

Introduction: Municipal Natural Assets Initiative

AIM Network Asset Management Conference
SEPTEMBER 15 2016



Overview of presentation

- 1) A municipal perspective (Emanuel Machado, CAO, Gibsons)
- 2) Methodology (Michelle Molnar, David Suzuki Foundation)
- 3) Scale-up (Roy Brooke – Municipal Natural Assets Initiative)

Part 1: Gibsons, BC

Nature:

A fundamental
component of
infrastructure
systems



Ecosystem & infrastructure services

Many Town services are delivered by nature:

Gibsons Aquifer

✓ Drinking water storage and filtration

Creeks, Woodlands, Soil

✓ Rainwater storage, treatment and conveyance

Foreshore Area

✓ Natural seawall protects people and property



Asset management in Gibsons

We have a revised practice that integrates nature into our decision making, using principles of:

- Asset Management
 - ✓ Core business. Experienced staff. Tools.
- Financial Planning
 - ✓ Risk and Liability. Valuation. Funding.
- Ecology
 - ✓ Conditions. Services. Best Practices.

Challenges and opportunities

Nature is...

- Under-valued, under-priced, over-used
 - ✓ Taken for granted, lack of metrics, environmental impact
- Infrastructure is decaying faster that we can afford to replace it
 - ✓ Canadian infrastructure worth \$538B
 - ✓ ~30% in poor condition
 - ✓ Lack of reliable funding
- Nature knows no boundaries

Infrastructure: a blend

... Of interdependant natural and built assets

With this understanding, in 2014, the Town deemed nature to be its most valuable asset:

- Redefined Infrastructure: to include inheritance of Natural Capital (NC)
 - ✓ Official Community Plan
 - ✓ Strategic Plan
 - ✓ Operational Plans
- New Policy – June 2014
 - ✓ Created new type(s) of assets
 - ✓ Natural / Biomimicry / Engineered
 - ✓ Distributed responsibility and allocated budget

Defining our approach

Natural capital: “Features in the natural environment that provide or support equivalent engineered municipal services”

- Town of Gibsons Asset Management Policy, 2014

Financial planning & valuation

How do we represent value in financial statements? Conventional assets worth \$47M, but natural assets such as aquifers, creeks and forests not listed (yet!)

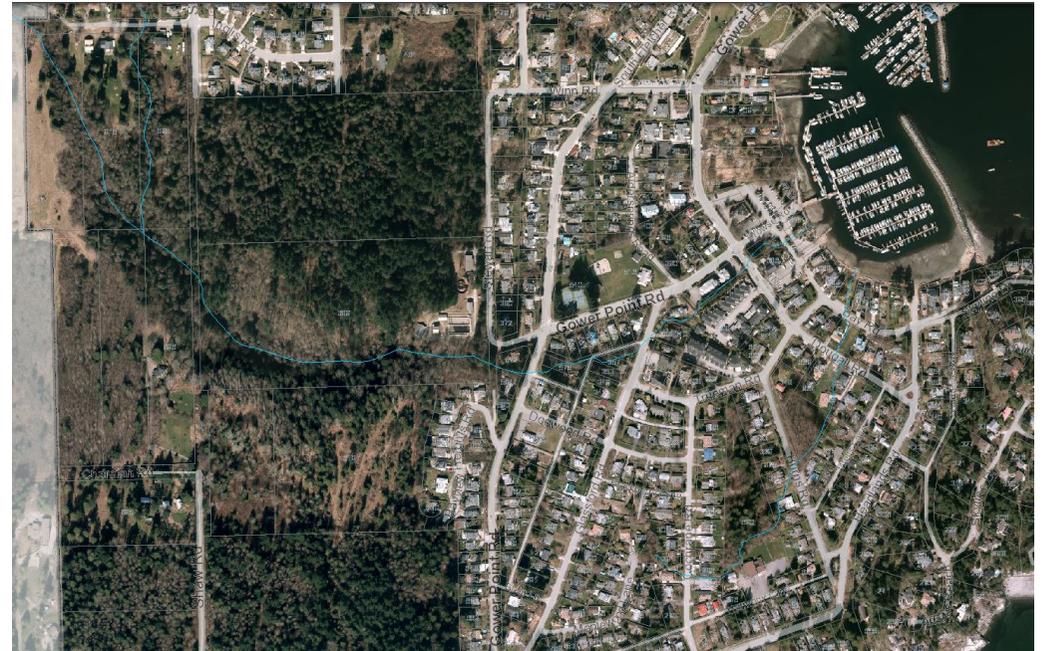
Natural Capital has advantages:

- ✓ No upfront, replacement or depreciation costs
- ✓ Carbon neutral, or even carbon-positive (carbon storage)
- ✓ Lower operating costs – Aquifer / Ponds
- ✓ Can last in perpetuity, if properly maintained
- ✓ Multi-purpose



Risk: can we afford not to maintain nature?

- ✓ Older assets struggle with changing weather; natural infrastructure can be more resilient
- ✓ Provision of drinking water: storage and filtration left to nature.
- ✓ Impacts of asset failure: loss of life, property damage, business interruption
- ✓ Impacts of replacement or major repairs
- ✓ Do we have the funds to replace with engineered option?



Gibsons' goal

To have infrastructure assets that are the:

- Most Natural
- Most Reliable
- Most Cost Effective
- Most Energy Efficient

Over the long term asset life cycle...

Part 2: Methodology

- The MNAI Stormwater Module guided by existing asset management questions & existing ecosystem service models.
- **Focus:** replicable, scalable and adaptable.
- **Core team** : economist, hydrologist, engineer, GIS analyst, hydrologic modeler, programmer
- Developed 2-step approach to include natural assets in asset management



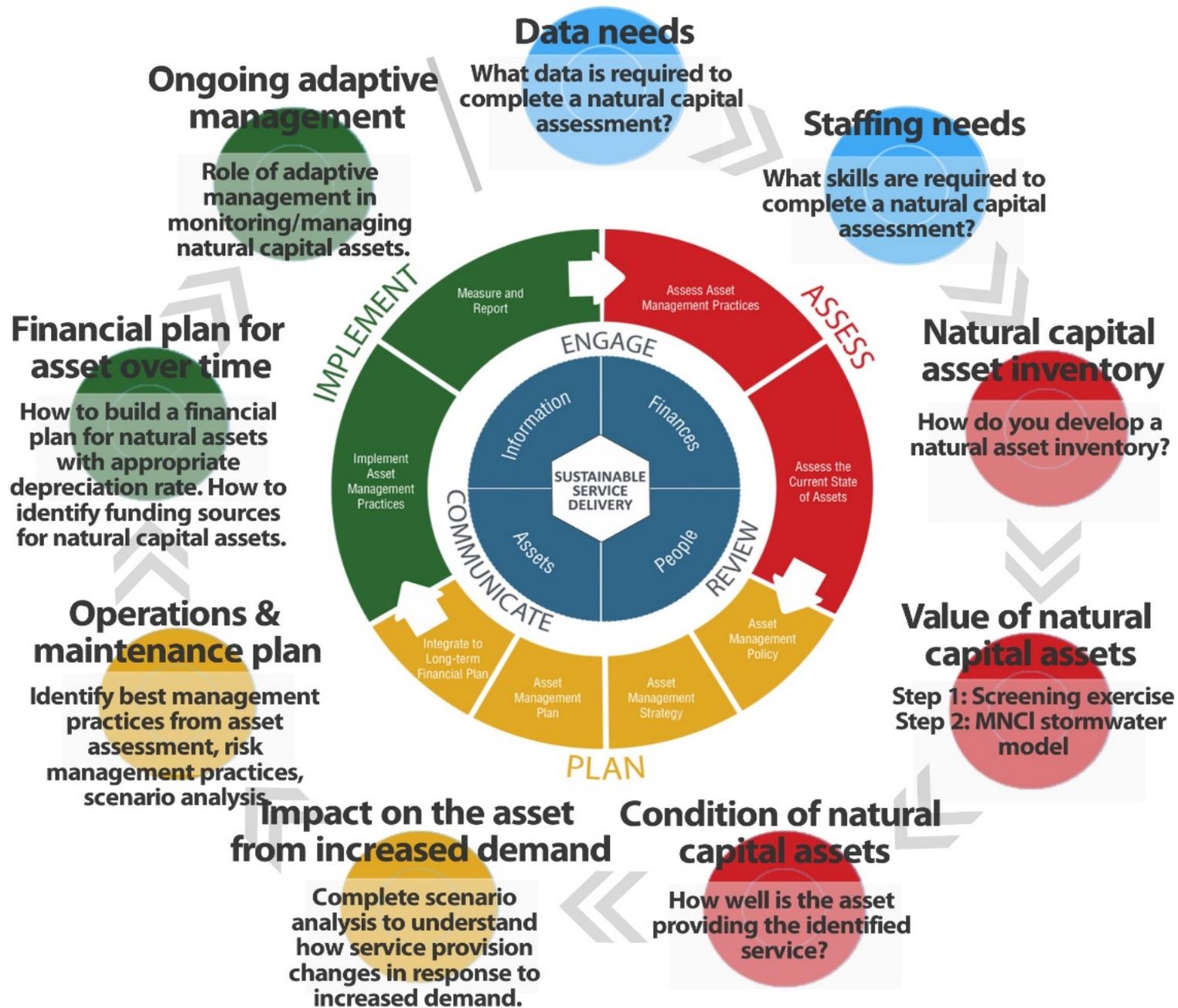
EPA SWMM



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Steps to integrate natural capital into asset management



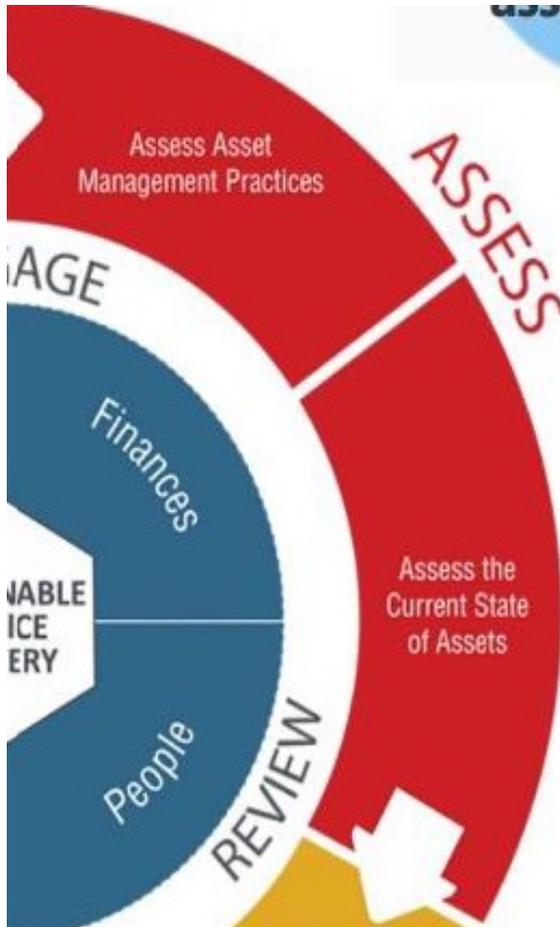
Questions related to the Assess stage

Natural capital asset inventory

How do you develop a natural asset inventory?

What is your natural asset inventory?

