

Governing for Learning: Institutional Foundations of Effective Adaptive Management

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Abstract

Adaptive management (AM) remains one of the most promising frameworks for managing conservation challenges under uncertainty, yet its potential is rarely realized in practice.

Conservation agencies routinely make repeated decisions under uncertainty, but those decisions are often not structured in ways that allow learning to accumulate and improve future choices.

This Perspectives article argues that success in AM depends less on technical sophistication than on governance systems that enable learning, accountability, and flexibility. Although the literature has extensively documented AM's failures, it has rarely provided practitioners with an integrated framework addressing three connected questions: when is AM genuinely appropriate rather than rhetorically invoked, who should do what within an AM process, and how must governance structures be configured to make institutional learning possible? We address each question in turn, with particular attention to the structural, rather than technical, reasons why AM so often falls short, and to the underappreciated role of the decision analyst in bridging science, stakeholders, and governance. We argue that AM succeeds only when institutions are designed not merely to make decisions, but to learn from them.

Introduction: The Promise and Peril of Adaptive Management

Conservation institutions routinely make consequential decisions under uncertainty: they set harvest regulations, alter river flows, restore habitat, control invasive species, and allocate monitoring funds without knowing exactly how ecological systems or stakeholders will respond. The practical question is not whether institutions will act under uncertainty; they already do. The question is whether those actions are organized so that future decisions become better informed,

or whether uncertainty is repeatedly rediscovered, debated, and avoided without accumulating usable learning.

Adaptive management was developed to address exactly this problem, yet few ideas in conservation have enjoyed such sustained enthusiasm or suffered such uneven implementation. The prevailing explanation for this gap focuses on technical shortcomings: inadequate monitoring, poor model design, or insufficient stakeholder engagement. This article argues that the more fundamental explanation lies elsewhere. AM failures are not accidental. They are structurally predictable consequences of how institutions are built and what they reward. These concerns are not new. Walters (1997, 2007) argued that many adaptive-management efforts fail not because modeling tools are unavailable, but because institutions avoid experimental policies, underfund monitoring, and lack the leadership needed to carry difficult programs through implementation. Decision makers operating under political and bureaucratic constraints have rational incentives to avoid the transparency, accountability, and long time horizons that genuine AM requires. Understanding those incentives, rather than attributing failure to ignorance or bad faith, is the starting point for designing governance systems that actually work.

Adaptive management has long been championed as a means of learning by doing: a way to manage ecological complexity and uncertainty while improving decision making over time (Holling 1978, Walters 1986). In principle, AM integrates science, management, and stakeholder participation in a structured process of decision making. Yet the term is often used to describe nearly any management process, from routine monitoring to political compromise, and its defining features of formal hypotheses, structured learning, and policy feedback are frequently absent (Reed 2008, Armitage et al. 2009). Recent critiques have documented these institutional

failures in detail (Allen and Gunderson 2011), but have generally stopped short of examining the structural incentives that make those failures predictable.

This article explores the institutional and governance foundations that make adaptive management effective. It argues that AM should not be viewed as a scientific method alone, but as a property of governance: how institutions make, evaluate, and revise their decisions (Folke et al. 2005). Although elements of this argument appear across the governance, decision-science, and AM literatures, they have rarely been integrated into a coherent framework aimed at practitioners responsible for designing or overseeing AM programs. Our contribution is not to propose a new technical method for adaptive management, but to identify the governance conditions under which existing methods can actually function.

Central to the argument is a concept that might be called governing for learning: the idea that learning should be treated as the primary design criterion for conservation governance, not an incidental benefit. This contrasts with the more common institutional orientations of governing for compliance, governing for efficiency, or governing for risk avoidance, all of which tend to crowd out the deliberate investigation of uncertainty that AM requires. The consequences of failing to govern for learning are familiar. A restoration program calls itself adaptive, but no alternative hypotheses are written down, monitoring is underfunded, and no decision rule specifies what will change if results differ from expectations. Years later, the program has data but no learning. Such programs may generate reports, meetings, and monitoring records, but they do not accumulate decision-relevant evidence. They are adaptive in name only.

