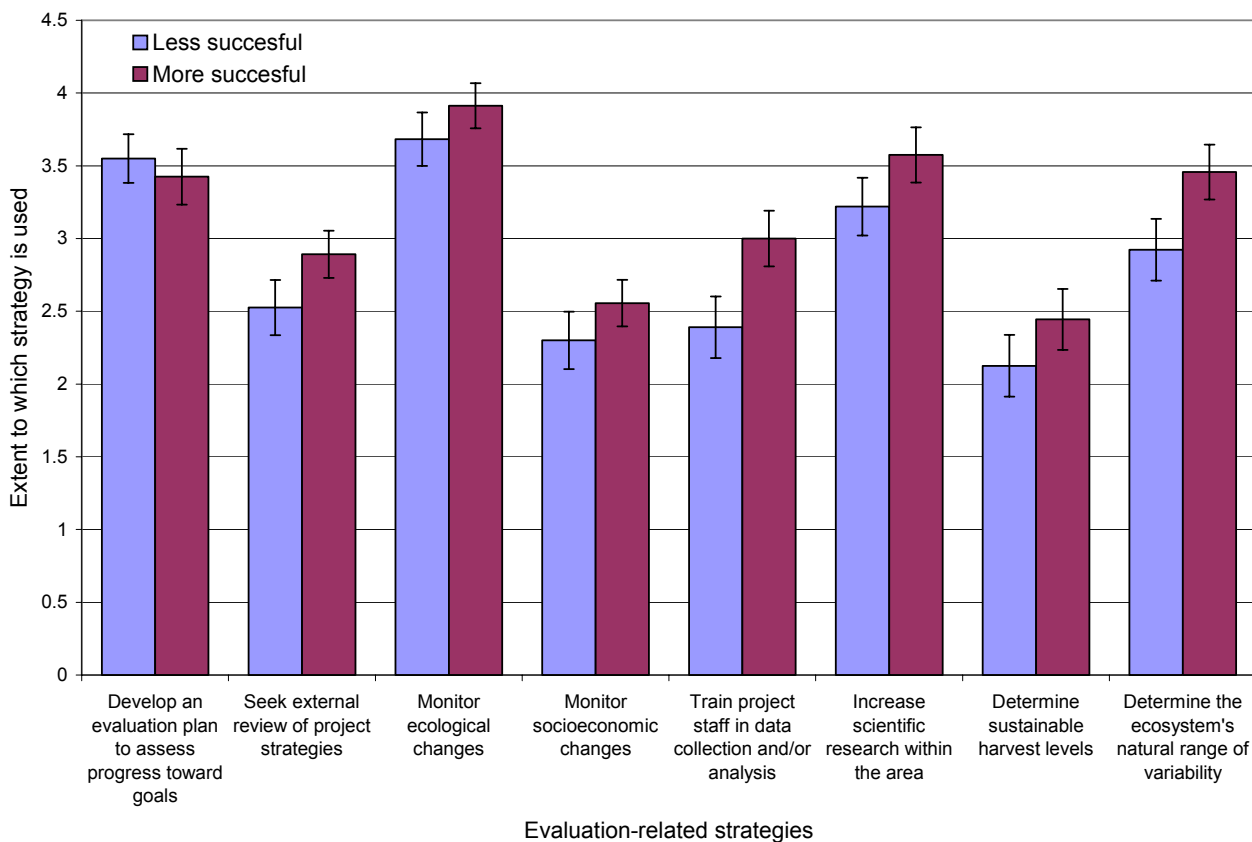
- ◆ Several ecological and social outcomes, but not process outcomes, were significantly higher for projects in full implementation compared to those in planning and/or some implementation (Mann Whitney U, $P < 0.05$):
 - Health or integrity of the ecosystem has improved.
 - Native species diversity had increased.
 - Amount of viable habitat for native species has increased.
 - Local economy is more diverse or stable.
 - Community character/culture has been protected.
- ◆ In accordance with the above results, several ecological outcome ratings significantly increase with project age (Spearman rank correlations, $P < 0.05$):
 - Health or integrity of the ecosystem has improved.
 - Native species diversity had increased.
 - Populations of previously rare native species have grown.
 - Amount of viable habitat for native species has increased.
 - Rate of habitat loss/modification has decreased.
- ◆ These results support our hypothesis that substantive change occurs late in a project's lifecycle.
- ◆ The success of fundraising efforts significantly decreases with project age (Spearman rank correlations, $P < 0.05$). This may be because fundraising is less of a focal strategy of older projects (see change in strategies over time, above), or because obtaining seed money is less difficult than *continued* funding.

