Full coding specification

Themes	1. Actionable understanding	2. Ongoing business	3. Eternally unfolding present
Sub-categories	a) Adaptive management b) Aims of the project c) Coming to decisions d) Conceptualizing the situation e) Generating practice f) Roles within the project	a) Disruptions b) Environmental processes c) Job roles d) Project procedures e) Routine actions f) Rules and requirements g) Skills f) Tools g) Understandings of practice	a) Practice invoking context and place b) Practice invoking knowledge c) Temporal emergence

1. Actionable Understanding

Definition: "A mutually held understanding of [the project] that enables [the participants] to take mutually acceptable action on it" (Cook and Wagenaar 2012: 20).
Description: Passages where participants discuss 'the problem' or problems they are facing, as regards Wildlands National Park – or specifically the Wildlands adaptive management (AM) project – and what to do about them or how to overcome them.
Inclusion criteria: People mention a challenge, or a problem, or a "tricky situation" in relation to their work in Wildlands National Park.
Exclusion criteria: People discuss routine practices or actions.
Examples:

- "So without – having to hedge your bets and saying, 'well we could have lots or we could have a few, so lets have a flexible approach that we can adjust as we go out there.' So it was quite tricky – it was really quite tricky."
- "Yeah, so the discussions in our meetings were a lot about that. What sort of shape, how big, how many, that sort of thing. And then within those sampling units, what do we measure? What do we estimate?"

1a. Adaptive Management

Definition: A management framework that is broadly intended to introduce scientific approaches to natural resource management as a way of responding to uncertainty and complexity.
Description: Passages where participants discuss their understanding of what 'adaptive management' means and entails in the Wildlands AM project.
Inclusion criteria: People mention adaptive management, or components of AM.
Exclusion criteria: People mention other styles of management that they work with or that exist in their organization (in which case, code under 'understandings of practice').
Examples:

- "So – and I think if we had a discussion as a group and talked about adaptive management options, we would come up with a big list of all different things, and things that I haven't said there."
- "So we had a discussion about how they combine both of those to be clear that this is [the Authority's] adaptive management cycle that we're using, and tying in the extra steps that they wanted to incorporate."

1b. Aims of the project

Definition: Intentions and goals of the Wildlands AM project.

Description: Understandings about what the goals of the Wildlands AM project are, what the project should deliver, and understandings of how these goals have changed over time.

Inclusion criteria: People mention 'aims' and 'goals' of the project, or talk about the 'needs' that the Wildlands AM project is responding to.

Exclusion criteria: People talk about the aims and goals of their organization in general, that are not directly related to the Wildlands AM project (in this case code under 'understandings of practice').

Examples:

- "So we're looking for [Sam] and [Val] and you guys to come up with some solutions for us I guess – some tools to mean that we can get some hard evidence that it's time to do some work on-ground."
- "... it was time to renew and revise where we were actually at. So this project allowed us to do that."

1c. Coming to decisions

Definition: Making choices about how the Wildlands AM project will proceed.

Description: Passages where participants relate decisions made within the project, or the processes used to come to decisions.

Inclusion criteria: People say things like, "and that's what we came up with," or "so that's what we did," or "the reason why we did that was ..."

Exclusion criteria: People describe the problem, but don't relate the decision that was made (in which case, code under 'conceptualizing the problem').

Examples:

- "Well I guess for example in the rapid surveys, a really easy way to record was to have the picture, and the inner circle and the outer circle, and you just divide it up and put those numbers directly in those spots, rather than having lines or grids or something. That was the simplest and most straightforward way to do it."
- "This year in Wildlands we walked both [the central and northern areas]. And that decision was – yeah, that decision was based on a concern that the aerial census was underestimating the kangaroo population in [the northern parts]."

1d. Conceptualizing the situation

Definition: Describing the difficulties or problems that need to be addressed.

