Practitioner insights

Policy sciences and congressional research: making sense of the research question

Susan Iott

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Abstract As an analyst for the US Government Accountability Office (GAO), I design and carry out policy studies mandated by law or requested by members of Congress. In 2006, GAO received a request to study federal land management agencies' use of ecosystem management. Procedurally, the analytical problem that I faced in designing a study to respond to this request was that the underlying policy problem was unclear and thus difficult to operationalize in a study. As the lead analyst, I used the policy sciences framework to assess the underlying problem and help design the study in the context of multiple federal policies and academic research. The policy sciences framework is useful for analysis of ongoing policy issues because it helps the analyst make sense of the activities, positions, and ideas in a particular policy arena. It helps the analyst create a map of the policy problem to better define the problem and identify possible policy alternatives.

Keywords Policy sciences framework · Ecosystem management · Collaborative resource management · Federal land management · Local · Stakeholders

Context

Under the Budget and Accounting Act of 1921, the US Government Accountability Office (GAO) has responsibility for investigating matters relating to the receipt, disbursement, and application of public funds and reporting to the President and Congress on ways to achieve greater economy and efficiency in public expenditures.¹ As a research arm of the Congress, GAO provides research capability to the members, primarily responding to mandates written into statute written or requests by committee chairpersons. These

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¹ P.L. 67-13; Sec. 312(a) 42 Stat. 25. The agency's name was changed in 2004 from the General Accounting Office to the Government Accountability Office to reflect this mission.

S. Iott (✉)
Natural Resources and Environment Team, U.S. Government Accountability Office,
1244 Speer Blvd. Suite 800, Denver, CO 80204, USA
e-mail: iotts@gao.gov

requests generally seek information to help the members in their efforts to write legislation and oversee the federal programs for which federal funds are provided. GAO is organized into different issue areas such as Acquisition and Sourcing Management, Defense Capabilities Management, International Affairs and Trade, Health Care, and Natural Resources and Environment. As an analyst for GAO, I design and carry out research studies related to particular mandates or requests. I specialize in natural resource policies, which involve the federal land and resource management agencies within the Department of the Interior and the Forest Service within the US Department of Agriculture.

In October 2006, GAO received a request regarding the federal government's efforts to use and apply ecosystem management. More specifically, the subcommittee members asked GAO to determine what policies had been created to carry out ecosystem management and what actions the federal land management agencies had taken in response. Further, the letter described particular land management situations that involved multiple, fragmented ownership (including private, state, and federal land) in which local land management goals conflicted with federal land management goals and requested that the study examine how federal agencies use ecosystem management to resolve such conflicts. As it related to land and resource management issues, this request letter came to the Natural Resources and Environment team and was further assigned to me as the analyst in charge of designing a study to respond to the request.

Problem statement

The analytical problem that I faced in designing a study to respond to this request was that the underlying policy problem was unclear and thus difficult to operationalize in a study. The term ecosystem management is used broadly by federal agencies to describe the work they are conducting to plan for and manage natural resources. While each of the agencies have a broad goal of improving land management and, by association, ecosystems, not all have specific policies or goals related to ecosystem management. Without some further context to help define the particular goals to be achieved, the concept is ambiguous and difficult to study. The policy sciences' problem orientation helped to clarify the problem in this case by helping my team and me to clarify the institutional goals that helped guide the study.

Goals

There are multiple goals involved in a policy problem and the first step is to clarify these. In thinking about the problem of ecosystem management and resolving land management conflicts, the policy sciences recommends that an analyst understand the goals of the policy to be achieved. This is also true of working at GAO, where analysts strive to understand the criteria supporting a program—the conceptual equivalent of goals. In addition to considering the goals of a particular policy, a GAO study also reflects the agency's own institutional goals for achieving accountability and transparency in federal government activities.

Land management involves managing natural resources such as trees, rangelands, wildlife, water, and air across large areas of land. Ecosystems and natural processes cross administrative boundaries of federal, state, and private lands and require that land managers work together to manage them. Ecosystem management is a broad goal, which needs

to take into account particular policies and goals related to specific resources. For example, ranchers use public rangelands for forage for their cattle, a resource use that public agencies try to balance with the overall condition of the rangeland or other ecosystems in which cattle graze. The way in which the agencies work to achieve specific goals is by working with different groups of stakeholders, such as ranchers or timber companies, to achieve some agreement on how the lands should be used while trying to maintain their overall health.

