



Salinity Investment Framework III (SIF3) Project

## Preliminary recommendations for priority investments in dryland salinity for the North Central CMA: Overview

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SIF3 Working Paper 0602

### Background to SIF3

SIF3 has been developed in response to the need for a more rigorous approach to salinity investment. It is based on the latest research knowledge from hydrogeology, biology, farming systems, resource economics, social science and policy mechanism design.

We identified 60 distinct circumstances where specific strategies can be recommended, depending on the type of asset affected, hydrological conditions, and economics of management options. Recommendations, based on research, theory, experience, judgments and logic, are very sensitive to these conditions.

Salinity impacts in four different asset classes are considered: (i) water resources, (ii) high-value terrestrial assets such as built infrastructure and key biodiversity assets, (iii) dispersed assets such as agricultural land, and (iv) salt-affected land.

Responses are considered in the following broad groups

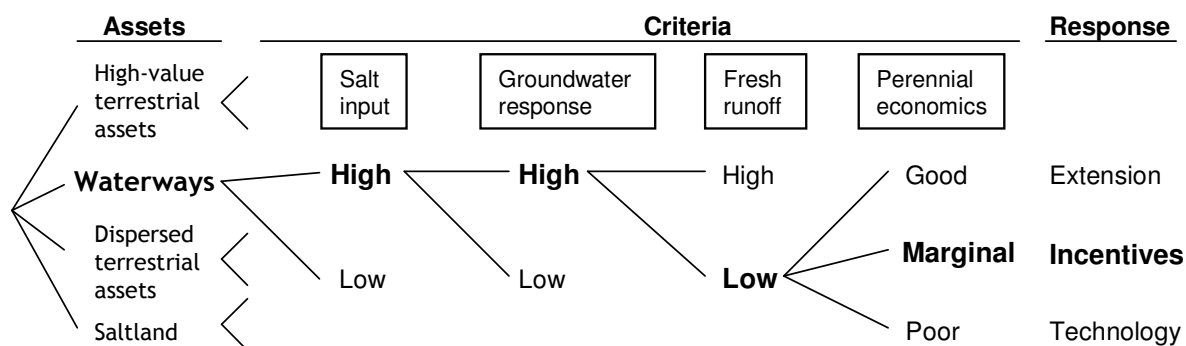
- *Extension*: Technology transfer, education, small temporary incentives. Relevant where existing management options are attractive to land managers.
- *Incentives*: Long-term incentives to support land use change. Examples: subsidies, market-based instruments, cost-sharing. Relevant to promote existing management options where off-site benefits exceed on-site costs.
- *Penalties*: Examples: transferable water rights, regulation on land use or drainage, zoning, government acquisition. Relevant to discourage existing plant-based systems in some circumstances, e.g. where forestry causes major downstream costs to water users.
- *Engineering*: Direct investment in public engineering works. Examples: salt interception through pumping saline groundwater; local engineering works on-site to protect public assets (e.g. towns). High costs, and variable effectiveness, so needs careful assessment.
- *Technology development*: Invest in development or improvement of technological options for salinity management, particularly R&D into improved plant-based systems. May also include investment in infrastructure, market institutions, etc. to support new industries.
- *Other R&D*: e.g. Research to provide information to support planning and decision making. Research into the performance and design of engineering options.
- *Land retirement*. Incentives for land-use change to non-commercial uses.
- *No action*: This response does not imply that there is no interest in addressing salinity. It simply means that no response is justified where the costs of intervention outweigh the benefits.

Several of these categories would be relevant to the broad category of 'capacity building': extension, technology development, R&D, some types of engineering works.

#### *Decision tree approach*

The process of identifying the appropriate response to salinity is illustrated in the figure below. It shows how the choice depends on the type of asset and on several other factors. The set of influential factors is different for each asset type. For waterways, as outlined in the example, the important factors are salt input, groundwater response, fresh runoff and the economics of perennials. There are different decision trees for the other asset classes. Detailed description is available in Ridley and Pannell (2005)<sup>1</sup>.

