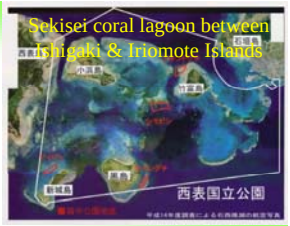
Guideline for nature restoration projects.



- **Committee on Ecosystem Management of The Ecological Society of Japan* (2005) Japanese Journal of Conservation Ecology 10: 63-75 with English abstract**
- *Hiroyuki MATSUDA, Tetsukazu YAHARA, Yasuhiro TAKEMON, Yoshio HADA, Mariko HASEGAWA, Kazumasa HIDAKA, Stefan HOTES, Yasuro KADONO, Mahito KAMADA, Fusayuki KANDA, Makoto KATO, Hidenobu KUNII, Hiroshi MUKAI, Okimasa MURAKAMI, Nobukazu NAKAGOSHI, Futoshi NAKAMURA, Kaneyuki NAKANE, Miho Ajima NISHIHIRO, Jun NISHIHIRO, Toshiyuki SATO, Masakazu SHIMADA, Hinako SHIOSAKA, Noriko TAKAMURA, Noriko TAMURA, Kenichi TATSUKAWA, Yoshitaka TSUBAKI, Satoshi TSUDA, Izumi WASHITANI

1

http://wwwsoc.nii.ac.jp/esj/J_CbnJJCE/EMCreport05e.html

http://www.epa.gov/owow/wetlands/restore/principles.html

U.S. Environmental Protection Agency

River Corridor and Wetland Restoration

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EPA Home > Water > Wetlands, Oceans and Watersheds > Wetlands > River Corridor and Wetland Restoration > Principles for the Ecological Restoration of Aquatic Resources

Bi-Weekly Update
ORD/MAIA Inventory
Restoration Principles

Principles for the Ecological Restoration of Aquatic Resources

Restoration Guiding Principles	
Preserve and protect aquatic resources	Use reference sites
Restore ecological integrity	Anticipate future changes
Restore natural structure	Involve a multi-disciplinary team
Restore natural function	Design for self-sustainability
Work within the watershed/landscape context	Use passive restoration, when appropriate
Understand the potential of the watershed	Restore native species, avoid non-native species
Address ongoing causes of degradation	Use natural fixes and bioengineering
Develop clear, achievable and measurable goals	Monitor and adapt where changes are necessary
Focus on feasibility	

2

http://www.eman-rese.ca/eman/reports/publications/rt_biostrat/

CANADIAN BIODIVERSITY STRATEGY (1994)

The Strategy has five goals, which are:

- To conserve biodiversity and sustainably use biological resources;
- To enhance both our understanding of ecosystems and our resource management capability;
- To promote an understanding of the need to conserve biodiversity and sustainably use biological resources;
- To provide incentives and legislation that support the conservation of biodiversity and the sustainable use of biological resources; and
- To work with other countries to conserve biodiversity, use biological resources sustainably and share equitably the benefits that arise from the utilization of genetic resources.

3

http://www.eman-rese.ca/eman/reports/publications/rt_biostrat/

The Strategy also describes a series of mechanisms for implementing the Canadian Biodiversity Strategy, including:

- reporting by all jurisdictions, within one year of its approval, on their policies, priorities and on any plans or actions that are underway or will be undertaken to implement the Strategy;
- co-ordinating the implementation of national and international elements of the Strategy;
- ensuring that there are mechanisms that permit and encourage non-government participation in the implementation of the Strategy; and
- reporting on the status of biodiversity through state-of-the-environment reports or other mechanisms.

4

http://www.epa.gov/osa/ratf.htm

see: U.S. EPA (2004) An Examination of EPA Risk Assessment Principles and Practices. pp.1-192

What is environmental risk assessment?

