Collaborative Monitoring in Walnut Creek, California[1]

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Abstract

In 1995 and 2000, a monitoring program was designed and implemented to track oak regeneration and native grass populations in target management areas in the four Open Space Preserves of the City of Walnut Creek, California. The program resulted from a collaboration of scientists at the University of California, Berkeley, a group of interested citizens known as the Walnut Creek Open Space Foundation, and the city of Walnut Creek. The goals of the monitoring project were determined by the City and the Foundation, as were the study site locations. The Foundation members volunteered and were trained to collect field data in both the 1995 and 2000 studies. All parties believe that they benefited from this collaboration, sometimes in unexpected ways. The volunteers stated that they learned where they might need to target their oak restoration efforts, and got a better idea of the value and limitations of a scientific monitoring program. The scientists found that they learned about the goals and abilities of local citizens and had to re-examine some of their own assumptions. The City of Walnut Creek managers stated that they gained insight into priorities of Preserve users and knowledge of areas that might require new management efforts.

Introduction

Monitoring, to evaluate changes in condition and/or progress toward meeting a management objective, can take many forms. It may be an integral part of an adaptive management project, a tool to assess changes in the population of a target species, or a means to assess changes in biodiversity (Elzinga and others 2001). Conservation biologists and land managers alike espouse the importance of long-term monitoring to restoration, protection, and natural resource management projects (Holechek 2001, Noss and Cooperrider 1994). In the case of the Walnut Creek Open Space Preserves, the goal was to monitor oak regeneration and native grass populations in specific target areas of interest to the Open Space Foundation. These areas were subject to various management practices, including planting of native grasses, cattle grazing, and cattle exclusion but the study was not designed to experimentally test the effects of these management practices in a broadly generalizable way. Rather, City land managers and Foundation members use the monitoring information to help make decisions about where they should focus

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seedling protection and planting efforts, and if necessary, modify existing practices, in the specific areas targeted for monitoring.

Collaborative management and participatory monitoring projects are based on the notion that conservation and resource management are most effectively executed when local people participate in the management and monitoring of the biodiversity and natural resources (Getz and others 1998). A variety of programs have employed some measure of community involvement in the management and monitoring of the resources they both use and protect: wildlife management programs in Africa put the responsibility of monitoring and management of large game animals in the hands of local people on communal lands (Childs 1996); Masoala National Park in Madagascar was delineated with input from local people who use potentially ecologically sensitive areas (Kremen and others 1998); extractive reserves in Brazil have been operated by cooperatives of rubber tappers who monitor and manage their own resource extraction (Hecht and Cockburn 1989). Though diverse, all of these programs have received attention for the varying degrees of success and limitations they have experienced in achieving their ecological and socio-economic goals (Getz and others 1998, Hannah and others 1998).

Though much of the work on community-based monitoring and management has occurred in regions outside the United States, the many similarities between the issues that these projects face and local land management issues in the U.S. are striking. In both cases, land managers are often in dire need of monitoring information, but lack the funds to get it. Local people, with a variety of interests and experience in a resource area, are often left out of the scientific research and decision-making for the land they know and care about. Finally, in both the U.S. and abroad, scientists are often not aware of the knowledge and concerns of the local people, nor perhaps even those of the land managers. Ironically, scientists, managers, and local people don't often communicate with each other when looking for ways to monitor the effects of management practices. Communication and collaboration between community groups, land managers, and scientists, whether in a game reserve in Southern Africa or an open space preserve in Walnut Creek, California, has the potential to greatly benefit all parties as well as the resource itself. Recent efforts called "all-party monitoring" projects have emerged that involve federal and local agencies as well as grass-roots community groups and environmental organizations (Gray and Kusel 1998). The intention is that collaboration will be more likely to produce an ecological monitoring program that persists due to participation and buy-in, is cost-effective and informative for managers, and provides researchers with a living laboratory and knowledgeable research assistants.

The Walnut Creek Open Space Biodiversity Monitoring Project in 1995 and 2000 was an attempt at just such a collaboration between managers, community members, and scientists. Much of the successes and obstacles encountered in designing and implementing this collaborative monitoring project parallel those experienced in developing countries. On the other hand, some of our experiences were unique to working in a middle- to upper-class city in the San Francisco Bay Area. The process of monitoring oak regeneration in the Walnut Creek Open Spaces is on-going, as a monitoring project should be. However, the lessons learned by the city managers, the community volunteers, and the university scientists may already be useful to other organizations interested in collaborative monitoring projects.