Description: Passages where participants discuss or describe the problem in Wildlands that needs to be addressed by the AM project.
Inclusion criteria: People talk about 'the current situation' or 'the problem we have at the moment' in relation to the Wildlands AM project.
Exclusion criteria: People talk about the history of, or their understanding of, Wildlands environmental dynamics that do not directly relate to the problems addressed in the AM project (in which case code in 'Ongoing Business -- environmental processes').
Examples:

- "It's tricky through time and it's tricky through the space of the site as well because there's places within the study area that are more likely to get recruitment, but also there's years that are more likely to have recruitment."
- "So yeah, it's been frustrating really because you can see it on the landscape, and you say, 'hey guys, come on!' And seven years go by and we haven't got any further advance."

1e. Generating practice
Definition: The content of an understanding or decision that points to a range of actions to take or activities to engage in.
Description: Passages where people talk about the actions or activities needed to address a particular problem, or to gain further understandings (in relation to the Wildlands AM project).
Inclusion criteria: People talk about the actions that stemmed from a particular understanding or decision, for example where they say things like, "so we decided we needed to do ... to move forwards."
Exclusion criteria: People talk about existing or longstanding actions/practices not directly related to the problem addressed in the AM project (in which case code at 'routine actions').
Examples:

- "Often a textbook will just say you measure the diameter at this height, you use the DBH tape or calipers or something like that. It'll give you those technical details but it won't say, "if it's on a slope, and you stand at the bottom of the tree it's here, but if you stand at the top of the slope on the other side of the tree it'll be thirty centimeters higher, or if there's multiple branches – which ones you might include …" You have to make those choices and decisions on the fly when you're out there."
- "So I think it provides us with some steps to move forward. It probably hasn't answered any one, you know, big question, but it has allowed us some steps to move forwards."

1f. Roles within the project
Definition: Understandings about individual and organisational roles within the project, and the distribution of responsibilities.
Description: Passages where people talk about their understanding of the roles people need to take in relation to each other to fulfil the Wildlands AM project.
Inclusion criteria: People talk about the roles of others within the Wildlands AM project, and how people have interacted or need to interact.

Exclusion criteria: People talk about their skills or job roles that relate to the everyday operation of their department or organization (in which case, code under 'Ongoing Business').
Examples:

- "My role is purely a field expert to try to help out with their project. So that was good, I was happy with that."
- "I'm only a lay person really."

2. Ongoing Business
Definition: The daily practical work of the participants - 'business as usual,' or 'the stable state' - which constitutes "A dynamic, developmental, often taken-for-granted and unproblematic background against which and within which problems and opportunities of communities' practice arise and are dealt with" (Cook and Wagenaar 2012: 21).
Description: Ongoing business consists of "a flow of routine actions and understandings, a certain physical environment, a set of tools, the presence of colleagues who behave in predictable ways, and shared memories, meanings, and expectations, that, taken together, form the experiential environment of the unit" (Cook and Wagenaar 2012: 20).
Inclusion criteria: People talking about or implying the routine actions, contexts and understandings of work activity in Wildlands National Park, the Authority and the scientists working for the University (and the routine actions without the Wildlands AM project as a distinct entity).
Exclusion criteria: People talking about generating new practices as a result of the AM project (code in 'Actionable Understanding -- generating practice) or understandings of the specific problem addressed in the AM project (code in 'Actionable Understanding -- conceptualizing the situation').
Examples:

- "So the pointing I had used a lot before, so I knew that well. And the really good thing about that is that it is objective."
- "We do a walking census down here [the southern part of the Park] as they do in [a neighbouring park], and other places where the vegetation is more closed. And where it's more open we do the census with aircraft, so […] And what happens is there's issues with getting aircraft when you want them, and then when they come it's one hundred degrees in the shade, the kangaroos aren't to be seen because they're all under a tree, we get figures that aren't realistic – we know there's more out there than what the census throws up."

