Uncertainty Survey Codebook

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Useful resource: https://usq.pressbooks.pub/socialscienceresearch/chapter/chapter-13-qualitative-analysis/

# Question 1: Thinking about the decisions you make, or help make, about conservation in a professional capacity, what are the major sources of uncertainty you experience? Uncertainty can come from multiple sources, such as the natural world, or social and political processes.

Please enter your sources of uncertainty below and rank them, with one (1) being the most significant source of uncertainty and five (5) being the least significant source of uncertainty.

## Q1: Emerging codes:

* **Resources** - catch-all for organizational resources (i.e., respondent didn’t specify if its funding, personnel, capacity, etc.)
* **Funding**
  + **Fund\_Amount: Amount (value $$) of funding**
  + **Fund\_Length: Length of funding**
  + **Fund\_Avail: Availability of funding**
* **Capacity -** organizational capacity (internal or external) to complete projects
* **Personnel** - number of people
* **Expertise** - expertise within the organization on a topic, practitioner knowledge/expertise/experience, lack of expertise in field crew
* **Expert consensus** - articles, scientists, and experts don’t agree, information is contradictory, unclear how to make a choice
* **Insufficient data** e.g., lack of data, not enough data, no knowledge on the topic, concerns about quality, sample size issues
  + L**ack of long-term data (insf\_long term),** e.g., lack of long-term baseline data, insufficient data to understand history of a site
  + **Site-specific data (insf\_sites)**
  + **Species-specific data (insf\_species)** e.g., population estimates, invasive species, community composition, how an invasive species may affect a system
  + **Impact-specific data (insf\_impact)** e.g., does this impact affect ecosystems/populations
* **Prediction** - inability, uncertainty in prediction/modelling the response of an ecosystem/biodiversity to disturbance, mitigations, or interventions
* **Climate change** - uncertain future, no longer able to infer based on past data
* **Ecology/Nature** - unpredictability, unsure how a broader ecosystem/natural system will respond, broader complexity of ecology1
* **Complexity** - includes social systems, complexity of human and natural interactions
* **Success criteria -** uncertainty around goals, what success looks like, etc.
* **Legislation** - existing legislation that causes uncertainty, unclear regulatory requirements; uncertainty around interpretation of policy/laws/legislation, conflicting interests of adjacent land parcels, unclear regulatory requirements
* **Political will** - what the government is interested in, priorities of different governments that may influence conservation, political decision making
* **Unclear responsibility** - where policy, legislation, mandates make it unclear who is responsible for certain parts of conservation, political confusion, gaps in responsibility
* **Lack of communication/collaboration** - between levels of government, other stakeholders, rightsholders, clients, a broader network of conservation practitioners not communicating or working together, relationships between people/groups/orgs.
* **Cost-effectiveness** - return on investment, what makes sense financially, risk assessments ($), trade-offs
* **Public buy-in/public perception/public support** - how the public views their work
* **Land Access** - will there be the possibility of access to land, concern about access/acceptability
* **Justice** - social movements (e.g., BLM, Land Back), environmental justice, EDI
* **Indigenous Rights/Sovereignty/Consultation**
* **OTHER - catch all for “other” right now, add description in ‘notes’**
  + **E.g.: Cumulative effects**

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## Q1 - Final Codebook

June 30, 2023

**RESOURCES**

* Resources\_Capacity – organizational resources and capacity
* Personnel – number of people (e.g., employees, volunteers)
* Expertise – expertise within the organization on a topic, practicioner knowledge/expertise/experience, lack of expertise in field crew, etc.
* Timelines - timeline of a project etc.

**FUNDING**

* Funding – any mention of funding (e.g., general funding, funding amount, length, availability, etc.)

**KNOWLEDGE/INFORMATION/DATA**

* Category for any kind of lack of data, insufficient data, needing more/different data, availability of data
* Data – a catch-all for data/without a specific type of data specified
* Species/Taxa – data about biota (e.g., invasive species, species at risk) such as population, impacts, etc.
* Long-term – no baseline data, insufficient information to know history of a site
* Site – location-specific data needs
* Impact – how will the impact (i.e., disturbance) affect ecosystem/species/etc.
* Methods – not enough information about a method

**EVIDENCE/ACTION**

* Access – access to evidence/data etc.
* Science - evidence/science/research
* Consensus – scientific/expert consensus, agreement between local knowledge and western knowledge
* Implementation – how to actually implement a method or similar
* Cumulative – cumulative or synergistic effects on a landscape
* Prediction – inability, uncertainty in prediction/modelling the response of an ecosystem/biodiversity to disturbance, mitigations, or interventions
* Success – effectiveness? what does success look like? what are the benefits of this action? What will this method/regulation etc. do?

