internal report 399

Presentations on wetland inventory, assessment and monitoring

CM Finlayson

Comprising: 8th Meeting of the Conference of Parties to the Ramsar Convention, Valencia, Spain, 18–26 November, 2002; Wetland Centres Workshop, Maun, Botswana, 1–3 December 2003; Conference on Environmental Monitoring of Tropical and Subtropical Wetlands, Maun, Botswana, 4–6 December 2002

January 2003

supervising scientist

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Part 1: 8th Meeting of the Conference of Parties to the Ramsar Convention, Valencia, Spain, 18–26 November, 2002

Part 2: Wetland Centres Workshop, Maun, Botswana, 1–3 December 2003

Part 3: Conference on Environmental Monitoring of Tropical and Subtropical Wetlands, Maun, Botswana, 4–6 December 2002

CM Finlayson

Supervising Scientist

Contents

Part 1

8th Meeting of the Conference of Parties to the Ramsar Convention, Valencia, Spain, 18–26 November, 2002

Three formal presentations were made. These are reproduced in the following manner.

I. Presentation to the side event on the Millennium Ecosystem Assessment, Wednesday 20 November 2002: The Millennium Ecosystem Assessment and the Ramsar Covention (text and powerpoint slides).

II. Technical presentation to the plenary, Thursday 21 November 2002: Improving tools for identifying wetland assets: gaps in, and harmonization of, Ramsar guidance on wetland ecological character, inventory, assessment and monitoring, and a Ramsar Framework for Wetland Inventory (powerpoint slides).

III. Closing speech on behalf of the International Partner Organisations to plenary session, 26 November 2002 (text).

The Millennium Ecosystem Assessment and the Ramsar Wetlands Convention

(text notes)

CM Finlayson

1. The MA was introduced to the Ramsar STRP more than a year ago. The initial response was – good idea, wonderful to have such analyses, but based on our investigations it as probably impossible or unachievable.
2. It was discussed further and considered in terms of – what would we want from the MA? That is, rather than respond skeptically, turn it around and see what was possible. What could we ask the MA to achieve? Could we influence the MA and develop an achievable agenda and outcome for Ramsar and wetlands.
3. The MA responded and a constructive dialogue developed and is continuing. The MA is not imposing an agenda on Ramsar, it is seeking to assist, to provide technical information that could be used by Ramsar parties and individual wetland managers and scientists.
4. This is being done by the MA at the same time as it works with other Conventions, the private sector and others. That is, the MA is just not talking to Ramsar, it is more encompassing than that, which also offers an opportunity for Ramsar to engage more widely, to benefit and contribute to the wider debate about our global ecosystems.
5. So, what is the MA doing that is of interest to Ramsar? First and foremost it has focused attention on ecosystem services that support human well-being. This was a hard won outcome and it came about as the MA brought together social and biophysical scientists – Ramsar has also been seeking to maintain a focus on wetlands while looking at the services wetlands provide for people.
6. That is, the MA is providing support for the wise use of wetlands and hence the maintenance of the ecological character of these wetlands.
7. Most of you are probably aware that maintaining the ecological character of wetlands is central to Ramsar. This means that not only should we maintain the biophysical features of wetlands, but also the ecosystem services. That is, ecological character is defined to include – biophysical components, ecological processes and ecosystem services.
8. So, what can the MA provide in a more tangible sense? First, there is a framework that supports many of the concepts espoused by Ramsar. Let's look at this again, as it portrays the essence of ecological character as defined by the Convention.
9. We have increasingly talked about peoples' interests within Ramsar, and recognized these as integral to maintaining the ecological character of wetlands – this corresponds to the Ecosystem Services and Human Wellbeing boxes in the MA framework and provides a basis for maintenance of Ecological Character which is the very essence of the Ramsar Convention. The other components of the MA framework are the indirect and direct drivers of ecosystem change. We have long recognised these drivers – going back to the

exhortations of Ted Hollis in the early 1990s – and consider them within the framework of agents of adverse change in ecological character. Over the years many of the direct causes have been addressed by guidelines and technical guidance. We have not on the whole considered how far we should move into the realm of indirect drivers, eg population growth, trade policy – the MA framework and analyses could provide us with valuable information on these and guidance for our efforts to address them.

10. The MA is also going another step, and this could assist Ramsar considerably. It is also looking at the direct and indirect drivers of change in ecosystems and ecosystem services and how these changes could affect humans. It is doing this through a coordinated and encompassing process involving biophysical and social scientists – it is undertaking a scientific analysis, not a political analysis.

11. The MA will therefore collate and assess information on wetlands and their services that can directly assist Ramsar parties. It will also provide analyses of the drivers of change that will assist individual parties and the Convention determine how it can respond to existing conditions or steps to address projected changes and the inter-related causes of change. In doing this we will all be better placed to determine the future of the Convention, and its relative emphases. We will be better placed as we will have a better scientific information base for our debates.

12. I feel that the MA is about collating and analysing scientific information on ecosystems, and we have the opportunity to guide this collation, and the opportunity to use the information for our own purposes and guidance. Thus, we have influenced the direction of the MA and it is responding to our needs. It is not everything to the Convention and nor is the Convention its only user. It does provide an opportunity for Ramsar.

The Millennium Ecosystem Assessment and the Ramsar Wetlands Convention

(powerpoint slides)

CM Finlayson

Millennium Ecosystem Assessment and the Ramsar Wetlands Convention

Max Finlayson

Scientific & Technical Review Panel (STRP)

Millennium Ecosystem Assessment

Introduced to the STRP in 2001

Initial sceptical responses

Considered further

What would we want from the Assessment?

Could we influence the direction of the Assessment?

Millennium Ecosystem Assessment

Could the MA meet Ramsar's expectations?

Millennium Ecosystem Assessment

What is the MA doing of interest to Ramsar?

Focussed attention on ecosystem services that support human well-being

Combining social and biophysical information

Ramsar representatives are involved

STRP participating in the MA

Millennium Ecosystem Assessment

The Assessment will provide information

- **in support of wise use of wetlands**
- **for maintaining the ecological character of wetlands**

Millennium Ecosystem Assessment

Ecological character of a wetland comprises:

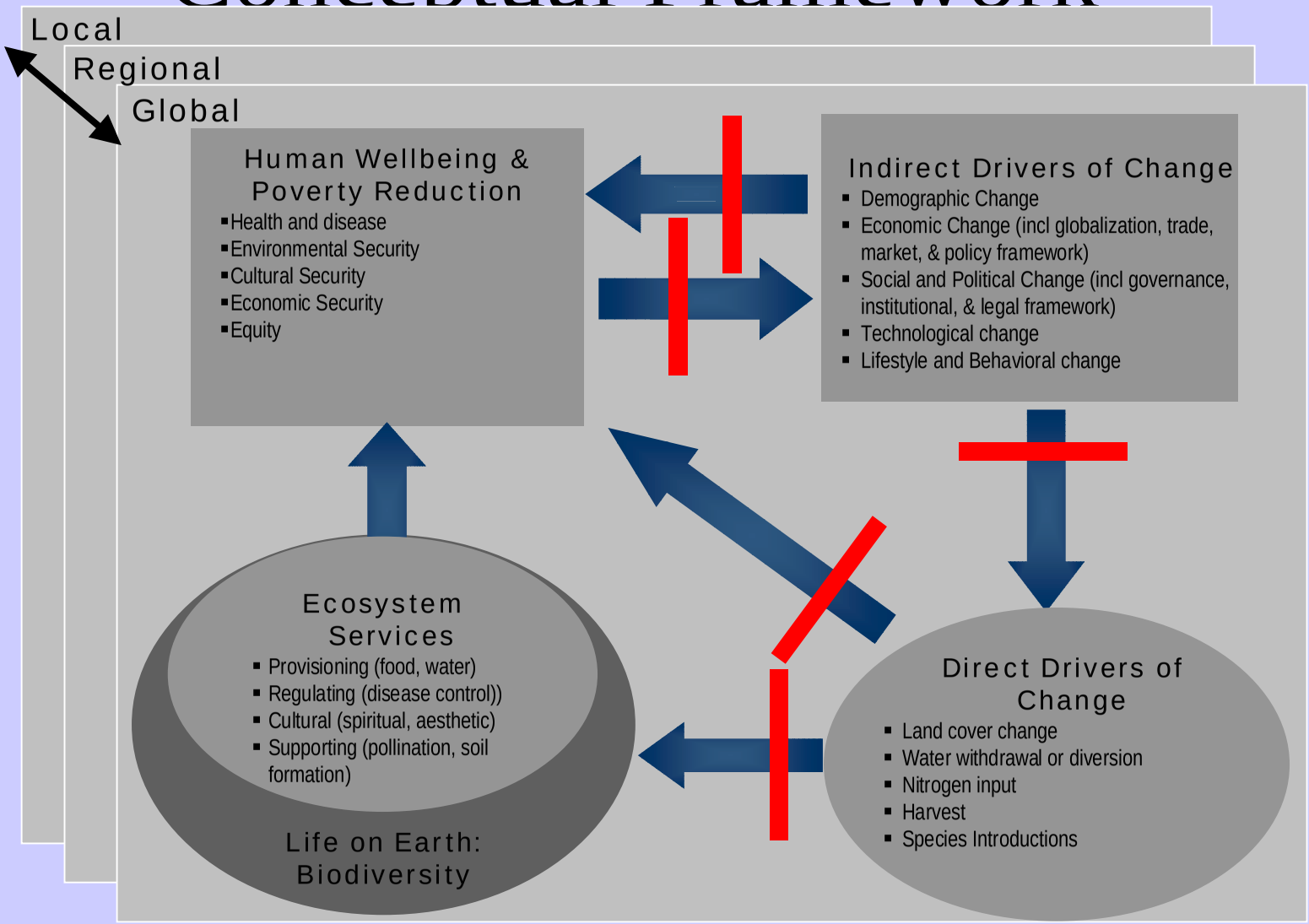
- **Ecological features**
- **Ecological processes**
- **Ecosystem services**

Millennium Ecosystem Assessment

What is the Assessment providing?

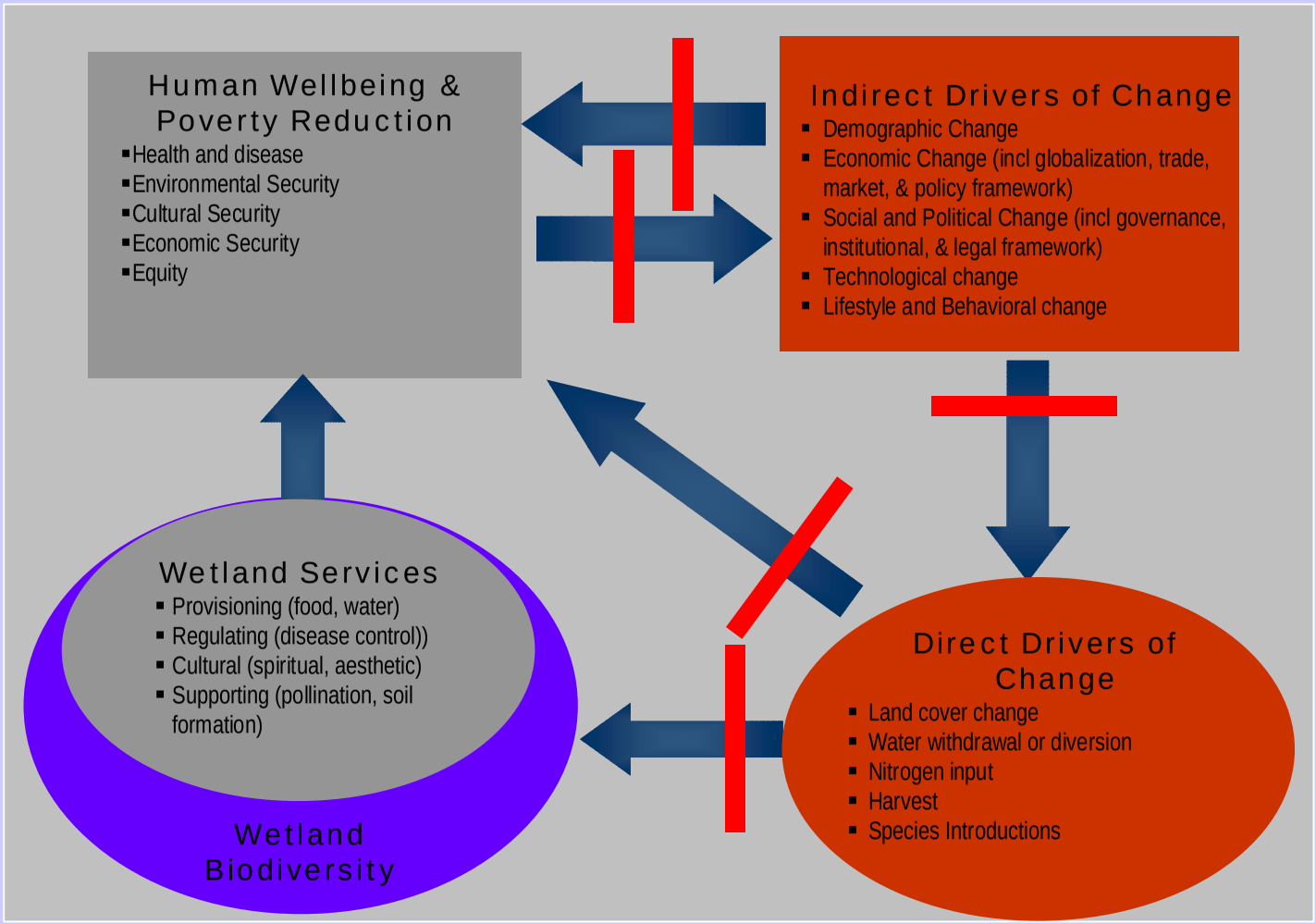
- **A conceptual framework that supports many of the concepts espoused by Ramsar**
- **Analyses of wetland extent, distribution, condition and scenarios of change using existing information**