2a. Disruptions
Definition: Threats or challenges to 'ongoing business.'
Description: Ongoing business is generally a taken-for-granted work environment, but because it is dynamic, sometimes events happen that disrupt this environment (thus revealing what constitutes ongoing business).
Inclusion criteria: Events or experiences perceived as a threat or challenge to daily work life, where people talk about 'shocks,' 'challenges' or 'problems.'
Exclusion criteria: Problems that are recurrent enough that, although problematic, they constitute 'routine actions' or understandings.

Examples:

- "Well, it's a very unproductive period, and it's a very upsetting period for a lot of staff because they're having to apply for their own or other jobs."

2b. Environmental processes

Definition: The environmental processes and dynamics that constitute the 'physical environment' of the Wildlands National Park.

Description: The grazing animals, the trees, the water and the fire, that together make up the environment of Wildlands and which the site staff and scientists attempt to manage.

Inclusion criteria: People talking about their understandings of seedling growth, animal dynamics, water, fire and so on.

Exclusion criteria: People talking about the responses of their human colleagues and management actions to environmental change (in which case code under 'routine actions' or 'understandings of practice').

Examples:

- "We get higher rainfall and we've got more – probably in some areas, well some areas a lot of grassland. So [in the northern parts] it's [grasslands] that were originally covered in pines, [but] now a lot of it is covered in grasses …"
- "Here we've got fragmented areas surrounded by [locally distinct] vegetation. There's always a reservoir, always a pool there, where rabbits, no matter how low you get them, they'll be two rabbits left and that's all you need, the way they breed."

2c. Job roles

Definition: The job roles and descriptions of participants in the project.

Description: The job descriptions and roles that participants in the project play in their organizations.

Inclusion criteria: People talking about their position in their organization and the consequent tasks that they fulfil.

Exclusion criteria: People talking about the allocation of responsibilities and roles specifically within the Wildlands AM project, e.g. responsibilities of the University to provide a report to the Authority (in which case code under 'Actionable Understanding -- Roles within the project').

Examples:

- "Well I'm a [site staff] team-leader, but with a focus on what we call environment, land and water programmes now […] so our biggest one is rabbit management, but yeah, that's part of the grazing management programme."

2d. Project procedures

Definition: The work tasks and procedures of the Wildlands AM project itself.

Description: All the tasks and procedures undertaken by participants in the Wildlands AM project in their attempts to fulfil the project aims and criteria.

Inclusion criteria: People talking about various workshops, phone conversations, meetings, pilot studies, fieldwork, and so on that are necessary to carry out the project.

Exclusion criteria: People talking about their routine actions and practices that are not necessarily part of the project itself (in which case code under 'routine actions').
Examples:

- "I've been involved in discussions at times. So I've been to forums, where I've had some input and been asked, 'give us a local perspective,' I suppose."
- "So in setting up the workshop they were very hands-on in asking us who we thought were some of those expert people that could come to the workshop. So they relied quite a lot on [the Authority's] knowledge about who were some of those experts."

2e. Routine Actions
Definition: The existing everyday work tasks, procedures and practices undertaken by project participants in their respective organizations.
Description: The "practical work" of participants in their respective organizations, including the typical range of activities that they undertake .
Inclusion criteria: People talking about the things they do regularly within their work, the 'normal' state of things.
Exclusion criteria: People talking about potential amendments to their practice and everyday work actions in response to, for instance, the Wildlands AM project (in which case code under 'generating practice'), or peoples interpretations of their work routines, e.g. whether they think it is good or bad, and their reflections on their effectiveness (in which case code under 'understandings of practice').
Examples:

- "Yeah, so we've got strips of land that we burn to provide a fuel-reduced area that is to reduce the risk of wildfire. And often they are linear and go for a long way."
- "So walked transects, two people – a navigator, a recorder and an observer, they both observe. Set transects that someone has walked year in, year out, record the vegetation types as you go, times, kangaroos seen, direction, and rangefinder distance. Record the number and species."

