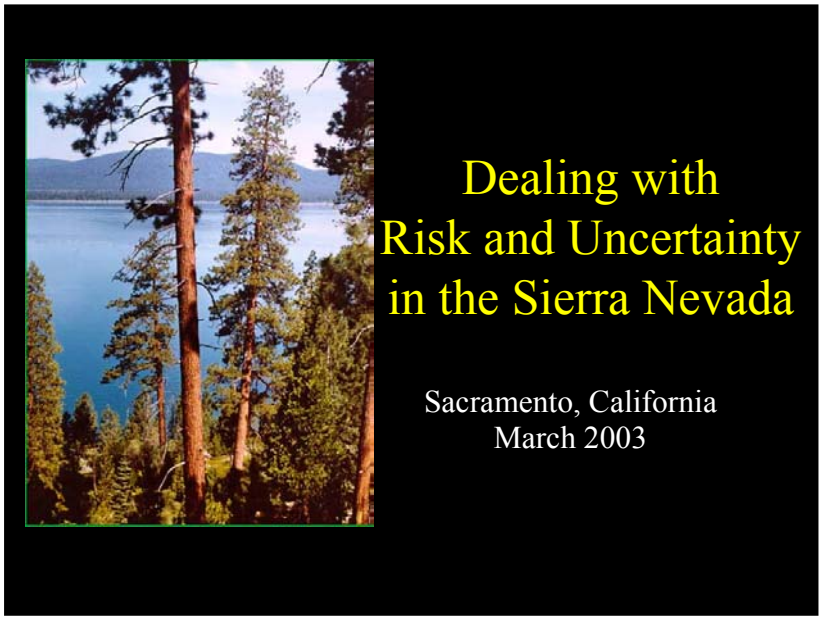


The following Power Point slide presentation was prepared for meetings with the Interagency Team (IAT) and stakeholder groups engaged in the Sierra Nevada Forest Plan revision process. These meetings were held on March 10 and 11, 2003, in Sacramento, California. The presentation was designed to inform the participants about the nature of risk and uncertainty and how it was applied in the Sierra Nevada case. Further, it discusses reasonable approaches to decisionmaking in the case of wicked problems, as characterized by the Sierra Nevada case.

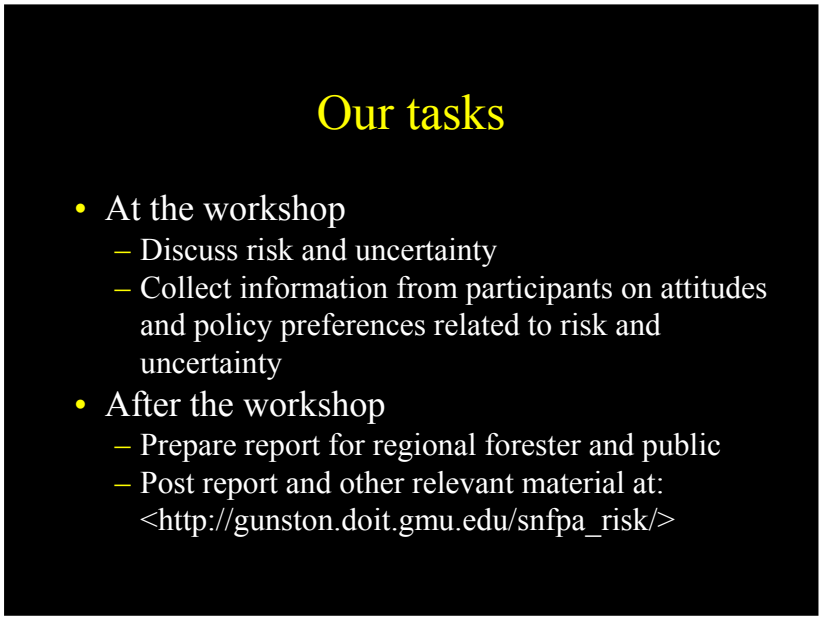
The presentation was intended to provide background information prior to the participants taking a series of risk and uncertainty preference exercises.

The presentation and preference exercises were conducted by Drs. Larry Walters, Peter Balint, and Ron Stewart from George Mason University, and Dr. Anand Desai from The Ohio State University.

Our charge

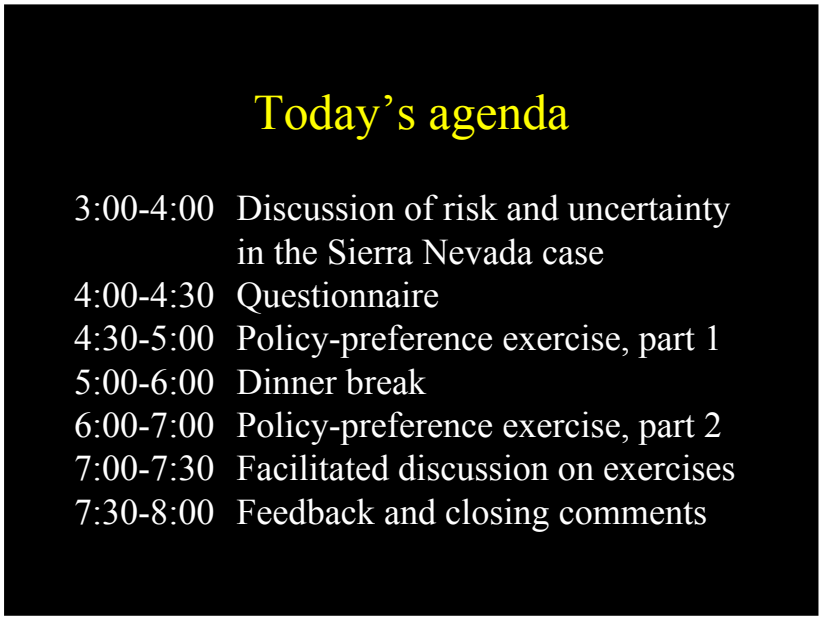
- "…to inform [the regional forester] and those interested in the management of the Sierra Nevada national forests about the nature of decision-making in a policy environment characterized by ***multiple and conflicting risks and uncertainties***..."
- No endorsement of any management alternative

The four of us were asked by the Regional Forester, Jack Blackwell, of the USDA Forest Service, Pacific Southwest Region, and his staff to examine the question of risk and uncertainty as it applies to the Sierra Nevada planning process. This includes understanding of the risk preferences of the various stakeholders and agency officials involved in the process. The intent is to inform the decisionmaker, the Regional Forester, about these preferences and to suggest ways to address risk and uncertainty in his consideration of a Supplemental Environmental Impact Statement and revised Record of Decision for the Sierra Nevada Forest Plan Amendment EIS and ROD.