This article focuses primarily on formal regulatory and multi-jurisdictional AM settings, where role clarity and institutional accountability are paramount. This is a deliberate distinction. In co-

management contexts, the blurring of scientist, stakeholder, and decision-maker roles can itself be a productive feature of the governance arrangement, enabling the relational flexibility that complex social-ecological systems sometimes require (Armitage et al. 2009). In formal regulatory settings, by contrast, role ambiguity is typically a liability. When authority is diffuse and responsibilities overlap, accountability erodes and learning stalls. The governance prescriptions that follow are designed with this distinction in mind. The discussion focuses on three interrelated themes: (1) the conceptual soundness of AM as a learning framework; (2) the distinct roles of scientists, stakeholders, and decision makers; and (3) the institutional capacity needed to support learning cycles. The paper concludes with a set of recommendations for strengthening adaptive governance across conservation contexts.

What Adaptive Management Is and Is Not

Adaptive management is not a universal solution to all difficult problems in resource management. We have found this misunderstanding especially common among higher-level administrators, who often face challenging, controversial, and uncertain decisions and may view adaptive management as a general-purpose label for flexible or participatory governance. Although adaptive management shares many features with other decision-analytic approaches, its defining characteristic is the deliberate reduction of scientific uncertainty that creates ambiguity about the preferred management action. In this sense, adaptive management is not simply monitoring followed by adjustment, nor is it continued model refinement in the hope that a best policy will eventually emerge. It is also not a trial-and-error, adapt-as-you-go process. Rather, it requires explicit recognition of the key uncertainties that matter for decision making, plausible alternative models or hypotheses about system response, management actions capable of discriminating among those alternatives, monitoring designed to evaluate whether predicted

outcomes occurred, and feedback loops that allow learning to alter future policy (Walters 1986, 1997). Adaptive management also requires temporal or spatial replication of the decision problem; without repeated opportunities to observe outcomes and revise decisions, there is no practical opportunity to apply what is learned (Walters and Hilborn 1978, Nichols and Williams 2006).

Thus, legitimate candidates for adaptive management are recurrent decision problems that involve reducible (epistemic) uncertainties (rather than, for example, simply environmental variation) and moderate to high levels of management control (Gregory et al. 2012, Williams and Brown 2014). Other forms of participatory decision-making are better suited when epistemic uncertainty is either negligible or "deep" (i.e., we don't know what we don't know). Moreover, many natural-resource problems involve low controllability; e.g., where there are multiple decision makers pursuing their own agendas, or where the ability to effect the desired change in the managed system is beyond the control of the decision maker.

Therefore, screening of candidate problems is essential and must be conducted by well-informed staff. Critical scoping questions include (Williams et al. 2009):

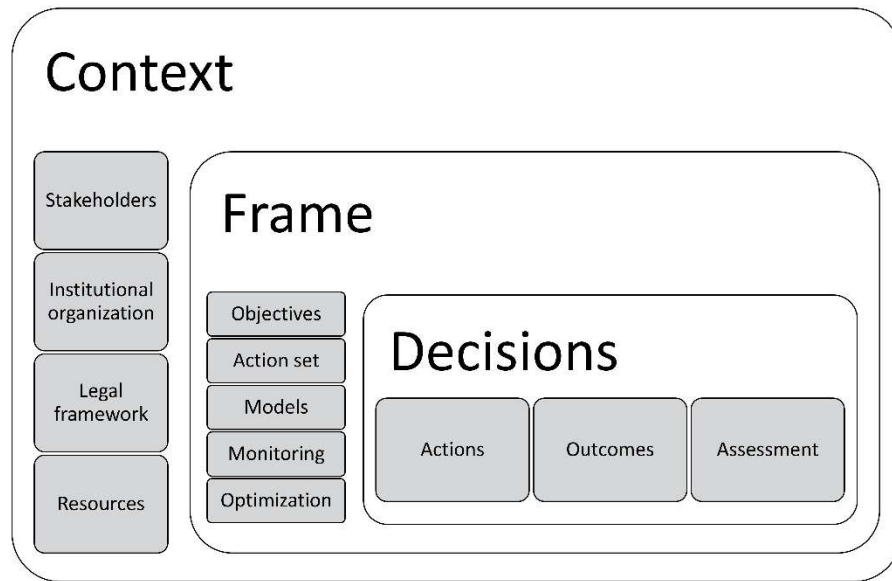
- Is the problem within the legal authority of the decision maker to address?
- Is it a recurrent decision problem, rather than a "one-off" decision?
- Are there fundamental conflicts among stakeholders in values that can be reconciled (at least to some degree) within a participatory process? In other words, can key stakeholders be expected to make compromises that will be necessary to develop unambiguous, quantifiable management objectives that are broadly supported?