Methods

The Place

The project was conducted in the rolling oak-dominated foothills of eastern Contra Costa County. The City of Walnut Creek manages four Open Space Preserves that total 2,800 acres. Most parcels share borders with larger regional and state parks, but nonetheless are adjacent to the suburban development characteristic of the area. Plant communities on these parcels include blue oak, valley oak, and coast live oak woodlands, and mixed chaparral, riparian and coastal scrub communities, all with annual grasses in the understory. A number of native perennial bunchgrasses are interspersed among the annual grasses, including needlegrasses (*Nassella* spp.), melic grasses (*Melica* spp.), wild rye (*Leymus* spp.), squirreltail (*Elymus* spp.), and others.

The People

The Walnut Creek Open Space Foundation was founded in 1979, and today consists of a group of active citizens who enjoy and have an interest in the management of the oak woodlands, grasslands, and riparian areas of Walnut Creek's four Open Space Preserves. One of their major projects is an Oak Habitat Restoration Project, for which they carry out acorn harvests, waterings, acorn and seedling plantings, acorn storage experiments, and other activities throughout the year. They have an active Board whose members are primarily retired long-time residents of Walnut Creek, and who are often a major source of labor for the Foundation's activities. The City of Walnut Creek Open Space Superintendent is responsible for the management of all four Open Space Preserves, including issuing cattle grazing permits, managing public recreation, maintenance, and management of open space natural resources. The researchers involved in the project are from the Department of Environmental Science, Policy and Management of the College of Natural Resources at the University of California, Berkeley. Extension and outreach is one of the missions of this land-grant institution.

The Process

The Walnut Creek Open Space Foundation has been conducting oak plantings and waterings for several years with the consent and encouragement of the City Superintendent. The City and Foundation wanted to know more about what was happening over time to oaks and native grasses on the preserves. There is, for example, some debate about the impacts of some management practices, particularly livestock grazing. In 1995, the Foundation decided to initiate a monitoring program that would help them assess "…whether the work they were doing was affecting or improving the Open Spaces" (Kraetsch, personal communication), and to evaluate how things were or were not changing in grazed and ungrazed areas. The City Superintendent contacted the College of Natural Resources at the University of California, Berkeley, because he knew that several researchers there specialized in California range and oak woodlands and would improve the quality and credibility of the project.

In order to develop a program that addressed the management objectives of the community and the City, Professor Lynn Huntsinger and her graduate students visited the Preserves with Foundation Board members, learning about their particular concerns and questions regarding management practices: Was the cattle grazing in

some areas affecting the regeneration of the oaks? Were the native grass plantings taking hold over the long term? Were the cattle affecting the native grasses? Foundation members identified specific target areas of interest, usually in places where oak seedlings and/or native grasses were already present. These became the locations of the permanent monitoring transects.

The most important factor is that the questions and objectives originated with the Foundation, not the researchers. Designed as a monitoring exercise to indicate progress toward the management goals of the Foundation and City of Walnut Creek, the project's intention was to track changes in special areas within the preserves, and in particular resources, to see if management changes were needed. The researchers provided a reliable yet user-friendly monitoring protocol that addressed stakeholder objectives. If an oak regeneration transect seemed to show poor recruitment, the next step would be to investigate the cause. This might lead to annual monitoring or to testing alternate management. It is up to the managers and stakeholders to develop creative management approaches that incorporate monitoring information.

Because the majority of the monitoring data would be collected by non-ecologist members of the Foundation, researchers designed the monitoring protocol with clear instructions for the users as well as accurate scientific data collection procedures *(fig. 1)*. Foundation members were provided with a reference binder of samples of the native grasses. Foundation volunteers were organized by the Board and trained by the scientists to identify species and take measurements consistently. Oak species in three class sizes were counted and measured on four-meter wide belt transects. Several transects included native bunchgrass abundance and photo points for visual comparison. Data collection occurred during May and June of 1995; re-surveying occurred during May of 2000. In both 1995 and 2000, the researchers compiled and analyzed the data and presented the results in a report to the Foundation and the City.