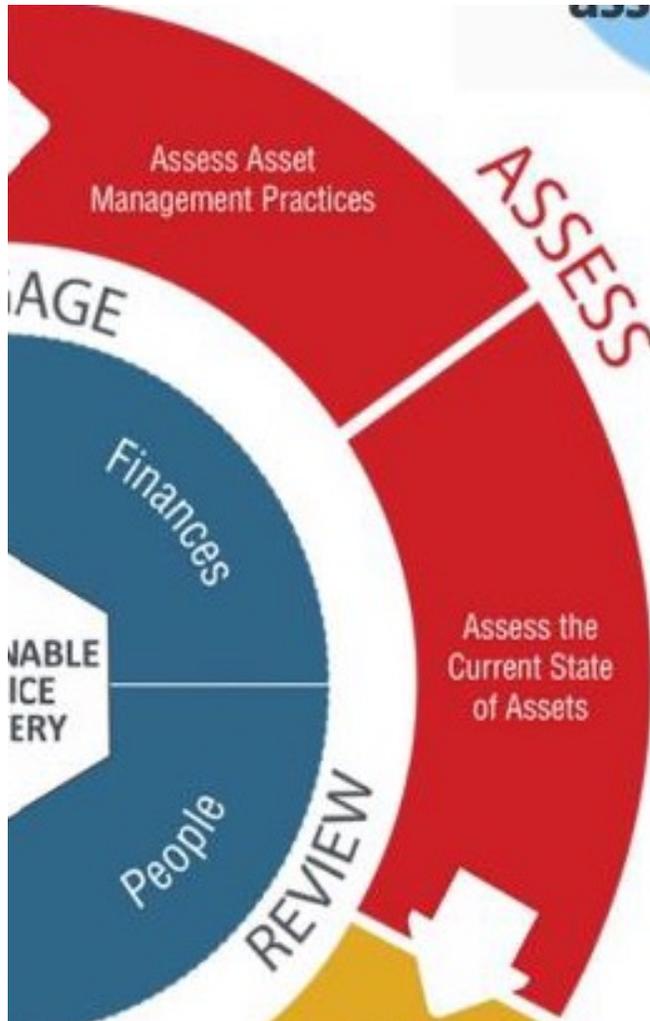
- Identify significant environmental components in community
- Ask what natural assets provide municipal services that are comparable to or enhance engineered infrastructure
- Prioritize according to local context



Questions related to the Assess stage

Value of natural capital assets

Step 1: Screening exercise
Step 2: MNCI stormwater model



What is the value of your natural assets?

Step 1: complete screening exercise to give macro view of asset

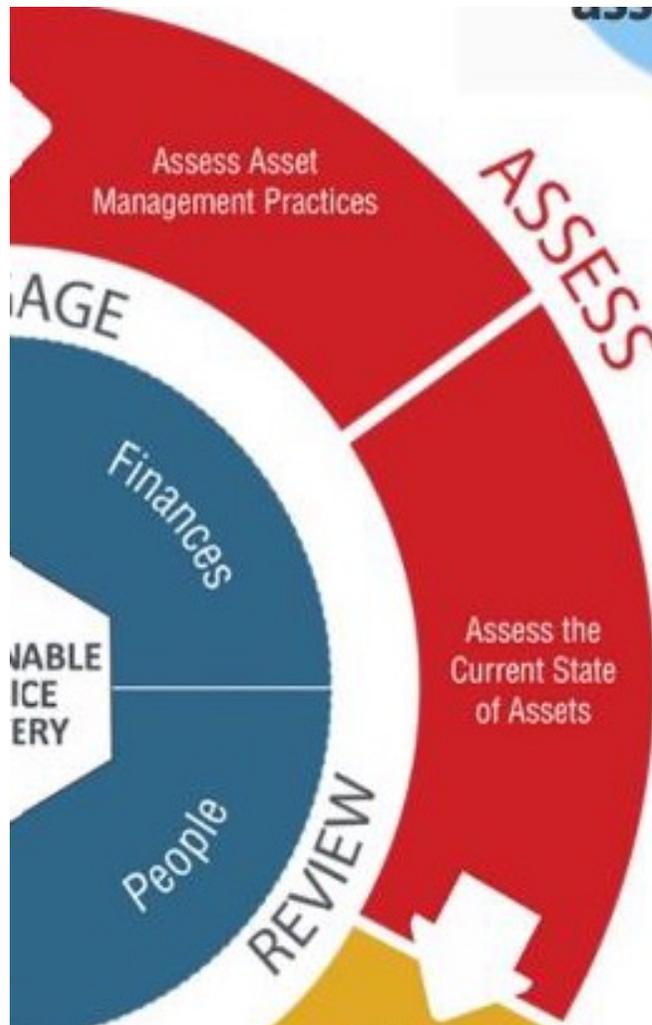
Step 2: complete municipal stormwater module to get biophysical, monetary metrics for asset management plan