- Can a finite set of possible decision choices be enumerated? This may involve a set of individual actions or a set of alternative portfolios, each comprising multiple actions.
- Can scientists construct plausible models of how the managed socio-ecological system will respond to intervention, as well as quantify key uncertainties (again, those that lead to ambiguity about a preferred course of action, given the stated management objectives)?
- Can monitoring protocols be designed or re-designed to enable state-dependent decisions (i.e., those depending, for example, on population abundance), to compare predicted and observed system responses, and to measure progress toward attainment of the management objectives?
- Finally, can management decisions be changed in the future depending on what is learned from the process?

If the answer is ‘no’ to any of these questions, another decision-analytic framework should be considered.

Institutionalizing the Learning Cycle

At its heart, adaptive management is a learning system. Yet learning does not occur automatically. It must be deliberately engineered. Moreover, learning can occur at multiple “levels” in applications of adaptive management. This is so because the iterative process of monitoring, assessment, and decision making is embedded in a problem frame, which is itself embedded in contextual frame (Fig. 1).



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Fig. 1. A conceptual framework for adaptive management.

Effective AM thus integrates three nested feedback loops (Pahl-Wostl 2009): (1) single-loop learning, in which actions are adjusted based on outcomes; (2) double-loop learning, in which the goals and assumptions embedded in the problem frame are reexamined; and (3) triple-loop learning, in which the governance structure itself is revisited. In practice, single-loop learning is expressed through continuous monitoring and feedback; i.e., the adjustment of management actions in response to changes in system states and model confidence. Double-loop learning requires regular reflection on whether the objectives, models, and stakeholder framings being used remain appropriate as new information accumulates. Triple-loop learning is the most demanding. It involves stepping back from the process itself to ask whether the institutional arrangements supporting it are still fit for the purpose at hand. Most AM programs achieve single-loop learning at best; designing deliberately for all three levels is what distinguishes governing for learning from mere adaptive tinkering.

Waterfowl harvest management in the U.S. offers a rare case study spanning all three loops (Johnson et al. 2015a, 2016). Single-loop learning has characterized the annual cycle of the adaptive harvest management (AHM) program since 1995, in which Bayesian updating of competing population models drives regulatory decisions each year, a sustained and well-documented example of structured learning at the operational level. Double-loop learning emerged as managers recognized that the program's original objective of maximizing sustainable harvest was a poor surrogate for what stakeholders actually valued: hunter participation and satisfaction. This realization forced a broader reexamination of objectives, regulatory alternatives, and model structures, the kind of questioning that double-loop learning demands. Triple-loop learning remains largely aspirational. The 2012 revision of the North American Waterfowl Management Plan called for integration of harvest and habitat management programs that are institutionally fragmented, governed by different authorities, and coordinated through informal networks rather than shared decision rules. Bridging organizations have been created and working groups convened, but fundamental governance restructuring has yet to occur. That even one of the most technically sophisticated and long-running AM programs in the world has not yet achieved triple-loop learning illustrates precisely why governing for learning must be treated as an explicit design challenge, rather than as an emergent property.