Oak regeneration transects - Sugarloaf

General location: South-trending drainage out of ranch buildings.
Transect no.: OR-SL1 (15) **Your name:** R. Kraetsch **Date**: 5/19/00
Grazing status: Grazed (heavily) **Compass bearings**: N5E to Marshall Gap; N30E to power tower
Transect runs (post to rebar): S6W **Photo nos.:** Roll#3/20,19
--Distance along tape in meters; all other measurements in centimeters--

Distance along tape	Which side of tape	Distance from tape	Species	Exact height	Size class	Notes
5.1	E	81	QULO	142	3	planted - in cage tubex
8.6	W	117	QULO	16	1	
15.2	E	123	QULO	8	1	
16.0	E	42	QULO	8	1	
18.2	W	106	QULO	20	1	
19.7	W	118	QULO	14	1	
27.5	W	183	QULO	tree	3	approx. 60 ft tall, dbh 100cm

NOTES:
Dominants: Avena, Lolium, Nasella pulchra (purple needlegrass), Taeniatherum, (medusahead), Symphoricarpos sp. (snowberry), QULO canopy.

Instructions: *Look for all oaks in a 2 meter band on both sides of the transect. If any part of the tree falls within this area, count it. Height of oak is from ground to top meristem. (Size classes are: Class 1: 0-30 cm (seedling); Class 2: 31-135 cm (sapling); Class 3: above 135 cm (tree)*

Figure 1—Example of oak regeneration data sheet.

Results and Discussion

At this point in time, after five years with one repeated visit, there were no large changes in oak recruitment and abundance of native bunchgrasses. Because seedlings are ephemeral in the oak woodland, seedlings were not used to evaluate regeneration success. An increase or decrease in the number of saplings, therefore, was used to assess recruitment levels for each transect. Some areas showed an increase in blue oak *(Quercus douglasii)* recruitment into the sapling class in ungrazed areas, whereas valley oak *(Quercus lobata)* had similar recruitment in grazed and ungrazed areas. One of the preserves had a change in grazing management in 1998, from light grazing to ungrazed, which makes conclusions about effects of grazing difficult for that area. In all cases these results are specific to target areas in the Walnut Creek Open Space Preserves.

The experience of implementing the monitoring program with a mix of scientists and non-scientists, students and retired people, rangers and volunteers provided us with a bounty of lessons and recommendations for those who might want to try a collaborative monitoring effort. A crucial element of this process is the art of capitalizing on the strengths of each group in an efficient and respectful way. The Open Space Foundation had monitoring objectives and volunteer labor, but needed outside expertise to establish a monitoring program. The City managers supported the need for monitoring data, but didn't have the personnel, finances, nor time to do the job or hire an outside consulting firm. The university scientists had expertise and were willing to help, but could not provide the quick turnover time that consulting firms are known for. Fortunately, each group participating in the project complemented the needs and constraints of the others.

In many respects, the collaborative effort of the Walnut Creek Open Space project paralleled the efforts of community-based management in other regions of the world. The Foundation volunteers provided a historical and intimate understanding of the landscape that neither the scientists nor the land managers could provide. Though managers and scientists had only recent experience with the area, many of the volunteers have walked these foothills for 40 years. This knowledge was crucial in both the design of the monitoring protocol and in the interpretation of the results in light of the management history. On the other hand, though many of the volunteers had extensive experience with the oak woodlands, they lacked some ecological training. One volunteer explained, "I'm a retired civil engineer. To meet people who could identify a plant with some degree of certainty was like enlightenment to me!" (Ceasar, personal communication). The scientists could contribute their expertise in ecology by designing a protocol that would be repeatable over time, and by analyzing and presenting the results in a way that addresses the management questions. The combination of this scientific "procedural knowledge" and the local "experiential knowledge" resulted in a rewarding learning situation for everyone involved. University participation also provided a "third party" point of view that was useful to volunteers and managers in discussing management options for the preserves.

Participation in the monitoring program provided Foundation members with more than just a new appreciation of plant identification; it gave them a better understanding of the benefits and limitations of the scientific process. Non-ecologists often look to scientists for causal connections or "black and white" answers to management questions, which are difficult to provide in a typical land management setting. Participating in every step of the protocol means that community members are more likely to understand the results, their implications, and can communicate

these results to others. In addition, lack of continuity is often an obstacle to long-term monitoring conducted solely by scientists or managers due to limited funding, attrition and movement between institutions. In the case of the Walnut Creek Project, participation by community members will be the single greatest reason that this project continues. As long as Foundation members remain interested and invested in the results of the project, it will continue.

