

APPENDIX 1. Common Monitoring Problems

Monitoring projects often do not function as intended. The following are common scenarios and suggestions for avoiding problems.

A. Monitoring Not Implemented

1. Priorities changed and monitoring was not implemented after the first 2 years.

A signed monitoring plan (Chapter 10) represents a commitment by the agency to implement monitoring as designed. Although not a guarantee in the changing world of agency budgets and priorities, a monitoring plan provides some insurance that the monitoring will be implemented. If other parties outside the agency were part of the development of the monitoring plan, they may provide additional incentive to implement the monitoring as planned.

2. Data collection went as planned during the pilot period, but when we started using student interns for the field work after the pilot period, we found that they sometimes confused seedlings of a common shrub with the rare species.

The pilot period should function as a true test run of the monitoring. If technicians will be used for data collection over the life of the project, they should be used in the pilot period. Monitoring design needs to accommodate the skill levels of those doing the field work as well as those involved in analysis and interpretation.

3. The specialist in charge of the monitoring project was transferred to Washington and the monitoring project is faltering because of lack of an advocate.

Again, a monitoring plan may prove useful, especially if more than one person within the agency was involved in its development and can function as a replacement advocate, and if outside parties are actively involved (Chapter 10).

4. The specialist in charge of the monitoring project retired, and no one remaining knows where the transects are or what size quadrats were used.

Again, a monitoring plan can help. Not only are monitoring plans useful for communication, they also provide a link between predecessor and successors (Chapter 10). A cover sheet that describes monitoring methods provides further insurance that information such as transect locations is not lost (Chapter 9). Monitoring that has been poorly documented will not be continued once the originator leaves. Even worse, it is likely that all of the data already collected will be thrown out, since no one can interpret it.

B. Monitoring Data Not Analyzed

1. The field work was completed, but there is not enough time to analyze the data and report the results.

When planning for monitoring, the time required for data entry, analysis, summary, and reporting are often forgotten, and only the field costs considered. Office work will likely require two to five times the field time and must be included in the budget. Commitment by decision-makers to allocate the time and resources required for the entire project, not just data gathering, should be part of the development of the monitoring plan (Chapter 10).

2. The field work was completed, but no one in the office knows how to analyze the data.

Part of the monitoring design should be the identification of analysis methods (Chapter 11). If those can't be identified by available staff during the design stage, additional expertise should be brought in during design, not after the data are collected.

3. The field work was completed by student interns, who have since returned to college. We can't find some of the field notebooks, and no one in the office can decipher the notes in the ones we have.

Field data sheets should be developed for each project, rather than using field notebooks for data recording (Chapter 9). Data collected by short-term employees or volunteers should be checked immediately, duplicated, and stored in a secure place.

C. Monitoring Yields Inconclusive Results

1. After 4 years of monitoring, the data were analyzed. The estimate of population size from the first year's data is 342 individuals, \pm 289 individuals at the 90% confidence level. Estimates of population size in subsequent years were no more precise.

If the first year's data had been analyzed immediately as a pilot study, it would have been apparent that the methodology was not producing reliable estimates of population size (Chapters 5, 6, 7 and 11). As it is, four years of imprecise data have been collected.

2. During 10 years of monitoring, the population has exhibited an annual decline. It is still uncertain, however, whether the heavy livestock use in the area is responsible, and no decision to alter livestock management can be made.

Developing a monitoring strategy of two phases—the first to identify an unacceptable decline and a second to determine reasons—would avoid this scenario (Chapter 4). Ten years is a long time to monitor a population decline and do nothing but watch.

3. After 12 years of monitoring, we've learned that the population size fluctuates up and down dramatically from year to year.

While this may be an interesting observation, it is not very useful for monitoring, and the annual fluctuations probably became apparent after 3-4 years of monitoring. Population size is not a sensitive measure to use for monitoring this species. You should have changed the measured attribute (here population size or density) have been changed after a few years, rather than continuing to measure it for 12 years. The potential for large annual variation in a chosen attribute should also be considered during the design phase (Chapter 4).

4. After 5 years of monitoring, we brought our data set to a statistician who said it was "nearly worthless."

Several mistakes were made here. During the design and pilot stages (Chapter 7), a statistician should have been consulted if the necessary skills were not available locally. Data should have been analyzed after the first year or two, so that changes in the monitoring could have been made before 5 years of time and effort were invested in the monitoring.

D. Monitoring Data Analyzed but not Presented

5. I don't have time to make fancy graphs and reports. I'm convinced of what the monitoring results say, and I'll use it to make better professional judgments concerning this species.

Such an attitude has two drawbacks. The first is that using the actual data is usually much more powerful than filtering it into "professional judgments," and the necessary changes will more likely be made if there are data to back them up. The improvement in the professional judgment of the specialist is important, but unless that translates into a management change, the monitoring really has not been successful. Second, failing to complete a report eliminates an important communication tool to describe results to successors, outside interested parties, and decision-makers.

6. The results are inconclusive. I don't have anything to report.

Inconclusive results need to be reported so others can avoid making the same mistakes.

E. Monitoring Results Encounter Antagonists

1. After 4 years of monitoring showing a significant decline in the population, the decision-maker refuses to change the grazing management because the range conservationist claims livestock never use the population area. I know I've seen herbivory and trampling in the population, but I don't have any data to prove it.

Other specialists may have information or concerns that need to be addressed when designing the monitoring (Chapter 10). Failing to include potential internal opposition during planning ensures their appearance after the data are collected.

2. We've monitored for 3 years, and have shown a statistically significant decline, but the timber company hired a consulting firm that has discredited our methodology.

Rare is the monitoring project that is not susceptible to criticism. Including the timber company during the development phase, and ensuring their support for the monitoring methodology and the potential results (Chapter 10), would have helped avoid this scenario.