Adaptive management often fails not because of flawed science, but because institutions are ill-suited to learn. Bureaucracies tend to reward stability, consistency, and procedural compliance – traits at odds with the investigation of uncertainty that AM demands (March 1991). Overly complex committee structures, diffuse authority, and rigid rules can smother adaptability. The Missouri River Recovery Program illustrates these institutional challenges in a highly contested setting. A congressionally authorized stakeholder committee created a formal venue for federal,

state, tribal, and nongovernmental participants to advise recovery planning after decades of litigation and legislative conflict (Mac and Palmer 2020). That structure improved representation and helped incorporate socioeconomic concerns, but it also revealed the limits of stakeholder processes when technical uncertainty, endangered-species recovery, and competing water uses collide. Independent science review helped build enough trust to advance adaptive-management recommendations, yet some stakeholders also pursued strategies outside the formal process to constrain potential recovery actions. The Missouri River case thus illustrates a central governance lesson for AM: participation is necessary, but not sufficient. Learning also requires trusted technical synthesis, clear authority, and a formal process resilient enough to withstand political end-runs (Marmorek et al. 2015).

Successful adaptive governance depends on several enabling conditions (Folke et al. 2005). Simplicity of design matters: streamlined structures and clear decision pathways prevent the kind of procedural paralysis that buries learning under process. Stable, dedicated funding for monitoring and analysis is equally essential; learning cannot be episodic and grant-dependent if it is to drive management revision. Transparency and accountability must be built into the architecture of the program rather than treated as aspirations: open access to models, data, and the rationale behind decisions is what allows both learning and trust to accumulate over time. Performance evaluation systems must reward adaptation and evidence-based revision rather than penalizing managers who acknowledge that earlier decisions were suboptimal. Finally, because environmental problems routinely cross administrative boundaries, governance structures must be designed to bridge jurisdictional silos rather than reinforce them.

Institutions that cultivate a learning culture, where curiosity, humility, and shared responsibility are valued, are far more likely to realize the promise of adaptive management.

Clarifying Roles and Responsibilities

In our experience, a common source of difficulty, if not failure, in adaptive management arises from confusion about who does what. The distinction between scientific, stakeholder, and political spheres must be both clear and respected.

Stakeholders: Legitimate Voices, Not Decision Makers

Stakeholders contribute essential perspectives on values, tradeoffs, and feasibility, and their participation enhances legitimacy, compliance, and social learning. Yet stakeholders are not decision makers; their role is strictly advisory. We have experienced situations in which decision makers intentionally or unwittingly cede decision-making authority to stakeholders. In practice, however, the absence of decision-making authority by stakeholders does not preclude influence. Stakeholders hold de facto primacy in defining the scale and scope of the decision-making problem, articulating management objectives, and suggesting what actions should be considered.

Productive engagement is challenging, however. Stakeholders often enter a participatory decision-making process with predetermined positions that they believe must be defended (Susskind and Cruikshank 1987, Gregory et al. 2012). This can easily lead to paralysis in even modestly controversial problems. The challenge is to turn their focus away from their own policy agendas and toward the values (i.e., objectives) they hold and the possible ways of achieving them. Because not all objectives can be fully achieved at the same time, it is important that stakeholders understand the nature and extent of the trade-offs among them. Reasonable stakeholders understand that they must compromise their objectives to some extent to accommodate the different values of others.

An additional concern in stakeholder engagement occurs when disaffected stakeholders attempt to discredit the process because of tradeoffs in management objectives they are unwilling to make, or else because they seek to broaden (or narrow) objectives and potential actions to an unworkable degree. They may also put forward predicted consequences of management actions that lack supporting evidence. Seeking consensus in these situations is usually untenable, and other approaches to conflict resolution are needed. If it is clear that the disputes concern the predicted consequences of management, then plausible system models may be admitted to the adaptive-management process of accumulating evidence. If the disputes are over how consequences are valued, then techniques like multi-criteria decision analysis can be enough to bring disaffected stakeholders back to productive participation (Keeney and Raiffa 1993, Gregory et al. 2012). In any case, effective communication is key to building trust and ownership among stakeholders in the process, and strong leadership from decision makers is needed to determine the extent to which disaffected stakeholders are allowed to exert disproportionate influence over the process.