<sup>1</sup> Ridley, A.M. and Pannell D.J. (2005). SIF3: An investment framework for managing dryland salinity in Australia. SEA Working paper 1901. CRC for Plant-based Management of Dryland Salinity, University of Western Australia, Perth. [http://www.crcsalinity.com.au/newsletter/sea/articles/SEA\\_1901.html](http://www.crcsalinity.com.au/newsletter/sea/articles/SEA_1901.html)



## What have we done in the North Central region?

We have used a consultative and participatory approach in applying SIF3. SIF3 was presented and explained to a variety of audiences in the North Central region, including the CMA Chairman, CEO, key staff, the Board, the two relevant Implementation Committees, the Department of Primary Industries (both research and extension arms), the Victorian NAP Office, and the City of Greater Bendigo.

We have reviewed the history and evolution of salinity decision making in the North Central CMA region. Salinity has been recognised as a major natural resource degradation problem for decades, with pro-active development and implementation of various approaches to salinity decision making in partnership with community, government and private organisations. The North Central region's approach to salinity decision making (both dryland and irrigated) has evolved over the last 25 years, initially from being fairly non-targeted, to salinity hazard-based, development of the targeted approach and now moving towards using an asset-based framework. The current targeted approach was developed in recognition that funding for salinity was insufficient to fix the problem and that a thinly spread 'vegemite' approach was unlikely to deliver salinity benefits. Much has been learnt during the implementation of the targeted approach. The asset-based approach used by SIF3 is the next step of this evolutionary process.

A very important part of our work was to hold a field tour in areas of the North Central region where we focussed our analysis. The aims were to:

- collect local knowledge on the assets from community members and experts;
- understand threats to the assets and possible responses;
- identify issues not adequately accounted for in the current version of SIF3; and
- build credibility of the project team with the CMA and with local communities.

Further data and information was collected and collated from the CMA (mostly through Geoff Park, Peter McRostie, Jon Leever and Adam Watt), DPI PIRVic (hydrogeology group), DPI CAS (local extension staff), DSE (Kim Lowe, Deb Brown, James Todd, David Parkes), local contacts (e.g. David Clark) and contracted hydrogeology expertise (Phil Dyson).

The technical analysis was mainly conducted using the GIS layers already held by the North Central CMA, combined with information from numerous reports. Key data used in the analysis included:

- Wetlands, river index of stream condition (ISC), River Health Strategy, roads, location and railway GIS layers to assess high-value assets;
- Conservation significance layer as a function of bioregional conservation status and habitat score (new layer developed by DSE) that became available in March 2006;
- Groundwater flow systems layer to assess tractability of the salinity problem;
- Depth to water table from the North Central Salinity Audit (2000) data to assess risk of salinity and urgency of the problem;
- New data from Sinclair Knight Merz (SKM) for watertable height and trend data, developed using "sequential gaussian simulation". Assets at risk are those estimated to have moderate (P=0.5-0.75) and high (P=0.75-1.0) probabilities of watertables at less than 5 metres depth in 2004.

We used the two different depth-to-watertable data sets to assess salinity risk because there is controversy around both data sets. The Salinity Audit data is known to over-estimate the salinity risk, but the new data layer from SKM has not been ground truthed.

We have analysed the investment responses for 17 focus areas. These include the 10 that are currently target areas, plus 7 others that are not. A brief summary of preliminary recommendations regarding investment responses is presented in Table 1. These are based on the activities and data outlined above, feeding into the SIF3 framework. On the basis of our application of SIF3, we recommend some substantial changes to the way funds are applied, to the strategies used to achieve salinity outcomes, and to the approach used to select priorities for investment. The full set of recommendations for each area, with detailed supporting information, assumptions and explanations, is contained in a separate detailed report.

Note: We welcome discussion on any aspect of our assumptions, which are outlined in the detailed report. Further analyses and peer review/feedback by experts is being conducted before these recommendations are finalised.

