



A Canadian Rapid Response Framework for Aquatic Invasive Species

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**A Canadian Rapid Response
Framework for Aquatic Invasive
Species**

**Un Cadre Canadien d'Intervention
Rapide contre les Espèces Aquatiques
Envahissantes**

A. Locke¹, N. E. Mandrak² and T.W. Therriault³

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Rapid Response

- The capacity to quickly respond to the detection of a suspected non-indigenous species and prevent or manage its establishment in a new location.



Rapid Response

- Considered the “second line” of defence (prevention being the first) against the introduction of non-indigenous species.
- If a non-indigenous species is detected in a new location then prevention has failed.
- Since prevention not 100% effective, rapid response is an integral component of invasive species management programs.



Rapid Response

- Optimal outcome of rapid response is the elimination of all further risks associated with the presence of the target species.
- Likely to be achieved only with eradication of the target species.
- Eradication defined as, “the removal of every potentially reproducing individual of a species or the reduction of their population density below sustainable levels”.



Rapid Response

- Eradication may be feasible only in limited circumstances.
 - e.g, where the target species is confined to a very restricted range - might only occur when detection occurred early in invasion cycle before species disperses.
- Thus, rapid response to non-indigenous species may encompass a range of management goals, from eradication, through suppressing abundance or dispersal, to learning to live with the species.



Rapid Response

- Wotton and Hewitt (2004) identified three main components of an effective rapid response system:
 - (1) processes and plans to guide response actions;
 - (2) tools with which to respond; and,
 - (3) the capability and resources to carry out the response.





Rapid Response Framework

- Our goal is to provide a structure or “framework” for first component of rapid response, development of rapid response plans for freshwater and marine non-indigenous species in Canada.
- This framework will provide guidance and consistent approach to steps needed for development of rapid response plans.
- Details contained within individual response plans will need to be tailored to suit the particular species and/or locations of concern.



Rapid Response Framework

- While we do not address the second and third components of rapid response (because input from other DFO sectors is required and addressing these components is beyond the scope of this Science exercise), any development of a rapid response plan must take into account availability of tools, and capability and resources to undertake a response.



Rapid Response Framework

- The proposed framework builds on several earlier initiatives to develop a rapid response planning protocol for AIS in Canada (Locke and Hanson 2009a, b; Locke et al. 2009).
- It benefited from the suggestions of participants at a tunicate risk assessment and rapid response workshop held in Charlottetown, PEI, in March 2007.
- The draft framework was formally peer reviewed at a National CSAS Advisory meeting held in Richmond, BC, in June 2009.