Conceptual Framework



= Strategies and Interventions

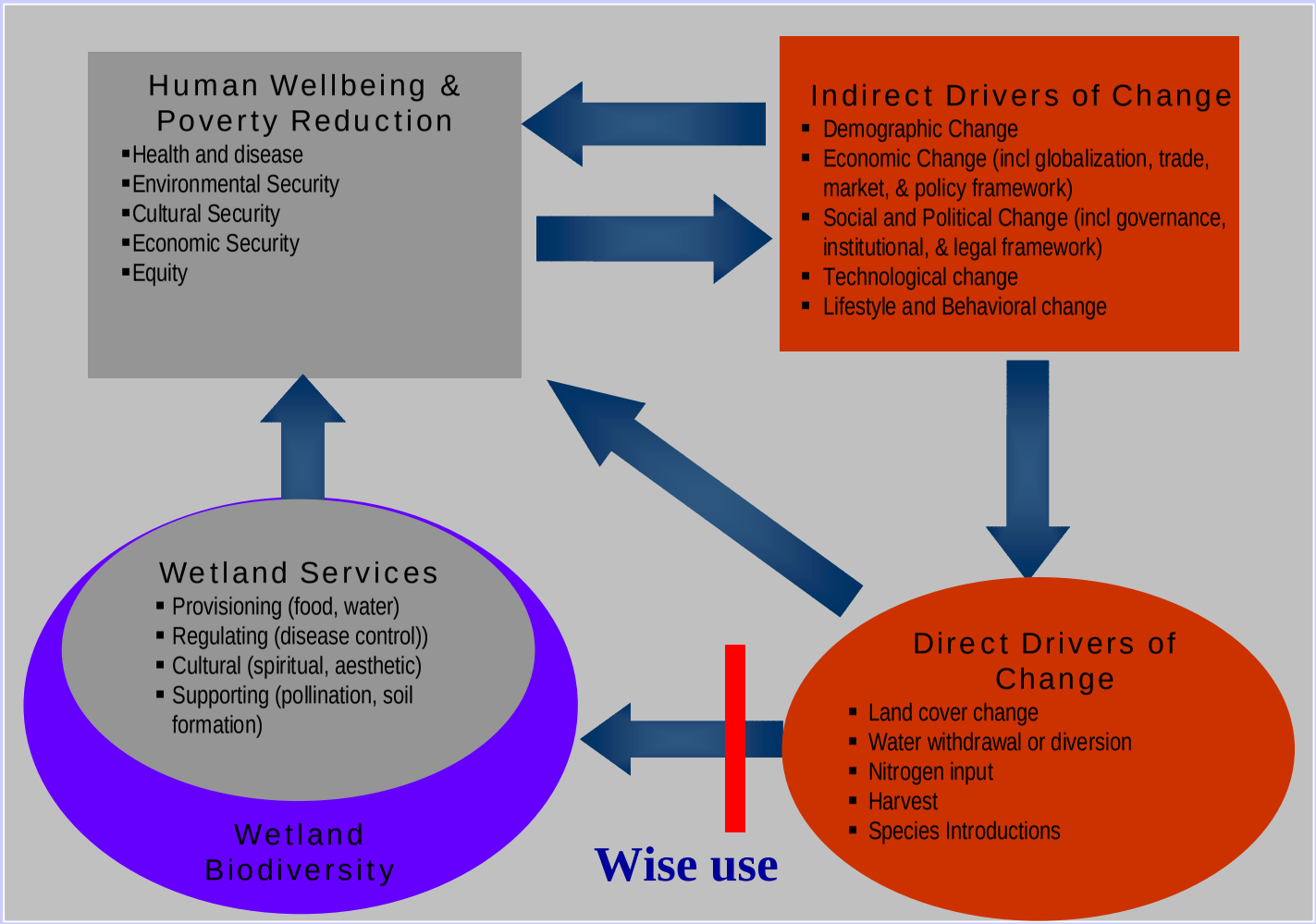
Conceptual Framework



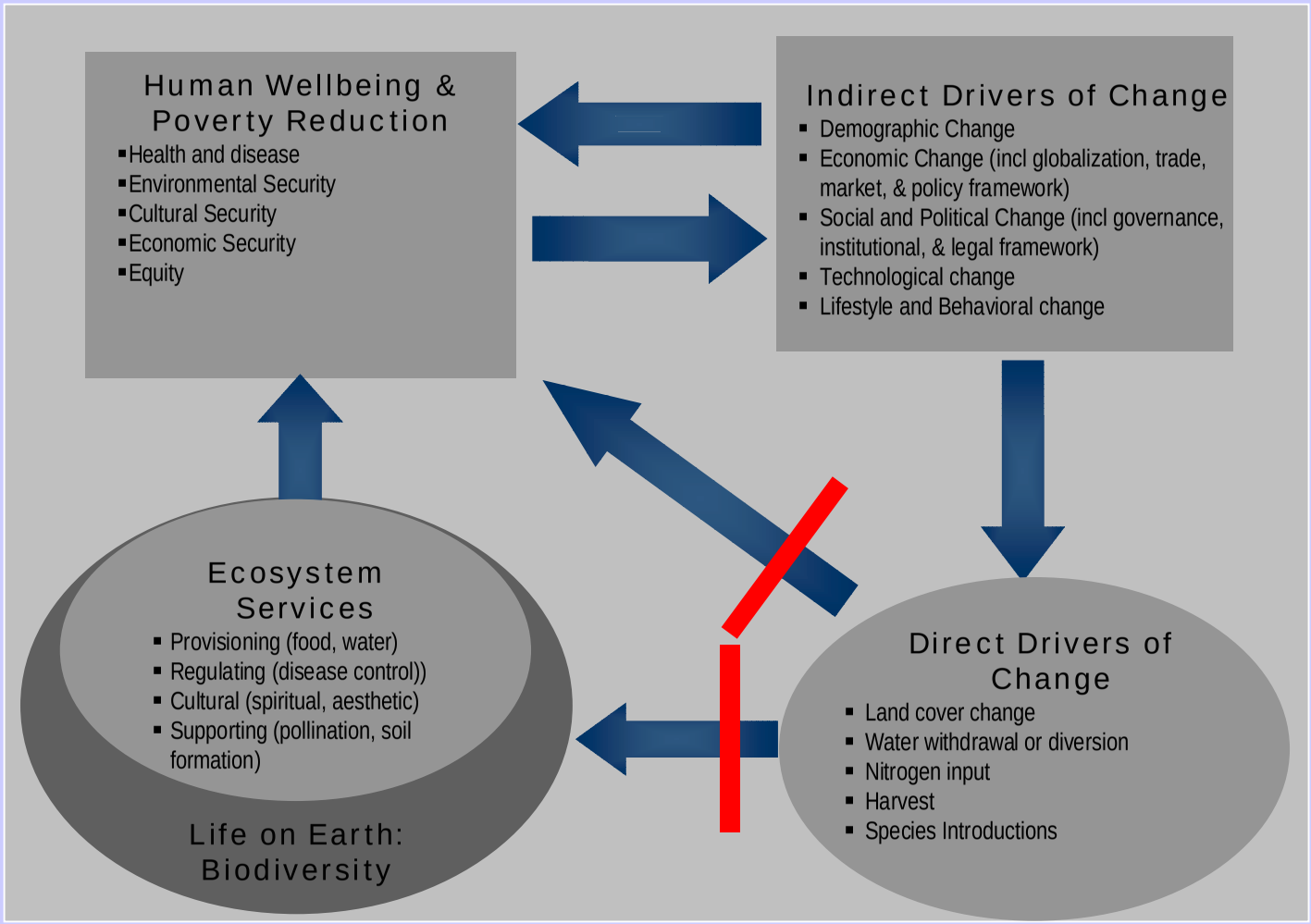
Ecological character

Causes of adverse change

Conceptual Framework



Conceptual Framework



Ecological character

Drivers of adverse change

Improving tools for identifying wetland assets: gaps in, and harmonization of, Ramsar guidance on wetland ecological character, inventory, assessment and monitoring, and a Ramsar Framework for Wetland Inventory

(powerpoint slides)

CM Finlayson

Improving tools for identifying wetland assets:

gaps in, and harmonisation of, Ramsar guidance on wetland ecological character, inventory, assessment and monitoring, and a Ramsar Framework for Wetland Inventory

Max Finlayson
STRP member (Oceania)

COP8 DR 6 / DR7 & DOC. 16

Improving tools for identifying wetland assets

1. Available guidance / whats in the toolbox
2. Gaps in guidance / missing tools
3. Conceptual framework for wetland analyses (a better toolbox)
4. Integrated tools for wetland analyses
5. Guidance for inventory / a particular tool
6. Priorities for improving the toolbox

1. Available guidance / what is currently in the toolbox?

What tools are needed?

What tools already exist?

Why do we need tools?

- Enable conservation and wise use of wetlands – principle embodied within the Convention
- Establish the location and ecological features of wetlands, assess trends and threats, monitor and take management actions
- Management planning guidelines stress that establishing ecological character is fundamental
- Actions within national policies are underpinned by information on trends and status
- Provide benchmarks or reference sites for national and international analyses

Available tools

STRP assessed existing tools:

- **Wetland assessment – risk assessment framework; environmental impact assessment**
- **Wetland monitoring – framework for designing a monitoring program**
- **Wetland management – guidelines for management planning; local communities and indigenous people's involvement; river basin management; managing invasive species**

2. Gaps in guidance / missing tools

What other tools are needed?

What other work needs to be done?

Substantial information gaps

- Global Review of Wetland Resources and Priorities for Wetland Inventory – 7% Ramsar parties have an adequate national inventory / 25% do not have an inventory
- Pilot Analysis of Global Ecosystems – status and trends information for inland/coastal wetlands is very patchy and incomplete
- Management plans not in place for many Ramsar sites – undermines objective of using these as a reference basis for monitoring network

Where are we?

- Require a better information base for maintaining the ecological character of wetlands – the reason we are here / rationale for the Convention!

- Require effective tools for collating and collecting an information base – request from Contracting Parties

Missing tools and gaps?

STRP identified gaps:

- **Some tools did not exist or were inadequate – poor quality or missing**
- **Inconsistencies and disharmonies – tools developed at different times and did not fit together very well**
- **Not clear how/why some tools should be applied – what is their purpose and usefulness?**
- **No clear overall unifying conceptual framework – toolbox for the tools not available**

Priority tools/issues?

STRP identified priorities:

- **Tools for determining the ecological character of wetlands**
- **Data fields for the Information Sheet on Ramsar Wetlands**
- **Incorporate tools used by other programs, including multiple scale and pressure analyses**
- **Guidance on methods and indicators for rapidly assessing and monitoring wetland biodiversity**
- **Review Ramsar habitat classification system**
- **Incorporate environmental impact assessment into risk assessment procedures**
- **Review the relevance of adaptive management methods**
- **Harmonise definitions and terms already being used**

3. A conceptual framework for wetland analyses

Conceptual framework for wetland analyses is needed

A better toolbox is needed

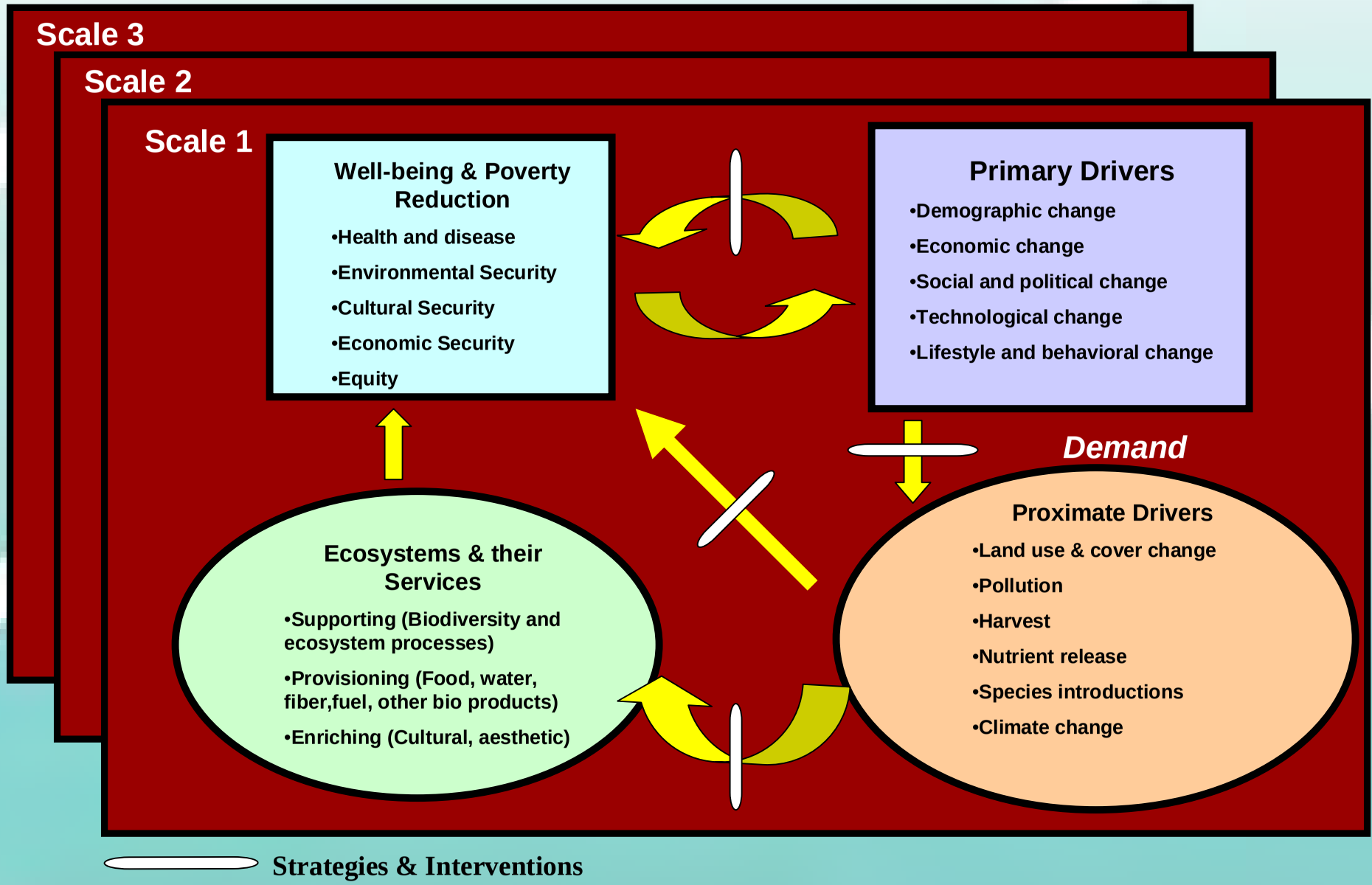
A conceptual framework for wetland analyses