- a process in which information is analyzed to determine if an environmental hazard might cause harm to exposed persons and ecosystems.
- Environmental decision making is often a controversial process involving the interplay among many forces: .
- Risk assessment informs decision makers about the science implications of the risk in question.
- the principle of “plausible conservatism”

12 laws of ecosystem approach

Nairobi correspondence at CBD 2000 CoP5

1. **Society will select the management goal**
2. **Decentralization of management**
3. **Think multi piled effect to other ecosystems**
4. **Management by economic sentence**
5. **Conservation form and function of ecosystem**
6. **Management at a limit of ecosystem function**
7. **Working on desirable time and space**
8. **Setting goal is from long-term perspective**
9. **Knowing change is unavoidable**
10. **Balance of conservation and usage**
11. **Entertain scientific, traditional and regional knowledge**
12. **Include related fields of social and natural science**

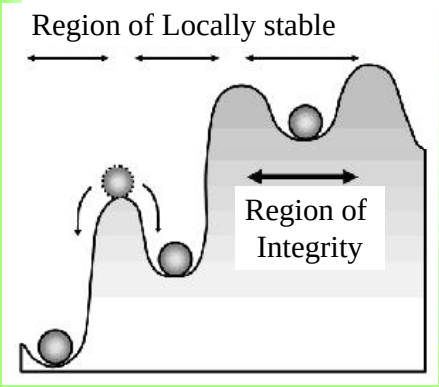
■ **5 operational guidance（abridged copy）**

Guide2 Implementation for equity allocation of benefit

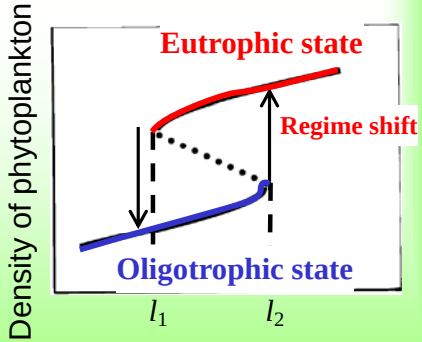
Guide3 Application of practicing of optimal management

Guide5 Save a mutually combination of sector

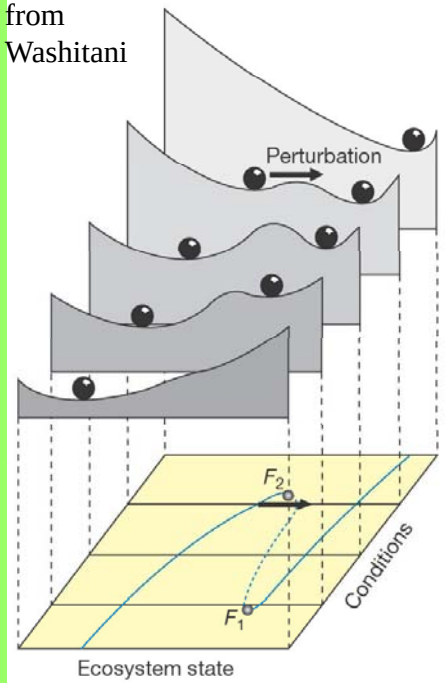
Resilience



The state of ecosystem

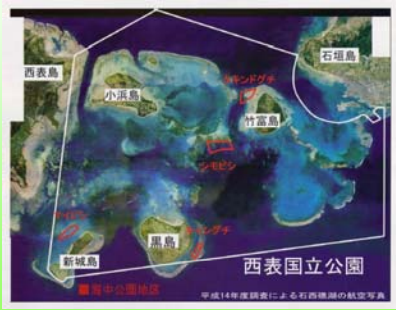


from Washitani



Targets that should be conserved:

1. **Species and their habitats**
2. **Community structure and interspecific relationships**
3. **Ecosystem functions**
4. **Relationships between ecosystems**
5. **Sustainable relationships between humans and nature**



http://wwwsoc.nii.ac.jp/esj/J_CbnJJCE/EMCreport05e.html

Clarification of the baseline


Damage on natural vegetation by deer in Yakushima World Heritage

6. Investigate the current situation of flora, fauna and habitats,
7. Project the future development under the assumption that no action is taken,
8. Clarify the characteristics of the ecosystem that is to be restored,
9. Consider the extent to which natural succession should be controlled.