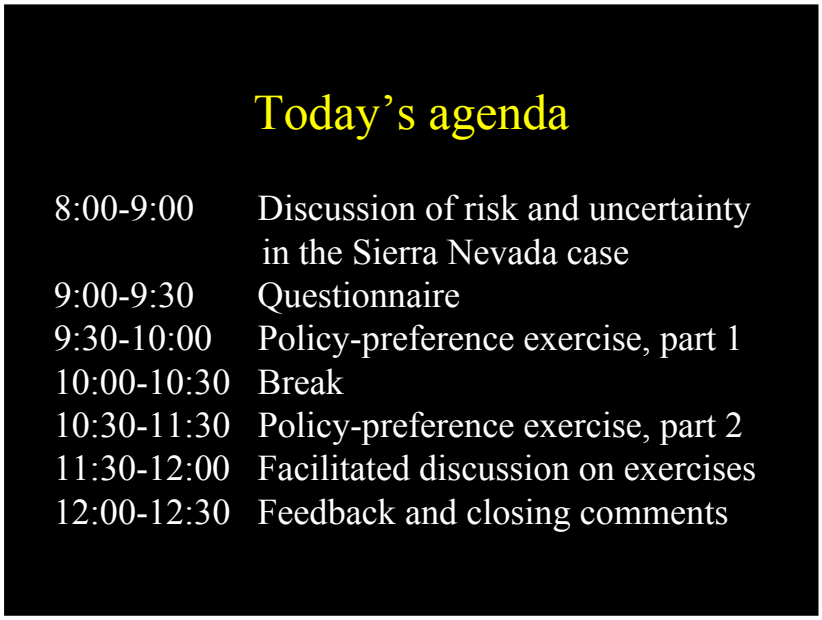


The two purposes of our meetings with the IAT and stakeholders were to provide information on risk and uncertainty and then to collect information from the participants on their preferences.

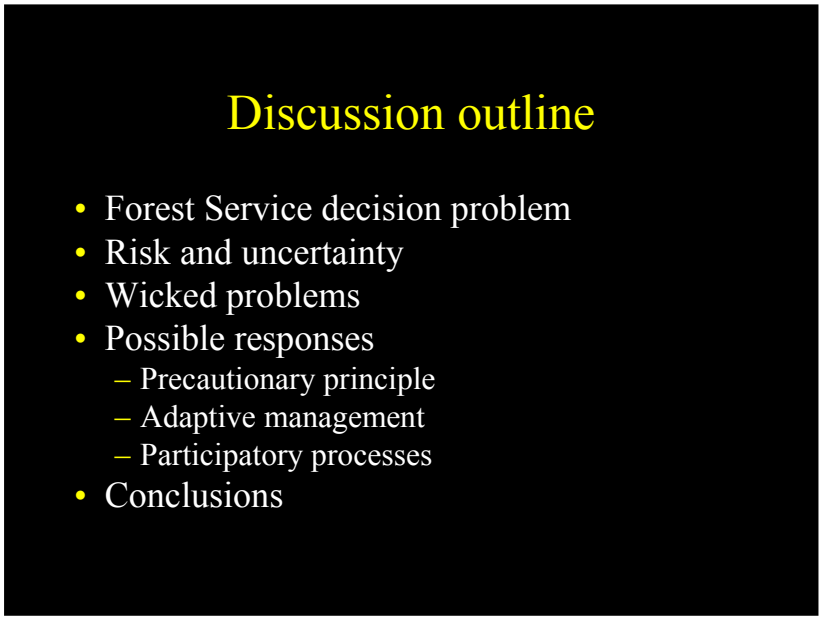
A report of our findings and recommendations regarding risk and uncertainty will be provided to the Regional Forester and to the public in early April.



This is the agenda for the March 10 and 11, 2003, meetings with stakeholders.



This is the agenda for the meeting with the IAT on March 11, 2003.



The topics that are covered in this presentation are:

•Our understanding of the Forest Service decision problem

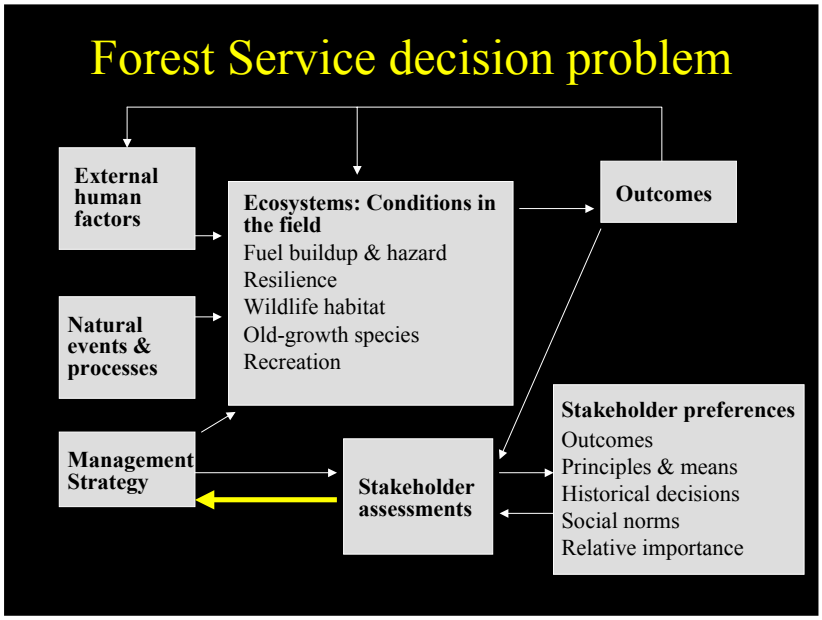
•How risk and uncertainty are characterized in the academic literature and their use by their Forest Service

•Explanation of the class of problems termed “wicked problems”

•Possible responses to wicked problems

•Conclusions

Forest Service Decision Problem

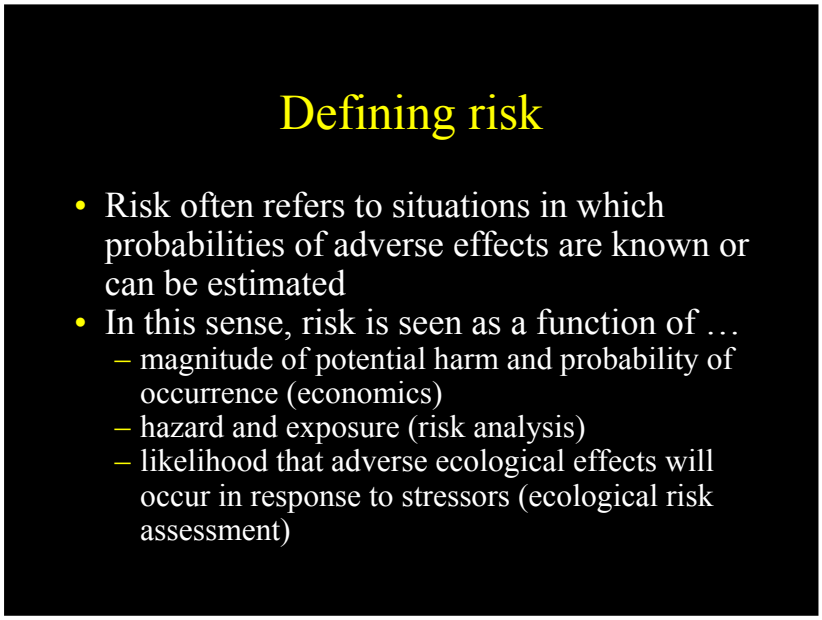


As our team looked at the Forest Service decision environment, we see that three broad areas or inputs impact the Sierra Nevada national forest ecosystems. These are external human factors, including the neighboring communities and visiting public; natural events and processes, mostly beyond the control of the agency, such as climate, occurrence of lightning strikes, plant community succession, and others (their timing, place of occurrence and associated impacts are largely unknowable); and the selected management strategy and the associated tactics.