**NATURE**

* Climate change – concerns about the effects of climate change
* Ecology – complexity of ecology
* Nature – anything related to nature (e.g., weather)

**GOVERNANCE**

* Politics - what the government is interested in, priorities of different governments that may influence conservation, political decision making, political choices/influence, political decisions not accounting for science/evidence
* Legislation & Policy - existing legislation that causes uncertainty, unclear regulatory requirements; uncertainty around interpretation of policy/laws/legislation, conflicting interests of adjacent land parcels, unclear regulatory requirements, policy not including evidence/science
* Indigenous Rights – sovereignty, consultation, frameworks for engagement, consent, collaboration, working with Nations, crown-nation interactions

**COMPLEXITY**

* Systems – complexity of socio-political-economic systems and their interaction with ecological systems, includes social systems, complexity of human and natural interactions
* Responsibilities - where policy, legislation, mandates make it unclear who is responsible for certain parts of conservation, political confusion, gaps in responsibility
* Comm\_Collab – communication or collaboration between levels of government, other stakeholders, rightsholders, clients, a broader network of conservation practitioners not communicating or working together, relationships between people/groups/orgs., competing interests
* Tradeoffs – risk assessments, trade-offs of political capital for a certain approach
* Costs - return on investment, what makes sense financially
* Justice - social movements (e.g., BLM, Land Back), environmental justice, EDI

**SUPPORT**

* Land access – land owners/stakeholders supporting land access, will they support conservation actions on their property, etc.
* Internal\_support – internal support within organization, organizational uncertainty, co-management bodies, administration/heirarchy
* External\_support – public/community/stakehoder etc. perception, media

**OTHER**

* Answers that don’t fit into one of the categories above

## Q1 - Final Codebook – Themes from Christine

September 18, 2023

**RESOURCES**

* Resources\_Capacity – organizational resources and capacity
* Personnel – number of people (e.g., employees, volunteers)
* Expertise – expertise within the organization on a topic, practicioner knowledge/expertise/experience, lack of expertise in field crew, etc.
* Timelines - timeline of a project etc.
* Funding – any mention of funding (e.g., general funding, funding amount, length, availability, etc.)

**KNOWLEDGE/INFORMATION/DATA**

* Category for any kind of lack of data, insufficient data, needing more/different data, availability of data
* Data – a catch-all for data/without a specific type of data specified
* Species/Taxa – data about biota (e.g., invasive species, species at risk) such as population, impacts, etc.
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* Impact – how will the impact (i.e., disturbance) affect ecosystem/species/etc.
* Methods – not enough information about a method

**EVIDENCE/ACTION**

* Access – access to evidence/data etc.
* Science - evidence/science/research
* Consensus – scientific/expert consensus, agreement between local knowledge and western knowledge
* Implementation – how to actually implement a method or similar
* Cumulative – cumulative or synergistic effects on a landscape
* Prediction – inability, uncertainty in prediction/modelling the response of an ecosystem/biodiversity to disturbance, mitigations, or interventions
* Success – effectiveness? what does success look like? what are the benefits of this action? What will this method/regulation etc. do?

**ECOLOGICAL COMPLEXITY**

* Climate change – concerns about the effects of climate change
* Ecology – complexity of ecology
* Nature – anything related to nature (e.g., weather)

**GOVERNANCE**

* Politics - what the government is interested in, priorities of different governments that may influence conservation, political decision making, political choices/influence, political decisions not accounting for science/evidence
* Legislation & Policy - existing legislation that causes uncertainty, unclear regulatory requirements; uncertainty around interpretation of policy/laws/legislation, conflicting interests of adjacent land parcels, unclear regulatory requirements, policy not including evidence/science
* Indigenous Rights – sovereignty, consultation, frameworks for engagement, consent, collaboration, working with Nations, crown-nation interactions
* Internal\_support – internal support within organization, organizational uncertainty, co-management bodies, administration/heirarchy