- Address major issues within an agreed conceptual framework for wetland analyses
- Link causes of adverse change with ecological character and human well-being through wise use
- Fundamental issue - illustrate the link between wetland services and human well-being for maintaining the ecological character of wetlands
- Framework supports wise use - process for identifying strategies/interventions to maintain or restore links between wetlands and people

A conceptual framework for wetland analyses

Millennium Ecosystem Assessment

- **General framework that links the condition of ecosystems and human well-being with the factors that cause adverse**
- **Recognises different scales of analysis**
- **Links ecosystems and their services inexorably = ecological character**


Scale 3
Scale 2
Scale 1
Well-being & Poverty Reduction
•Health and disease
•Environmental Security
•Cultural Security
•Economic Security
•Equity
Primary Drivers
•Demographic change
•Economic change
•Social and political change
•Technological change
•Lifestyle and behavioral change
Demand
Ecosystems & their Services
•Supporting (Biodiversity and ecosystem processes)
•Provisioning (Food, water, fiber,fuel, other bio products)
•Enriching (Cultural, aesthetic)
Proximate Drivers
•Land use & cover change
•Pollution
•Harvest
•Nutrient release
•Species introductions
•Climate change
Strategies & Interventions

- **Modify framework for a Ramsar relevant example – climate change or damming streams**

4. Integrated tools for wetland analyses

Toolkit needs to contain all necessary tools

Available tools need to be compatible

Integrated tools for wetland analyses - toolkit

- **Integrated approach (toolkit) for wetland inventory, assessment & monitoring**

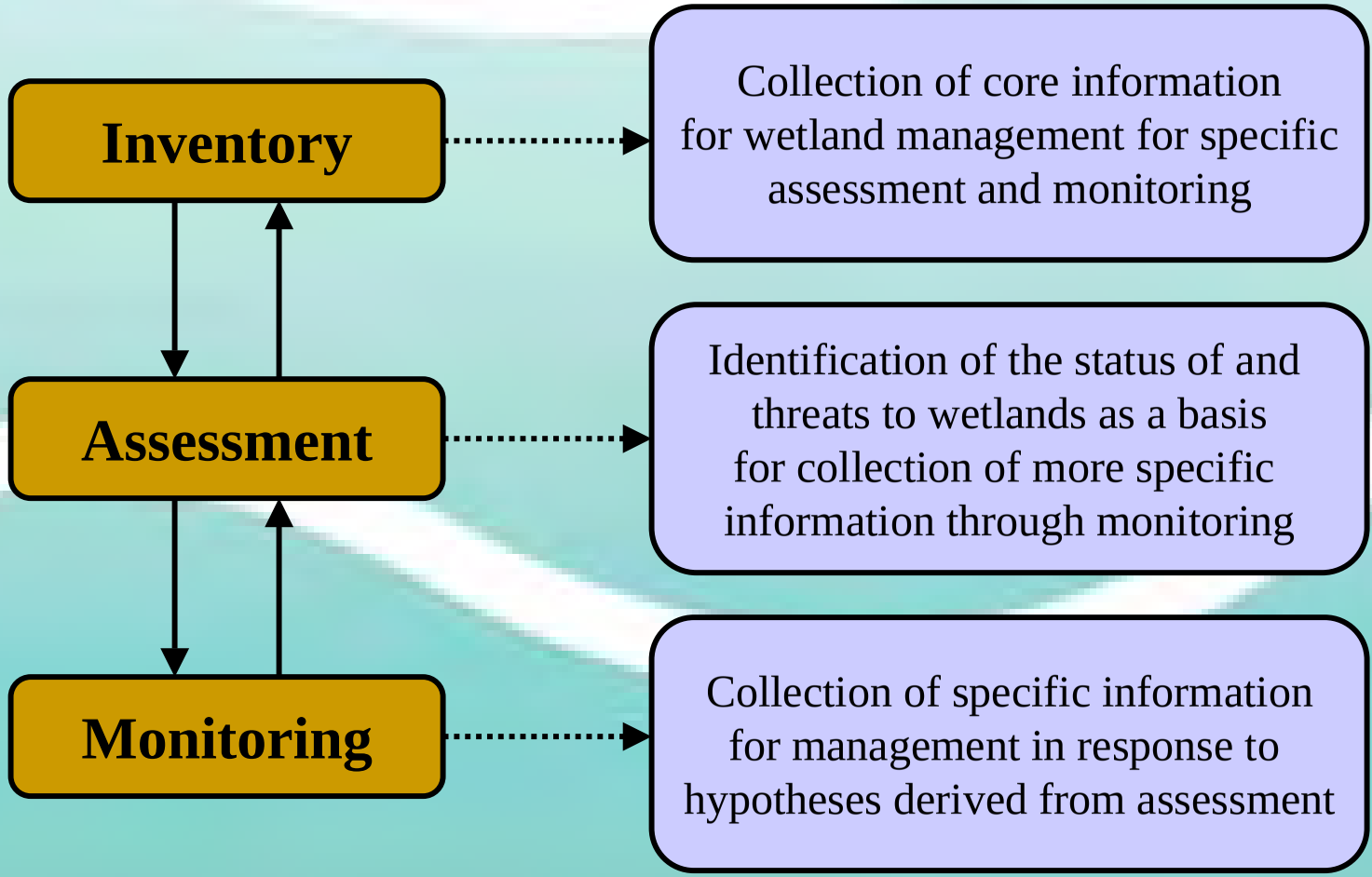
  Inventory **– collection of core information for wetland management for specific assessment and monitoring**

  Assessment **– identification of status of and threats to wetlands as a basis for collection of more specific information through monitoring**

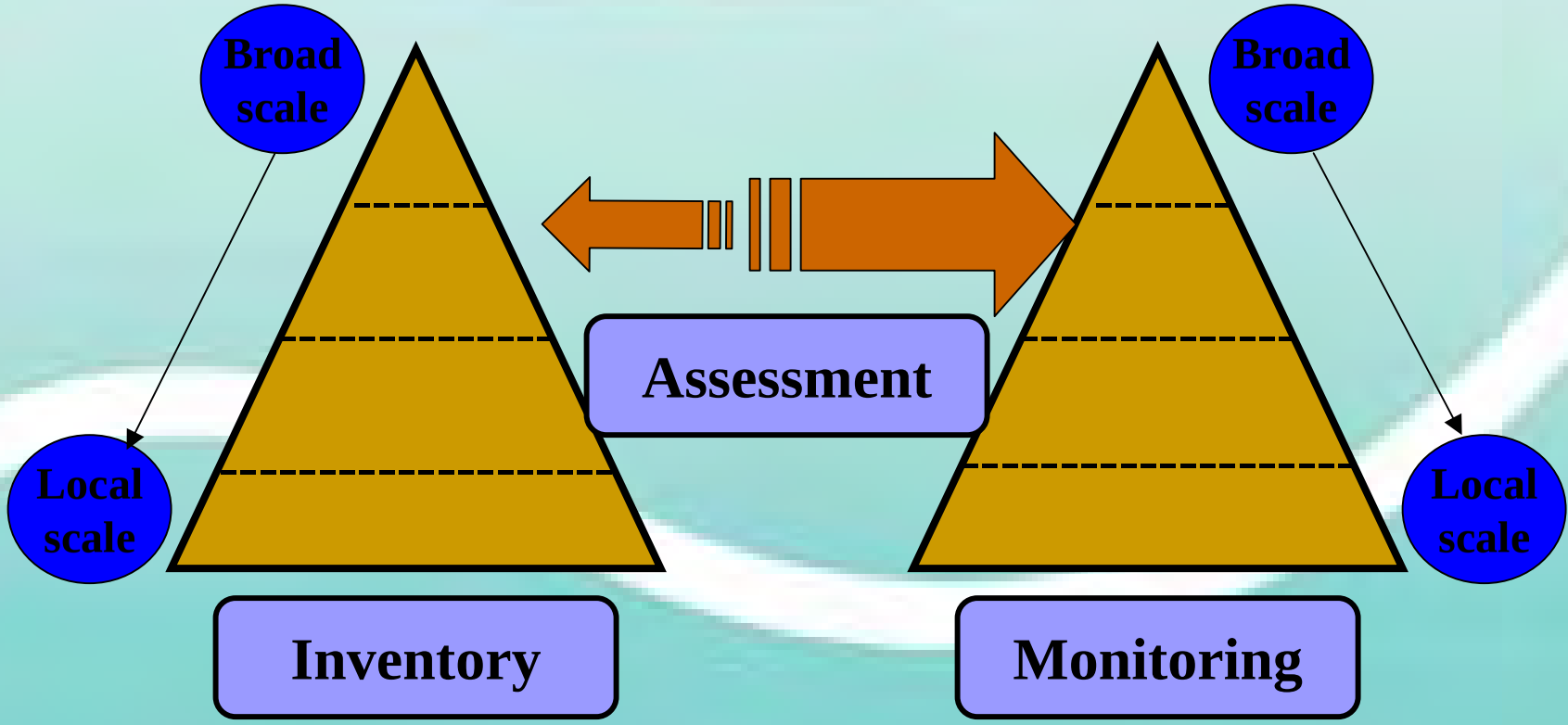
  Monitoring **– collection of specific information for management purposes in response to hypotheses derived from assessment**

- **Integrated program often needs to be multi-scalar and address multiple pressures (threats)**

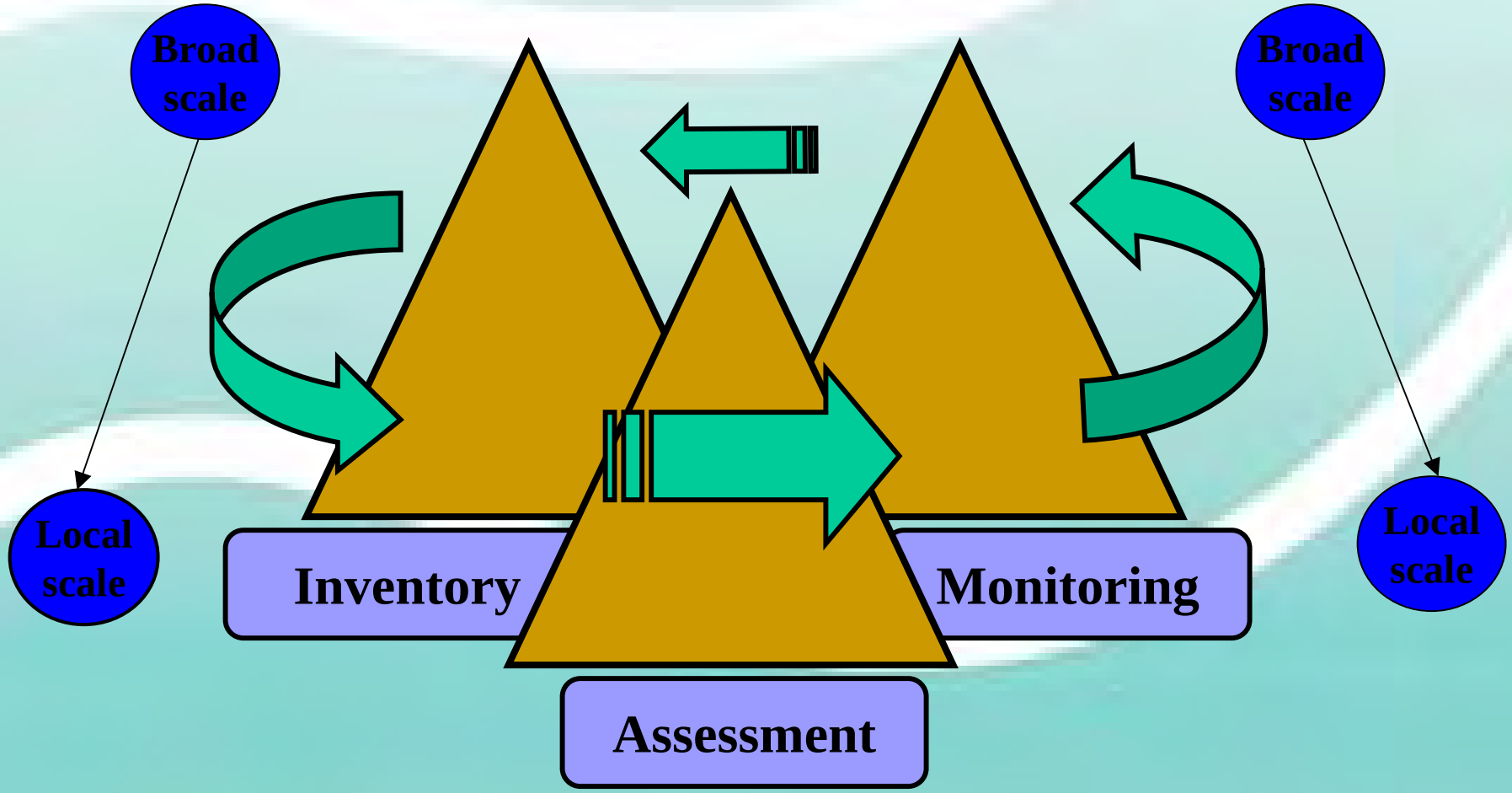
Integrated tools for wetland analyses - toolkit