Federal land managers manage lands to achieve goals established in many land management laws. For example, the Bureau of Land Management (BLM) within Interior is required under the Taylor Grazing Act to provide forage for private livestock on public lands. Under the National Forest Management Act and others, the Forest Service is required to provide timber for sale from public lands. The agencies are also required to provide for many different uses of public lands under the Multiple Use Sustained Yield Act and the Federal Land Policy and Management Act—including recreation, fish and wildlife habitat, and others. Furthermore, the agencies must provide for habitat for wildlife under the Endangered Species Act and manage areas identified as wilderness, wild and scenic rivers, and other special uses. Each unit within each land management agency—a forest, BLM field office, national park, or fish and wildlife refuge—sets the goals for that unit’s land in a land management plan. These plans are vetted with the public through a formal public participation process as defined by each agency’s regulations.

While these laws discuss resources and the health of public lands, they do not establish a goal for ecosystem management. Federal agencies adopted an ecosystem-based management policy in the mid-1990s. This policy defined an ecosystem as an interconnected community of living things, including humans, and the physical environment within which they interact. It also said that ecosystem management is a “method for sustaining or restoring ecological systems and their functions and values” that is driven by goals and based on collaborative relations developing a vision of future conditions that integrate “ecological, economic, and social factors” (MOU 1995, p. 1).

In addition to broadening the landscape under consideration, ecosystem management considered broadening the participants of the land management decision-making process. The existing approach to public participation involved presenting public groups with a land management plan and asking for comments. Under ecosystem management, managers envisioned greater cooperation and collaboration among stakeholders. Collaboration is needed because ecosystem management involves broad landscapes—hundreds of thousands of acres—that cross administrative jurisdictions—private, state, and federal lands. Management of such areas necessarily involves the integration of these fragmented jurisdictions.

As a GAO analyst, my goals include identifying the policy problem at hand and designing an approach to study it, informing the requesters about it, and providing a final report for the requesters and the public that describes the problem and potential solutions, as well as meeting the needs of the client. The goals of the client can vary, depending on their political and legislative purpose. To that end, GAO teams meet periodically with the clients to identify their policy concerns underlying the request and the potential use of the GAO-supplied information. Depending on how the information will be used, the type of study can vary—if immediate hearings will occur or legislation is imminent, then a short-term study will be conducted. If legislation and oversight can occur within the next year or so, then a longer more rigorous study can be designed incorporating multiple methods and data collection efforts.

GAO has an institutional goal of ensuring that federal funds are used in the way that Congress intended in passing laws and making appropriations. GAO reviews agency

programs using criteria established by the law, regulations, and agency guidance and considers the goals of accountability, transparency, and internal controls. Accountability refers to the processes put in place to ensure that federal funds are not misspent, stolen, or misused and include such things as having multiple people approving the expenditure of federal funds. Transparency involves clear documentation of the actions taken by agency officials and availability of these documents to the public and/or auditors.

GAO manages its work within practical resource constraints, and therefore, also has a goal of designing efficient research studies. Resource constraints include time, staff, and travel resources. Studies can take anywhere from 6 months to a year, and sometimes longer. This leaves about 3–4 months to conduct fieldwork. The agency typically provides two to three staff persons to work full time on a job, in addition to legal, methodological, and management staff. GAO staff typically travel to locations across the country to conduct site visits, and so the amount of travel resources effectively limits the number of cases that can be selected for visit. GAO often supplements its visits with literature review, surveys, telephone interviews, and other cost-effective methods, but site visits and meetings form the foundation for the other methods to supplement.

As a policy scientist, my goal is to clarify the policy problem at hand and to form a comprehensive understanding of the context of the problem so as to identify factors that have been omitted or misconstrued. In this case, it became apparent that the problem—finding common interests to resolve land management conflicts among multiple owners—could be solved in other ways aside from ecosystem management, and the idea was to develop a study that offered a way to understand approaches that opened up decision making in land management, regardless of what those approaches were labeled.