The map on the last page shows the locations of 15 of the focus areas. Our analysis also included the mid and lower Avon-Richardson catchment areas (no boundaries drawn), effectively covering the whole Avon Richardson catchment. The 17 focus areas thus comprised 4 areas in the Avon-Richardson catchment, 5 in the Avoca, 5 in the Loddon and 2 in the Campaspe. The map shows the major rivers, wetlands and high value native vegetation biodiversity assets in the North Central region as well as areas where there is moderate-to-high probability of shallow (less than 5 m depth estimated in 2004) watertables.

## Recommendations and comments for North Central CMA

### ➤ *Targeting*

#### **Recommendation 1. Strengthen the targeting of investments by North Central CMA.**

Targeting should be on the basis of identified assets, and should be significantly tighter than under the current 'target areas' approach. Many current investments in land-use change in target areas are in locations where they are probably having little if any effect on high-value assets. Currently, some CAS staff are not sufficiently discriminating between the priority of different locations within a target area when allocating incentives. The targeting process needs to be strongly based on both technical and local knowledge.

We note that the North Central CMA is responsible for reporting on end-of-valley targets on the river systems of the Avoca river at Quambatook, the Loddon at Laanecoorie and the Campaspe at pumps (Rochester). SIF3 does not specifically attempt to address end-of-valley targets as we believe that that approach is too coarse to be useful for assessing protection of within-catchment assets. This said, we also believe that the current target-area approach is unlikely to achieve the resource-condition and management-action targets in existing target areas.

### ➤ *Investment mechanisms*

#### **Recommendation 2. Base the selection of investment mechanism (e.g. extension, incentives, R&D, etc.) on a sound framework that considers the adoptability of improved practices, and the balance of public and private benefits.**

The implicit assumption that the available options for sustainable land-use are sufficiently profitable and adoptable on a wide scale in the North Central region does not seem to stand up. In discussions with people in the CMA and DPI, we have noticed a lack of clarity about the relevance of public and private benefits, and their implications for investment strategies. Similarly, in our discussions with DPI, we considered that their views about the profitability of perennial farming systems were often overly-optimistic.

#### **Recommendation 3. Reduce the overall emphasis on extension, target extension activities more precisely to situations where they will be more effective, and change the emphasis of extension more towards participatory research to test and improve farming systems options.**

In the current strategy, there is an emphasis on extension officers promoting the uptake of existing sustainable land-use options, including by offering small, temporary incentives. However, in most locations this is not an effective approach, due to the lack of sustainable land-use options that are adoptable at large scale. The role of extension would shift towards, (a) extension/participatory research, connected to strategic research, to attempt to develop improved sustainable land-use options that are more adoptable (including being more profitable) and (b) general support for other responses, to raise awareness and participation (including revegetation and land retirement).

Table 1. Summary of recommendations for 17 areas in the North Central CMA and comparison with current NAP