Wetland inventory, assessment and monitoring framework – the toolbox



Wetland inventory, assessment and monitoring framework – the toolbox



5. Guidance for inventory / a particular tool

Develop specific tools for wetland inventory

Technique for planning an individual inventory

Framework for wetland inventory

- Inventory is undertaken for many purposes and at many scales to provide information for describing and maintaining the ecological character of wetlands, including delineation and mapping
- Inventory required as a basis for formulating and implementing national wetland policies
- Inventory provides the basis for quantifying the global wetland resource as a basis for assessment
- STRP asked to review and develop further inventory methods, taking note of new data sources (remotely sensed imagery) and technology (GIS)
- Training in data collection, analysis and management is needed for effective inventory

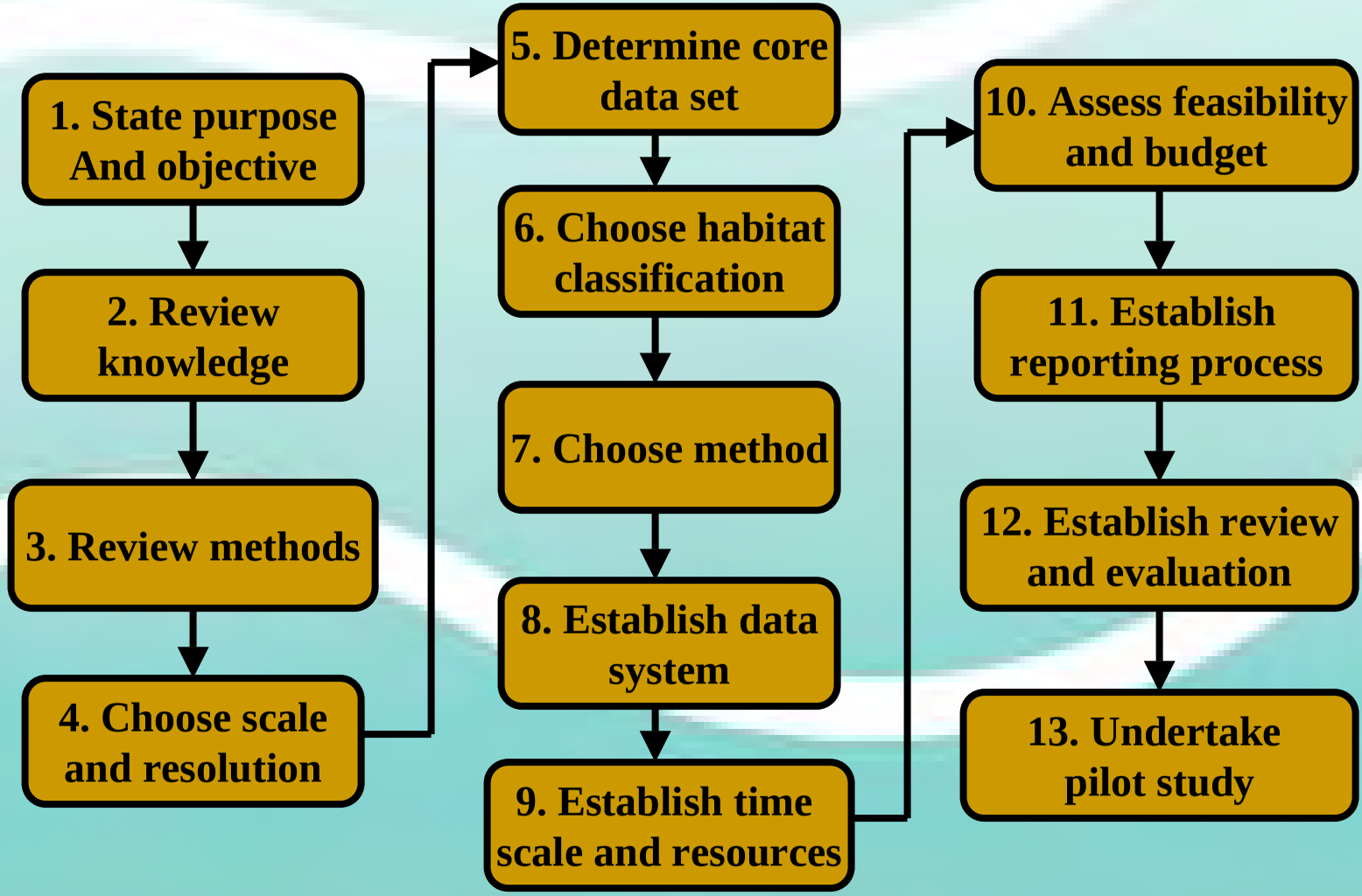
Framework for wetland inventory

- Framework for developing a wetland inventory has been provided – decision process to choose best approach for individual purposes
- Framework emphasises the link between purpose, scale and core data fields
- Standardised core data fields can provide a description of ecological character
- Habitat classification should suit the purpose of the inventory – different systems will be needed
- Different methods available and being developed – MedWet / Asian / Uganda / Ecuador / USA

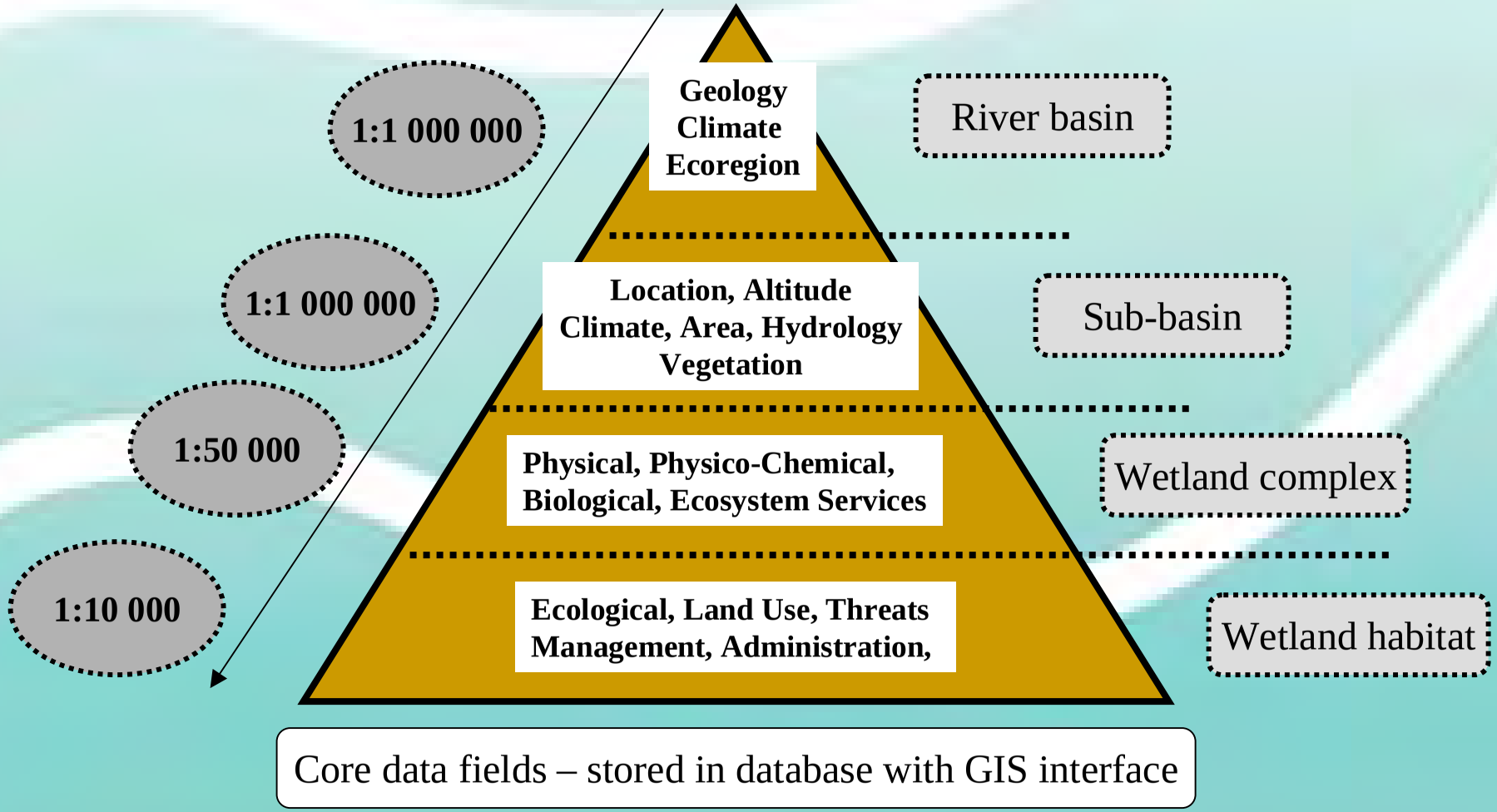
Wetland inventory framework

1. State purpose and objective
2. Review knowledge
3. Review methods
4. Choose scale and resolution
5. Determine core data set
6. Choose habitat classification
7. Choose method
8. Establish data system
9. Establish time scale and resources
10. Assess feasibility and budget
11. Establish reporting process
12. Establish review and evaluation
13. Undertake pilot study

Wetland inventory framework



Hierarchical, multi-scalar inventory with standardised core data fields



Purpose of inventory

Wetland inventory has multiple purposes

- Listing particular wetland types in an area
- Listing wetlands of local, national or international importance
- Describing the occurrence and distribution of wetland taxa
- Describing the occurrence of natural resources such as peat, fish or water
- Establishing a baseline for measuring change in ecological character
- Assessing the extent and rate of wetland loss
- Promoting awareness of wetland values

Inventory – core (minimum) data fields

Biophysical features – describe the wetland

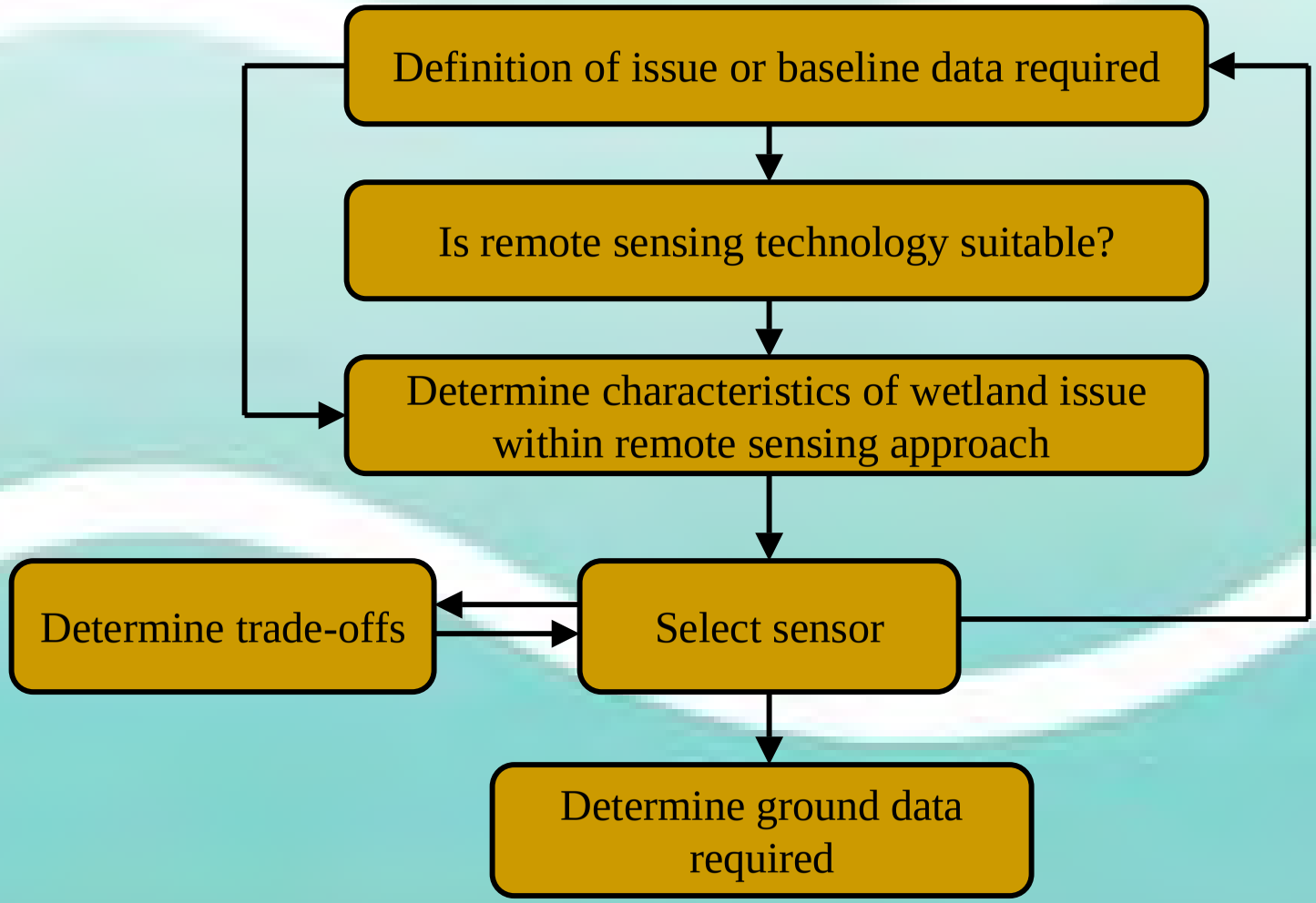
- Site and catchment name
- Area and boundary - size and variation)
- Location - coordinates, elevation)
- General shape
- Climate - zone and major features)
- Soil - structure and colour)
- Water regime - periodicity, source of water ….
- Water chemistry - salinity, pH, nutrients, metals…
- Biota - vegetation, fauna, special species……

Inventory – core (minimum) data fields

Management features:

- Land use - local and in catchment or coastal zone
- Pressures/threats – current and emerging
- Land tenure and administrative authority
- Conservation and management status
- Ecosystem services – values derived by people
- Management plans and monitoring programs

Inventory –remote sensing



6. Priorities for improving the tools and the toolbox

STRP identified priorities:

- **Tools for determining the ecological character of wetlands**
- **Data fields for the Information Sheet on Ramsar Wetlands**
- **Incorporate tools used by other programs, including multiple scale and pressure analyses**
- **Guidance on methods and indicators for rapidly assessing and monitoring wetland biodiversity**
- **Review Ramsar habitat classification system**
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- **Review the relevance of adaptive management methods**
- **Harmonise definitions and terms already being used**

Acknowledgements

STRP / Ramsar Bureau

Environment Australia / Supervising Scientist Institute

Wetlands International

Wetland managers / scientists scattered around the world's wetlands

Closing speech on behalf of the International Partner organisations to plenary session, 26 November 2002

(text)

CM Finlayson

(President, Wetlands International) on behalf of Birdlife International, IUCN-The World Conservation Union, WWF-World Wide Fund for Nature, and Wetlands International

Madame Chair, distinguished delegates, ladies and gentlemen

I bring you this closing statement on behalf of the four International Organization Partners – Birdlife International, WWF – the World Wide Fund for Nature, IUCN – the World Conservation Union, and my own organization Wetlands International, and the many members of our delegations who have organized the Global Biodiversity Forum on your behalf and supported your debates over the past 10 days.