Trends

In an effort to understand whether and how federal land management agencies were using ecosystem management, particularly to manage land management conflicts, my team and I gathered information—studies and interviews with agency officials and academic experts—to determine the status of ecosystem management in federal policy. The policy sciences indicates that once goals have been described, an analyst gathers evidence of trends that show whether the goals are being met. As part of an effort to identify a policy problem, facts and information show if progress is being made in achieving the goals; if not, then a problem exists.

The concept and practice of ecosystem management has been around for a number of decades but evolved in the 1980s and 1990s in the following ways.

In the 1980s and 1990s, land managers realized they faced large-scale ecological problems such as invasive species, threatened and endangered species, water quality problems, and more. Scientists also realized that land management had large and lasting impacts across more than just public lands. Using the concepts of landscape ecology, scientists and land managers developed the idea of ecosystem management. They believed that a broader focus on the landscape would help to make better policy and decisions regarding the use of public lands.

Conflicts over resource use increased after the 1970s, when passage of environmental laws, and the environmental movement changed the public's expectations of the management of public lands. Conflicts over federal timber management peaked in the 1990s when the Endangered Species Act caused a great decline in the timber harvested off of public lands.

In the 1970s and 1980s, land managers in a few key places, such as Yellowstone National Park, began to realize that federal lands were impacted by private land management outside their boundaries. Land managers also began to realize that species biodiversity was affected by land management on federal lands, as well as outside federal lands (Keiter 2003).

Ecosystem management became prominent in federal land management and agency documents during the 1990s, described as an approach to land management that moved beyond dominant commodity uses to a systems approach. A federal study conducted in 1995 describes the principles that make up ecosystem management. They include the following: (1) develop a shared vision of the ecosystem condition, (2) develop coordinated approaches among federal agencies and collaborating with state, local, and tribal governments, (3) maintain diversity and sustainability of the ecosystem, (4) support economic, cultural, and community goals, (5) respect private property rights, (6) recognize that ecosystems and institutions are complex and dynamic, (7) use adaptive management, (8) integrate science into decision making, and (9) establish baseline conditions (Interagency Task Force 1995, pp. 19–20).

In practice, several examples of large ecosystem studies were carried out during the 1990s around the country. In 1993–1994, the concept of ecosystem management was applied to the problem of preserving old-growth forests for Northern spotted owls and other threatened and endangered species in the Pacific Northwest. The Pacific Northwest Forest Plan incorporated the concept of ecosystem management in both its development and its execution. It amended the Forest Service's and BLM's land management plans on the west side of the Cascade Mountains to include standards for managing resources such as timber and riparian areas to protect species (Regional Ecosystem Office 2006).

Another large study, the Southern Forest Resource Assessment, was conducted of southern forest ecosystems to identify the conditions and changes to these systems. The study documented the ecosystem effects resulting from many different landowners managing the region's resources. It did not, however, make particular recommendations for changes to land management (Wear and Greis 2002).

Another large ecosystem study, the Interior Columbia River Basin Ecosystem Management Plan (ICBEMP), began in 1993. It sought to assess the resource conditions in several states on the east side of the Cascade Mountains in the Columbia River Basin. The study was completed in 2000. Unlike the Northwest Forest Plan, it was determined that the ICBEMP study would not be used to set standards to amend any federal land management plans. In 2003, the agencies involved in the assessment agreed to cooperatively implement the assessment on all federal forests and BLM lands in the study area (Interagency MOU 2002).

Ecosystem restoration efforts were undertaken in South Florida, Chesapeake Bay, Great Lakes, and other areas. These large-scale, intergovernmental efforts focused on large ecosystems such as the Everglades, Chesapeake Bay, and water quality in the Great Lakes, but with the purpose of conducting restoration projects to recreate ecosystem attributes (GAO 2005a, b, 2007).

Federal agencies soon deemphasized ecosystem management policies because of several difficulties that included the following: (1) defining an ecosystem, (2) dealing with multiple definitions of ecosystem management, and (3) dealing with multiple landowners across ecosystems (Yaffee 1999; Cortner et al. 1999; Bissix and Rees 2001; and Cheng and Matter 2006). Federal ecosystem policy worked best with one landowner; it continued to be part of the federal land management plan process, which involved development of large-scale plans and alternatives and public participation. One substantial development

was that federal agencies began to incorporate stakeholder groups in the development of alternatives (Cheng and Matter 2006).