http://wwwsoc.nii.ac.jp/esj/J_CbnJJCE/EMCreport05e.html

Principles for nature restoration projects


Nakaikemi wetland

10. principle of conserving regional races
11. principle of conserving species diversity
12. principle of conserving genetic variability
13. principle of natural recovery (passive restoration)
14. principle of multidisciplinary cooperation
15. principle of respect for traditions
16. principle of feasible goals

http://wwwsoc.nii.ac.jp/esj/J_CbnJJCE/EMCreport05e.html

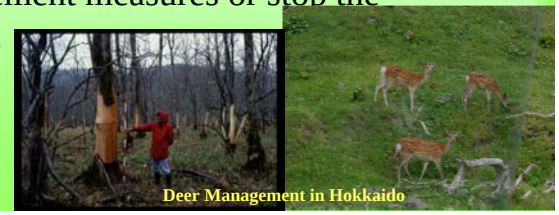
13. Principle of passive restoration

- Rely on natural recovery wherever possible, and avoid interference with natural processes. Unnecessary action based on lack of understanding ecosystem “homeostasis” often loses resilience. We should try to remove factors that prevent autonomous restoration of ecosystems. If a large interference with natural processes is impossible, long-term smaller interferences often result better outcomes than a short-term larger interference.

http://wwwsoc.nii.ac.jp/esj/J_CbnJJCE/EMCreport05e.html

Adaptive management

17. Ensure the transparency of the project process
18. Employ the precautionary principle to avoid irreversible damage to ecosystems.
19. Set a concrete target to be evaluated in the future.
20. Indicate the degree of uncertainty
21. Test the hypotheses and adapt management measures through monitoring,
22. Improve management measures or stop the project if wrong



Deer Management in Hokkaido

Guideline for Nature Restoration Projects by ESJ/EMC

18.Employ the precautionary principle to avoid irreversible damage to ecosystems.

- If irreversible damage is expected under no management actions, lack of full scientific certainty should not be used as a reason to postpone a nature-restoration project.
- Irreversible damage that might occur under a nature-restoration project should be avoided even lack of full scientific certainty
- Precautionary measures is needed and should be wisely used.

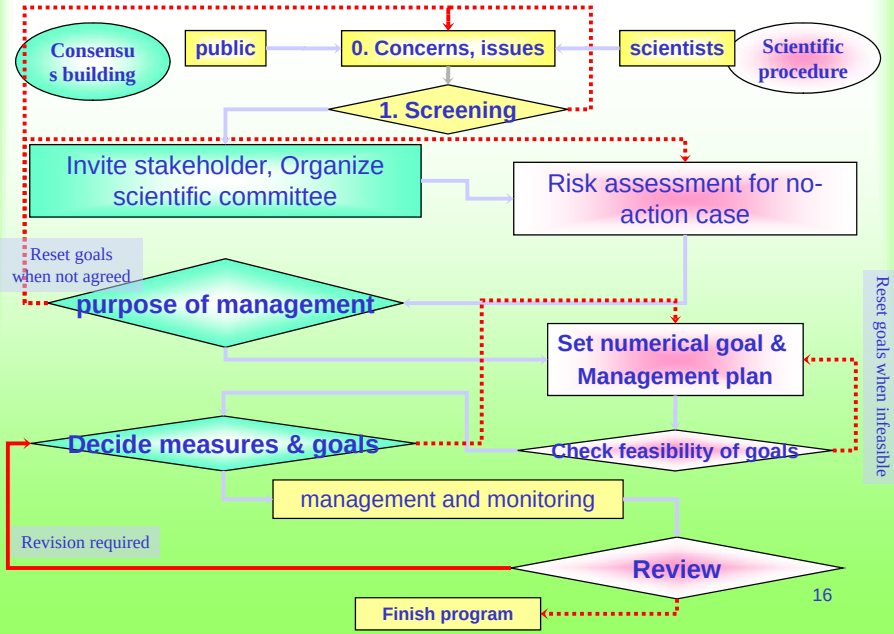
http://wwwsoc.nii.ac.jp/esj/J_CbnJJCE/EMCreport05e.html

Guidelines for consensus building and cooperation

23. Ensure that scientists play an adequate role.
24. Educate future generations who will bear responsibility for the project.
25. Build trust and consensus among stakeholders in the project area.
26. Establish links with other projects working for environmental conservation.