We may work in different organizations and sometimes operate in different ways, but we also have much in common, such as our commitment to promoting the conservation and wise use of wetlands, and for more than 30 years actively supporting the development and implementation of the Convention. In supporting the Convention for such a long period we have seen many changes and I propose to comment on some of these.

First, I will highlight some of the achievements from CoP8. Foremost is your decision to increase the budget by 4%. We welcome this decision while noting that it is less than required for the effective implementation of a mainstream Convention. Achievements include your pledged target of listing 250 million hectares of wetlands on the list of wetlands of international importance. This is an ambitious target and we will work with you to achieve it. In doing this we note that some past pledges have not been achieved. Your decisions include those that confirmed the role and importance of the STRP. The STRP is the primary source of expert technical advice for the Convention and we welcome proposals that recognize the importance of this panel and support its role within the Convention. We also congratulate you on reaching agreement on a further strategic plan for the Convention. We are very happy with the adoption of resolutions on dams, climate change, invasive species, and agriculture.

These resolutions will provide your administrative authorities with a broader mandate to become fully engaged with other sectors that have significant influence on the conservation and wise use of wetlands. These resolutions should also encourage greater dialogue and partnership for enhanced environmental management, sustainable food production, and the equitable sharing of benefits from water resources that are so vital to many sectors of society.

However, to echo the words from our opening statement we emphasize that the value of your decisions will be in their implementation. And we look forward to on-the-ground action in support of these decisions.

The CoP is now addressing technical issues in the broader context of sustainable development. We welcome this change and recommend that you debate how the Convention can retain its established identity and move forward within this broader context.

Given the name of this conference you are increasingly focusing on wetlands in the context of development and the well-being of people. This raises some questions that need to be addressed in an open and transparent manner.

As an example, how do the socio-economic arguments that are put forward in support of development plans such as the Spanish National Hydrological Plan and the Danube Delta channel take into account the impacts on local people and ensure their views are heard? Where is the balance between short-term gain and long-term wise use of wetlands?

Your Convention is changing and some of your debates and decisions have signaled that further change may occur. You are making decisions based on input from other international sources. You have started debate on agriculture and dams and we recommend you continue your efforts to address such complex issues.

We would like to express our gratitude to Secretary General Delmar Blasco. Thank you Delmar for giving us many opportunities to rise to new challenges through the Convention. Under your guidance the Convention has developed new perspectives on issues vital to wetland conservation and wise use. You have "mainstreamed" the Convention and you have done this through partnerships. You have supported the involvement of our organizations in the Convention and we applaud your efforts and wish you all the best in the future.

In closing Madam Chair we thank our colleagues from the Ramsar Bureau, the Municipality of Valencia, and the Government of Spain for making CoP8 a success.

Thank you

Part 2

The Wetland Centres Workshop, Maun, Botswana, 1–3 December 2003

The following formal input to the meeting was made.

IV. Summary statement from Wetlands Centres Workshop presented verbally and then prepared for formal presentation at the Conference on Environmental Monitoring of Tropical and Subtropical Wetlands (text & powerpoint).

Summary statement from Wetlands Centres Workshop made to Conference on Environmental Monitoring of Tropical and Subtropical Wetlands

(text)

CM Finlayson

1. This has primarily been a science-based conference and it has been valuable and worthwhile. It is always a pleasure to listen to erudite and knowledgeable scientists. We have had many high quality presentations.

2. At times though I was left wondering if particular research could have been addressed in a different way. In some cases I thought that some filed projects could have benefited from further desk-based or library assessment of the issues being investigated, and the theoretical basis of the general science explored more before commencing the field work. If this had been done in depth it was not always evident in the presentations.

   In some instances a model or conceptual framework could have been constructed to support the hypotheses or choices being made. I am or was a field ecologist and know the joy of being in the field sampling and working hard, but I also now know that at times we could have saved time (costs) by giving some more thought to our activities before rushing out and sampling.

3. I was also left wondering about the relative role and importance of institutional or even national strategic research priorities versus the interest and influence of a variety of technical organizations and funders from outside the country or region. This is, I was unsure how the priorities were set, or if the research effort was meeting these priorities, locally, nationally or regionally.

4. On the third morning we entered into a discussion that left the relatively safe realm of scientific investigation to enter the more complex realm of the relevance of science to local people, and the extent of interaction between scientists and local people. We had a range of views – a not unexpected range – on the role of scientists and their links to other people and the dissemination of scientific information.

5. My personal view on the above, and one that we have instigated in our institute, is that unless effective and relevant consultation with stakeholders is planned and demonstrated at the outset of a project and effective information dissemination planned the project should not receive public funding. This does not automatically mean that these steps are equally effective, but it does signal our intent and is incorporated into our management processes.

6. In terms of looking forward and the next steps I refer to the necessity to have coherent wetland policies and management plans for individual wetlands or complexes of wetlands that identify and support research priorities. We have heard about the project to develop a

management plan for the Okavango delta, but whilst developing this plan we still need to manage, and we need to do this with existing information. We can not afford to sit back and wait for the management plan or the research to be planned, undertaken, reported in scientific journals and the like, and then, usually by percolation, find its way to the decision makers and local wetland owners.

7. One way of shortening this process is to engage more with local people when ever possible from the outset, combine the knowledge bases, and work together to resolve current impasses and develop effective research. This does not mean that we should leave the research planning and decisions to local people – it means collaboration and communication on a continual basis and the development of a more relevant knowledge base and a strengthen role for scientists and their knowledge.

8. To achieve these outcomes we need to think carefully about the way in which we currently conduct our research. I agree with previous speakers that research needs to urgently address catchment hydrology, climate change, interactions between multiple pressures (threats) whilst seeking to maintain habitat diversity at what ever scale you are working at. And, as mentioned earlier in this conference, we need further taxonomic expertise. I am not sure how exactly you can achieve all this within your own realm, but I am sure that negative assaults on established parties or structures are more likely to result in ineffective outcomes as contrasted to dialogue and engagement. Thank you for the opportunity to participate in your conference.

Summary statement from Wetlands Centres Workshop made to Conference on Environmental Monitoring of Tropical and Subtropical Wetlands

(powerpoint)

CM Finlayson

PRE-CONFERENCE
WETLANDS WORKSHOP

Gunn's Bush Camp, Okavango Delta

1-3 December 2002

Summary of workshop discussions

prepared by

Dr Max Finlayson

Director, National Centre for Tropical Wetland Research (Australia)

Objective/Purpose:

Explore opportunities for greater contact between Wetland Centre and for the development of collaborative and comparative research and training programs

Emphasise south-south interaction

Presentations:

Wetland Centres

Africa, Asia, North & South America & Australia

Information on European centres/programs

Develop database of contacts

Linkages

Informal contactsiften used to develop projects

Formal linkages useful for access to various countries or institutions. Not much use if left on the shelf.

Access list of wetland experts held by Ramsar Convention and being updated by Wetlands International

Major wetland issues

Human impacts

Monitoring

Training and education

Transboundary management issues

Central components of the global issues currently being addressed through the Ramsar Wetlands Convention

Human impacts: **conference on wetland ecotourism, link natural and social scientists, produce guiding principles on effective operation of wetland ecotourism, and publish. Scheduled for late 2003.**

- ***Monitoring:*** **symposium, develop guidance on issues of scale when monitoring, and methods for large scale monitoring for catchments, e.g. using radar and other appropriate imagery, provide a baseline or reference condition for hydrological cycle.**

Training and education:

- **web-based listing of courses, undertake regional training needs analyses through the Ramsar Training Service**
- **individual institutions to arrange joint and co-supervised post-graduate courses**
- **investigate strategic links with others, such as that being discussed between RIZA, Wetlands International and NCTWR**
- **develop regionally applicable training for wetland restoration techniques**

Global Wetland Consortium

HOORC host initial secretariat

Develop web site with links to other institutions

Develop ecotourism and monitoring meetings

Develop training links and courses

Develop a special symposium at Intecol Wetland Conference, mid-2004, entitled

“The Comparative Biodiversity Value of Wetlands – Knowledge and Gaps”

Thank you

Part 3

Integrated inventory, assessment and monitoring of tropical wetlands

V. Keynote presentation at Conference on Environmental Monitoring of Tropical and Subtropical Wetlands (abstract & powerpoint)

Integrated inventory, assessment and monitoring of tropical wetlands

CM Finlayson

Abstract

The interest in sustainable use and adaptive management of tropical wetlands has increased in recent years. At the same time the pressures on tropical wetlands has also increased as primary drivers such as demographic and economic change have led to more intense proximate drivers such pollution, species introductions and land use and cover changes. These pressures have in turn reduced the value of supporting, provisioning and enriching services derived from wetland ecosystems. Given the extent of these pressures and the need to provide relevant information for wetland management (including rehabilitation) we have worked with various international interests to develop integrated approaches for wetland inventory, assessment and monitoring. This has entailed agreement on various definitions as a basis for an integrated hierarchical framework that can be used to collect and manage information on tropical wetlands.

The framework provides a linkage between wetland inventory, assessment and monitoring and enables multiple-scale analyses to be undertaken through adoption of core data fields and modern data management tools, including GIS. Examples of multiple-scale inventory and monitoring in tropical wetlands are provided. The role that risk assessment can play in interlinking wetland inventory and monitoring is then illustrated and extended to include modeling of ecological components and processes and their ability to support wetland services. The successful implementation of these integrated approaches is fully dependent on commitment of resources and the development of local capacity to undertake the analyses and apply the outcomes. Steps to develop such capacity are then outlined.

Integrated inventory, assessment and monitoring of tropical wetlands

(powerpoint slides)

CM Finlayson

Integrated inventory, assessment and monitoring of tropical wetlands

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Scientific and Technical Review Panel (STRP)