Focus area	Catchment	NAP Priority	SIF3 priority for salinity investment?	Recommended strategy** (see full report for details on where these strategies are recommended)
Upper Avon-Richardson*	Avon Richardson	Yes	No – for downstream salinity reduction. Maybe – for protection of specific wetlands. Probably no – for flood risk. Probably yes – for sedimentation and nutrient management. Maybe – for town of Marnoo	Waterways: technology, no action or possibly extension. Wetlands: land retirement, technology development, possibly large incentives, possibly engineering, possibly extension depending on circumstances. High-value wetlands need further investigation. Agricultural land: no action or technology development. Saline land: extension and technology development. Town of Marnoo: possibly engineering; needs assessment.
Reedy/Paradise*		Yes	No – for downstream salinity reduction.	No action.
Mid Avon Plains*		No	Maybe – for selected wetlands.	Waterways: possibly engineering, technology development or no action. Wetlands: Possibly large incentives for carefully chosen wetlands. Agricultural and saline land: as for Upper Avon-Richardson.
Lower Avon Richardson*		No	No – for Lake Buloke. Maybe – for some selected wetlands. Maybe – for Donald.	Waterways: no action or technology development. Lake Buloke: no action. Donald – possibly engineering. Other lakes: case specific, needs analysis. See full report. Agricultural and saline land: As for Upper Avon-Richardson.
Redbank*	Avoca	Yes	No, high-value assets not threatened.	Probably no action –see full report.
Carapooee*		Yes	No, high-value assets not threatened.	Probably no action – see full report.
Natte Yallock*		Yes	Possibly for Bradshaw Swamp. Agricultural land – technology development or extension.	Waterways: no action or technology development. Wetlands: Bradshaw Swamp but needs further analysis. Could be engineering, incentives, technology or no action Agricultural land: technology development if economics marginal, extension if lucerne is profitable.
Pental Hills		Yes	Probably no, will depend upon judgements about the value of downstream assets and impacts.	Agricultural land: no action or technology development.
Glenloth		Yes	Recommendations highly dependent on watertable data: Salinity Audit – no in short term, high-value assets but low urgency. New SKM data – yes for selected wetlands. Highlights a large problem of reliability of both new and old watertable data.	Waterways: technology, extension or no action. Wetlands: High value wetlands and floodplains – engineering, technology development, incentives for floodplain regeneration or no action – see full report. Needs further analysis on case-by-case basis. Town of Quambatook: probably no action. Agricultural land: no action, extension or technology development.

\* These areas were visited in the SIF3 tour of December 2005, or subsequently.

\*\* In all cases, the investment responses currently used in NAP priority areas consist of extension and small, temporary incentives.

Table 1 (continued). Summary of recommendations for 17 areas in the North Central CMA and comparison with current NAP.

Focus area	Catchment	NAP Priority	SIF3 priority for salinity investment?	Recommended strategy** (see full report for details on where these strategies are recommended)
Upper Bet Bet*	Loddon	Yes	No from the perspective of protecting agricultural land. Probably no from an asset-based perspective, but further analysis with CAT modelling is needed.	Waterways: probably no action, but needs more analysis. If further analysis indicates action justified: Steep hills: Retirement of land from agriculture. Lower slopes: large, long-term incentives (for woody perennials), technology development. Saline land: extension and technology development.
Timor West		Yes	No, less justified than Upper Bet Bet. Other comments re Upper Bet Bet apply also.	Waterways: probably no action, but see full report. Agricultural land: no action or technology development. Saline land: extension and technology development.
Moolort*		No	Yes – in discrete areas to protect high-value wetlands and selected waterways. Case-by-case analysis of high-value assets is needed.	Waterways: possibly regulation or some form of penalty (needs more analysis), engineering, incentives, technology development, or no action. Lakes and wetlands: various recommendations. See full report – needs case-by-case analysis. The Merrin Merrin Swamp is the highest value asset.
Bullabul		Yes	No, no high-value assets threatened.	No action or possibly incentives for land retirement.
Kamarooka*		No	Yes – both to protect high-value wetlands and reduce off-site impacts of salt-affected land. Case-by-case analysis of high-value assets is needed.	Waterways: extension, technology development or land retirement. Tang Tang Swamp is the highest value asset: engineering (if economic). Other wetlands: asset value needs to be assessed. Most likely will be no action. Infrastructure: engineering (if economic) and possibly incentives, technology development or land retirement. Agricultural land: no action, technology development or extension. Saline land: possibly extension, technology development. Needs further analysis.
City of Greater Bendigo*		No	Yes – in partnership with City of Greater Bendigo and with further information.	Engineering in specific areas. Very high values, but also high costs. Requires detailed further investigation.
Wild Duck*	Campaspe	No	Probably no, but further analysis is needed.	Probably no action, possibly penalties or incentives for land retirement, see full report.
Axe Creek*		No	Probably no, but further analysis is needed.	Waterways: Possibly incentives for land retirement, subject to further analysis. Probably no action.