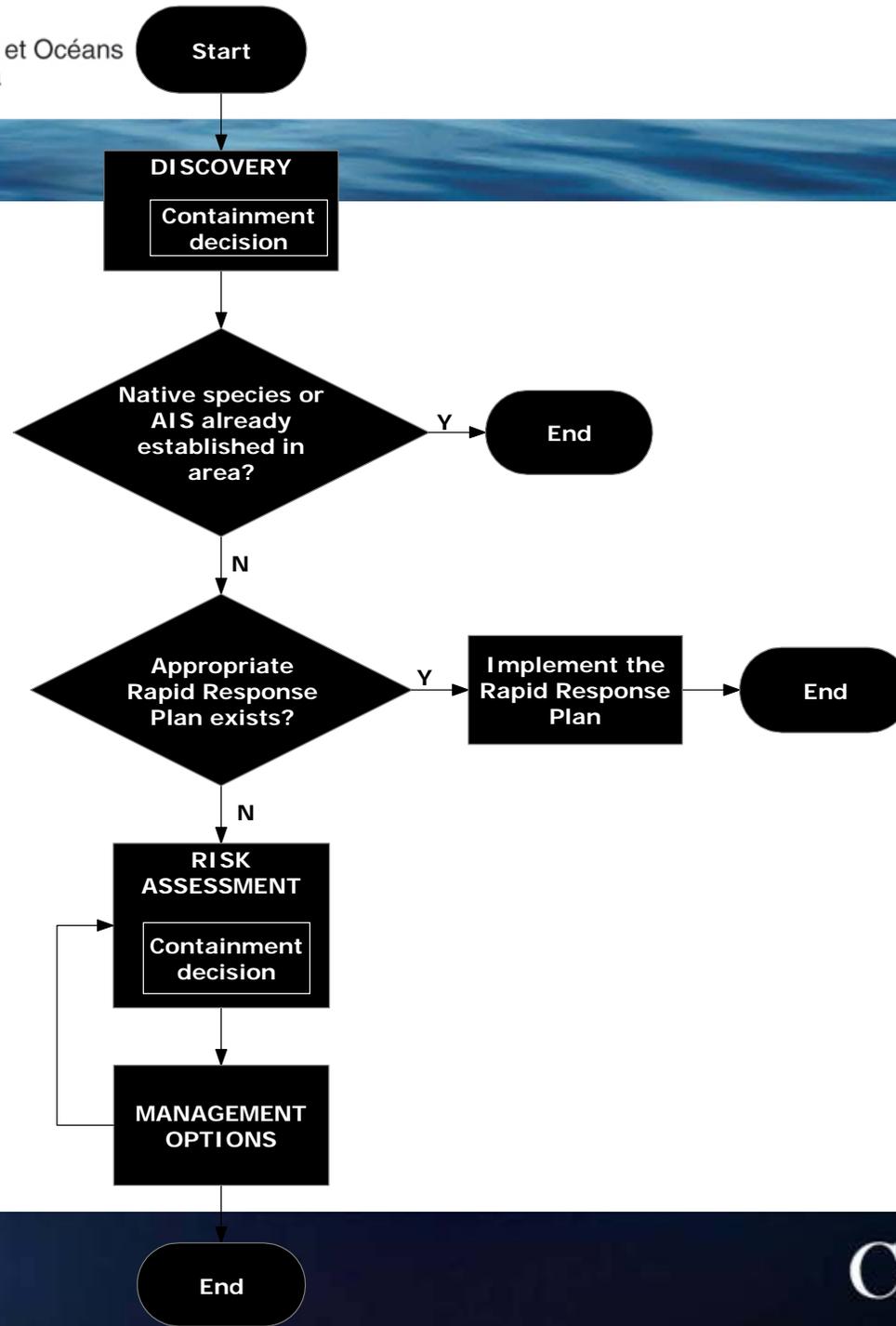
Rapid Response Framework

The Framework is structured around a series of nested flowcharts:

- DISCOVERY
- CONTAINMENT
- RISK ASSESSMENT
- MANAGEMENT OPTIONS



OVERVIEW





Rapid Response Framework

The different DFO sectors likely to be involved in the different steps are identified on the flowcharts:

- Red represents DFO Science functions;
- Green represents socio-economic functions (likely DFO Policy); and,
- Blue represents management functions (likely a cross-sectoral working group led by the DFO AIS lead sector).





Detection of
potential AIS

Coordinate with
relevant parties

DISCOVERY

Containment
decision
process

ID species.
Confirm
location.

Species native
or established
AIS?

Y

If necessary,
remove
containment

End

N

Appropriate
Rapid Response
Plan exists?

Y

Implement
Rapid
Response Plan

End

N

Containment
Decision
Process

Document the
species report.
Communicate the
discovery to
appropriate parties.

- Science
- Management
- Policy

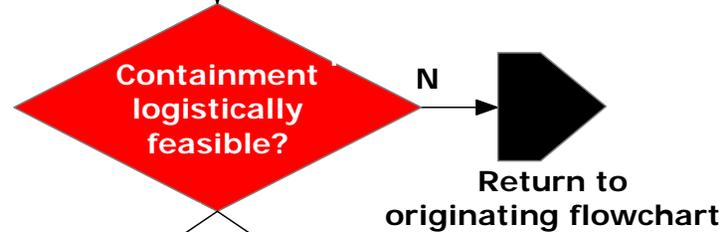
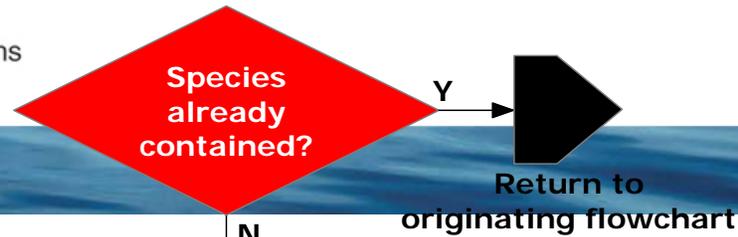
Go to Risk Assessment