Kasumi-gaura

Flow diagram for ecological risk management



Role of Scientists

- Do not play as a stakeholder
- Encourage stakeholders rather than give criticisms
- Make a logic, Build trust.
- A wider view of possible concerns
- Check consistence between aims and goals in management
- Check feasibility in a management plan

SC for Shiretoko World Heritage

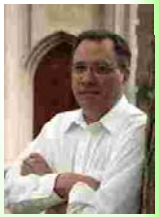
リスク管理：最低限やってほしいこと
Risk Management: Minimum Tasks

- Focus on targets that should be solved
- Management designed by multiple persons.
- Guess all events that may happen
- Estimate the frequency of these events
- Prepare action for each event
- Publish these plans
- Never forget existence of unforeseen events

- 解決すべき目標を絞る
- 複数の管理者で以下を計画
- さまざまな起こりえる事態を予想し
- その発生頻度を推測し
- それぞれの事態への対応を準備し（想定内）
- それらの計画を公表する
- 対策を取らない想定外があることを自覚する

8 commandments for nature conservation

by Simon Levin “Fragile dominion”



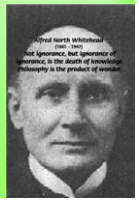
- (Stand in awe of the Nature)
- (Keep wildlife wilderness)

Added by H.M.

1. Reduce uncertainty
2. Expect surprise
3. Maintain heterogeneity
4. Sustain modurality (I read as to keep natural features of each region)
5. Preserve redundancy
6. Tighten feedback loops (I read as Learning by doing)
7. Build trust (I read as Love people first, nature second);
8. Do unto others as you would have them do unto you

7 principles for adaptive management

1. Describe assumptions
2. Describe how and where to change policy
3. Set evaluation methods and criteria
4. Use risk management including uncertainty
5. Imagine multiple outcomes & prepare measures
6. Build trust
7. Remember possibility that our temporal decision is wrong.



“Seek simplicity, but distrust it.” by Alfred N. Whitehead

Limit of ecological risk assessment

- On-site assessment to the open ecosystem.
- 1 year assessment to the nonequilibrial ecosystem. ==“Hanshin Tigers Problem”
- No understanding of balance between succession and disturbance.

  ==“Sazae-san Syndrome”

篩い分けscreening assessment

- in a screening-level risk assessment, the risk assessment starts with a more “protective” stance
- use literatures and default assumptions
- These high-end screening assessments usually contain many default assumptions since data are generally not available or the costs of collecting data ... may be prohibitive.

Transparency in risk assessment practice and risk management process

- ... conscious use of planning and scoping with risk assessors and risk managers before a risk assessment is started.
- Continued use of the triage approach to decide how much time and resources are necessary for a risk assessment.
- better communication of the data and assump-tions and choices used in our risk assessments.
- transparency in the risk management process: ... encourage work on a decision making framework.

By H. Matsuda

Roles of Science Committee

- various fields, including social science
- members agreed by all stakeholders
- double casting in necessary fields
- not substitute of some stakeholders, but representative of each science field
- Open meeting, transparent meeting record
- Analyze feasibility of numerical goals, review of any scientific problems

4 “scenarios” in Millennium Ecosystem Assessment

Global Orchestration

Global, Reactive env. policy

Lower population, Lower habitat loss, Higher economic growth, Higher GHG emissions

Glb

TechnoGarden

Global, Proactive env. policy

Best GHG, Best Nitrogen, Best Water , Slower economic growth than Global Orchestration, Reliability of ecosystem services decreased, risks increased, New problems emerge from technologies

React.

Proact.

Order from Strength

Regionalized, Reactive

Worst across the board (except GHG/Climate due to slower economic growth)

Slower economic growth than Global Orchestration

Adapting Mosaic

Regionalized, Proactive

Best GHG, Best Nitrogen, Best Water, Slower economic growth than Global Orchestration

Reliability of ecosystem services decreased, risks increased

New problems emerge from technologies

Rgn

Is Science Policy Utilized Within the Risk Assessment Process?