These interact and affect the ecosystems of the Sierra Nevada and result in changed conditions within the various plant and animal communities. In turn these effects are translated into various outcomes, such as wildfire acres burned, old-growth habitat gained or lost, timber volume produced, etc. These outcomes influence stakeholder acceptance of and reaction to the Forest Service's management strategy. In addition, stakeholders bring a range of preferences for certain outcomes and aversion to various risks and uncertainties.

The focus of our task and these meetings is on the three boxes at the bottom of the chart. In particular, we will be eliciting information from the participants on their attitudes towards risk, potential strategies and outcomes and the decisionmaking process as depicted by the yellow arrow from Stakeholder assessments to Management Strategy.

Note the ecosystem, external factors, natural processes, management strategies, and stakeholder preferences boxes in this diagram. We will come back to these again as we consider uncertainties in the decision process.



Risk is the probability or likelihood that a harmful consequence will occur as a result of an action and is a function of both hazard and exposure. For a risk to occur, there must be both a source of risk (a hazard) and an exposure to the hazard. The study of risk looks at the probability of a harmful consequence occurring from exposure to a hazard. There is no such thing as a zero-risk estimate because there is always some degree of uncertainty and with every action there is the potential for a bad outcome.

Risk has been defined in many ways; for example, early definitions distinguished between uncertainty where all the possible outcomes, and consequently, their associated probabilities were not known and risk where all the potential outcomes and their probability of occurrence were known. In general, risk can be considered **in the economic case** where risk and uncertainty are intertwined (i.e., many people consider the stock market as a risky investment today because of the uncertainty of the economy and other factors); in the **biological and medical case** where risk is associated with a dose response curve and considers both the hazard [the effect of the drug or treatment] and the probability of exposure to a dose that produces an undesirable effect [both hazard and exposure must be present for there to be a risk]; and in the **ecological** case where we consider the response of the ecosystem to one or more independent or interacting stressors [as in the biological or medical case, it is assumed that there many be thresholds of stressors below which there may be no or limited effect and above which adverse effects appear].

Defining risk, cont.

- Definitions of risk based on probabilities are too narrow in the Sierra Nevada case – and in similar cases
  - For many adverse outcomes in such cases, probabilities are unknown or unknowable
  - Some possible adverse outcomes may not be foreseen

Definitions of risk that rely solely on probabilities of known outcomes in complex ecosystems, such as the Sierra Nevada, are too narrow because it is often difficult to determine the probabilities of adverse outcomes and some adverse outcomes may not be possible to predict (such as unintended consequences).

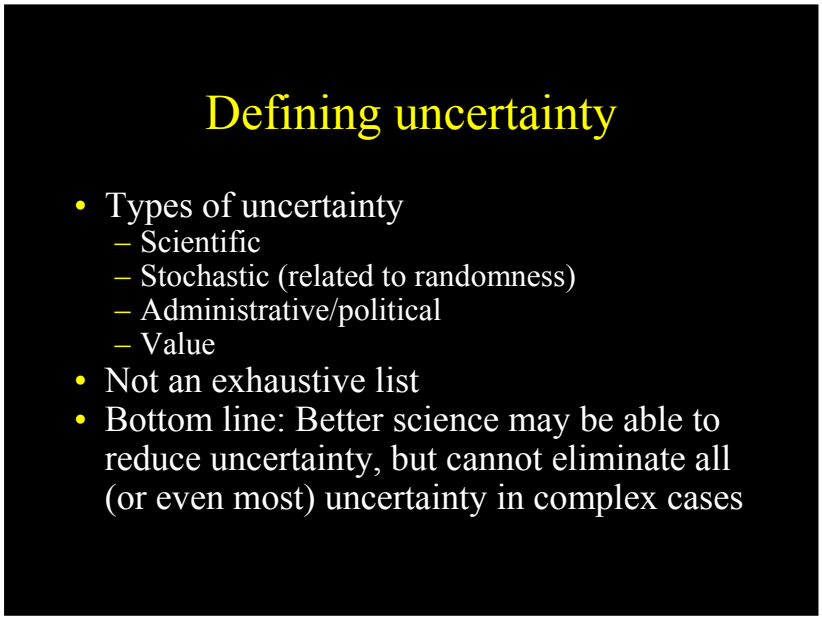
Perceiving risk

- Attitudes toward risk are not merely 'rational'
- They are affected by whether the harm or exposure is perceived to be…
  - involuntary vs voluntary; uncontrollable vs controllable; immoral vs moral; unfamiliar vs familiar; dreadful vs not dreadful; uncertain vs certain; catastrophic vs common; memorable vs ordinary; unfair vs fair; or managed by untrustworthy vs trustworthy institutions

Our attitudes about risk are not purely a rational response to realities but are conditioned by our perceptions about the nature of the specific technology or activity. Our attitudes towards risks are affected by a series of characteristics we associate with the risk, such as risks that we expose ourselves to voluntarily, risks under our control, new risks, or risks scientists understand. Individuals also judge risks according to their personal values. Finally, the mass media are more likely to set the agenda of which risks will be evaluated, whereas interactions with friends and family are more likely to shape what people think about those risks. We also are conditioned by recent events, for example the perception of risk of flying may go up temporarily immediately following televised coverage of a commercial airline accident.

Because risk is conditioned by so many factors, our acceptance of individual risks can change with time.

Misperceptions about the real degree of risk are largely associated with: (1) a lack of knowledge of existing data or lack of available data; (2) emotionalism associated with various risks; (3) distortions or misconceptions conveyed by mass media; (4) heuristics that people use to simplify the complexities generally associated with low-probability high-consequence events; or (5) other factors such as uncertainty or personal bias.



Because we do not and cannot control all events and actions, and the effects of decisions on complex ecosystems are imperfectly known or unknowable, the outcomes of policy decisions and management activities have a degree of uncertainty. Uncertainty can be positive or negative. That is, the outcome can be either greater or lesser than predicted.