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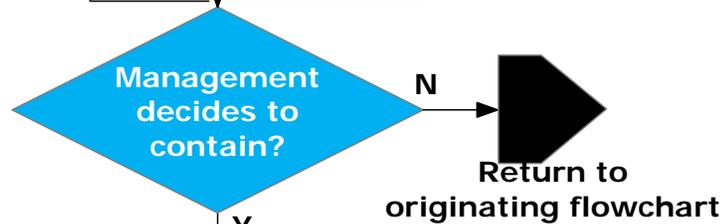
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CONTAINMENT



Socio-economic
considerations
re containment

Biological
considerations
re containment



Document
decision.
Communicate.

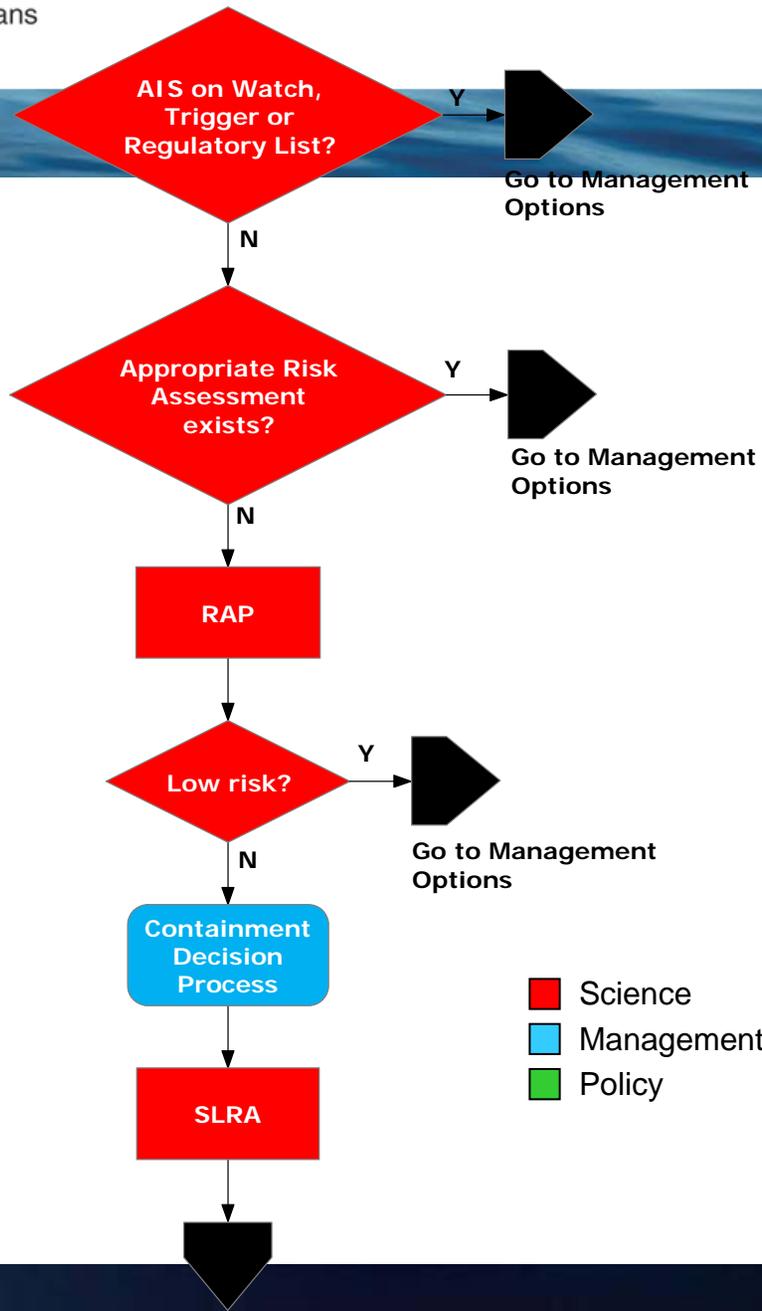
Implement
containment

- Science
- Management
- Policy





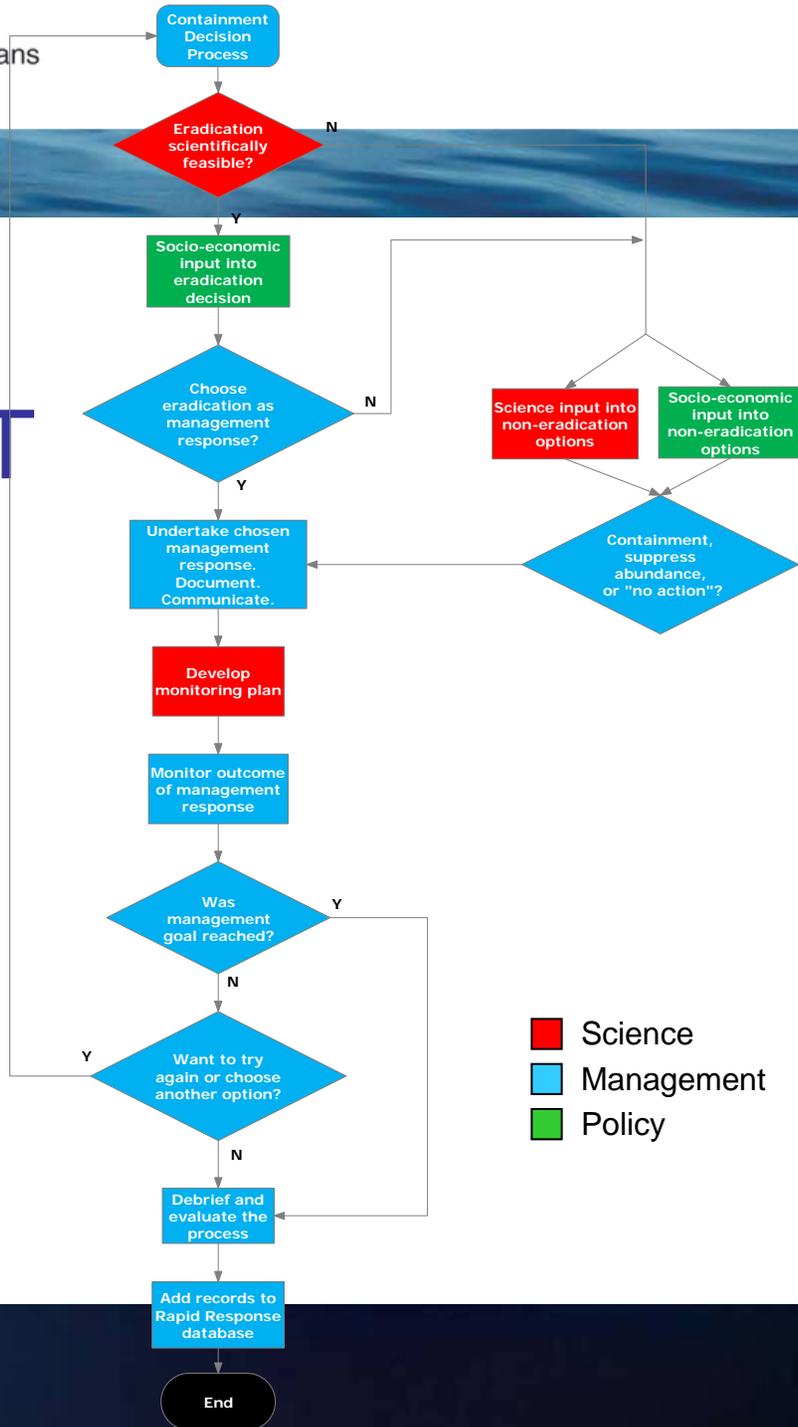
RISK ASSESSMENT



- Science
- Management
- Policy



MANAGEMENT OPTIONS

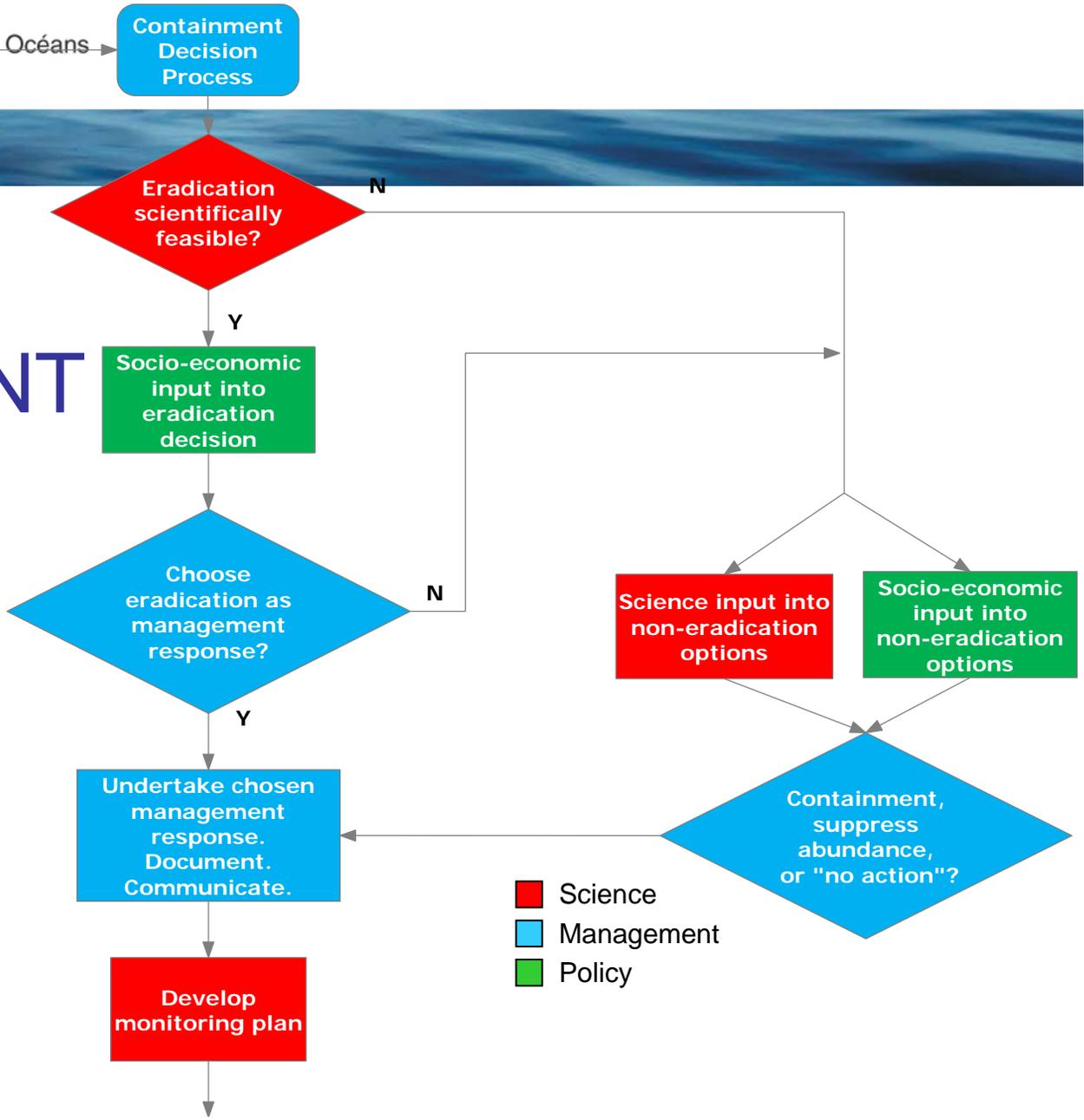


- Science
- Management