2f. Rules and Requirements
Definition: The rules and specifications that direct and shape practice within the participants' respective organizations.
Description: The legal rules, regional and national legislation, management plans, and so on, which shape priorities and structure action within the participants respective organizations, and within the Wildlands AM project.
Inclusion criteria: People mentioning formal rules that they are obliged to follow, or that shape their practice (e.g. particular legislation or management plans).
Exclusion criteria: People talking about informal understandings or assumptions that shape practice (in which case code under 'Understandings of practice').
Examples:

- "The one we work from now actually needs updating. It's a 2012 Wildlands rabbit strategy – yeah, it provides a basis of the works we do with rabbits now, still. So that's

probably a little bit overdue to be updated, but that's where we get our authority to do what we do, I guess."

- "A tough part of management at the moment though, is with the government's plan now where they have to burn [a percentage] of the state every year as part of that response to the […] bushfires. So they said, "right, we're going to burn [a particular percentage] of the state every year to reduce the fire risk," and that sort of thing. The only thing is, is places like [Wildlands], which is a very large area and very easy to burn, and very low risk to people, it's really easy to burn large areas and to get their quota up."

2g. Skills

Definition: The competencies needed and employed by each participant in their job (and specifically in the Wildlands AM project).

Description: The competencies and abilities of each participant that are important for their work in their organization and on the Wildlands AM project, or skills that are missing or insufficient.

Inclusion criteria: People talking about their particular skills or their lack of skills, for instance, "my speciality is this ..." or "I'm not very good at this."

Exclusion criteria: People talking about particular tools that they apply (in which case code under 'tools') and/or the everyday actions that they engage in (in which case code under 'routine actions').

Examples:

- "And one of them is probably my greatest skill-set is in fieldwork, because I've done a lot of it, and I enjoy it, and so they said, 'there is this project that is on kangaroos that needs people with field expertise to help out, and so Logan would slot into that perfectly because Logan needs things of value to do in this year.'"
- "So I guess to make sense of it, for the [local] district, a lot of – they had their own environmental leader, and very self-sufficient within the district, and they had a lot of skills within the district. But now those skills within the district is being brought within the regional office which is [hundred of miles away]."

2f. Tools

Definition: The tools that are applied by and available to participants in order to solve problems.

Description: The range of tools, including particular methods or ways of thinking, that are applied by participants to solve the problems they face as part of their work (including those employed in everyday work and as part of the Wildlands AM project).

Inclusion criteria: People talking about particular "applying" particular tools/methods.

Exclusion criteria: People talking about approaches or actions, rather than the specific tools they use as part of those practices (in which case code under 'routine actions').

Examples:

- "The easiest thing is just to plant a bunch of trees in the ground, or get a bunch of ten-eighty baits and bait a bunch of foxes."

- "So the pointing was an option, the rising plate-meter was good because that's another way of looking at biomass separate to cover, which I hadn't done before but one of the other guys had."

2g. Understandings of practice

Definition: The interpretations, understandings and meanings attributed to practice by participants.

Description: The opinions of participants about the veracity of their practices (whether they are effective or not, and in what ways), their opinions on other people in their organization or within the Wildlands AM project, reflections on the meaning they attribute to particular actions and what constitutes "good" practice.

Inclusion criteria: Places where people reflect on and evaluate their practice, beginning sentences with words/phrases like, "the good thing about that is ..." or "we have always thought that was a bit silly..."

Exclusion criteria: Places where people talk specifically about coming to new understandings of how to progress or deal with a situation within the Wildlands AM project (in which case code under 'Actionable Understanding').

Examples:

- "So the pointing I had used a lot before, so I knew that well. And the really good thing about that is that it is objective."
- "You like to think that your work is doing something, but rarely is it affecting day-to-day decisions of management."

3. Eternally Unfolding Present

Definition: "the immediate present of practice [in which] actionable understandings are formed and ongoing business is sustained" (Cook and Wagenaar 2012: 22).