**SOCIAL COMPLEXITY**

* Systems – complexity of socio-political-economic systems and their interaction with ecological systems, includes social systems, complexity of human and natural interactions
* Responsibilities - where policy, legislation, mandates make it unclear who is responsible for certain parts of conservation, political confusion, gaps in responsibility
* Comm\_Collab – communication or collaboration between levels of government, other stakeholders, rightsholders, clients, a broader network of conservation practitioners not communicating or working together, relationships between people/groups/orgs., competing interests
* Tradeoffs – risk assessments, trade-offs of political capital for a certain approach
* Costs - return on investment, what makes sense financially
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**SUPPORT**

* Land access – land owners/stakeholders supporting land access, will they support conservation actions on their property, etc.
* External\_support – public/community/stakehoder etc. perception, media

**OTHER**

* Answers that don’t fit into one of the categories above

**Notes**

* If someone said “regulatory review” by DFO etc., I put it as “internal support” aka support from someone they are working with.

## **Question 1: Example quotes**

**Rank 1**

Legislation – “Policy scope missing the scientifically relevant parameters in the assessment entirely” (rank1)

Internal Support - “support and follow-through from senior management to defend and implement actions resulting from decisions” (rank1)

Responsibilities – “Authority. which layer of government is most responsible and has most authority to achieve conservation” (rank1)

Politics = Federal, provincial policy dynamics. Legislative policy change often happens without adequate consultation with ENGOs or concerned stakeholders. Industry lobbying can be decisive and non-transparent, as is likely evident in a recent decision to reverse previous rules around neonicotinoids in Canada.

Legislation – “Policies of adjacent land jurisdictions (provincial government)” (rank1)

Legislation – “Regulatory requirements - regulatory agencies are vague in expectations opting to provide vague answers to question to ensure they are not perceived to be directing you and retain the ability to lay charges if an infraction occurs.” (rank1)

COMMCOLLAB – “Client pressures”

Politics – “Political decisions regarding conservation being made based upon social/political vs scientific reasoning.”

Tradeoff – “conservation being prioritized ahead of economics”

Data – “if the sample size we can budget is adequate to detect status and trends”

Success criteria - “The biological benefits (biodiversity, carbon sequestration) of conserving areas that are not well studied”

Success criteria – “Regulation performance. Implementing a fisheries management action (e.g., change to size limit, quota, season, etc.) and whether there is a measurable effect.”

Implementation – “Uncertainty about the need for action”

**Rank 2**

Legislation – “Red tape/bureaucracy”

Success – “Is doing this better than me doing nothing (and maintaining the status quo)?”

Tradeoff – “Short and long-term economic implications”

Prediction – “uncertainty about the response of a species to the intervention”

Politics – “political changes - politicians re-organizing government at every election, their biases or personal preferences, economic decisions over ecological”

Politics - “Not making decisions based on evidence, but rather opinion or fear”

Legislation - “setting legal or policy precedence in areas of shared or complex jurisdictional authorities”

OTHER – project scope – “Project scope missing the budget or timelines to allow for monitoring resolution of relevant parameters”

Success – “Uncertainty in the effectiveness in management actions to avoid, mitigate or compensate for impacts of human activities”

Resource/Capacity – “Organizational inability to take appropriate action once needed action is clear.”

Systems - Cost of Living Crisis

Success – “Effectiveness of avoidance, mitigation and offset measures.”

Resources/Capacity – “Changing human dimensions (e.g. bringing new leaders up to speed and constantly adjusting for different personalities/working styles) within my own organization.”

Timeline – Data – “short data collection timelines (collecting info may not occur over a long enough timeframe) Often just a constraint imposed by project owners.”

Data & Access – “Often there is a lack of information of the ecosystem, resources don't exist to gather the information to make an informed decision or there's a lack of access to the scientific literature without paying large fees.”

Communication/Collaboration – “Cooperation between "competing" conservation organizations and individuals”

Data– “most current science”

Implementation – “how our restoration work will be treated by other land users (will it be vandalized, will there be enforcement, will people complain about it)”

Internal Support – “The willingness of conservation partners to conserve areas permanently”

Legislation – “policy interpretation by multiple agencies”

Implementation – “Potential harm of implementing BMP for non-target species”

Communication/Collaboration – “Regulators treating restoration work the same way that they would treat development proposals....assuming damage rather than considering improvement.”

Rank 3

Methods – “Technology and its ability to fill stewardship needs/conservation gaps”

Success – “Effectiveness - Is the management decision going to be more effective than other decisions I could make.”