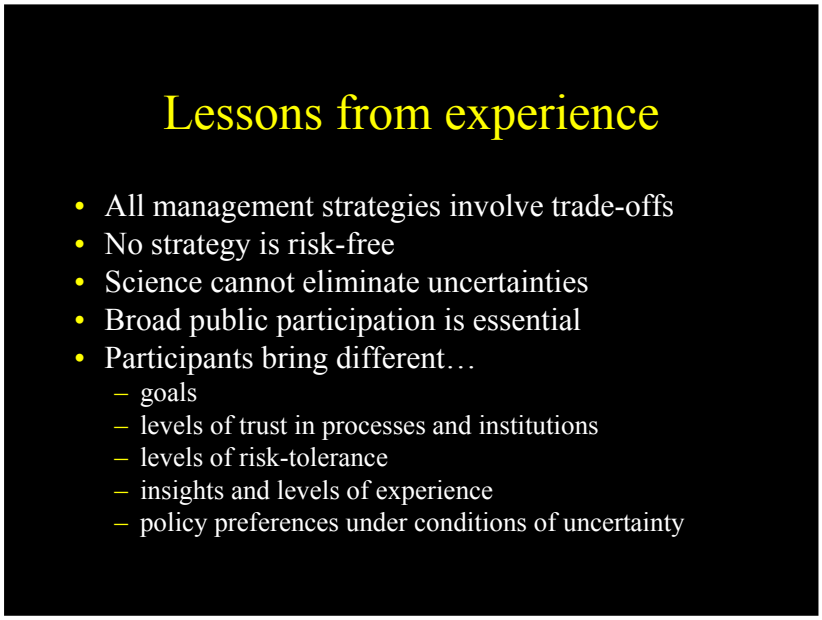
For our purposes, we have identified four kinds of uncertainty: scientific uncertainty is the the result of our incomplete understanding of nature and the inaccuracy of our models, and is often expressed as confidence intervals about the mean or projected model outcome; stochastic or chance uncertainty is due to random events beyond the control of individuals or agencies such as climate change or the timing and effects of a storm; administrative and political uncertainty is a result of unpredicted organizational changes, effects of new laws or litigation, and future funding; and value uncertainty results from changes in public values over time.

Better science may be able to reduce scientific uncertainty by producing more accurate models of the Sierra Nevada ecosystem. Science can also contribute to our understanding of the nature, effects, and probability of occurrence of stochastic or random sources of uncertainty. However, science is not well designed to contribute to an understanding of either administrative/political or value uncertainties.

Sample uncertainty matrix

	Scientific	Administrative	Stochastic	Values
Ecosystem	Sampling errors	Implementation errors	Measurement errors	Shift with education
Natural processes	Climate change	Unintended consequences	Fire; Drought	Feared becomes attractive, and vice versa
Human factors	Population trends	Adjacent development	Changing social needs	Increasing recreational use
Mgt. actions	Long-term effects	Funding; Institutional capacity	Political support	Conservation vs. preservation ideals
Stakeholder assessments	Acceptance of scientific information	Preference instability	Changing social priorities	Political strife vs. compromise

This matrix represents some of our quick thoughts of sources of uncertainty that affect the Sierra Nevada decision environment. This is far from an exhaustive list, but the key is that it is not difficult to find significant sources of all four kinds of uncertainty in every one of the Forest Service decision problem areas identified in slide 9.



Experience and the literature suggest that:

•All management strategies involve trade-offs primarily due to resource constraints; where resources include time, money, information/knowledge and human capital.

•No strategy is risk-free since with every action there is the possibility of unintended consequences, some of which may be undesirable.

•Science cannot eliminate political/administrative or value uncertainties

•In a democracy broad public participation is essential to identify and attain goals that have popular support

•Participants bring different…

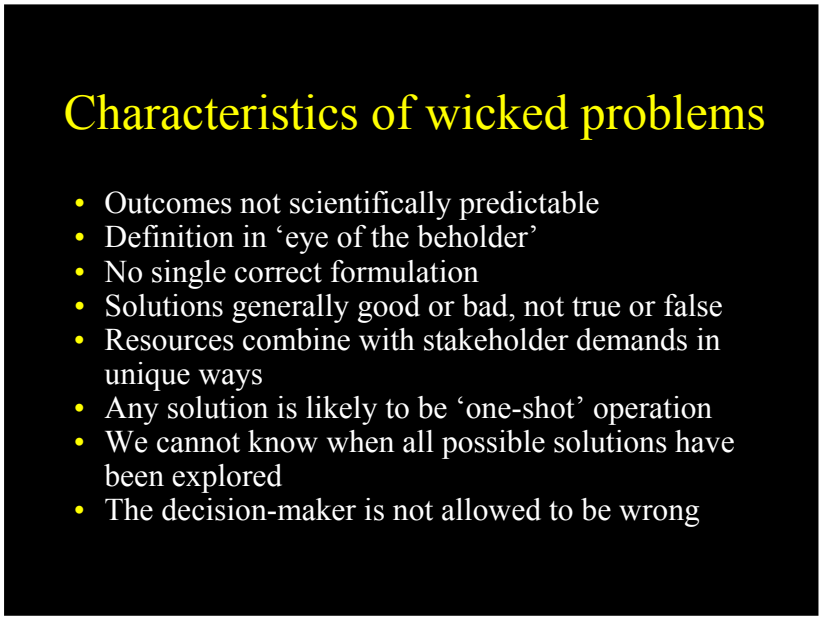
- ✓ Goals
- ✓ Levels of trust in processes and institutions
- ✓ Levels of risk-tolerance
- ✓ Insights and levels of experience
- ✓ Policy preferences under conditions of uncertainty

Wicked Problems

The nature of issues

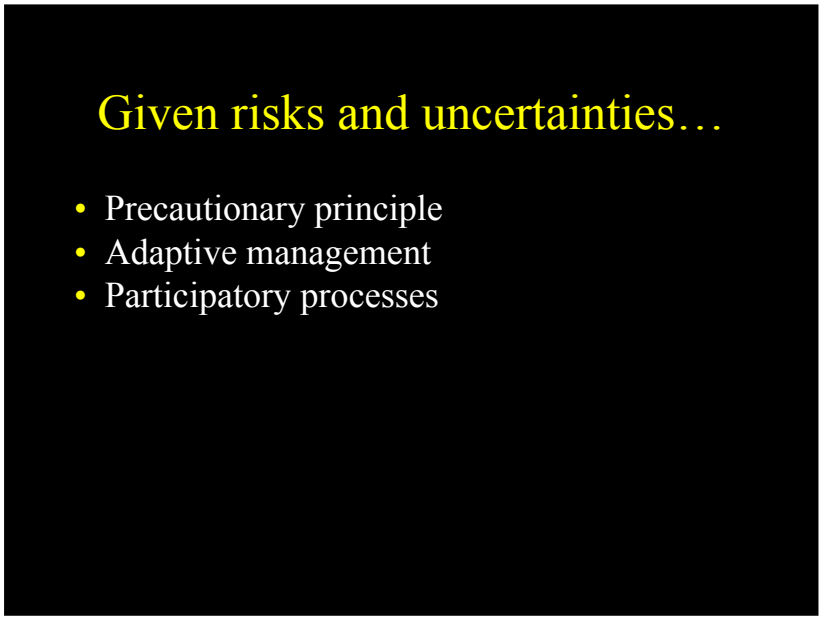
State of knowledge	Agreement on values	
	HIGH	**LOW**
Well developed	Routine analysis with periodic stakeholder and expert review. ***Decisions are easy!***	Emphasis on stakeholder deliberation with periodic expert review.
Tentative/gaps/ disagreements/ research needed	Emphasis on expert deliberation with stakeholder review.	Emphasis on both stakeholder and expert deliberation. ***Wicked problems!***

If the knowledge base underpinning an issue is well-understood and generally accepted and the agreement on values among stakeholders is high, then decision making is easy. If agreement on values is low and the science is well-understood, then the focus is on dialogue among the stakeholders guided by the science to try to resolve and understand the value differences. When the science is uncertain and there are important gaps but the agreement on values among stakeholders is high, then the focus is on getting the science issues resolved with oversight and engagement of stakeholders when needed to assure that their values are being reflected in the science. But when the science is uncertain and the agreement on values is low, then the issue is a "wicked problem" and significant dialogue between and among scientists, stakeholders, and decision makers is needed.