Description: Passages that point to knowledge and context "taking on the form and meaning that constitute them as artifacts of practice" (Cook and Wagenaar 2012: 22), forms coming into being through process and interaction.

Inclusion criteria: People talking about how they are working and making decisions "in the moment," about uncertainty, and about things happening (and consequent reactions) that could not have been foreseen.

Exclusion criteria: People talking generically about time - for instance, how a lack of time is a challenge for their work (in which case, code under 'Understandings of Practice - time').

Examples:

- "So we knew it was going to change, and we hoped that being there would help inform how good those methods were and try to – is this the right size, are these the right number of points, are we doing too many, or is this to slow – all of those things come out in the wash in the pilot study."
- "So yeah, we're just doing the best we can with what we know now, but the future will have to look after itself."

3a. Practice invoking context and place

Definition: Practice shaped by, and in turn shaping, context and place.
Description: The activities of the scientists and managers coming together in a particular place and time and producing the 'Wildlands National Park' as a place to be managed, and in turn their practices being shaped by the particularities of the Wildlands ecology and landscape. Context evoked in what the scientists/managers do.
Inclusion criteria: People talking about how their practice is shaped by the particularities of Wildlands, and how human practices have shaped Wildlands as a distinct place.
Exclusion criteria: People talking about how knowledge is evoked in practice (in which case, code under 'Practice -- knowledge').
Examples:

- "And when there's high numbers it makes it worse. And that's what I get annoyed about. Like, for grazing management we can't – if the farmer runs out of feed the sheep go out the gate, you know, they're sold! – we keep our kangaroos and we just let them die. So, I don't like it from a humane point of view, I think it's really poor management. And people just dismiss it, saying, "it's nature," but it's not! Because your numbers are inflated because there's grasslands there that shouldn't be there."
- "Doing field surveys – if you think you can do it off the top of your head in a place you've never been and start without never having – "OK, we've got it right, let's go!" – then you are kidding yourself. So we knew it was going to change."

3b. Practice invoking knowledge
Definition: Practice producing knowledge that is "sustained, evoked, shaped and deployed […] in the present" (Cook and Wagenaar 2012: 24).
Description: Knowledge not as a condition for practice, but the other way around - practice acting as condition for knowledge. Knowledge coming into being through active engagement in the present.
Inclusion criteria: People talking about (or examples of) practice acting as a necessary precondition for knowledge, for instance people saying things like, "it's hard to know beforehand," or, "we had to do it and see," or "learning by doing."
Exclusion criteria: People talking about how place is evoked in practice (in which case, code in 'Practice -- context and place').
Examples:

- "So yeah, just discuss, discuss, discuss, and try to nut it out and pros and cons of each method, and then come up with a best guess. And it was tricky, but that's what we came up with – the best guess of something that would balance out a detailed and a rapid survey that would provide the best information that they want."

3c. Temporal emergence
Definition: Understanding and experience given form only in the present.
Description: Passages that highlight the processual nature of experience - where the temporal sequence of events is recounted as an especially important part of acting and knowing within Wildlands, and particularly in the adaptive management project. Where it becomes clear that the past is continually reassembled in the present as we move through time, and the future remains a feature of our present imaginings.

Inclusion criteria: People talking about interacting/interwoven sequences of ecological and human events that led up to a particular moment, understanding or experience. For instance, moments where people highlight the importance of timing and process.
Exclusion criteria: People talking generically about time - for instance, how a lack of time is a challenge for their work (in which case, code under 'Understandings of Practice - time').
Examples:

- "I do think timing is interesting because I think the staff have wanted to move towards the [new] model for ages now, ever since Jackie first did the work. But there was that period from 2008, 2009 until now that we haven't culled, which meant that we could never test it against real cull figures. So its only now that we've had a cull and we've had someone like Val on board that we could actually do that analysis."
- "And staff were screaming out that they were seeing some regeneration, but it wasn't – yeah we weren't culling and hence it was being grazed on. We've got this three-year lag with the vegetation. So I think the timing is important."