Concurrent with the federal agencies' move to adopt an ecosystem management policy was an effort that focused on communities and the natural resource base for their economies and livelihoods. Starting in the early 1990s, at the same time that ecosystem management was being applied as a way to resolve conflicts over land management use on federal lands, several independent, local citizen-led efforts arose in different parts of the country to resolve specific conflicts on nearby public lands or waters. These groups include the Quincy Library Group, the Applegate Partnership, the Malpai Borderlands Group, the Blackfoot Challenge, the Friends of the Cheat and other such groups formed to work out conflicts over multiple uses of resources like forests, rangelands, and rivers. These groups were known by many different names—community-based conservation, cooperative or grassroots ecosystem management, collaborative natural resource management, community-based initiatives, and others, but all included various principles of collaboration (Brunner et al. 2002; Koontz et al. 2004; McKinney et al. 2002; Weber 2003; Wondolleck and Yaffee 2000).

In response to successful community groups, in the mid-1990s, the Forest Service developed a partnership policy and program to work with local and private groups to improve natural resources (National Forest Foundation and USDA Forest Service 2005). Soon after, BLM also established a collaboration policy to work with local groups on resource improvement projects (BLM 2007).

In 2001, the administration changed parties. The White House wrote an Executive Order calling for Cooperative Conservation among the departments of the Interior, Agriculture, Commerce, and Defense and the Environmental Protection Agency. This was defined as actions that involved collaborative activity among federal, state, local, and tribal governments, private for-profit and nonprofit institutions, and other entities to implement environmental and natural resource laws (EOP 2004). The White House sponsored a conference on collaborative efforts that resulted in publication of many cases (White House Conference on Cooperative Conservation 2005).

Conditioning factors

The trends revealed two approaches to land management, each intended to provide information to help federal agencies make better land management decisions and to manage better across broad landscapes and agencies' jurisdictional boundaries. One was the centralized decision-making approach of ecosystem management, which focused largely on public lands, and the second was a decentralized approach called collaboration. Given that there were different approaches, the team needed to understand them and the factors shaping them—the conditioning factors from the policy sciences framework.

Conflicts over the goals of federal land management stem from the expectations of many different users in the public. Land management laws allow a range of uses, and land management plans are established to allow some uses and deny others. The traditional approach to public participation did not provide for a way to discuss and resolve problems prior to decision making. Land managers, policy makers, interest groups, and scientists looked for different ways to resolve the differences in desired uses of public lands.

Conflicts over land management goals across a larger landscape result from different ownership and different land management goals. Yet, there cannot be one land management regime nor can administrative boundaries be made to easily match ecosystem boundaries.

Frustration over conflicts and fragmented jurisdiction led land managers to try different ways to manage resources. The two approaches—ecosystem management and collaboration—arose in the 1980s and 1990s in response to the need of federal land managers and interested stakeholders to manage conflicts, as well as ecological processes that do not stop at administrative boundaries.

Both approaches were tried in different parts of the country, but collaboration appears to have been the policy that dispersed successfully. The ecosystem management approach was tried in several different arenas and is still the approach being used in the Pacific Northwest. However, few new efforts have been undertaken except those proposing ecosystem restoration. On the other hand, collaborative efforts have been used in numerous parts of the country and the approach has been highlighted in federal policy, both at the agency level and at the White House level.

Collaboration offers an alternative governance structure or process to incorporate local communities in the decision-making process for federal land management, while ecosystem management does not have a different process to include communities. Federal collaboration policies represented an alternative approach to working with communities on resource management issues. While some viewed ecosystem management as a new land management approach, others viewed it as a way for the federal government and other interests to limit traditional uses of public lands. Efforts like the Pacific Northwest Forest Plan resulted in standards for riparian management and to survey resources prior to timber sales, which critics viewed as too directive and inflexible. Federal policies that focused on communities were more acceptable to these critics.

In 2001, with the change in administration and philosophical direction for land management, federal agencies received new priorities for land management. Collaborative and partnership policies were emphasized under the Cooperative Conservation effort, and ecosystem management using large-scale ecosystem assessments was deemphasized. The experience of successful community efforts was highlighted in a 2005 Conference on Cooperative Conservation. Successful collaborative groups attended this meeting and helped develop agency practices for collaborative efforts. University researchers and others picked up on such successes and emphasized the decentralized groups offered a solution to managing across jurisdictions when federal efforts failed.