The characteristics of wicked problems as described by Allen and Gould are:
•Outcomes not scientifically predictable: The complexity of the system is such that it is not possible to predict all the possible outcomes
•Definition in 'eye of the beholder': Individuals bring different perspectives to the problem and therefore have different perceptions of the nature of the problem in terms of its source, approaches to address the problem or definition of a potential resolution of the problem.
•There is no single correct formulation because of the disparity in beliefs regarding its cause and nature.
•Solutions generally good or bad, not true or false
•Resources combine with stakeholder demands in unique ways
•Any solution is likely to be 'one-shot' operation and so experience from other, apparently similar situations, is not always useful.
•We cannot know when all possible solutions have been explored
•The decision-maker is not allowed to be wrong
[Allen, Gerald M. and Ernest M. Gould, Jr. 1986. Complexity, wickedness, and public forests. Journal of Forestry 84(4):20-23]

Responses to Risk and Uncertainty in Wicked Problems

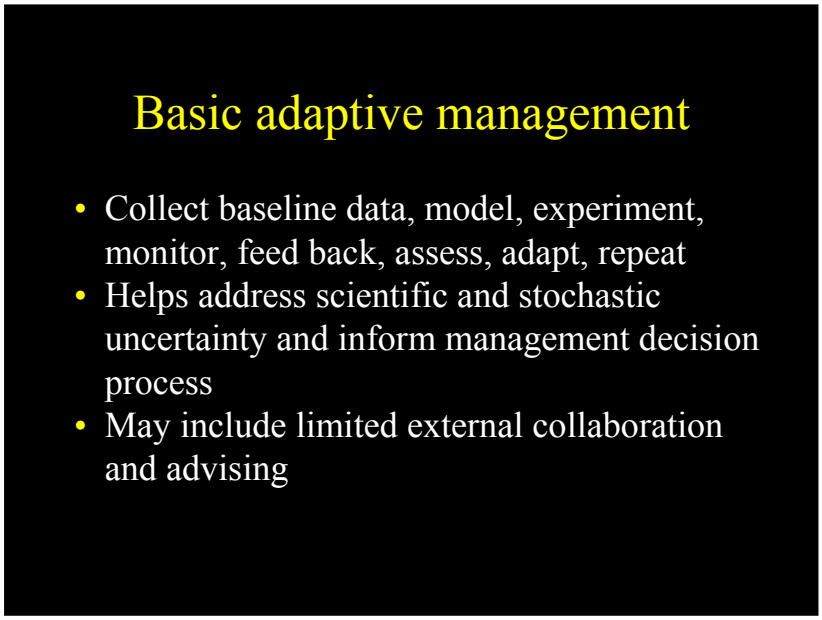


People and institutions use many approaches to deal with uncertainties. Two that have been used either implicitly or explicitly in the Sierra Nevada case are the precautionary principle and adaptive management. Both have significant intuitive appeal, but both also have important limitations, especially when applied to wicked problems. In this section of the presentation, we discuss the precautionary principle and adaptive management. In the next section of the presentation, we will introduce an alternative that may address the limitations inherent in these two approaches. The alternative we will consider involves broadened and strengthened participatory processes. [Note: Working papers to be posted on the website associated with this project will include references to key sources of information on the precautionary principle and adaptive management. The website address is http://gunston.doit.gmu.edu/snfpa_risk.]

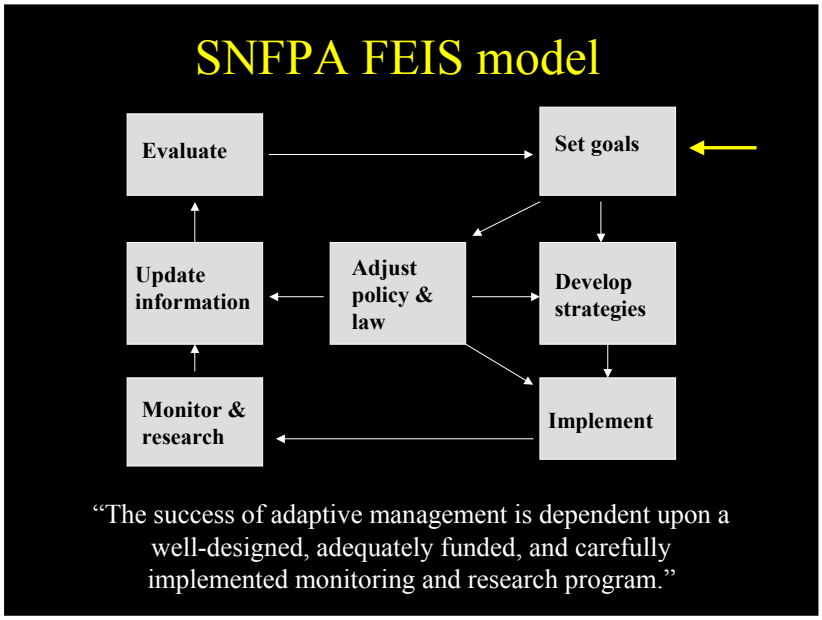
Precautionary principle

- Formulations
  - "First, do no harm"
  - Scientific uncertainty does not justify risky action
  - Manager/actor has burden of proof on safety
- Appealing at first glance, but logically untenable, particularly in wicked problems
- May lead to…
  - adverse outcomes
  - circularity problems
  - paralysis