- the utilization of science policy in the risk assessment process is not meant to “bury” or “hide” risk management decisions within the risk assessment.
- recognize that the policy positions themselves are developed outside the risk assessment.
- examine and report on the upper end of a range of risks or exposures when we are not very certain about where the particular risk lies.
- 規制科学regulatory science
  http://www.jpec.or.jp/contents/c21/reguratory.html

What is Regulatory Science?

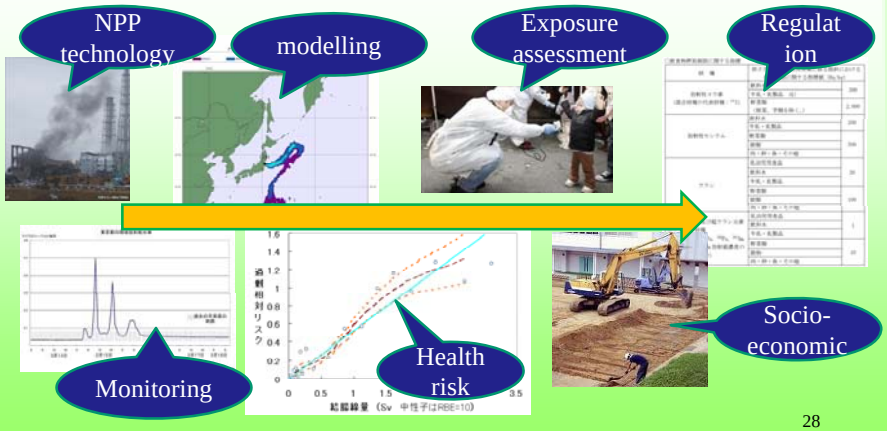
- Mitsuru Uchiyama内山充(1987) proposed “regulatory science” as the science of optimizing scientific and technological developments according to objectives geared toward human health”.
- Sheila Jasanoff (1990: The Fifth Branch) analyzed the concept of regulatory science, conducted for the purposes of meeting l… mandated standards, and the "boundary" drawing activities of science advisory committees.

Kishimoto

Regulatory science as an integrated knowledge

Revised after Atsuo Kishimoto

No expert knows everything… (in Fukushima disaster)



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By H. Matsuda

Identify scientific truth from assertion based on a particular value

- complex in environment issues
- damage on environment = truth
- conserve environment = value
- “propose a policy in order to conserve an environment” = target of science

Relationship assessment and management in risk

- risk assessment (evaluation of the science) and risk management (decision making, setting of policy) are not necessarily separated.
- separate assessors and managers, under transparency and peer review system
- risk assessors are best qualified to understand the quality and nature of the data
- the risk manager integrates the risk assessment with other considerations in order to make and justify regulatory decisions.

Quantifying uncertainty

- Will the quantitative analysis improve the risk assessment?
- Are there time and resources for a complex analysis?
- Will a quantitative estimate of uncertainty improve the decision? How will the uncertainty analysis affect the regulatory decision?
  - How about probabilistic weather forecast?

Consensus of Management Aims

- Clarify endpoints and their hazards
- Assess risks under no action
- Make abstract concepts that are acceptable by “all” stakeholders
- Build consensus among “all” (potential) stakeholders

Setting numerical goals and criteria of management

- These must agree to management aims
- Concrete goals that will be tested during management (adaptive management)
- Feasible goals with low probability of failure
- Goals that are acceptable by majority
- Consensus of monitoring method, monitors and budget

http://www.argos-net.co.jp/sozoken/topics2004_04a.htm

5 levels of public involvement

（1）give information
（2）receive comments
（3）superficial reply
（4）substantial reply
（5）public participation (involvement) = stakeholders share both rights and duties （original meaning of risk communication）

hardcore of consensus building

- Never deny a sentence that has once been agreed if all stakeholders do not hope
- Phase-in-agreement (aims, goals, executive systems)
- Scientific committee keep calm and is accountable during management enforcement
- If numerical goals are clearly difficult, revise goals under agreement of stakeholders

Subsistence/artisanal fisheries are also endangered

- Can whaling be managed to protect whales and whalers? – A plenary talk by Judy Zeh (past IWC/SC chair) at International Mammalogical Congress at Sapporo, 2005
- Commercial Fishery is possible in the Shiretoko World Nature Heritage