How have outcomes changed from 1999 to 2003?

- ◆ In paired analyses of the projects surveyed in both years, none of the outcome ratings compared were significantly different between years. This could be due in part to our limited ability to capture variation in responses; outcome responses were recoded into only four possible levels in order to compare the 1999 and 2003 survey questions that were on different scales.
- ◆ In terms of *trends*, for those cases in which there was a change in outcome rating, more cases reported increases than decreases in the following: ecosystem health or integrity, scientific understanding, trust or respect among stakeholders, protected area, quantity or quality of monitoring data, private landowners' practices, and native species diversity.
- ◆ By contrast, more cases reported decreases than increases in the following: public awareness of environmental issues, new stakeholder involvement, communication or cooperation between stakeholders, and hydrology patterns, water quality.

How does project success relate to evaluation activities?

- ◆ Projects that engaged in training project staff in data collection and/or analysis have significantly higher overall outcome ratings (Mann Whitney U = 675, $P = 0.028$).
- ◆ There is also a *trend* for projects that engage in other evaluation-related activities, such as seeking external review, monitoring, scientific research, and determining ecosystem parameters such as sustainable harvest or the range of natural variability.
- ◆ The degree to which projects develop an evaluation plan to assess progress towards goals does not relate to outcome levels.
- ◆ There is also no apparent relationship between project success and the degree to which respondents perceive monitoring programs as a significant facilitator of progress. Projects that rate the availability of *baseline* data as a significant progress facilitator do, however, have higher overall outcomes. This suggests that monitoring data is especially useful for project success when it can be compared to a reference or baseline and/or has been collected for some time.
- ◆ Making conclusions about the current relationships between evaluation strategies and outcomes is difficult, because it is likely that increased outcomes would not be apparent until evaluation strategies had been in place for some period of time.