Scientists: Honest Brokers, Not Advocates

In our experience, scientists rarely act as objective and disinterested experts in addressing resource-management issues. All decision problems are defined in part by their objectives, which are based on subjective human values. This distinction helps decision makers understand whether disagreements are over predicted outcomes or how those outcomes are valued, and it clarifies the role for scientists in resource decision making as honest brokers rather than as policy advocates (Pielke Jr. 2007).

Often, scientists are asked to make management recommendations. This should be avoided. Any recommended course of action will inevitably reflect the scientists' personal values and, in our experience, scientists tend to place ecological concerns over social or economic ones. Thus, scientists will often seek to limit management options for the decision maker, when in reality they should seek to expand them.

Compared to the typical role played by scientists in resource-management problems, scientists should understand that in adaptive-management problems they will have a limited, albeit critical role. This role includes system modeling, the design (or re-design) of monitoring protocols, the optimization of management actions given the agreed-upon objectives and candidate actions, and the updating of models based on what is learned from the process.

Finally, scientists should be well versed in a Bayesian rather than a frequentist approach to learning. The distinction matters fundamentally for AM. Frequentist analysis treats each year's data as an independent test, resetting inference with each management cycle, while Bayesian inference accumulates learning across cycles by carrying forward an updated probability distribution as the basis for the next decision (Williams et al. 2002, Ellison 2004). This makes Bayesian updating the natural statistical engine of adaptive management. Ensuring that scientists are equipped with this approach, and with appropriate optimization tools for dynamic decision problems, is an institutional responsibility as much as a technical one.

Decision Makers: Accountability and Leadership

Many decision makers have strong incentives to minimize visible uncertainty, limit exposure to criticism, and avoid accountability for outcomes that remain only partly controllable (Jasanoff 2004). Decision makers sometimes seek to avoid discussions about uncertainty and what makes

for an acceptable risk, even though there will always be some (perhaps non-negligible) chance of a bad outcome from any management action or policy, whether in an adaptive-management program or otherwise.

Decision makers, already inclined to minimize uncertainty and political risk, may also resist full transparency and accountability. In conservation contexts, this challenge rarely reflects ill intent but rather the structural realities of bureaucratic decision making. Open disclosure of assumptions, data, or trade-offs can expose decision makers to criticism from stakeholders, political superiors, or the public, particularly when outcomes are uncertain or contested.

Transparency may also constrain managerial discretion, invite conflict, or reveal institutional inconsistencies that are difficult to address within the existing governance structure. As a result, decision makers often favor procedural control and message discipline over open deliberation, even when greater transparency might ultimately enhance trust and learning. Although the AM literature has long recognized that decision makers must own uncertainty (Williams 2011, Gregory et al. 2012), less attention has been paid to the structural incentives that make avoidance rational from an institutional standpoint. Understanding these incentives, rather than attributing resistance to ignorance or bad faith, is essential for designing governance arrangements that make transparency politically sustainable.

These structural pressures are compounded by a subtler, longer-term problem: institutions do not merely constrain behavior; they also select for it. Over time, promotion systems tend to reward the traits that organizations value most, whether those traits are technical competence, political reliability, procedural caution, or willingness to avoid conflict. In agencies where compliance is rewarded more consistently than candor, the leadership culture that accumulates will predictably

be poorly suited to the institutional learning that adaptive management requires (DiMaggio and Powell 1983, March 1991).

External political forces can compound these challenges further. Even when authority and objectives are clear, shifts in elected leadership, agency priorities, litigation risk, or high-profile media events can rapidly change acceptable risk levels, truncate time horizons, or override previously agreed-upon decision rules. In those moments, decision makers may retreat to procedural control or seek single, decisive predictions that reduce near-term political exposure, even if doing so undercuts transparency and learning. This is closely tied to the broader tendency for decision makers to avoid owning uncertainty and to offload risk to scientists, which adaptive management is meant to prevent. Recognizing these political dynamics up front, and designing AM cycles that are as robust as possible to political shifts, is part of governing for learning.