Note: values arrived at only signify the economic infrastructure-related values of nature

How well is the asset providing the identified service?

What is the condition of the natural asset?

- How well is asset providing identified service; can it be improved?
- Risk assessed here and interconnections with other components of the environment



Questions related to the Plan stage

Impact on the asset from increased demand

Complete scenario analysis to understand how service provision changes in response to increased demand.

What is the impact on natural asset from increased demand?

- Complete scenario analysis to determine how provision of services shifts with changes in land use and/or management policies.



Questions related to the Plan stage

Operations & maintenance plan

Identify best management practices from asset assessment, risk management practices, scenario analysis.



What is operation & maintenance plan?

Most work going into developing model inputs should feed into operation & maintenance plan.

- In assessing the condition of an asset, a set of best management practices, restoration options, and monitor plans is developed
- In running scenarios, insights will be gained into risk management practices

Questions for the implementation stage

Financial plan for asset over time

How to build a financial plan for natural assets with appropriate depreciation rate. How to identify funding sources for natural capital assets.

Managing natural assets.



What is the financial plan to operate, maintain and replace your asset over time?

The municipality should now have some of the key pieces of information to complete a financial plan.

- They will have the capital cost of the asset.
- They will have maintenance & monitoring costs associated with improving and maintaining the asset,
- And they will understand the marginal change in service provision based upon scenario analysis.

Part 3: Scale up through MNAI

Moving from:

- Natural assets assessed case by case, service by service, if at all
- Approaches hard to replicate
- Lack of structured approach to assets and/or understanding of natural capital role

Opportunity:

- Increasingly standard, common methodology that includes natural assets:
- Ease of replication
- Lower risk & costs, better decision-making



Evolution of MNAI

Phase 1: (complete). Stakeholder consultation/engagement.

- Provided multi-stakeholder validation and input

Phase 2: (underway). April 2016 start to December 2017

- 5 municipal pilot projects: City of Grand Forks; City of Nanaimo; District of West Vancouver; Region of Peel; Town of Oakville
- Initial focus: stormwater & related issues
 - Guidance material
 - Kick-off workshop, regular check-ins, help-desk function throughout
 - Research on issues identified in Phase 1
 - Coordination across pilots to ensure common approach
 - End of pilot: understanding of assets, condition, value; planning scenarios, operations and maintenance plans, financial plans
- Phase 3: wider scale up (2018+)?

Pilots

- City of Grand Forks, BC
- Region of Peel, ON
- Town of Oakville, ON
- City of Nanaimo, BC
- District of West Vancouver, BC

Discussions on the scope of work for all pilots are ongoing and therefore subject to change and confirmation.