The precautionary principle has intuitive appeal because it is based on the idea of "safety first." There are many formulations of the precautionary principle in the environmental policy and other literature. A common formulation is a simplified version of the Hippocratic Oath: "First, do no harm." In other words, a physician treating a patient wants at least to be sure that the treatment won't leave the patient worse off than before. A straightforward application of the precautionary principle in practice is our requirement that new pharmaceuticals be subjected to rigorous, extended, and expensive testing programs before they are approved for general use. We want to be sure that any side effects of new medications are understood and judged acceptable before proceeding. According to the precautionary principle, uncertainty about possible adverse outcomes cannot be used to justify going ahead with potentially risky treatments, technologies, or management strategies. In other words, the burden of proof on safety shifts from the regulator to the developer of the novel product or activity. Few would argue about applying the precautionary principle in a case like the drug approval process mentioned above. But this is not a wicked problem. The precautionary principle is less useful in more complex cases, especially in cases with multiple interacting uncertainties such as the Sierra Nevada case. This became clear when the regional forester evaluated the Final Environmental Impact Statement (FEIS) in preparation for the Record of Decision (ROD) issued in January 2001. The regional forester considered 8 or 9 alternatives, but because of the ecological and political uncertainties, he could not be sure that any of the proposed alternatives would not ultimately harm the very characteristics of the forests he was charged to preserve, such as old growth forests and habitat for California spotted owls. Thus the precautionary principle would have required him to reject all proposed alternatives until further research could reduce the uncertainties. Unfortunately, in wicked problems, it is not possible to eliminate all uncertainties. This left the regional forester with only the "no action" alternative. However, the status quo also carries with it risks of harm to old growth forests and owl habitat, particularly from the increased likelihood of stand-destroying fires in the absence of adequate fuels treatment. Thus, the precautionary principle would not allow any of the proposed actions to be implemented, nor would it allow the status quo to continue, and a decision maker attempting to follow the precautionary principle would be paralyzed. In practice, the regional forester in the ROD approved Modified Alternative 8, a ruling that included precautionary language and prescriptive standards and guidelines relating to protection of old growth forests and owl habitat. In practice, however, people in the field responsible for implementing the ROD soon reported that they were unable to apply the management plan in a way that would achieve its stated goals



Adaptive management is an alternative to the precautionary principle that is explicitly promoted both in the FEIS and in the Review Team's March 2003 report recommending changes to the ROD. Like the precautionary principle, adaptive management also has powerful intuitive appeal. The idea is that even in conditions of uncertainty we must act. But in order to avoid locking ourselves into a risky management strategy, adaptive management suggests that we should carefully monitor the results of the strategy we implement, learn from experience, and modify our strategy to maximize observed positive outcomes and minimize undesirable effects as we go along. This is a fundamentally scientific approach, viewing implemented strategies as experiments and as ways to test hypotheses. Because the outcomes of experiments are inherently uncertain, adaptive management conflicts with the precautionary principle. This conflict became apparent as the Forest Service attempted to implement the ROD, which included both precautionary and adaptive approaches.



Adaptive management as described in the FEIS (Appendix E) includes the basics of the approach as described on the previous slide—Forest Service personnel should develop a management strategy, implement the strategy, monitor effects in the field, and provide feedback to managers so they can modify and improve the strategy. However, the FEIS also recognizes that this scientific approach is not isolated from the broader social and political decision-making arena. The model presented in this slide, taken from the FEIS Appendix E, shows links to public stakeholders (indicated by the yellow arrow in the upper right) in the goal-setting process. This model also acknowledges the requirement that administrators go through a public and transparent process as they modify management strategies in response to new information (as indicated by the box in the center of the diagram). The authors of the FEIS also emphasize the critical importance of monitoring and research in adaptive management. Without effective monitoring and feedback, adaptive management collapses.

FEIS adaptive management

- Views all policies – not just particular management strategies – as experiments
- Stresses monitoring and feedback
- Calls for different approaches depending on levels of uncertainty and public concern
- Broadens stakeholder participation and input
- Sees adaptive management as nested within a larger decision process

The FEIS version of adaptive management is broader and more robust than more basic formulations, particularly in that it recognizes the importance of stakeholder involvement.

Limitations

- Both scientific and administrative components are hard to implement in practice
- Scientific framework underlying adaptive management is not ideal for addressing social/political/ethical dilemmas
- Wicked problems include more – and more complex – uncertainties than adaptive management alone can deal with effectively

Even the strengthened adaptive management described in the FEIS has significant limitations, however, particularly when applied to wicked problems such as the Sierra Nevada case. Adaptive management depends on monitoring, but the Forest Service may not have the funding and other resources necessary to do effective monitoring. Moreover, the agency is not designed, or permitted by law, to be broadly flexible in its implementation of management strategies, and thus it may not be able in practice to respond rapidly to new information coming in from the field. In addition, adaptive management, a fundamentally scientific process, is useful for addressing scientific and stochastic uncertainties, but it is a poor tool for dealing with the social and political uncertainties that also characterize wicked problems.

Summary so far…

- The Sierra Nevada case is a wicked problem
- Risk and uncertainty cannot be eliminated
- The precautionary principle, in restrictive formulations, is not a useful decision tool
- Adaptive management, broadly defined, is necessary, but not sufficient
- Next: A look at participatory processes

This slide summarizes the main points of the presentation so far.

Participatory Processes

Adaptive management problems

- Over reliance on rational comprehensive planning models
- Tendency to discount nonscientific forms of knowledge
- Inattention to processes to promote shared understanding among diverse stakeholders

As mentioned earlier, Adaptive Management as implemented in this instance is primarily a scientific process. Consequently, it captures readily quantifiable, rational analyses of the situation. Idiosyncratic knowledge based on experience is generally considered to not have a rational or scientific basis and is therefore discounted as being unreliable or not valid.

The emphasis in such instances on finding the scientifically sound and therefore, obviously desirable solution, leads decisionmakers to ignore the need for "buy-in" from key stakeholders. Thus apparently good solutions cannot be implemented because they lack support and oftentimes face active opposition of well meaning stakeholders.

McLain and Lee, 1996

The Final Environmental Impact Statement (FEIS) lists a number of sources of uncertainty in this context of finding a satisfactory management strategy for the Sierra Nevada Forests. Listed here is only a small subset of these sources of uncertainty mentioned in the FEIS.

The uncertainty dilemma

- Simple characterizations likely to be wrong, biased or misleading
- Detailed characterizations likely to be confusing or unusable
- No scientific/technical solution for this dilemma
- 'Solution' may be found in the decision processes
  - Combine iterative deliberation and analysis
  - Allow participants to understand where scientists agree and where they disagree

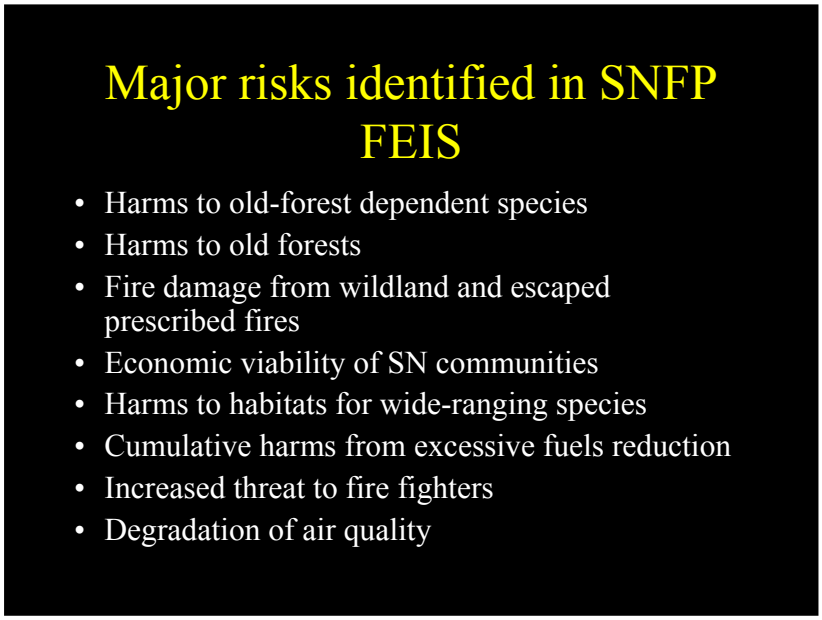
Communicating with people about risks inherent in any complex decision being made under conditions of uncertainty is fraught with difficulty. There are a variety of reasons for this difficulty. One reason, characterized as the uncertainty dilemma, has to do with the level of detail that should be included in communicating about the nature and source of the uncertainty.