- Policy



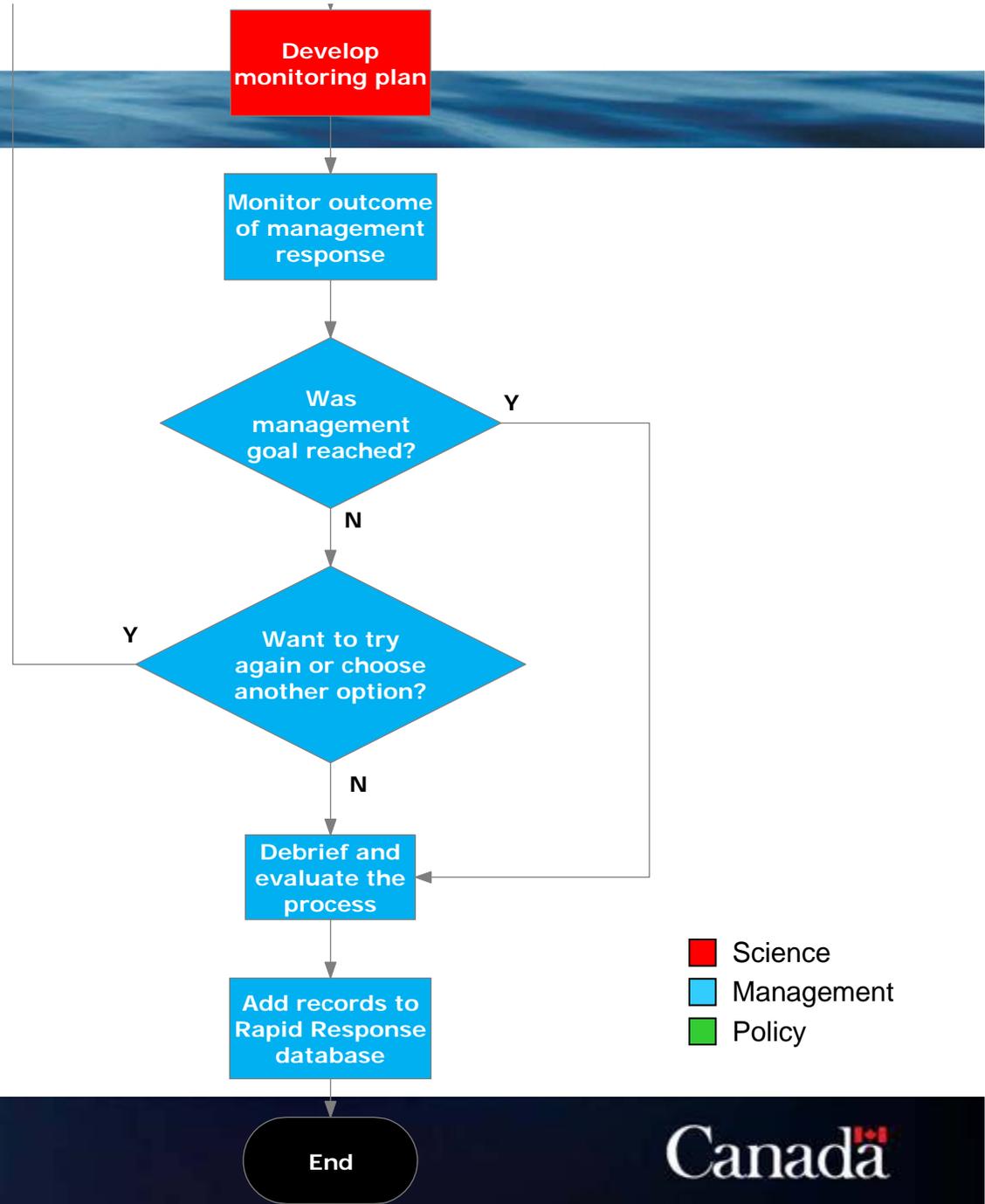
Containment Decision Process

MANAGEMENT OPTIONS





MANAGEMENT OPTIONS





Management Options

- Consideration of appropriate management options must take into account scientific feasibility of various actions (i.e., advice provided to the rapid response committee by scientists).
- Final decision to be made by managers taking into account environmental and socio-economic consequences of scientifically feasible actions.





Management Options

- Guidance is provided on:
 - possible management options that may be considered (e.g. from eradication to doing nothing);
 - considerations that may be used to rank management options (and specific treatments within each option).





Management Options

- As a general principle, we suggest that eradication should be considered as first choice for management for two reasons:
 1. eradication of the species will prevent the risk of long-term ecological or economic impacts; and,
 2. the window of opportunity for eradication may be lost if another management option is tried first.



Management Options

Recommendations

- The effectiveness of the action taken should be evaluated during and after completion of that action.
- All science-based steps should be well documented and in a rapid response database.





Management Options

Recommendations

- ALL responses, including failures, should be published in internal and scientific literature, otherwise any lessons learned are unlikely to be communicated to many researchers and managers outside of DFO and its partners, and valuable lessons (often hard fought) will be lost.



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