Alternatives/projections

The team started planning for the study by examining ecosystem management policies. It identified the underlying problem involved in the requester's letter as the need to resolve conflict among multiple landowners with different land management goals. The team quickly learned through mapping the goals, trends, and conditioning factors described above that there are other approaches than ecosystem management to identify the common interest. Our work suggested that if we designed a study that looked at federal ecosystem management policies and efforts, we might not get at the underlying concerns that the requester had described. In effect, the requester had identified a problem of conflicting interests and was interested in a way to identify the common interest. Our study needed to focus on a successful way to define the common interest in the face of conflicting interests and multiple, fragmented land ownerships. The team's planning involved laying out alternative study designs and projected the potential outcomes of the studies to consider whether they would meet the requester's goals and our own.

Ecosystem management study

We could design a way to study federal ecosystem management as an alternative way of working to align multiple, conflicting views and define a common interest. This would have entailed selecting case studies from among the several existing ecosystem management examples: Yellowstone, the Everglades, the Pacific Northwest, and others described above, and conducting interviews and analyses of appropriate documents to understand the decision-making process in each case. The study would have identified the ways in which federal agencies work with private, local, and state stakeholders to apply and invoke ecosystem policies. In studying how federal agencies are, or are not, carrying out ecosystem management, the study would describe how federal agencies are applying and invoking ecosystem management, how the agencies are—or are not—including participants, and the successes or failures in land management. It would also likely discover good and bad aspects of ecosystem management and public participation. In these ways, a study would meet GAO's goal of evaluating the transparency and accountability of ecosystem management policies and it would meet the requester's needs of describing federal use of ecosystem management. In other ways, however, the requesters' goals would not be achieved, nor would my goals of meeting the requesters' needs. In particular, ecosystem management cases largely involve federal lands and the planning process involves a version of the public participation process. In this regard, the cases would not shed light on a new or alternative approach to addressing conflicts over land management goals or processes to identify the common interests across multiple land ownerships.

Public participation study

We could design a study to understand public participation among stakeholders, including state, local, and private parties, in setting federal land management goals. We would select cases for interviews and document review that would focus on land management planning, public participation, and ways to increase and improve public participation. The study would examine public participation processes and outcomes and discuss how input is used to change land management alternatives or projects. Such a study could be designed to satisfy GAO's goals of improving land management policies and accountability and transparency of land management by designing steps in the study to examine the participation process and how the agencies resolve different and conflicting comments from the public. The study would include ecosystem management in that it would look at land management plans for large land areas that contain one or more ecosystems. The study would also identify conflicts among stakeholders because public participation processes are designed to gather formal input from a range of participants. However, the direct problem that the requesters were interested in—resolution of management conflicts—would not be addressed in such a study because the public participation process is not designed to resolve differences among the multiple users of federal lands. In this way, the study would not fully meet the requesters' goals, or my goals of meeting their needs. The study would uncover the good and bad aspects of public participation but would not identify alternative ways to move beyond public participation to identify a common interest.

Collaboration study

We could design a study to examine collaborative resource management groups as alternative governance structures available to federal agencies as they work with state, local,

and private landowners on natural resource problems. Such a study would focus on natural resource problems that these land managers have in common and how they have worked to solve them. We would identify a number of collaborative groups to include as case studies, such as the Blackfoot Challenge, Malpai Borderland Group, and others, not limiting them by type of group or name but seeking a variety of resource management problems and participants. We would select several to visit to interview participants and review documents. Such a study would indirectly meet the requesters' needs to understand the use of ecosystem management by focusing on how the groups manage broad areas of land and natural resources for common purposes. It would also answer the requester's need to understand more effective approaches to resolving conflicts among landowners and resource users at a local level. A study on collaborative resource management would focus on the factors that have made the collaborative groups successful, using literature and examples. The study could include ways to achieve accountability and transparency in using such groups, meeting GAO's goals in this area. In addition, an examination of federal policies to encourage collaboration to deal with land management conflicts would identify areas in which the agencies or Congress could take action to better encourage collaboration over land management, where appropriate. This would meet GAO's—and my—goals of identifying areas of improvement in federal land management.