Providing too little information, in an effort to simplify the complexities involved could lead knowledgeable people to accuse the communicator of leaving out vital information and therefore providing an incomplete and inaccurate depiction of the issues. On the other hand, an effort to provide detailed information that captures all the complexities inherent in the situation could lead people to accuse the communicator of drowning people in the details in an effort to purposefully confuse the audience.

Since the "appropriate" level of detail depends upon the sophistication of the audience, there is no rational process by which this level can be ascertained.

An approach to resolving this dilemma is to work closely with the audience/participants so that there is gradual growth in understanding the complexities underlying the decisions. By engaging in an open process involving both discussion and analysis, it is argued, that it is possible to bring along all participants to a common understanding. This understanding allows the participants to appreciate the full complexity of the problem and to realize that even the experts have honest differences of opinion.

Understanding Risk: Informing risk decisions in a democratic society, National Research Council, 1996



These are some of the major adverse consequences that the SNFP attempts to mitigate.

The risk dilemma

- Framing of risk information shapes judgments of the participants in a risk decision
- No scientific way to determine that one framing of risk is more accurate or less biased than another
- No technical solution to the problem of generating an unbiased and useful framing of risk information
- 'Solution' is to seek agreement through a process that incorporates both analysis and deliberation

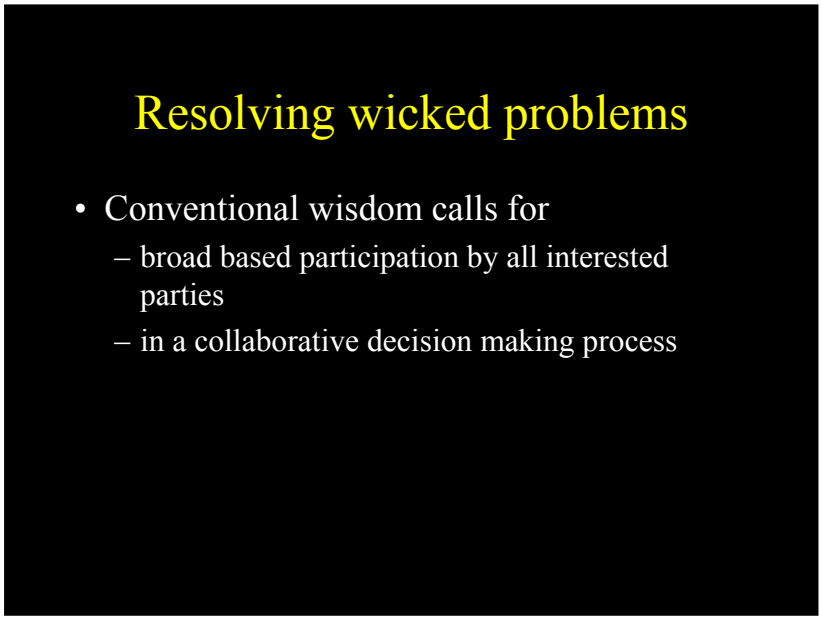
Human beings use a number of simple heuristics to deal with complex situations. Unfortunately, these simplifying tactics have built into them identifiable and predictable biases. For instance, the "recency" bias leads us to recall and fear most those bad experiences that occurred most recently.

Of particular importance in major public decisions is the role played by how the issue is framed or described. If the issue is framed in a positive light, people are more likely to dwell on the positive aspects of the decision than if it were to be framed in a negative context. For instance: summarizing medical risks in terms of mortality rates yields very different perceptions compared to the same information presented in terms of survival rates. If we say that a given treatment has a mortality rate of 10% it is perceived very differently than if we say the treatment has a survival rate of 90%. Experts are not immune from this framing bias. The effect is as strong where subjects are physicians as when they are lay people.

"Numerous research studies have demonstrated that different but logically equivalent ways of summarizing the same risk information can lead to different understandings and different preferences for decisions." (UR, pg 57)

There exists no scientific way to determine that one framing of risk is more accurate or less biased than another, as long as both account for the data.

Once again, the hope for avoiding the problems associated with such misperceptions associated with people's understandings of low probability, high consequence events is placed in a process that ensures active participation and discussion of all the issues.



Complexity associated with multiple stakeholders, conflicting values, scientific, stochastic and budgetary uncertainties, and a highly structured legal and administrative process are some of the characteristics of wicked problems. Such problems do not lend themselves to easy solutions.

Conventional wisdom seems to suggest that a democratic process where all the participants get an opportunity to voice their opinions, learn together through well designed experimentation and analysis and develop mutual trust and a common understanding of the issues has a greater chance of success in resolving wicked problems than processes that do not include such an iterative process.

Another characteristic of wicked problems is that they rarely get solved, hence the process would be one that requires long term engagement with a high level of involvement.

Challenges of participatory processes

- Participation does not guarantee agreement or avoid all law suits
- Can be slow and expensive
- Trust is easier to destroy than build
- Sponsoring agency may have different goals for participation than participants do
- Participants tend to retreat to general principles and broad commitments without adequately considering feasibility

Unfortunately this process is not a panacea. The literature seems to suggest that it is quite easy for such processes to get derailed and there are many more instances of failed processes than of successful ones.

However, some safeguards can be built into the process to increase the likelihood of success.

Risk characterization in an on-going learning network

- Synthesis and summary of information about a potentially hazardous situation
- Addresses the needs and interests of decision makers and stakeholders
- Prelude to decision making
- Depends on an iterative, analytic-deliberative process.

People pay attention to information when having that information could potentially affect the choices they make. Risk characterization should be "decision-driven activity" directed toward informing choices and solving problems. In addition to the risk information being current, accurate, thorough and pertinent to stakeholder concerns it must be placed in the appropriate context for the stakeholders to be able to see the relevance of that information to the decision at hand.

Attaining this level of understand in complex situations requires sustained attention and involvement from the earliest stages of the exercise. Thus, what we need is a process that supports mutual trust and a common understanding of the issues. The learning network creates a "space" in which this understanding and growth can occur over time.

Risk characterization should be "decision-driven activity" directed toward informing choices and solving problems

Understanding Risk, page 27

Aim of risk characterization

Describe potentially hazardous situation…

- accurately
- thoroughly
- and in a decision-relevant manner

Address stakeholders' significant concerns

Make information available and accessible to public officials and involved parties

Coping with risk

Requires broad understanding of potential relevant losses to stakeholders

This in turn requires incorporating perspectives and knowledge of stakeholders from earliest phases

Analytic-deliberative process

- Getting the right science
- Getting the science right
- Getting the participation right
- Getting the right participation
- Developing accurate, balanced, informative synthesis

This analytic-deliberative process requires the coming together of the appropriate scientific knowledge and stakeholders. The process entails the setting up of a feed-forward mechanism by which stakeholders frame what is relevant in terms of the science and the science frames the stakeholders' understanding of the issues.