Nonnative fish management in Grand Canyon illustrates this problem. Declining reservoir elevations, warming conditions, and increased potential for downstream passage of nonnative fishes from Lake Powell have created pressure for rapid, defensible action below Glen Canyon Dam (Epehimer et al. 2025). The potential establishment of smallmouth bass (*Micropterus dolomieu*) in this reach raises difficult questions under substantial uncertainty about recruitment, predation risk, temperature, turbidity, and the likely effectiveness of control measures. In such settings, institutions may seek a single authoritative prediction – How severe will the invasion be? Which action will solve it? – even when the more defensible adaptive-management response is to articulate competing hypotheses, identify monitoring capable of distinguishing among them, and specify in advance how management actions will change as evidence accumulates. The challenge is not simply scientific; it is institutional. Decision makers must be willing to own uncertainty, define acceptable risk, and make learning consequential for future policy.

Overcoming these hurdles requires a participatory approach that aligns openness with institutional incentives, rather than perceiving transparency and accountability as a threat to authority. Decision makers are more likely to embrace transparency when it is embedded in structured, well-facilitated processes that emphasize shared problem definition, explicit recognition of uncertainty, and joint ownership of outcomes. Mechanisms such as co-designed monitoring programs, regular stakeholder-agency review cycles, and clearly bounded decision problems can help preserve accountability while reducing personal or political exposure. Building organizational cultures that reward learning through after-action reviews, adaptive evaluation, and recognition of improvement also normalizes transparency as part of professional practice (Folke et al. 2005).

A Missing Role: The Decision Analyst

Most successful adaptive-management projects have depended on a “champion”: a person willing and able to carry the process through the difficult work of problem framing, model development, stakeholder engagement, policy comparison, implementation, and revision process (Walters 1986, Failing et al. 2007, Gregory et al. 2012). Walters (2007) identified the absence of such leadership as one of the primary reasons adaptive-management proposals fail to become implemented programs. In successful cases, the champion is rarely a charismatic figure. More often, this person is a persistent, trusted, technically literate facilitator who understands the decision problem, the institutional setting, and the people whose cooperation is needed to move from analysis to action.

We refer to this role more specifically as the decision analyst. The decision analyst is not simply a modeler, meeting facilitator, or project manager, although the role draws on all three. What is

needed is someone who can hold the technical, facilitative, and institutional dimensions of the adaptive-management process together: translating among scientists, stakeholders, and decision makers; keeping the process anchored to agreed-upon objectives; ensuring that models are decision-relevant rather than merely elaborate; and helping groups move from problem framing to policy comparison and implementation. The decision analyst must be trusted as having no personal policy agenda and must be able to manage group dynamics without allowing the process to drift toward advocacy, endless model refinement, or procedural stalemate.

This role is especially important because adaptive management often fails at the transition from planning to implementation. Modeling exercises may identify critical uncertainties, stakeholders may agree in principle that learning is needed, and agencies may endorse adaptive management rhetorically, yet the program still may stall before management actions, monitoring designs, and decision rules are actually put in place. Bridging that gap requires sustained attention to administrative details, institutional incentives, interpersonal conflict, and technical coherence. These are not incidental tasks; they are central to whether adaptive management becomes a functioning learning system or remains a planning exercise.

Yet the skills required for this role are rarely taught together. Ecology and natural-resource programs seldom train students in decision analysis, optimization, or structured facilitation. Decision-science programs seldom train students in ecology or natural-resource institutions. Facilitation and group-process skills are rarely treated as core professional competencies in either domain (Keeney 2004, Johnson et al. 2015b). The result is that adaptive-management processes often begin without anyone in the room equipped to perform this integrative function, and the deficit is usually discovered only after the process has stalled.