A comparative study of ecosystem management, collaboration, and public participation

We could design a study to examine the three different ways of managing public participation in land management decision making. Such a study would involve selecting cases of each kind of decision process—land management planning with public participation, ecosystem management, and collaborative resource management. The study would identify good and bad aspects of each process in identifying the common interest, although the study would have limited examples of each upon which to base any conclusions. Resource constraints would limit the number of cases of each that could be studied, perhaps limiting cases to two of each type. The study would meet the requester's interest in identifying approaches to generate common interest from conflicting interests and would offer some comparisons upon which to base possible legislative changes to current public participation approaches. However, the limited number of cases that involve an alternative—either ecosystem management or collaboration—would be less instructive for legislative purposes. A more in-depth study of the alternative approach would provide greater insight into aspects that could be replicated in legislation.

Selected alternative

For three key reasons, the team determined to study collaborative resource management and federal collaboration policy. First, one of the key goals of ecosystem management is collaboration with multiple parties across agency and other land ownerships and jurisdictions. Collaborative groups are examples of how this happens on a case-by-case basis on the ground. In particular, the successful examples of the Quincy Group, the Applegate Group, the Malpai Borderlands Group, and others, showed how federal land managers can work with local communities and stakeholders.

Second, the requester was interested in the resolution of conflicts among different landowners. Again, collaborative groups have demonstrated success in identifying common interest solutions despite competing interests. We determined that it would be most

useful to study the key characteristics of these groups to identify where federal policy could be helpful in providing encouragement or incentives.

Third, by selecting collaborative cases for the study, the team focused the study on a realistic set of examples for our research, given resource restraints, that would best respond to the requester's needs. By also including in our study the federal Cooperative Conservation policy to encourage collaborative efforts, the team developed a way to assess the larger context surrounding collaborative groups and analyze the potential federal actions at a higher level than in our several cases.

The study, published in February 2008, identified key principles of collaborative resource management groups and studied seven cases of collaborative groups throughout the country (GAO 2008). The study used a literature review and interviews with a number of academic experts to identify common principles of collaborative groups. The study described seven cases in detail: the Blackfoot Challenge, Cooperative Sagebrush Initiative, Eastern Upper Peninsula Ecosystem Management Project, Malpai Borderlands Group, Onslow Bight Project, Steens Mountain Cooperative Management Area Advisory Council, and the Uncompahgre Plateau Project. These groups were selected because they involved a variety of landscapes (forests, wetlands, and grasslands), a range of participants (nonprofit, private, state, local, and federal agencies), a variety of resource problems (fire restoration, wetlands restoration, forest restoration, wildland fire, grassland management and fire, and species conservation), and a variety of organizational arrangements (nonprofit organization, memorandum of understanding, informal) and a range of experience (newly forming to 20 years of experience). Finally, the study reviewed federal collaboration policy, particularly as emphasized by a White House initiative on Cooperative Conservation. The study concluded that federal policy could encourage collaborative efforts in several ways, such as studying legal and financial impediments to federal agencies' participation in collaborative groups and strategizing for further federal involvement. The advent of a new administration with a new focus on health care and the economic downturn have turned attention to other issues and the policies continue at the department and agency level.

Conclusions

The policy sciences framework is useful for analysis of ongoing policy issues because it helps the analyst make sense of the activities, positions, and ideas in a particular policy arena. The analyst can use the policy sciences framework to create a map of the policy problem, and all the elements involved in that policy area, to guide further analysis. The framework allows an analyst to distinguish among seemingly contradictory trends and conditions to develop a more comprehensive definition of the policy problem in hand and clarify alternative solutions based on projections of possible outcomes. In the case of this GAO study, in particular, the framework helped my team and me realize that focusing on federal agencies' current policies of collaborating with other owners would help to answer the requesters' questions about ecosystem management. It did so by helping us to focus on the goal of managing broad landscapes and identifying the common interest among multiple participants, not the specific practice of "ecosystem management." This allowed us to analyze the policy trends—the devolution of ecosystem management policy and the more successful diffusion of collaborative policies to achieve similar goals. It then helped us to understand those trends and the importance of a governance tool to incorporate local information in federal decisions. This information, projected forward in different alternative studies, allowed us to consider different study designs and the potential outcomes of

each. These projected outcomes, compared to the requester's goals—as well as GAO's goals as a research arm for Congress—helped us identify a study that met our common interest.

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