Integrated inventory, assessment and monitoring of tropical wetlands

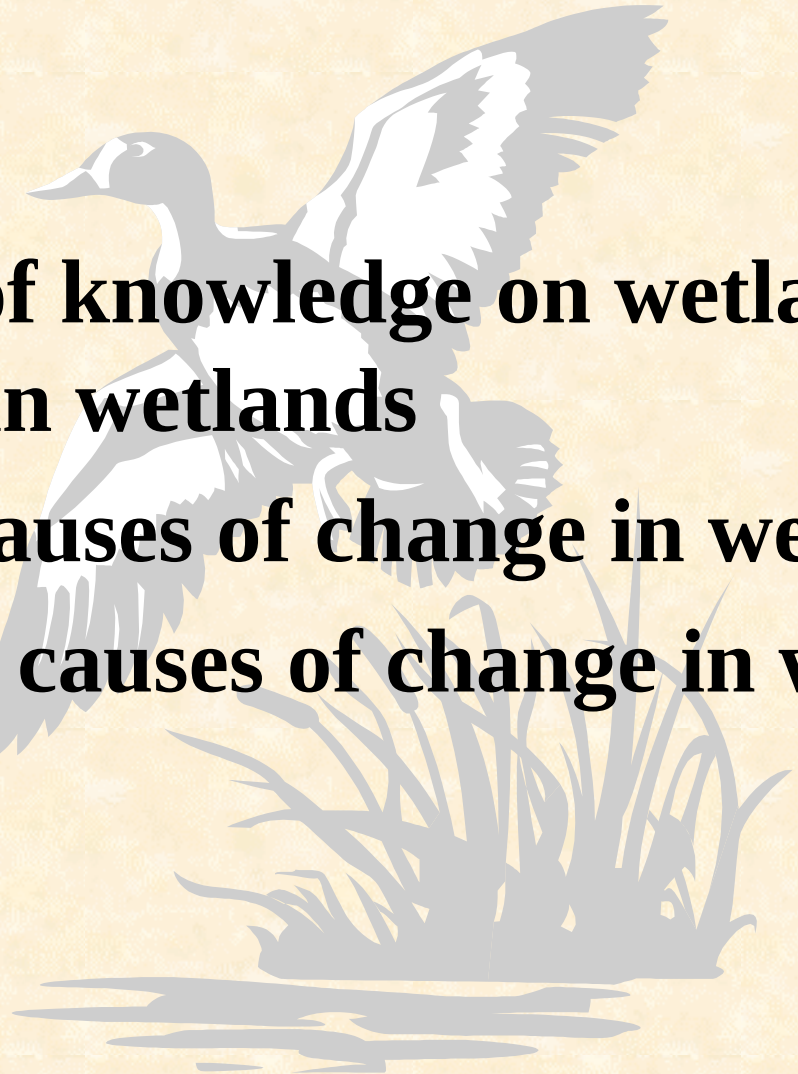
1. Background – change in wetlands

2. Ramsar conceptual framework for wetland management

3. Ramsar framework for integrated technical analyses

4. Ramsar approaches for inventory, assessment and monitoring

1. Background – change in wetlands

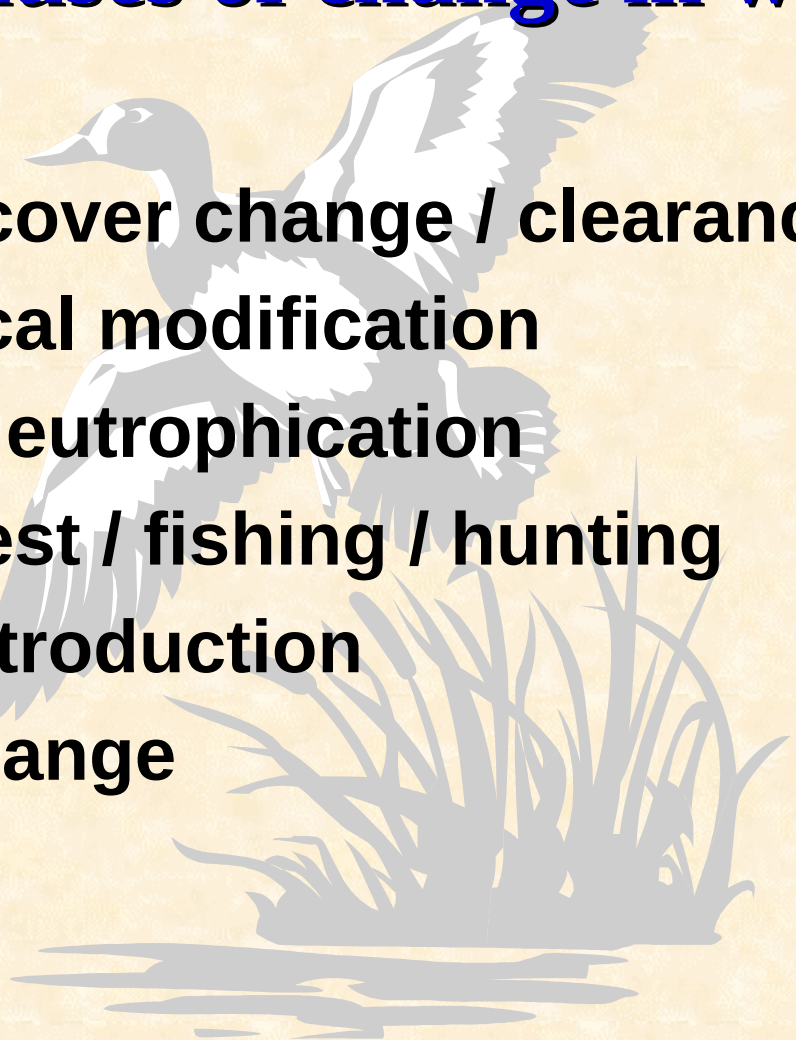


- Extent of knowledge on wetlands and change in wetlands
- Direct causes of change in wetlands
- Indirect causes of change in wetlands

Substantial information gaps

- **Global Review of Wetland Resources and Priorities for Wetland Inventory (1999) – 7% Ramsar parties had an adequate national inventory / 25% did not have an inventory**
- **Pilot Analysis of Global Ecosystems (2001) – status and trends information for inland/coastal wetlands was very patchy and incomplete**
- **Management plans not in place for many Ramsar sites (2002) – undermines objective of using these as a reference basis for monitoring network**

Direct causes of change in wetlands



- Land use/cover change / clearance / drainage
- Hydrological modification
- Pollution / eutrophication
- Over harvest / fishing / hunting
- Species introduction
- Climate change

Indirect causes of change in wetlands

- **Demographic – population size, growth, distribution and rate of change**
- **Economic – international trade, capital flows, subsidies, consumer demand**
- **Social and political – governance, gender, NGOs, decentralization, conflict resolution,**
- **Science and technology – materials, molecular biology, information processes**
- **Values, culture and religion – inequality, intolerance, taboos and values, prescription**

2. Conceptual framework for wetland management

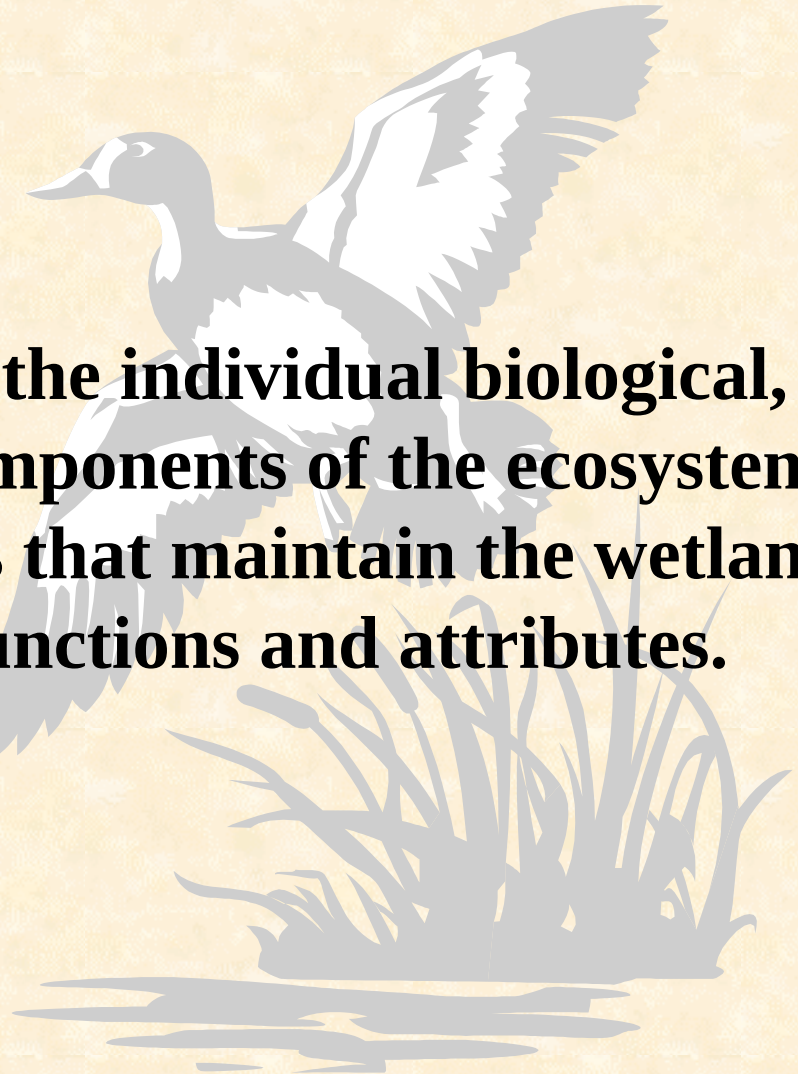
- Address major issues within an agreed conceptual framework
- Link causes of adverse change with ecological character and human well-being
- Identify strategies or interventions to maintain or restore links between wetlands and people
- Provide basis for maintaining the ecological character of wetlands through wise use

Wise use

- **The *wise use* of wetlands is their sustainable utilisation for the benefit of humankind in a way compatible with the maintenance of the natural properties of the ecosystem.**

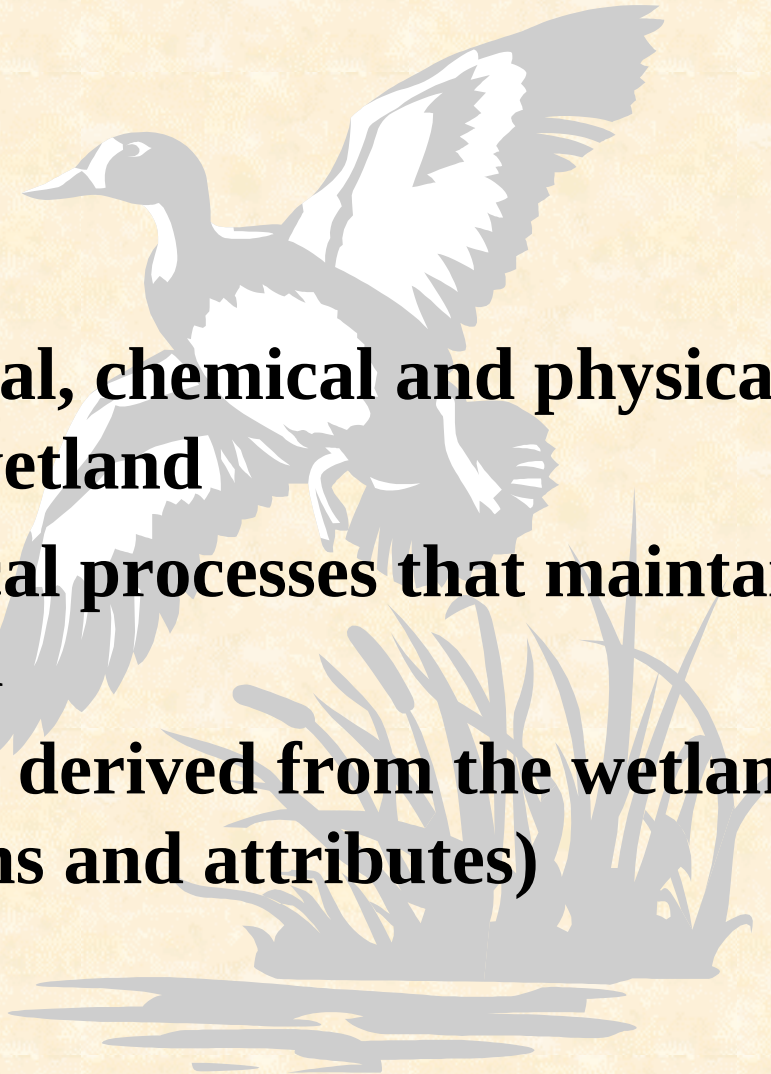
- **Wise use of wetlands involves maintenance of their *ecological character*, as a basis not only for nature conservation, but for sustainable development.**

Ecological character



The sum of the individual biological, chemical and physical components of the ecosystem and their interactions that maintain the wetland and its products, functions and attributes.

Ecological character comprises

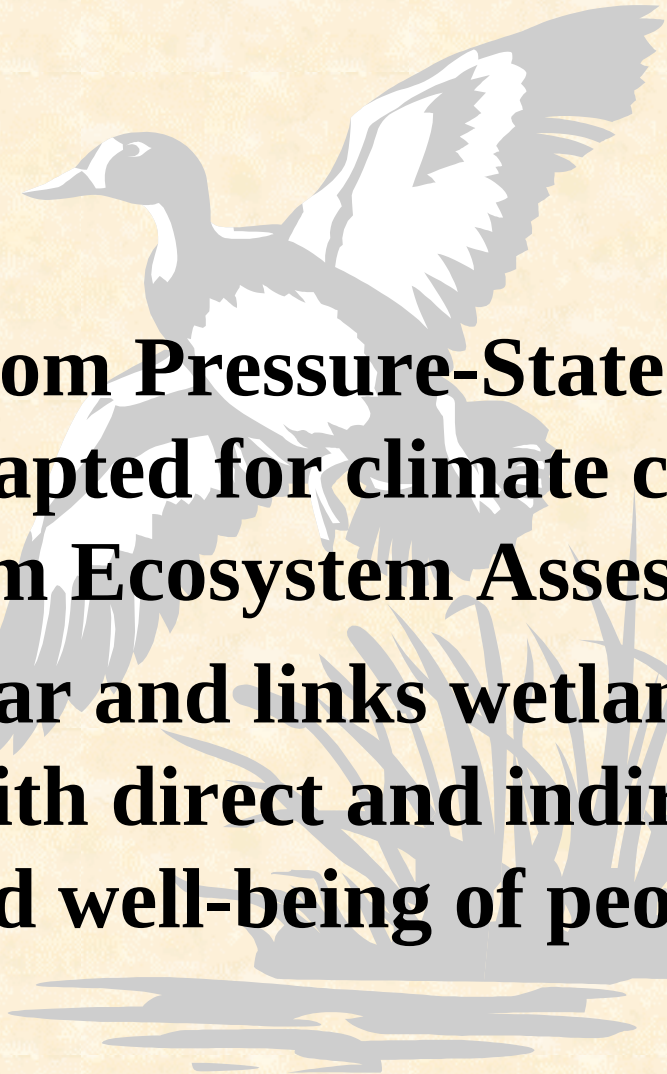


- **biological, chemical and physical components of the wetland**
- **ecological processes that maintain the wetland**
- **services derived from the wetland (products, functions and attributes)**