\* These areas were visited in the SIF3 tour of December 2005, or subsequently.

\*\* In all cases, the investment responses currently used in NAP priority areas consist of extension and small, temporary incentives.

The technology transfer role of extension (including small, temporary incentives) would only be targeted to specific cases where the technology is assessed as being already attractive to landholders (e.g. saltland pasture systems in some areas).

We believe that there is a need for additional formal training of some extension staff. We see three immediate training needs: (a) training of understanding in salinity and landscape processes; (b) saltland agronomy; (c) integrated natural resource management training, covering issues such as erosion processes, nutrient management, acidification and biodiversity conservation within agricultural landscapes.

➤ ***Changes to plans and strategy***

**Recommendation 4. Revise Land Management Plan in 2006 in the light of SIF3 recommendations.**

**Recommendation 5. Revise the Regional Catchment Strategy in 2007 in the light of SIF3 recommendations.**

The required changes are substantial, rather than superficial. The SIF 3 team are very confident that the analysis presented here offers a valuable opportunity for the North Central CMA to improve their Land Management Plan and Regional Catchment Strategy, through improved targeting of investments and improved choice of methods for achieving targets.

**Recommendation 6. Embedding SIF3 thinking into planning for other natural resource management issues when revising the as input to the Regional Catchment Strategy.**

Support the extension of SIF3 to more fully encompass multiple natural resource management outcomes, potentially including biodiversity conservation, water quality (nutrients and potentially pesticides), soil erosion and soil acidification. This is a major task, but we believe that it is both achievable and worthwhile.

**Recommendation 7. Apply SIF3 to areas with high salinity threat that have not been considered in this initial study.**

➤ ***Transition process for the next Regional Catchment Investment Plan***

**Recommendation 8. Develop a transition strategy to manage the process of introducing SIF3 recommendations into the CMA's plans and strategies.**

Elements of a transition strategy might include:

- *A communications strategy:* Undertake a process of community engagement in light of SIF3. Explain the need for change in the light of new knowledge, experience and more comprehensive analysis. In view of the major changes to investment that we recommend, the process of community engagement and ownership will be a very important.
- *A timetable for change:* Identify recommendations that are priorities for earlier change. Set a timetable for changes over the coming two or three years, taking into account the seasonal delivery by DPI and the CMA, and inform stakeholders of this timetable.
- *Training of existing staff in key areas:* See earlier recommendation
- *An induction process for the new Board:*
- *An induction process for the Implementation Committees.* A follow-up workshop is recommended.
- *'Capacity needs' considerations:* Based on the capacity needs identified in the SIF3 project (yet to be completed), develop a plan for securing the necessary skills within the CMA or key service providers.
- *Liaise with extension service providers:* Discuss the need for more strategic targeting of salinity extension, and refocussing of extension strategies (see earlier recommendation).

➤ ***Research and analysis for the next Regional Catchment Investment Plan***

**Recommendation 9. For high-value wetlands and river reaches where substantial new investment is envisaged, conduct studies of technical and economic feasibility.**

We have identified a number of areas where high-value wetlands and river reaches are threatened by salinity. However, without additional analysis and investment in some data collection, the available salinity-risk information is usually at too coarse a scale to be confident that possible interventions would be technically feasible and cost-effective. Additional studies should include collection of new data, and collation

of existing data, expert opinion and local knowledge. Engage a skilled person with both ecological and communications skills to lead this process.

**Recommendation 10. Commission a project to further develop and implement catchment modelling (surface and groundwater processes) tools in the North Central region, and to communicate results.**

This will enable a strengthening of conclusions about the trade-off between water yield, river salinity and land salinity. We recommend the use of the Catchment Analysis Tool (CAT), which links surface management to groundwater and stream impacts. Currently a single-layer groundwater model has been developed for the North Central region, but a more complex, multi-layer groundwater model would be useful. In addition, more use could be made of CAT information that is already available. We recommend a workshop to inform the CMA on this, followed by a commissioned project.