Data –“ Use of standard datasets that represent "the best available" in all decision making around a certain topic or theme in conservation ie: governments not wanting to use third party data that will provide them more details about the decision they are trying to make)”

Comm/Collab – “Social: Lack agreement among parties or groups involved in the decision process about what the uncertainty is”

Funding - having funds in hand is the optimal approach to be strategic, and take advantage of opportunities. The uncertainty of grant applications, and convincing landowners to agree to contracts before these outcomes are known reduces flexibility

Cumulative – “What is the appropriate "balance" of resource use (forestry, industry) and conservation on a landscape and how to make that transition equitably”

Science & Implementation – “Failure of science to inform management decisions”

Responsibilities – “Appropriate organization to undertake the work”

Internal support – “Project team rejecting prescribed mitigation and enhancement for identified impacts”

Internal support – “Lack of clarity about my own organization's decision-making hierarchy”

Indigenous rights – “Political reconciliation versus natural needs.. how can the little remaining old growth, resource and reforested lands be provided for reconciliation with first nations without set asides for conservation?”

Site – “local or regional-specific data”

Cumulative & Methods – “Unclear whether conservation practices (many of which focus on particular species and their habitats) appropriately address scope of problems and complexity of natural systems”

Consensus – “When knowledge from hunting/fishing guides directly competes with scientific ideas”

Prediction/Cumulative/Climate Change - “There is no mechanism to account for the uncertainty of models, natural variability, climate change to evaluate residual impacts of projects used to set management threshholds and not having a mechanism to actively assess and adapt management decisions if the effects are greater than expected.”

Data/Implementation – “Uncertainty that the proposed monitoring can detect significant impacts in a timely manner, and that corrective actions can/will be taken”

Internal support – “regulatory processes / assessment outcomes (sometimes related to timeline, somethimes related to what may be agreed to or approved)”

Success – “Uncertainty related to effectiveness of decisions - need for follow up (though depending on the species/ conservation action - outcomes may not be clear for a long time. Long-term planning to follow up is required. Staff turnover is a potential issue.”

Data – “Insufiecient effort put into collecting required data - ruled by budgets rather than quality data needs”

Data – “Uncertainty in the most effective conservation actions to address those threats”

LandAccess – “Private Landowner Stewardship - as much of the land in the area is privately owned (mostly agriculture), the responsibility to protect and conserve natural features ultimately come down to landowner decisions.”

Success – “Changing work deliverables based on species status”

Science – “Lack of research on a given topic of conservation”

Rank 4

Consensus – “Disagreement between the findings of scientists/wildlife biologists and "local knowledge", which may be dealing with observations at very different spatial and temporal scales.”

Data – “Harvest rates for various species with unreported harvest (e.g. First Nation harvest)”

Success - :” uncertainty about what ultimate (root) goal/outcome is actually desired...”

Politics – “Federal and provincial political volatilty”

Science – “enough research available to inform decision”

Implementation - :” Regulators failing to apply the rules that apply teeth to prescribed mitigation and enhancement (regulators stop caring once approval is given and especially fees are paid glorified collection agencies with stall tactics on the front end very little science”

Politics – “Political uncertainties affecting legislation, policies, regulations, and the minutia of behind the scenes protocols in place to protect and maintain biodiversity.”

External support – “Public perception of conservation. Environmental protection and conservation is still considered a niche or luxury action by Canadians, and as socioeconomic shifts occur, the ability to rally support for important conservation actions also changes unpredictably”

Cumulative – “Our decision-making processes apply to individual project impacts and do not consider ecosystem or conservation objectives established through other processes and mechanisms. We typically rely on other authorities to prohibit projects when the status reaches a critical or high risk state.”

Success – “Future viability of target species (will our effort be worthwhile or is it destined to fail)”

Tradeoff – “Conflicting needs for species-specific actions. One species might need tall grass, another species might need short grass”

Rank 5

Tradeoff – “conservation value factors. not all land can be restored and then become worthy of conservation.”

Longterm AND Success – “lack of monitoring to confirm if restoration fulfilled design goals”

Success – “With the potential for catastrophic habitat effects of anthropogenic influences will any of this matter.”

Success – “Potential benefit of implementing BMP for impacted species”

# Question 9: In your opinion, what actions or changes would reduce the degree of uncertainty you experience in your conservation decision-making process?