Recognizing and institutionalizing the decision-analyst role through training, dedicated hiring, career pathways, or partnerships with academic decision-science programs is therefore one of the highest-return investments an agency can make in adaptive-management capacity. Without this role, agencies may have scientists, stakeholders, and decision makers all present, yet still lack the person responsible for making institutional learning possible.

Recommendations for Strengthening Adaptive Management Practice

The arguments above point toward five concrete governance reforms. First, agencies should adopt a formal AM screening protocol, applied before any program is designated as adaptive management. The protocol should require written responses to the diagnostic questions outlined earlier, review by staff with decision-science training, and sign-off by a senior manager with documented rationale for why AM was judged appropriate rather than an alternative decision framework. This single requirement would eliminate the majority of rhetorical AM applications, which consume resources and damage the credibility of genuine AM programs when they fail.

Second, agencies should invest in tiered decision-science training at all levels of the organization. In our experience, confusion about what AM is and what it requires is as common among senior administrators who approve and fund AM programs as among field staff who implement them. The consequences of that confusion at the top are considerably more damaging. Training should be differentiated by role. All staff benefit from short introductory courses that establish a common vocabulary and clarify the distinct contributions of scientists, stakeholders, and decision makers. Staff who will manage or oversee AM processes need more advanced training in facilitation, structured decision making, and the handling of uncertainty. Those serving as decision analysts require the most demanding preparation: advanced decision science,

group facilitation, and cross-disciplinary communication, combined with apprenticeship under experienced analysts (Johnson et al. 2015b). The National Conservation Training Center model in the United States, which combines formal curricula with practical workshops and a mentorship program for analysts-in-training, offers a proven template that other agencies and jurisdictions would do well to replicate.

Third, agencies should establish the decision-analyst role as a named, dedicated position with a formal position description specifying competencies in decision science, facilitation, and natural-resource management. In the absence of such a position, the analyst function is typically assumed informally by researchers who want their work to influence management, an understandable motivation but a structurally problematic arrangement. Researchers can bring agendas into what should be a values-neutral facilitation function, and the result is often stealth advocacy: the appearance of scientific analysis with the substance of advocacy. This is not a failure of individual integrity; it is a predictable consequence of an unfilled institutional role. The solution is not to exclude researchers from AM processes but to ensure that the facilitation function is performed by someone whose institutional role and training are explicitly oriented toward process integrity.

Fourth, every AM program should maintain a living decision record: a structured document updated at each management cycle that records the objectives, models, monitoring protocols, management actions taken, outcomes observed, and the rationale for any changes to the program design. This document is not simply bureaucratic overhead. It is the primary protection against institutional memory loss when staff turn over, the evidentiary foundation on which future learning depends, and the basis for any meaningful evaluation of whether the program is working.

Fifth, performance evaluation systems should explicitly reward adaptation. Managers who revise objectives, update models, or change course based on evidence should be recognized for doing so, not quietly penalized for implying that earlier decisions were suboptimal. This cultural shift is inseparable from the training investments described above: managers cannot be expected to embrace uncertainty as a professional asset if their training has never framed it that way, and training will have little lasting effect if evaluation systems continue to reward consistency and procedural compliance over evidence-based revision. Agencies that address training without reforming evaluation, or reform evaluation without investing in training, will find that neither intervention takes hold.

Conclusion

Adaptive management is both a scientific framework and a philosophy of governance. Its power lies not in its technical sophistication, but in its capacity to institutionalize learning. True adaptive governance transforms uncertainty from a liability into an engine for policy improvement. Institutions that succeed at AM share a common trait: they are designed to learn. They clarify objectives, empower scientists without ceding authority, engage stakeholders without surrendering legitimacy, and reward leaders who admit uncertainty and act on evidence. Governing for learning is not a philosophical aspiration; it is an engineering problem. It requires institutions deliberately designed to clarify authority, sustain funding for monitoring and model revision, protect the decision-analyst function, and support leaders who are not incentivized to support the status quo. The conservation programs most likely to fulfill AM's long-standing promise are those built on the understanding that learning does not happen because people are well-intentioned, but because the governance structure makes it rational, rewarded, and routine.

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