Right Science – How do the experts representing the spectrum of interested and affected parties assess the technical adequacy of the analytic effort?

Science right – Do representatives from the spectrum of interested and affected parties feel that their concerns are adequately addressed by the scientific work that will inform the decision?

Right participation – Do public officials and representatives of the spectrum of interested and affected parties feel that other parties should have been involved?

Participation right – Were representatives of the spectrum of interested and affected parties adequately consulted during the process? Were there points when they could have contributed but did not have the opportunity?

Synthesis – Do representatives of the spectrum of interested and affected parties feel they understand the basis for the decision? Do they perceive any bias in information coming from the responsible organization?

Schematic view of the process

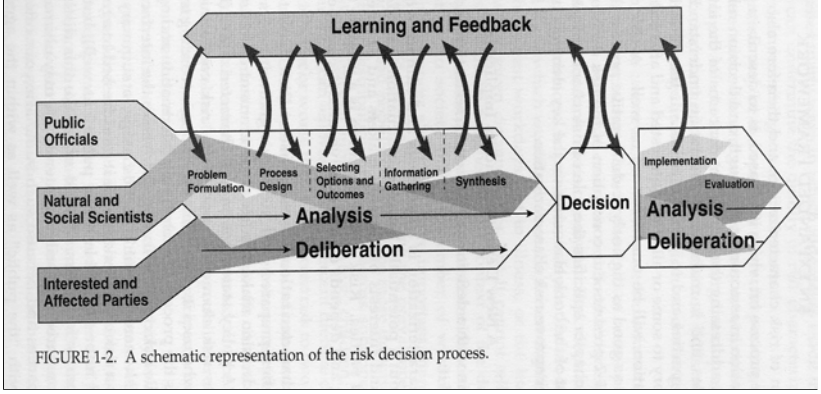


FIGURE 1-2. A schematic representation of the risk decision process.

Building organizational capacity

Learn from experience

Work with stakeholders to define criteria for evaluating processes

Iterative, analytic-deliberative process

From Shindler, Eco-Watch dialogues, 6/7/1999 pg 7

Organizational responsibility

Organization responsible for characterizing risks should blend analysis with deliberative processes that…

- clarify concerns of stakeholders
- prevent avoidable errors
- offer balanced and nuanced understanding of the state of knowledge
- ensure broad participation

Requirements for civil public discourse

Debate must be informed ("onus to insure that this occurs is squarely on the forest agencies.")

Discussion must be deliberative, with real opportunities for mutual learning and reflective thinking

Debate must be discursive (know what you want/need from public and frame participation appropriately)

Why a learning network?

- Brings to light preferences that
  - experts might ignore,
  - interest groups might misrepresent, and
  - citizen opinions unconstrained by awareness of tradeoffs might distort
- Broadens the value preferences that must be addressed in the decision
- Elicits more information and ideas
- Creates a reservoir of good will

Recent research on learning organizations (Senge, 1990) and the creation of communities of practice (Wenger, 199?) suggests that bringing together diverse groups of individuals for the duration of a project is an effective approach to address complex problems. In the case of the Sierra Nevada, such an approach that brings together the various stakeholders is essential to ensure that broad participation is seen to and does actually occur.

Such participation increases the chances of all value preferences being represented, takes advantage of expert opinion resident among the various interest groups and reduces the chance of any one interest group being perceived to dominate the agenda.

The creation of a broad based process would generate the goodwill essential to implement solutions where there is no "best" answer.

From Bardach, JPAM, 2003, 22(1):116

And . . .

- Systematic deliberation informs and changes attitudes
- Deliberation creates a shared public space for opinions and decision making
- Deliberative processes involving a broad cross-section of participants produce better solutions

Is it necessary?

- SNFP FEIS:
  - "many of the issues [in the SNFP context] are well understood, science and scientific uncertainty are at the core of decision processes and public interests already have sophisticated understanding of both process and content." (Appendix E, pg 28-29)
- Interpretation: "This is a science problem"

SNFP FEIS view of collaboration

- In this context, collaboration calls for "explicit agreements about the scope and nature of the problems to be solved, clear lines between dialogue and decisions and meaningful engagement of well-prepared representatives of diverse public interests." (E-29)

Unanswered questions

- What is the appropriate scale for managing the SN (stand, landscape, bioregion, etc.)? Does the public understand and agree? Should public participation be matched to the management scale?
- Are the meanings people give to specific places adequately reflected in the SNFPA analysis and recommendations?

There needs to be a match between the unit of analysis, the level at which a decision is made and the level at which the participation occurs. Making decisions at the appropriate level would help insure the inclusion of relevant community perspectives and accommodate special considerations that communities associate with local traditions and places.

1. Shindler, Bruce. 2000 Landscape-level Management: Its all about context. *Journal of Forestry*. Dec, 2000 pg 10-14

More questions

- Are the social and community changes implicit in the SNFPA understood and accepted by the relevant communities?
- If, given uncertainty, no one can forecast with confidence how any management program will turn out in 150 years, shouldn't both scientific and informed public opinion be equally considered in deciding how risks are characterized now?

There is a tension between expert opinion and lay perspectives and considerations. In cases where the complexities are enormous and the scientific knowledge is uncertain, the authority usually given to expert advice is perhaps not justified.

Although the decision authority and responsibility lies with the Forest Service and the relevant public officials, a truly participatory process where the participants share in the responsibility for the decision is more likely to succeed. However, to ensure that the decision is sound, it is important that the experts and the lay participants are equally well informed about their different perspectives. That sharing of knowledge, preferences and values can be enhanced by the deliberative-analytical process proposed here.

Elements of success for a learning network

- Goals for participation clearly defined in advance
- Participation broadly and fairly based
- Participation starts early in the process
- Decision rule should be collective satisficing rather than optimizing
- “We did a good job” vs. “I won”

Conclusions

- No purely scientific or technical solutions
- No purely political solutions
- Critical that good science and broad involvement interact throughout
  - the decision process
  - the monitoring process
  - future adaptive decisions

Quote is from Shindler, 2000, pg 13

"the public's acceptance of natural resource policies is linked to the quality of the decision making procedures, including opportunities for their participation."

Simple solutions to wicked problems

While wicked problems are complex, their practical resolution requires solutions that are

Understandable and practical to implement

Effective and technically feasible

Economically sustainable

Politically implementable

Optimality must give way to adequacy

Sampling Attitudes and Preferences

Questionnaire

- A way for us to get information about your attitudes and preferences
- Exercise is demanding, but your effort is valuable
- Details…

Card sort exercise

- Focus on specific policy preferences
- Requires consideration of multiple dimensions
- Each card is an internally consistent option
- Deck is a set of plausible policy choices and outcomes

Our website

http://gunston.doit.gmu.edu/snfpa_risk/