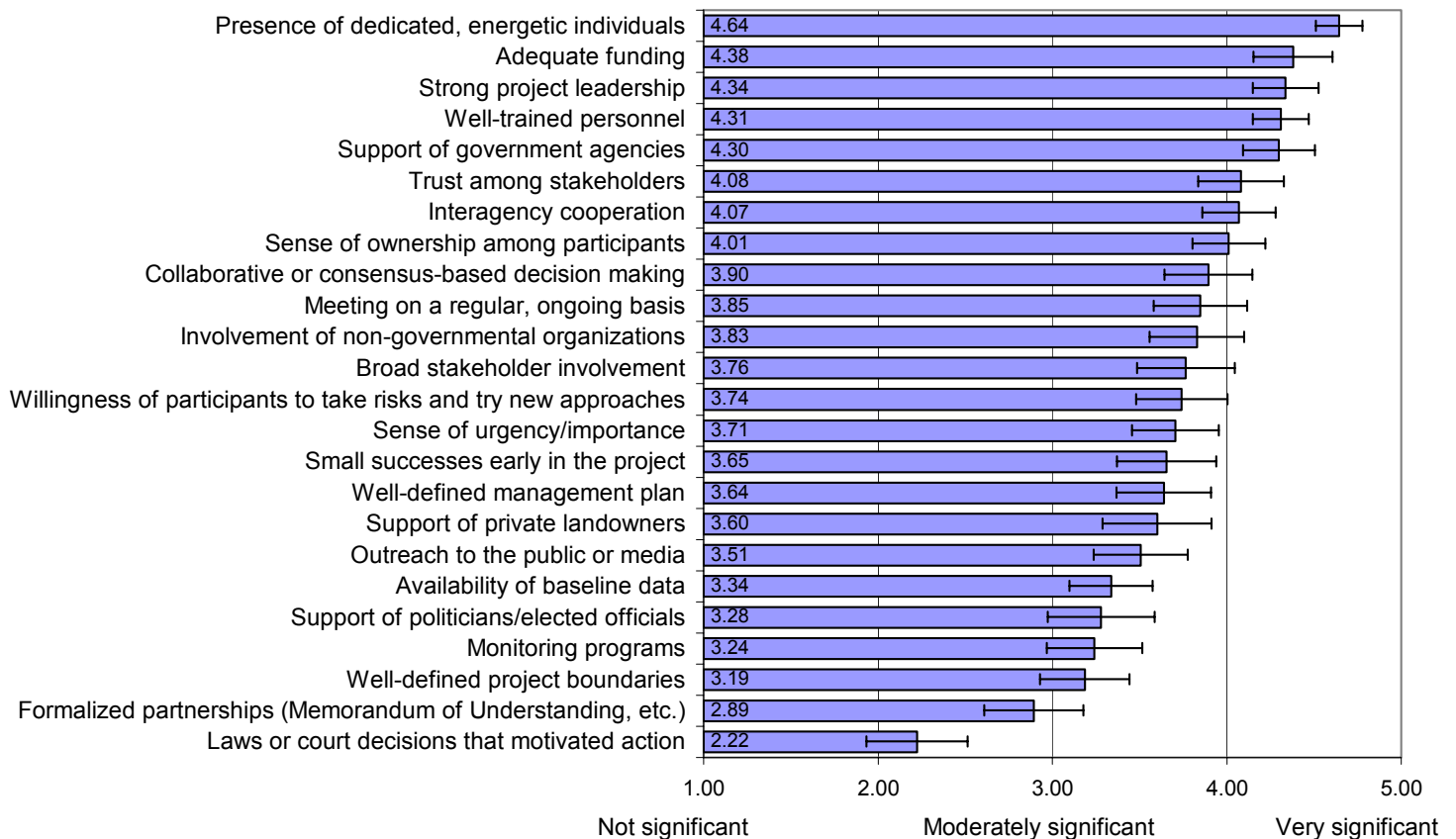
Error bars are standard error of the mean. More or less successful indicates whether projects were below or above the median for all outcome ratings.

Facilitating factors and obstacles

What are the significant facilitating factors for project progress?

- ◆ The presence of dedicated, energetic individuals was rated statistically more significant than many other factors.
- ◆ 40% of projects rated monitoring programs as more than moderately significant to progress.
- ◆ Formalized partnerships were not significant for 20% of projects, but more than moderately significant for 36%.