Verbatim > First codes (unique codes) > Second code (common codes) > Third code (theme)

## Emerging Common Codes

|  |  |
| --- | --- |
| Common Code (second code) | Notes |
| Improved funding process |  |
| Better access to funding |  |
| Long-term funding |  |
| Increased funding |  |
| Funding for data/evidence |  |
| Funding for resources |  |
| Secure/stable funding |  |
| Funding (non specific) |  |
| Long-term datasets |  |
| Standardized datasets |  |
| Collaborative data creation |  |
| Improved data sharing |  |
| More data/evidence/research |  |
| Better data management |  |
| Access to data/research/evidence |  |
| Evidence synthesis |  |
| Evidence-based approaches |  |
| Evidence-based decision-making |  |
| Decision-support processes |  |
| Transparency in decision-making |  |
| Addressing biases |  |
| Follow-up/evaluation of decisions/outcomes |  |
| Reduced political oversight/influence |  |
| Leadership/politicians understanding evidence |  |
| New technology |  |
| Better acceptance/documentation of uncertainty |  |
| Accountability |  |
| Improved public engagement/education |  |
| Clear goals and priorities |  |
| Longer-term actions | Longer-term action and clear timelines could potentially merged as timelines and then your description of the code could have both elements if you want to call upon them when describing the results. It depends on how granular you want to be with your codes. For a figure for example as you saw it can be tricky to fit everything in, so if you want to merge some and then you can include some elements if you described the codes.   The paper with the data I showed you came out this summer, <https://www.tandfonline.com/doi/full/10.1080/13549839.2023.2238750>  you can see how the results are organized and how we described the overarching themes using the codes nested within |
| Clear timelines |  |
| Stable government priorities/long-term policies |  |
| Government prioritizing conservation |  |
| Conservation prioritized in all levels of decision-making |  |
| More autonomy/empowerment | more autonomy/empowerment for whom? I think it could go in collab and engagement OR quality of governance process depending on what was coded here |
| Clear communication |  |
| Socio-economic revolution |  |
| Processes for collaboration/communication |  |
| Willingness to act |  |
| Science-politic collaboration |  |
| Meaningful action | suggest merging with meaningful climate actions |
| Better internal communication/collaboration |  |
| External collaboration/communication |  |
| Capacity/resources for projects/data collection |  |
| Social and political will |  |
| Clear jurisdictions |  |
| Meaningful climate action |  |
| Accepting risks/incentivizing conservation action |  |
| Clarity around policies and legislation |  |
| Better/stronger conservation policies |  |

**Question 9 Codes**

**Resources**

* Improved funding process
* Better access to funding
* Long-term funding
* Increased funding
* Funding for data/evidence
* Funding for resources
* Secure/stable funding
* Funding (non specific)
* Capacity/resources for projects/data collection
* Autonomy within a budget/with resources

**Data and Evidence**

* Long-term datasets
* Standardized datasets
* Collaborative data creation
* Improved data sharing
* More data/evidence/research
  + Also includes training
* Better data management
* Access to data/research/evidence
* Evidence synthesis

**Use of Data and Evidence**

* Evidence-based decision-making
* Decision-support processes
* Addressing biases
* Follow-up/evaluation of decisions/outcomes
* Accepting risks/incentivizing conservation action
  + Risk management approach in your description of the codes around risk and uncertainty
* Evidence-based approaches
* Better acceptance/documentation of uncertainty

**Quality of Governance Processes**

* Transparency in decision-making
* Reduced political oversight/influence
* Leadership/politicians understanding evidence
* Accountability
* Clarity around policies and legislation
* Clear jurisdictions
* Government support
  + Research and policy
* Shift in governance/management
* More autonomy/empowerment

**Collaboration and Engagement**

* Improved public engagement/education
* Clear communication
* Processes for collaboration/communication
  + Including integration/coordination
* Science-politic collaboration
* Better internal communication/collaboration
* External collaboration/communication

**Priorities**

* Clear goals and priorities
* Longer-term actions
* Clear timelines
  + Longer-term action and clear timelines could potentially merged as timelines and then your description of the code could have both elements if you want to call upon them when describing the results
* Stable government priorities/long-term policies
* Government prioritizing conservation
* Conservation prioritized in all levels of decision-making
* Meaningful climate action
* Better/stronger conservation policies
* Social and political will
* Willingness to act

**External Factors**

* New technology
* Socio-economic revolution

Notes:

* More autonomy under a budget