

## Effective Adaptive Management

Hi my name is Matt Petersen, I work with AECOM and I'm here to talk about adaptive management, and more specifically, how to effectively use adaptive management in planning. First off I want to start off with a definition from the Department of Interior Adaptive Management Technical Manual. Which basically says adaptive management is a decision making process that promotes flexible decision making that can be adjusted in the face of uncertainty. And there's a couple of key elements there, one is decision making, and secondly is the uncertainty. Which means you're actually doing something, and you actually have a plan and you're recognizing what the uncertainty is, and that's the key to making adaptive management flexible. We're going to talk today about how to do adaptive management the right way, and we're going to show examples of the wrong way as well. So when do we use adaptive management? Adaptive management is a tool that's used when you have controllability. You have the ability to plan and you have the ability to do decisions and management actions, but you have high uncertainty. Right? When you have high uncertainty but you have high controllability that calls for having an adaptive management scenario to address that uncertainty with known ability for management action.

But whenever you're talking about a plan, the next question that's going to come up is, how do we disclose what's going to happen from this planning process? Whenever an agency has a plan, or planning process, they typically have to do a national environmental policy act disclosure on the impacts of that plan. And so it's important for us to understand how those two things can work together. So how can national environmental policy act and adaptive management work together? First off, explanation is that adaptive management allows for effective resource planning, it allows you to address uncertainties, and it allows you to make plans that can respond to situations. It also provides a very powerful tool to address significant adverse impacts. By developing criteria and stipulations in your planning that can adapt to the situation, you can allow for effective planning in the future that avoids those impacts. And it helps ensure that your actions, your management actions, your proposed actions, mitigations associated with those are effectively implemented. And an important concept with this is that you're actually able to disclose and understand the impacts of that adaptive management. Because under the national environmental policy act, decision makers cannot make a decision unless they are informed about the potential impacts of that decision before it's implemented, and hence that's one of the challenges of effectively using adaptive management.

So if you look at an adaptive management scenario, and this came out of the DOI manual for adaptive management, you will see that adaptive management is about assessing a problem, designing an approach, implementing that approach, then monitoring, evaluating effectiveness, and then adjusting that approach to better address that problem. So it's an iterative process to help you solve problems as uncertainties arise. But the challenge that we have here is if you're doing NEPA disclosure on the environmental impacts of a project and the adaptive management that NEPA disclosure is going to happen here. After design and before implementation, because you are not allowed to implement that project until you go through the NEPA process. So you need to discuss, develop that adaptive management, at a level that you know what the environmental consequences or can analyze the environmental consequences of that management before implementation.

## Effective Adaptive Management

So how do we know integrate this into the disclosure process? First and foremost, we need to have a clear description of what the adaptive management is. Now if you look at the BLM NEPA handbook it says that, “a proposed action should be described using the who, what, how, when, and where.” And that same thing applies to adaptive management, you have to know who’s going to implement it, what it will be, how it will be implemented, where, and when it will be implemented, including how often. How much level of detail? And I get this question a lot, how much level of detail do we need? You need enough level of detail that the person who’s using that NEPA document knows how effective that adaptive management will be, and knows what the impacts of implementing that are. You don’t need more detail than that, but you can’t get by with less. If you can’t disclose the impacts, then you don’t have enough detail.

So how do we make this work? Here’s an example of the wrong way, and this is based on my experience working on planning documents in the past. The wrong way I’ve seen adaptive management used is things like, trust us we’ll do the right thing, we have a great toolbox, we’ll monitor the situation, and we’ll develop great mitigation once we implement the project. So you can see there are some things missing here. There’s no plan, there’s no description of what that management would be, there’s no description of when it would be used, and no description of what would happen if it doesn’t work. It’s basically trust us, we have a lot of things we can do, and we’ll do the right thing. And we don’t want to use this approach because it’s not a plan. And the fact that it’s not a plan means it’s not going to provide the detail to give you a defensible impacts disclosure under NEPA or the assurances so the decision maker could make an informed decision.

What’s an example of the right way? Here are our adaptive management tools and they’re described, we will monitor these metrics or indicators, these are the thresholds and when these are surpassed, we will implement these measures. That’s effective adaptive management in a nutshell. And if I were to define it, simply I would call forth an “if, then” scenario, adaptive management is about if, then. If this happens, then we will do this, if this happens, we will do this. So there are some key points that you need to describe well to make that “if, then” scenario clear for that NEPA process, and allow for that defensible disclosure. So, when you’re talking if-then, you’re talking thresholds, and you’re talking triggers. Meaning, you got have a plan. Okay? Adaptive management is not an excuse to not have a plan. So you need to have a plan of what that will mean. So you have to look forward at that uncertainty. What are the future situations that we might run into? And there are lots of things out there that could be uncertain, there could be climate change issues, there could be upcoming situations where you have population changes in certain wildlife species, you could have additional development in a certain area. So you have to identify, to the best of your knowledge, those potential situations. You try not to be speculative with that. You have to look at what’s reasonably foreseeable in that uncertainty. And then you identify indicators that you can measure or gauge the situation for a representative resource. Okay? Once you have those indicators, there are certain thresholds that if they are surpassed, need to trigger a response. So I have thresholds and triggers. So you have your indicators, what thresholds happens would trigger what response, and here’s what that response would be. And you could have several of those depending on the adaptive management scenario. So monitoring alone is not enough, right? We’ll monitor the stream until it goes dry. Well that’s done nothing towards management. But if you monitor

## Effective Adaptive Management

the stream flow until it gets to a certain level and then you cease snow making for example, that's an adaptive management scenario. You identify a threshold and the criteria, the criteria stream flowed, the threshold is a certain level, and the management response is, we'll quit withdrawing for snowmaking at this level. And that's the right way to do adaptive management because it constitutes a plan and it allows you to disclose what would be the consequences of that.