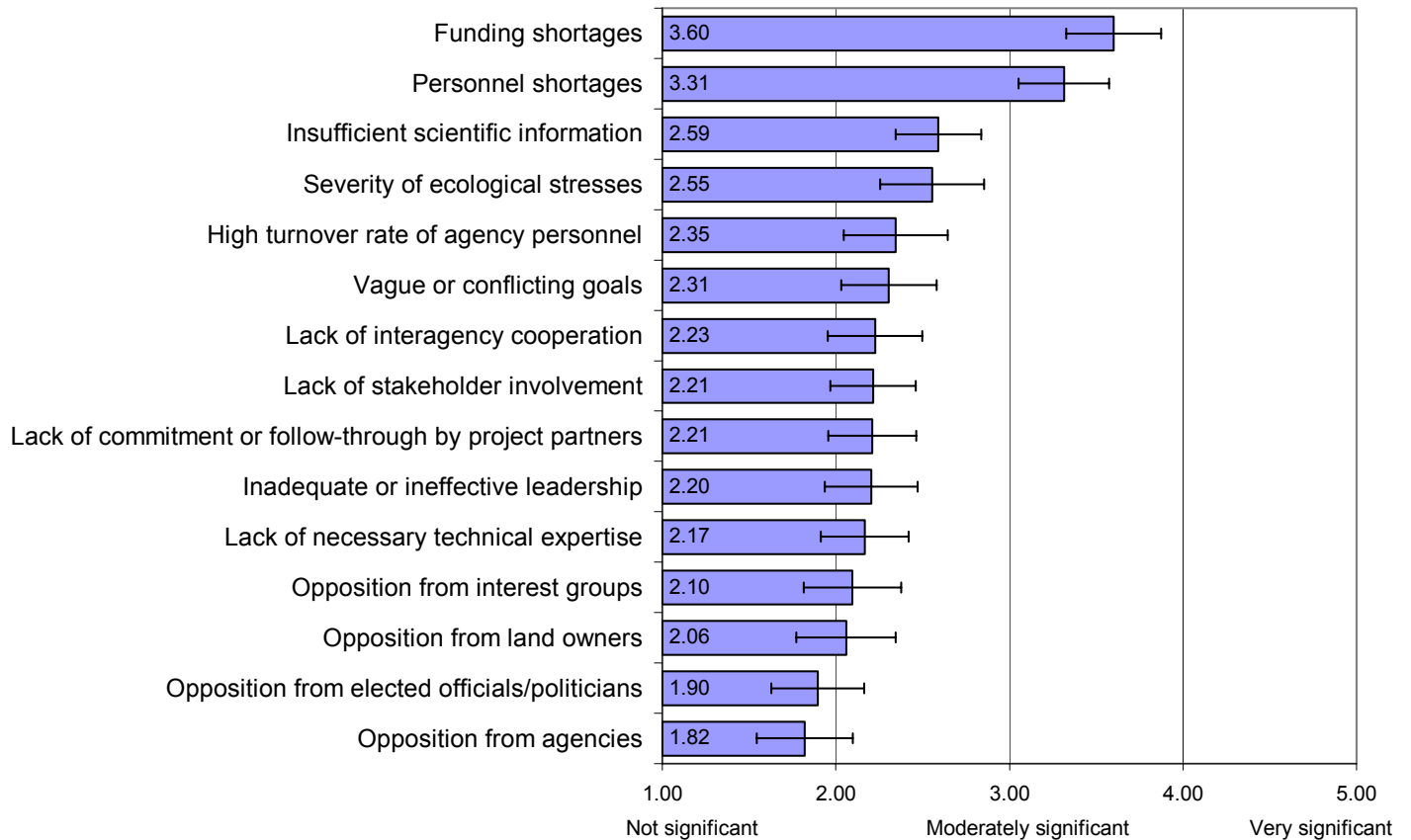
Please rate the significance of the following factors in *facilitating* the progress of your project.



What are the significant impeding factors for project progress?

- ◆ The significance rating of many impeding factors is lower than facilitating factors.
- ◆ Funding and personnel shortages were the top two barriers to progress.
- ◆ Projects were split on the importance of high personnel turnover rate. It was not a significant barrier for 39% of projects, but was at least moderately significant for 42%.

Please rate the significance of the following factors in *impeding* the progress of your project.



How do facilitating and impeding factors relate to project age or stage?

- ◆ Several facilitating factors were significantly higher for projects in full implementation compared to those in planning and/or some implementation (Mann Whitney U, $P < 0.05$):
 - Well trained personnel
 - Involvement of non-governmental organizations
 - Trust among stakeholders
 - Willingness to take risks
- ◆ With increasing project age strong project leadership and meeting on a regular basis are rated as *less* significant facilitating factors (Spearman rank correlations, $P < 0.05$). No impeding factor rating was significantly correlated with project age.

How have facilitating and impeding factors changed in importance from 1999 to 2003?

- ◆ Several facilitating factors were rated significantly *lower* in 2003 than in 1999 (based on same respondents, $N = 32$). Asterisks indicates significant changes (in the same direction) when all projects were considered ($N = 60$).
 - strong project leadership
 - well-defined management plan
 - availability of baseline data
 - collaborative or consensus-based decision-making
 - support of private landowners*
 - well-defined project boundaries*
- ◆ As impediments to progress, insufficient scientific information, opposition from agencies, and opposition from landowners were rated *lower* in 2003 than in 1999.
- ◆ No impeding or facilitating factor was rated significantly *higher* in 2003 than in 1999.