**Recommendation 11. Invest in research and development and trialing to develop improved plant-based systems for salinity management through a partnership with CRC Salinity.**

With the exception of lucerne in some situations and perennial grass-based pastures in a minority of situations, there is currently a lack of plant-based options that are profitable enough for broad-scale adoption. This is re-enforced by some of the DPI extension staff being unable to meet their targets for on-ground works. There is need for strategic R&D to develop profitable solutions combined with partnerships with active local farmer groups to trial potentially profitable options for salinity management.

**Recommendation 12. Assess whether there are sufficient data on groundwater salinity concentrations from available bores through collation of existing data.**

We were able to procure a groundwater salinity layer from DPI, but we had such doubts about its reliability that we did not use it. We suggest that investment in data collection and collation is needed. There is currently limited information available in an accessible form (GIS) on salinity concentrations in bores and so assessment of salinity risk is based only on watertables and expert knowledge. This highlights a much larger issue of data quality and custodianship more generally.

**Recommendation 13. For future scientific projects and consultancies, build external peer review into the process and insist on a short, plain-English version of the project outcomes.**

We have reviewed a very large number of technical documents for the North Central region. We are very concerned that almost none of them are peer reviewed and some appear to be of dubious quality. Peer-review is the standard accepted method for quality assurance in research, and it should not be considered an optional extra. Another problem is that many reports are so long that they are highly inaccessible. Plain-English summaries are crucial to enable Board and Implementation Committee members to understand the technical basis for strategic investment, and should be required.

## **Other issues for the CMA**

### ➤ **Demographic changes**

We have not yet dealt adequately with demographic changes occurring in the region, such as those outlined by Neil Barr and Roger Wilkinson of DPI, who have identified categories of commercial, amenity and transitional landscape types. Ongoing research in the project being conducted by Roger Wilkinson will continue to study this important issue and its implications for recommended strategies, particularly in regions where there are drivers other than commercial agriculture. Roger will be conducting interviews and analysing available information over the next 6–12 months within the North Central CMA region. This may help us to modify recommendations on issues such as incentives, technology development where commercial motivation is not the only consideration, and assess the potential for land retirement options.

### ➤ **Non-salinity issues**

Recommendation 5 was to embed SIF3 thinking into plans for other NRM issues. Here we provide a little further detail behind that recommendation.

- (a) A broader NRM framework needs to handle small biodiversity remnants in more detail than does SIF3;
- (b) Of the 101 river reaches in NC region, the River Health Strategy identifies 56 as being of high priority. This is too many to be protected with available resources -- more stringent prioritisation is needed;
- (c) The basis of selecting areas for improved nutrient management could be improved;

- (d) The Victorian Water Quality Monitoring data can be used to assess if there are issues of acidification of waterways in addition to nutrient issues;
- (e) Due to the complexity of considering multiple outcomes, robust catchment modelling will be crucial.

In relation to observation (a) we need to be clear that SIF3 is dealing specifically with salinity impacts, and not with other opportunities for environmental protection or enhancement. The main issue is that in SIF3, small biodiversity remnants are categorised together with agricultural land as being of 'low-value' as it is unlikely that any would be of sufficient value in their own right to be competitive with larger biodiversity assets for investment to protect them from saline watertables. If an individual threatened remnant is of outstanding value in its own right, it would be handled within the 'high-value' category. However, there may be other types of investment in relation to remnants that would be highly beneficial, such as linking groups of remnants with corridors. We have not assessed these opportunities, but the rules developed by Fiona Ferwerda from DSE, as incorporated within the CAT model, enable remnant connections and impacts on recharge to be assessed.

## Recommendations and comments at the state level

### **Recommendation 14. Undertake detailed revisions to Regional Catchment Strategies across Victoria, to take on the lessons of SIF3.**

Given what we have learnt in the past few years, and applied in North Central region with SIF3, there needs to be a systematic overhaul of the Regional Catchment Strategies, not a superficial update.