Conclusions

The project report presentation for the 1995-2000 monitoring project reflected the unique circumstances and success of a collaborative project. The researchers gave an informal presentation at the City of Walnut Creek Superintendent's office to several uniformed park rangers and Foundation Board members and volunteers. The volunteers enjoyed scrutinizing the results that had been generated by their days in the field collecting data. The park rangers were delighted to have a body of data from which they could begin to discern the effects of some of their management activities. The scientists found an appreciative yet appropriately critical audience. In fact, the Foundation was so pleased with the work of the researchers that one graduate student received a $200 tip!

The lessons learned do not end with the project report, however. A major criticism of some community-based management and monitoring projects involving scientists or researchers is that they are often "hit and run", that is, once the project is complete, the researcher abandons the community and moves on (Getz and others 1999). This need not always be the case. Since the completion of the 2000 phase of the monitoring project, the relationship has been maintained by a researcher who periodically participates in the oak plantings and watering of the Oak Habitat Restoration Project. There is an un-quantifiable value to researchers and community volunteers working side by side in a continuation of the relationship formed through the monitoring project. However, in the long term, it is the local people who are the most committed to the site for the long term, and who will see that the project continues. Because they participated in the projects design, goals, and implementation, the Foundation is well equipped to do so.

Several aspects of the Walnut Creek Project are very different from the experiences of community-based management projects reported in the literature (Barrow and Murphree 2001). The longevity of this monitoring program will depend on several factors that reflect the unique situation of working with an empowered group of middle-class retirees in the San Francisco Bay Area (*table 1*).

Table 1—*Comparison of obstacles to collaboration in monitoring projects.*

Community-based projects in developing regions	Walnut Creek Open Space Monitoring Project
Often a large power differential; researchers' and community members' education, socio-economic status, ethnicity are dissimilar (Getz and others 1999).	Little to no power differential; researchers' and community members' education, socio-economic status, ethnicity are similar.
Government agencies often unstable—may hinder collaboration (Childs 1996).	Government agencies relatively stable—enables collaboration.
Remote location may not allow for opportunity for collaboration.	Neighboring university allows for opportunity for collaboration.

The largest obstacle in participatory monitoring in developing countries is often a differential in power or status between scientific "experts" and the local community (Barrow and Murphree 2001). In this case, though dichotomies existed between ecologists and non-ecologists, students and retired persons, the Walnut Creek Open Space Foundation Board members knew how to work within the system of governmental agencies and universities and were not intimidated by the prospect of working with researchers. In fact, many of the Foundation members were engineers, geologists and other professionals. The differences in disciplinary training between ecologists and community members contributed more to misunderstandings than socio-economic or cultural differences did. This certainly contributed to the ease with which this project was established and maintained, and will hopefully contribute to its future success. These are presented below.

The Foundation leaders, researchers, and city managers all generated recommendations for non-profit organizations, agencies, and academics that might be interested in pursuing a similar collaborative monitoring project.

- **Land managers and governmental agencies**—When in need of monitoring information without strict time constraints, consider drawing on the resources of the local university. Managers should also keep in mind that different institutions, departments, and researchers have different specialties that may reach far beyond their local area; they can start by asking for help at the local college, and then pursue researchers who may be farther away but specialize in the habitat of interest.

- **Community groups and non-profit environmental organizations**—These organizations should have specific goals and objectives for what they want to monitor and why. Especially when time and money are limited, explicit priorities need to be clearly defined so they can be communicated to the researchers and agency personnel. An important factor that was present in the Walnut Creek Open Space Monitoring Project is organized and strong leadership. When working with university researchers with limited time, it is essential that community groups organize their volunteers efficiently. In addition, make sure there is enough continuity within the organization to sustain the project even after the research support is gone.

- **Academics and natural resource scientists—**Though academics may not consider outreach and extension as part of their typical job description, they should consider contacting local resource management agencies and community groups who may be able to contribute ideas, study sites, labor, and positive public relations toward achieving their research goals. Collaboration can enhance appreciation for local expertise, and promote an exchange of knowledge about the landscape that could not be achieved by science alone. Most importantly, the relationships created can help break down the barriers that often exist between agencies, communities and scientists.

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