City of Grand Forks, BC pilot

- *Scenario: City in interior BC wants holistic water management approach (including for flooding, drinking water protection)*
- **Site & natural asset:** Oxbow wetland in center of Grand Forks, including wetland, forest areas, soils within catchment, channels
- **Services:** maintaining water quality to aquifer & fish-bearing streams; water storage; limiting localised flooding
- **Proposed project scenarios**
 - Climate change, including seasonal drought and flooding
 - Land intensification in current green/open spaces
 - Role of Low Impact Development in reducing drainage issues
- **Possible outcomes**
 - Management options to minimise flooding and drought
 - Business case to support land acquisition decision-making
 - Basis to engage local population in management of natural assets
 - Costed Operations and Maintenance plan

Region of Peel, ON pilot

- **Scenario:** Pilot focuses on Region of Peel's Credit River watershed; approximately 1000km² with 22 sub-watersheds and 1500 tributaries.
- **Site & natural assets:** Natural assets (wetlands, forests and grasslands) within 2 sub-watersheds in Credit River Watershed are likely sites of interest (1 urban, 1 rural)
- **Services:** mitigation of risks from increased flooding in local area and downstream; addressing degraded water quality and reduced flow.
- **Proposed project scenarios:**
 - Current conditions
 - Climate Change scenarios
 - Natural system management/enhancement scenarios
- **Possible outcomes:**
 - Determine value of services provided by natural assets in avoiding flooding/erosion and maintaining clean water and baseflow
 - Identification of potential management options to maximize the above services
 - Assessed impact of climate change trends on the natural assets and the services they provide
 - Operations and maintenance costs associated with the management options associated with the natural assets for each selected scenario

Town of Oakville, ON

- *Scenario: In Oakville intensification of land use may take some natural assets out of service & increase pressure on storm water system.*
- **Site and natural assets:** Wellington Weir area in established part of Oakville; public and private streams, ditches, open spaces.
- **Services:** Improving water quality; managing/limiting water quantity; limiting local flooding.
- **Proposed project scenarios:**
 - Climate change scenarios (current versus projected)
 - Level of land-use intensification
- **Possible project outcomes:**
 - *Understanding management options to maximise value of municipally-owned remnant streams / other natural features in pilot area.*
 - *Understanding of how costing services from privately held natural assets could enhance / support collaborative decision-making and/or development of partnership tools.*

City of Nanaimo, BC pilot

- *Scenario: City wants to maximize services from 54 HA reclaimed wetland/floodplain in center of Nanaimo, BC.*
- **Site and natural assets:** Entire marsh and channels and adjacent forest in sub-watershed.
- **Services:** Ensuring water quality; managing quantity; limiting localized and downstream flooding; managing marsh storage capacity; biodiversity as draw for residents. Capacity to moderate impacts from extreme storm events in future.
- **Proposed project scenarios**
 - Potential climate change impacts: how resilient is marsh to future storm events?
- **Potential outcomes:**
 - Management options to minimize localized and downstream flooding
 - Possible justification for future capital expenditures
 - Operations and maintenance plan to maximize value of services in the wetland

District of West Vancouver, BC

- *Scenario: The District of West Vancouver wants to determine risk/financial implications of daylighting a creek.*
- **Site and natural assets:** Vinson Creek, East Branch. Originates near Upper Levels Highway, discharges into Burrard Inlet. Creek is 3.74 km² and 5.99 km long. Assets include creek, riparian area, surrounding green space
- **Services:** Potential services include reducing peak flows and improving water quality; social benefits to the community may also apply.
- **Proposed project scenarios:**
 - Status quo versus daylighting – costs and risks for doing each.
- **Possible project outcomes:**
 - Rationale (both economic and risk) for shedding engineered assets associated with buried creeks
 - Model or method for valuing daylighting that can be applied in other communities

What can I do now?

1. Get on mailing list to stay abreast
2. Start initial thinking of nature as asset:
 - what are the natural assets in my community and what services do they provide?
 - What role do natural assets play in key priorities e.g. ISWMP?
 - What condition are my natural assets in?
 - What are potential management objectives for identified natural assets?
 - How could we operate / maintain asset, what would this cost and how could I link this into financial plans?
 - Consider a natural asset policy / directive
3. Work through pre-audit package (once available)

Information

- DOCUMENTS: <http://tinyurl.com/hbmffc9>
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