### **Recommendation 15. Establish a Rural Towns Salinity Program in Victoria, to be operated on a state-wide basis in cooperation with CMAs and local government.**

Towns have among the highest concentration of high-value assets under threat from salinity, but effective salinity management in most towns is likely to be expensive, so careful evaluation is needed. Experience in Western Australia has shown that the technical and economic feasibility of pumping to protect towns varies very widely between towns that superficially appear similar, so case-by-case assessment is needed. The response in WA has been a "Rural Towns Program" that monitors salinity threat and undertakes detailed assessment of hydrogeological conditions and the likely feasibility of various salinity management options. Many of the issues in the required feasibility assessments are technical and specialised and there is a limited availability of specialists with the required skills.

### **Recommendation 16. DSE and the NAP Office should ensure that the new water table depth and trend data developed by SKM is properly reviewed.**

This needs to include assessment of whether the methodology is valid and appropriate given the number of bores used. Also we understand there has been no ground truthing with bore data. Without adequate scrutiny, we don't believe that CMAs can be sufficiently confident of making sound investment decisions based on this data. As this issue applies to all NAP regions in Victoria, not just the North Central CMA, the NAP Office and DSE should be responsible for ensuring that it occurs.

State organisations DSE and DPI should also particularly note the earlier recommendations relating to bore data (Recommendation 12) and peer review (Recommendation 13). These are relevant throughout the state and should be pursued at the state level.

## Observations on the SIF3 process

We feel that we have been able to incorporate most of the latest science and contemporary thinking into the SIF3 analysis. Once we had collected the required information, we found it quite easy to apply the framework. Our original intention was to analyse 10 areas, including a mixture of current target and non-target areas. Due to the relative ease with which we were able to apply SIF3, we increased the total number to 17. We did not have an opportunity to personally visit the additional areas, so recommendations were based on the various data sets that we were able to collate and follow up with extension staff. Again this worked well. Nevertheless, an ideal process would involve local visits and local consultation for each area analysis.

Although SIF3 focuses on salinity, we have also been able to make comments about nutrients, erosion and flooding. (Note, however, that only for salinity have we developed a full decision framework, so our comments on other issues are relatively brief.) We have used the priority setting processes used by the

North Central CMA to classify rivers and wetlands and have used the latest DSE biodiversity conservation significance work as part of the basis for identifying high-value assets to underpin our analysis.

We have been struck that in many cases the available scientific information relevant to North Central region is poorly integrated, by which we mean that there has been insufficient effort given to pulling together relevant information from different sources and different disciplines to produce advice that is balanced and comprehensive enough to be practically useful for regional planning. (We suspect that this is also the case in other regions.) For example, as we have shown, hydrogeological information, no matter how accurate, is not sufficient. SIF3 is an attempt to do the required integration.

Here we suggest characteristics of the SIF3 analysis that have led to its success as an integrating process:

- A decision-making focus for the analysis;
- An experienced multidisciplinary team, including good background in several relevant areas of research;
- Within the team, inclusion of expertise in socio-economic aspects, not just bio-physical aspects;
- Excellent networks among the research community to identify the most relevant information and expertise for specific issues;
- A thorough analysis of issues affecting appropriate investment responses and investment priorities conducted in advance, leading to simple criteria for cases where particular decision choices are appropriate, and highlighting the variety of information that would be needed for practical planning;
- Development of an overall decision framework, independent of the particular circumstances of North Central region.

Apart from those aspects related to integration, we consider that other important elements of the approach taken include the following:

- Excellent cooperation and assistance from CMA staff, supported by leadership (Chair, Board, CEO).
- Being open and explicit about decision rules used;
- Being open and explicit about assumptions made about the characteristics of each area;
- Making extensive use of formal and informal peer review;
- Hiring the best available expertise for advice on key technical aspects;
- Involvement in the team of people from outside the region, and even from outside the state, to allow a really fresh look at the issues;
- Working on the analysis in a concentrated fashion, with adequate time available from team members.

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