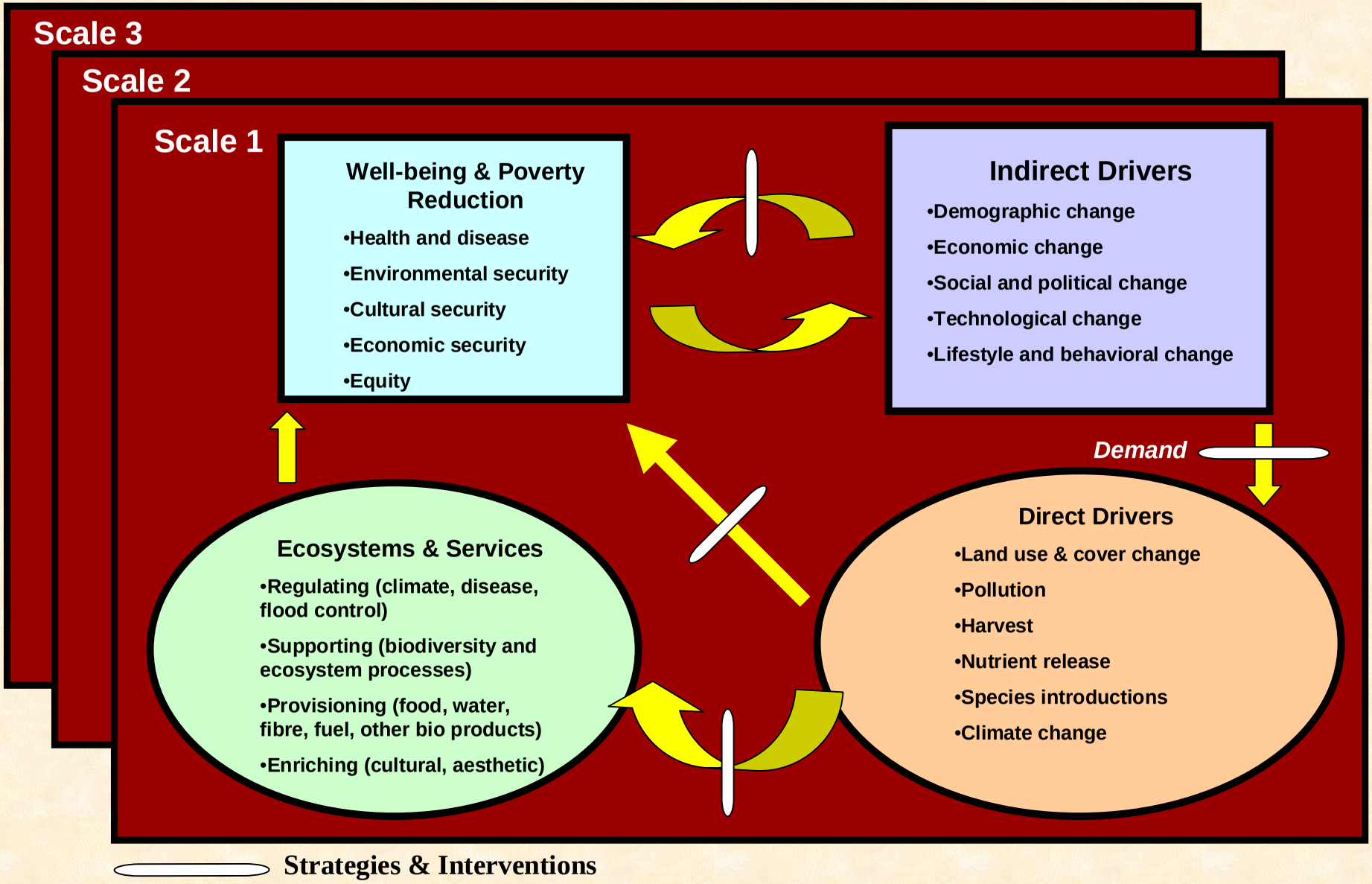
Wise use comprises

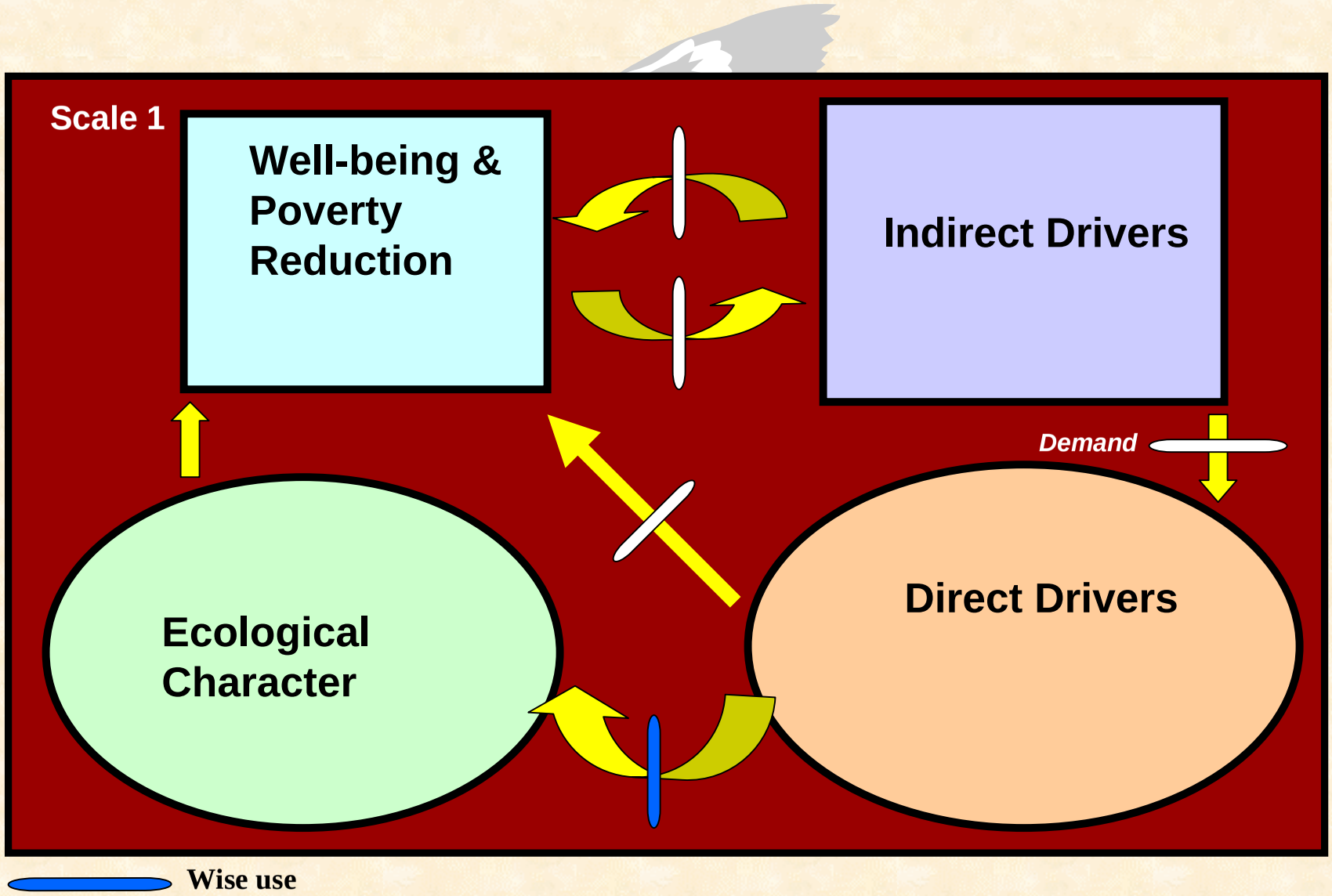
- Maintenance (restoration) of the biological, chemical and physical components of a wetland
- Maintenance (restoration) of the ecological processes that maintain the wetland
- Sustainability (restoration) of the services derived from a wetland

Framework for wise use of wetlands



- Derived from Pressure-State-Response models adapted for climate change and Millennium Ecosystem Assessment
- Multi-scalar and links wetlands and their services with direct and indirect causes of change and well-being of people


Scale 3
Scale 2
Scale 1
Well-being & Poverty Reduction
•Health and disease
•Environmental security
•Cultural security
•Economic security
•Equity
Indirect Drivers
•Demographic change
•Economic change
•Social and political change
•Technological change
•Lifestyle and behavioral change
Demand
Ecosystems & Services
•Regulating (climate, disease, flood control)
•Supporting (biodiversity and ecosystem processes)
•Provisioning (food, water, fibre, fuel, other bio products)
•Enriching (cultural, aesthetic)
Direct Drivers
•Land use & cover change
•Pollution
•Harvest
•Nutrient release
•Species introductions
•Climate change
Strategies & Interventions


Scale 1
Well-being & Poverty Reduction
Indirect Drivers
Demand
Ecological Character
Direct Drivers
Wise use

3. Framework for integrated technical analyses of change in ecological character

An integrated analysis of change in ecological character needs to:

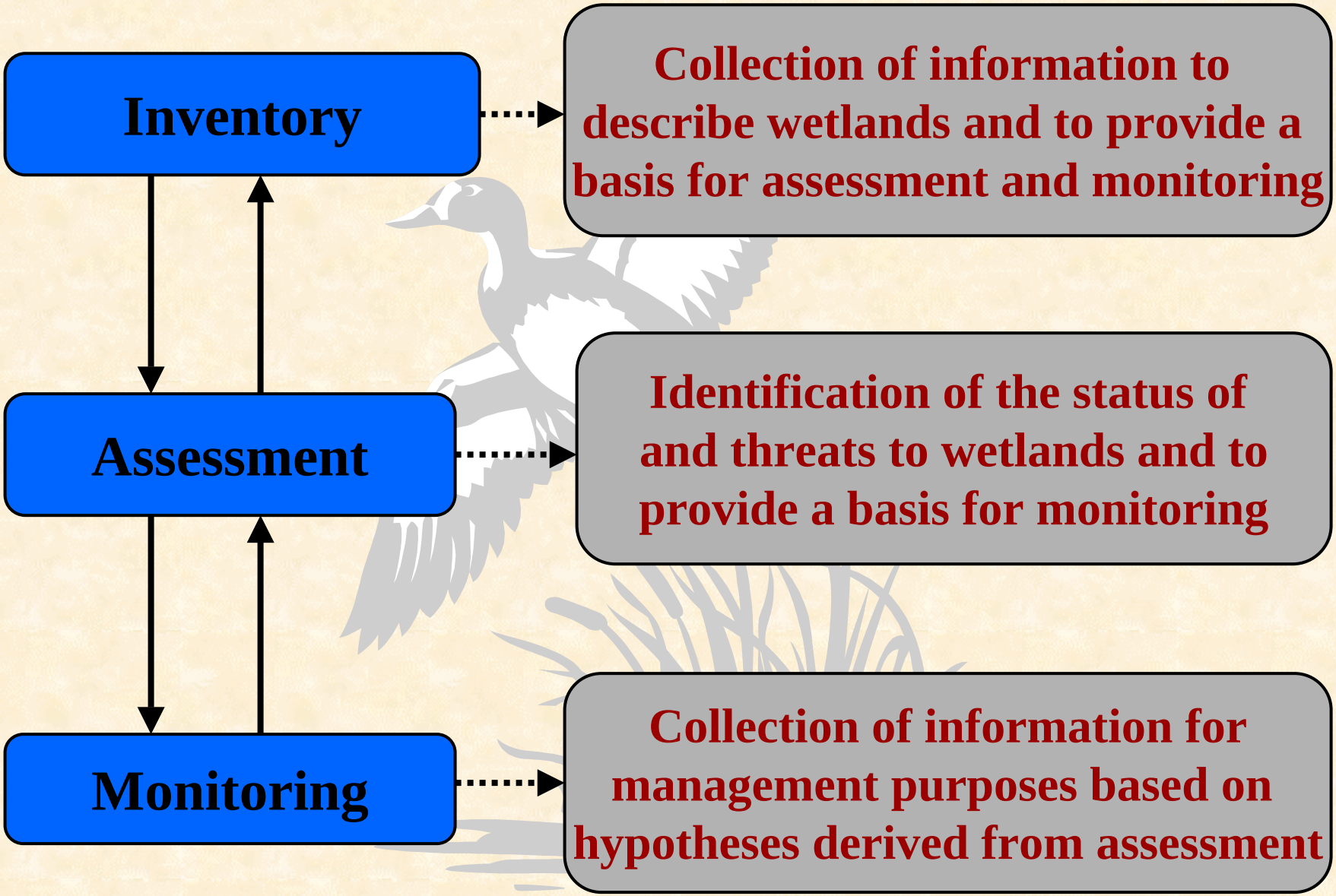
- **combine inventory, assessment and monitoring**
- **encompass multi-scalar analyses**
- **address multiple pressures (threats)**
- **provide information in an accessible and usable form**