So here's examples that I've used before. One I just talked about, you have instream flow in the Santa Clara River, if it goes below 3 cubic feet per second, then the water will be released from Gunlock Reservoir to augment that flow. Another one might be, if monitoring indicates a visitation to a cultural site, like the Moon House, is causing adverse impacts to that cultural site, then that visitation will be by permit only. And if that keeps happening, then we will close that visitation. So there you have two thresholds. Right? If you have impacts, you will have permitted visitation, if you continue to have those same impacts, physical impacts, then you will close it. If temperatures are high, and conditions are dry, such that fire dangers extreme, vegetation treatments in WUI areas (Wildland Urban Interface) will be done using mechanical herbicide treatments only to prevent the risk of starts. Those are 3 simple examples of adaptive management. Notice that all of them have the "if, then" in there, if this happens, then we will do this to adapt to that. Because they clearly describe what you will be doing, this also allows for effective NEPA disclosure. Under that first scenario for example, you will know that water will not be going below 3cfs because if it approaches 3cfs, you're going to release to augment the flow and keep it up there. That allows you to disclose those impacts, and it allows you to plan for the problems you could potentially have.

So I'm going to present actual examples that have used the planning process that I have worked on. One, in fact, I'll talk about this one in detail, is for the Moab Resource Management Plan. And in that case we did a drought adaptive management plan for drought because of the increasing drought issues there. And that was based on what's going to happen with our resource use if we have severe drought? How are we going to change that? And we've also done adaptive management for other projects. For the Forest Service we did one for the ski area expansion that talked about changing water withdrawal locations, storage, and amounts, all 3 adaptive based on meeting our instream flow requirements. So let's talk about, in detail, the Moab example. Here's an example that we used in Moab, and right here when we were doing our drought management adaptive, adaptive management, the first thing we did is identify, as I said before a metric or indicator to measure the resource condition that we were concerned about, in this case it was drought. So what's an indicator for drought? In that case we used a Palmer Drought Index. And if you look here you can see the categories using the Palmer Drought Index and we had a description of what those meant and each one of those levels were indicators and thresholds that if they were surpassed would illicit adaptive management response. And here's those responses. If we hit drought index severe, d2, there were going to be drought letter sent out to permittees for grazing. We were going to coordinate with UDWR (Utah Division Wildlife Resources) on big game herd control, to keep herd levels at a level that the range could support. We're going to prepare local seasonal precipitation graphs and suspend or limit seed collecting activities. If we go to extreme, then we are getting more extreme restrictions on use. No service to surfacing activities in areas with sensitive soil. We may change livestock use based on what we're seeing on those allotments.

## Effective Adaptive Management

We're going to confine our OHV use to designated roads and routes within open areas, etc. and then if you see an exceptional, there's going to be change in livestock used based on site-specific data, no surface disturbing activities, period, pre-valid existing rights, valid existing rights, and we're going to consider closing areas of public entry all together. So you have three different thresholds, and adaptive management scenarios to all three of those.

Now one of the things here, that I want to point out as I walk over here, is some of these could be strengthened. So right here for example, changes and livestock use will be based on site specific data on those allotments, well that's something that could be done anyways. So let's be frank, that may not be that strong of an adaptive management response to exceptional drought conditions. Anyone who knows the Palmer Drought Index, exceptional is a pretty bad drought. So you may consider even stronger language in your planning document depending on the resource and how critical it is. So for example here, one of the things we considered if drought conditions were exceptional is that we were not going to allow surface disturbing activities, and we were going to remove livestock from federal lands because of that. So this is an example of an adaptive management scenario that implements the "if, then", the criteria with the thresholds, and the response once those thresholds are exceeded. And that's the sort of thing that allows you do to effective NEPA disclosure and also provides an actual plan to guide your management, and adapt to the conditions that could happen. So having gone through several planning processes, there's some lessons learned that I would like to sum up. One is, clear unambiguous criteria, is essential for adaptive management to work. If we're working in vague suppositions and assurances, we don't have a plan ourselves. We do not know what we're going to do, and we don't know what the impacts of that are going to be. Which means our NEPA disclosure is going to be non-defensible, we're not going to make an informed decision, and we really won't have a plan on how to do things. Total flexibility, is not a plan. Trust us, we'll do the right thing is not a plan, and again it doesn't allow for disclosure, and it doesn't constitute a way forward for the decision maker. You can have flexibility, but if you're going to have flexibility, it has to be bounded by the identifying relevant criteria you're working with; the levels of drought, the changes in veg type based on potential climate change that could be out there, right? Identifying indicators that make sense that you're concerned about, and the thresholds that you don't want those to pass, or that if they pass those thresholds, what kind of actions are you going to take to get them where you need to, to meet your management goals. You have management goals, you have desired future conditions, that means you can identify that kind of criteria and the flexibility that you allow yourself based on the uncertainty that's out there. Always remember "if, then" if this happens, then we will do this. If this happens, then we will do this. Also, collaborations with cooperators when you're going through this planning process on adaptive management, is critical. It allows input that could give you ideas for expanding or thinking about solutions that you may not have, and it also allows coordination with surrounding land owners or agencies. For example if you look back at that Moab RMP example, Utah Division of Wildlife Resources, that can more effectively allow you to do that adaptive management. Thank you.