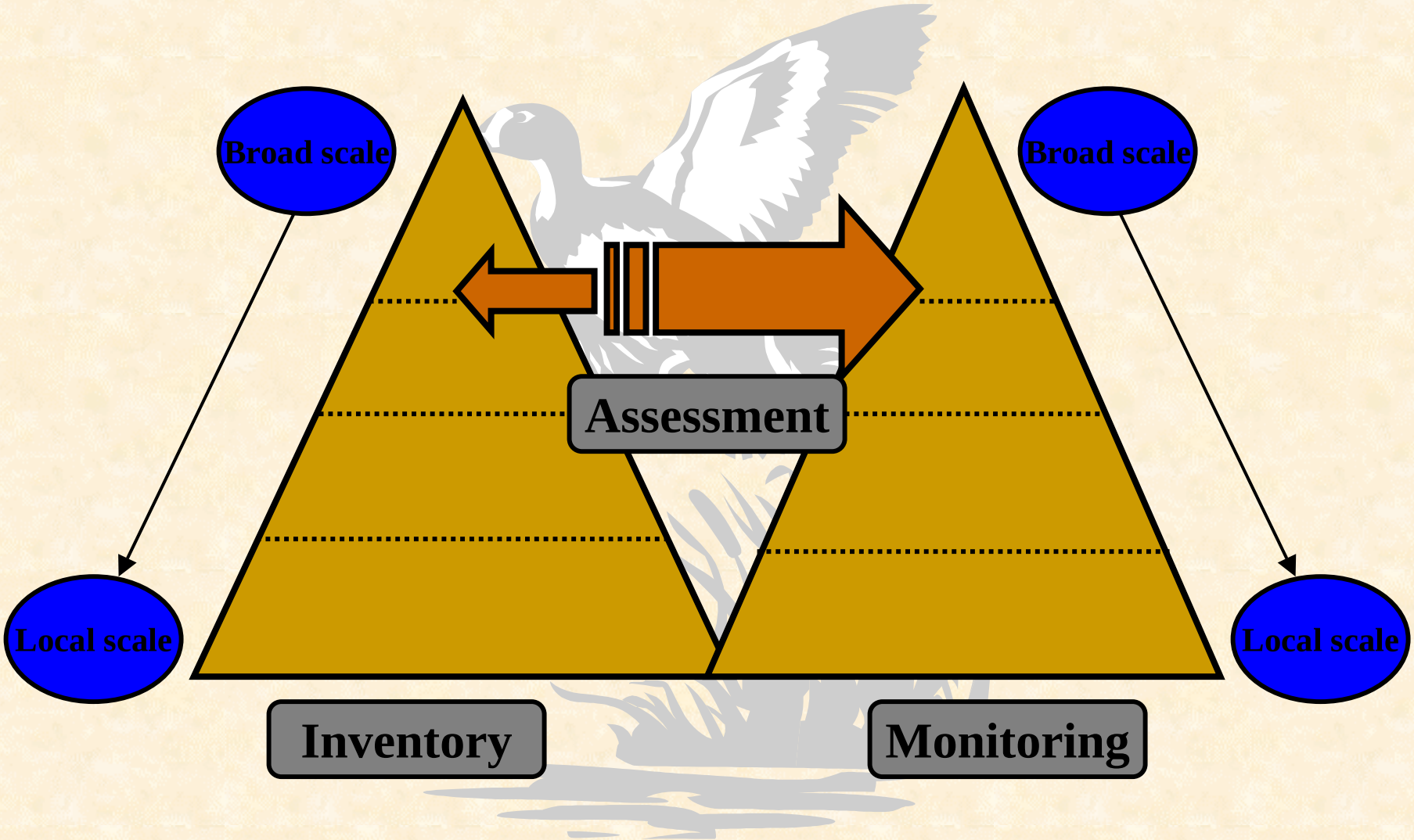
Integrated inventory, assessment and monitoring

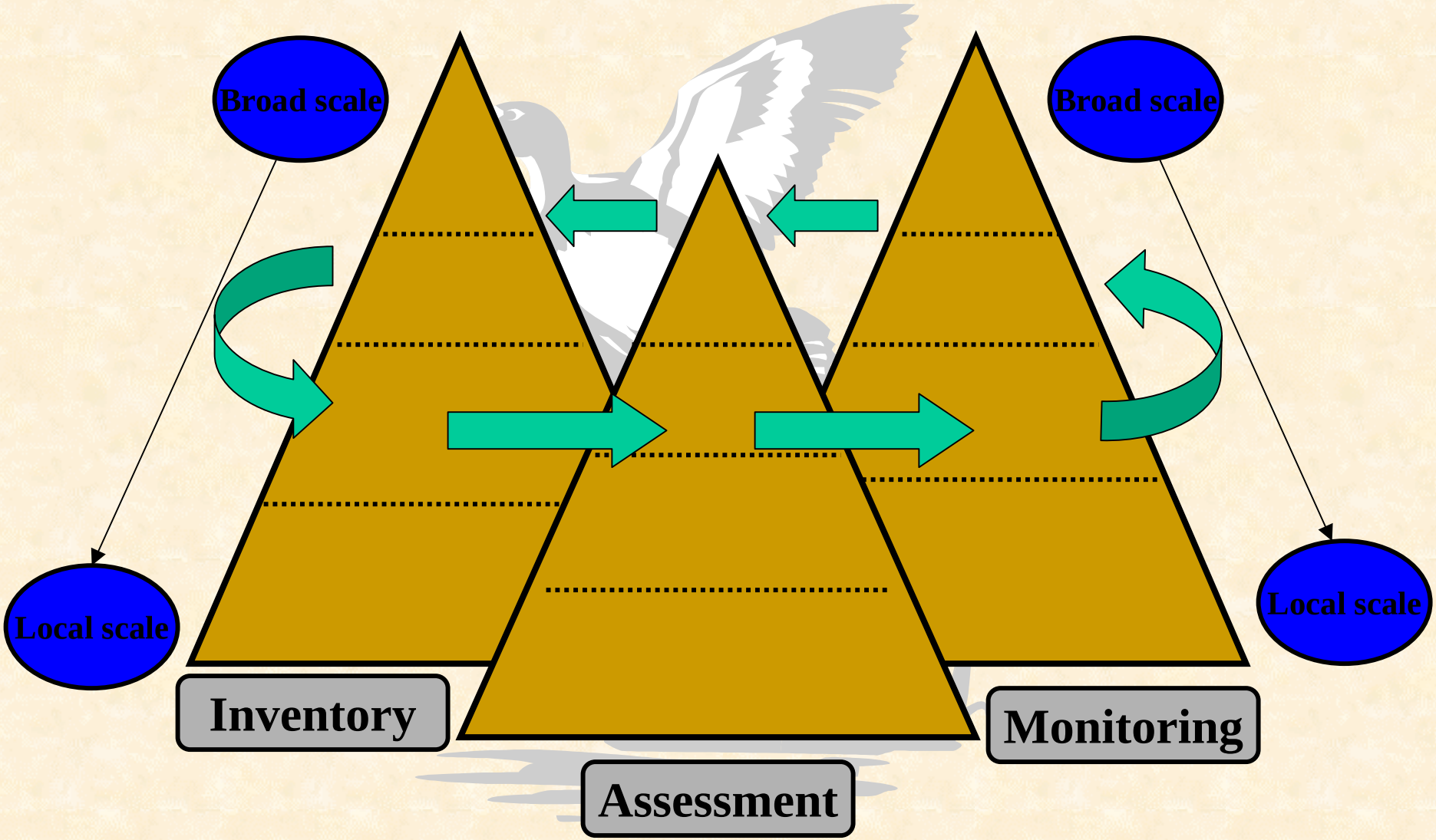
Inventory **– collection of core information for wetland management for specific assessment and monitoring**

Assessment **– identification of status of and threats to wetlands as a basis for collection of more specific information through monitoring**

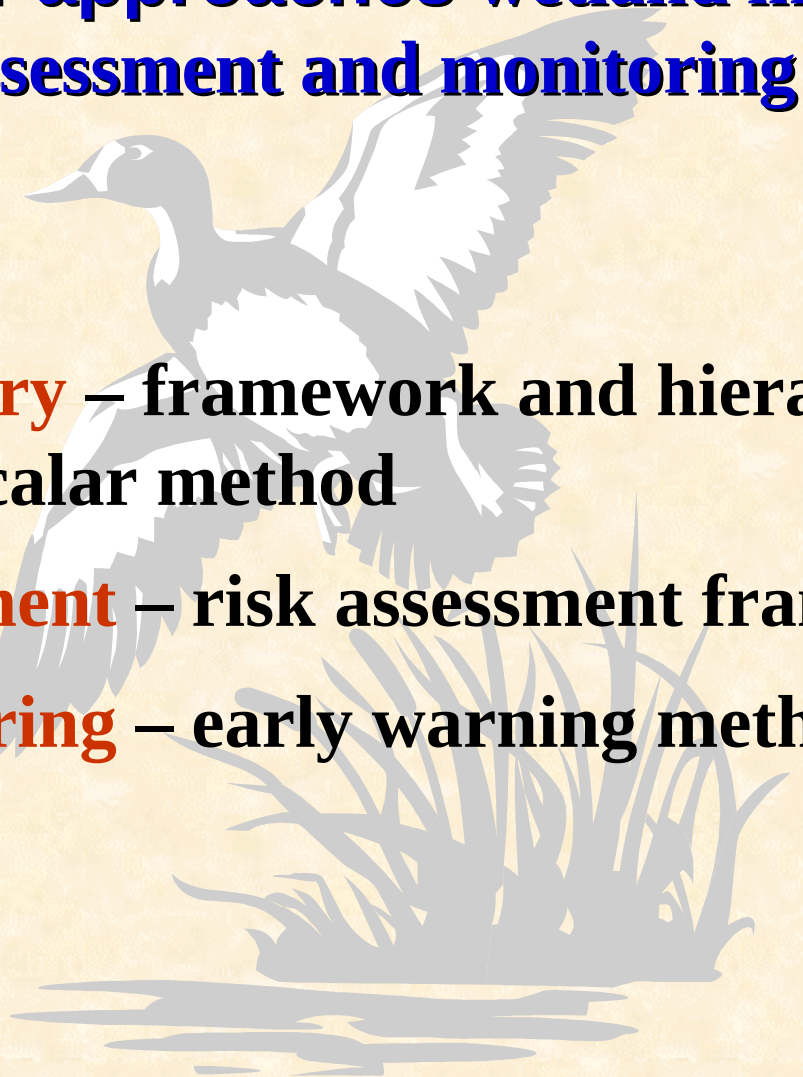
Monitoring **– collection of specific information for management purposes in response to hypotheses derived from assessment**


Inventory
Collection of information to describe wetlands and to provide a basis for assessment and monitoring
Assessment
Identification of the status of and threats to wetlands and to provide a basis for monitoring
Monitoring
Collection of information for management purposes based on hypotheses derived from assessment


Broad scale
Broad scale
Assessment
Local scale
Local scale
Inventory
Monitoring

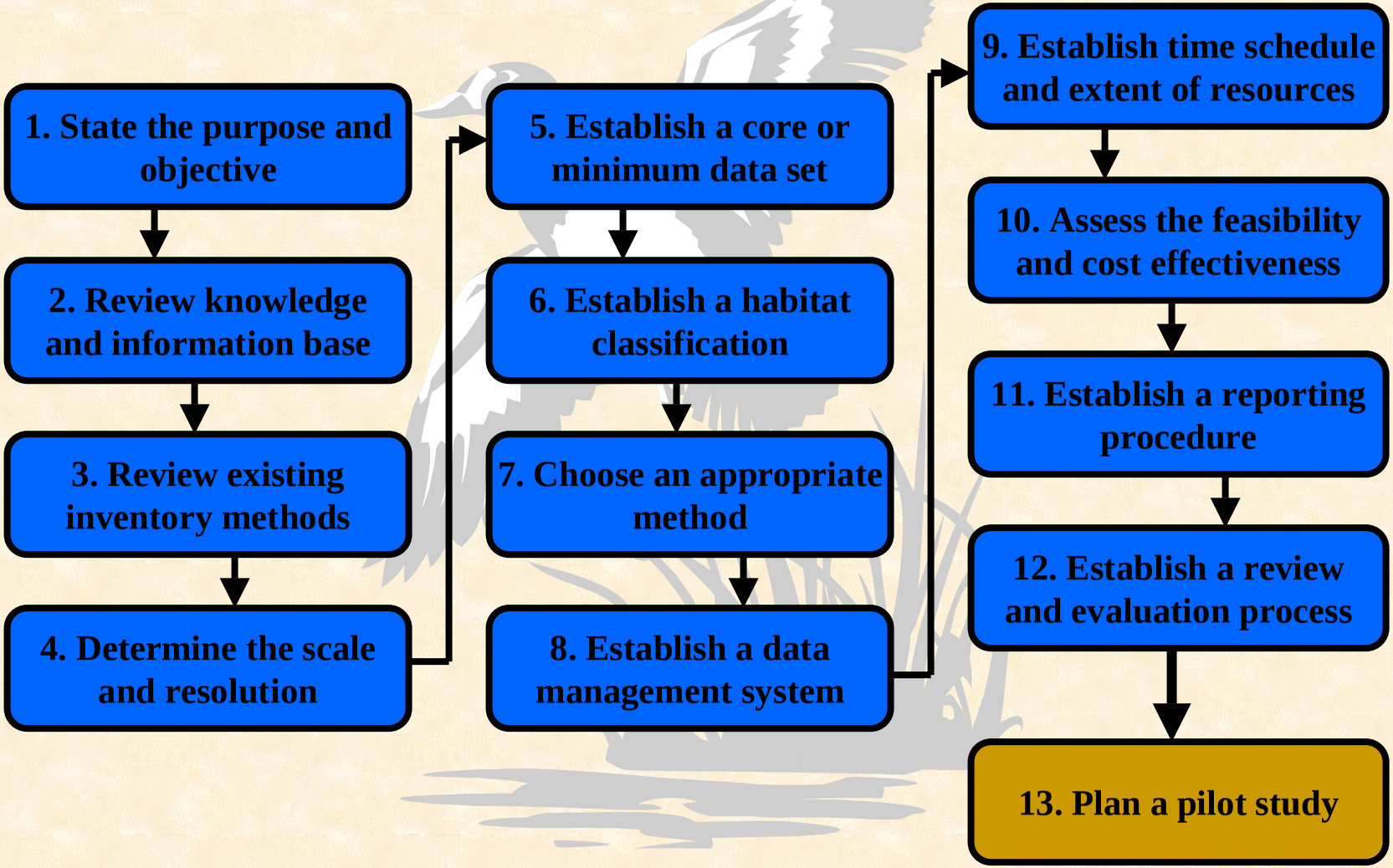

Broad scale
Broad scale
Local scale
Local scale
Inventory
Assessment
Monitoring

4. Ramsar approaches wetland inventory, assessment and monitoring



- **Inventory** – framework and hierarchical, multi-scalar method
- **Assessment** – risk assessment framework
- **Monitoring** – early warning methods

Framework for wetland inventory



Further actions

Develop practical methods and publish in a readily usable manual

Provide tools for wetland inventory, assessment and monitoring and make them readily available

Thank you