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Climate Change Canada

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NEW AND UPDATED GUIDANCE: Ecological Risk Assessment (ERA) for Federal Contaminated Sites

Science Advisory Board for Contaminated Sites (SABCS) in BC Conference
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Canada

FEDERAL CONTAMINATED SITES ACTION PLAN (FCSAP)

- A federal program with the goal of reducing environmental and human health risks from known federal contaminated sites in Canada and their associated federal financial liabilities.
- Policy based (**not regulatory**): Real Property practitioners must manage contaminated sites according to the Directive on the Management of Real Property (2021):
 - ... Prioritizing remediation **or risk management activities** on sites that pose the highest risk to human health and the environment; and
- FCSAP provides funding to custodians, guidance, tools, and other resources to facilitate the management of federal contaminated sites in a scientifically sound and nationally consistent manner.

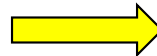
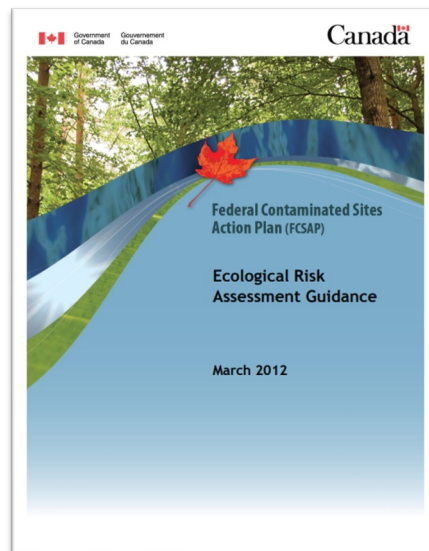


Why Update the ERA Guidance?

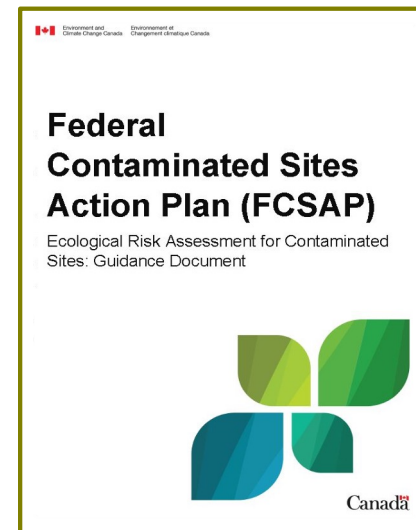
Ecological Risk Assessment (ERA) on Federal Contaminated Sites

Updated draft guidance in press, expected to be published in 2025

FCSAP 2012



FCSAP (in press)



FCSAP ERA Guidance

www.canada.ca/contaminated-sites

Ecological Risk Assessment (ERA) on Federal Contaminated Sites (FCSAP ~~2012~~, in press)

Comprehensive, technical guidance for entire ERA process

Supporting Technical ERA Guidance

Module 1: Toxicity test selection and interpretation

Module 2: Selection or development of site-specific toxicity reference values

Module 3: Standardization of wildlife receptor characteristics

Module 4: Causality assessment

Module 5: Defining background conditions and using background concentrations

Module 6: ERA for amphibians on federal contaminated sites

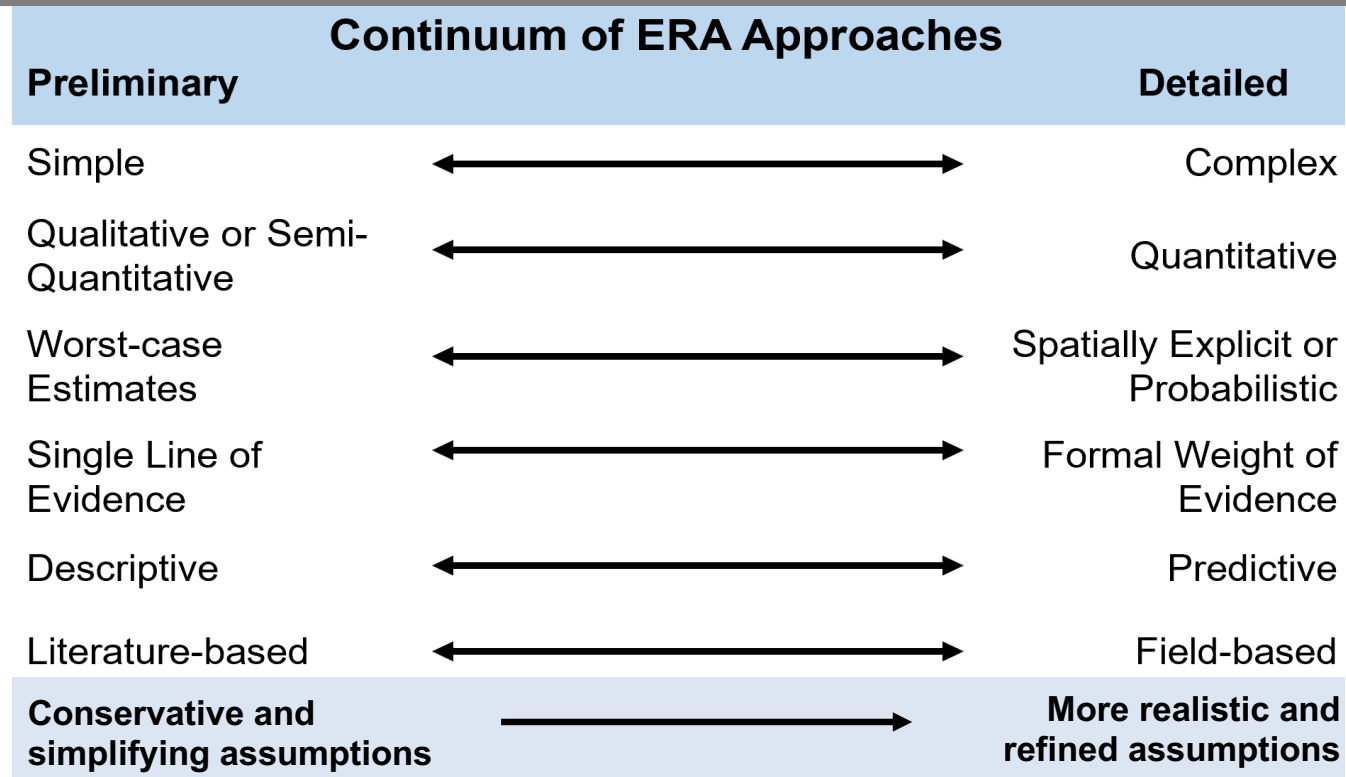
Module 7: Default wildlife TRVs recommended for federal contaminated sites

Module 8: Fish-Specific Toxicity Reference Values for Use in Ecological Risk Assessment

Module 9 (in prep): ERA for reptiles on federal contaminated sites

Statements of Work for Ecological Risk Assessments at Federal Sites

Key Concept: Balancing ERA Approaches



Only conduct risk assessment to the level of detail required to support defensible management decisions

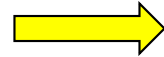
What Has Changed in the Updated ERA Guidance?

Key Changes Highlighted Today

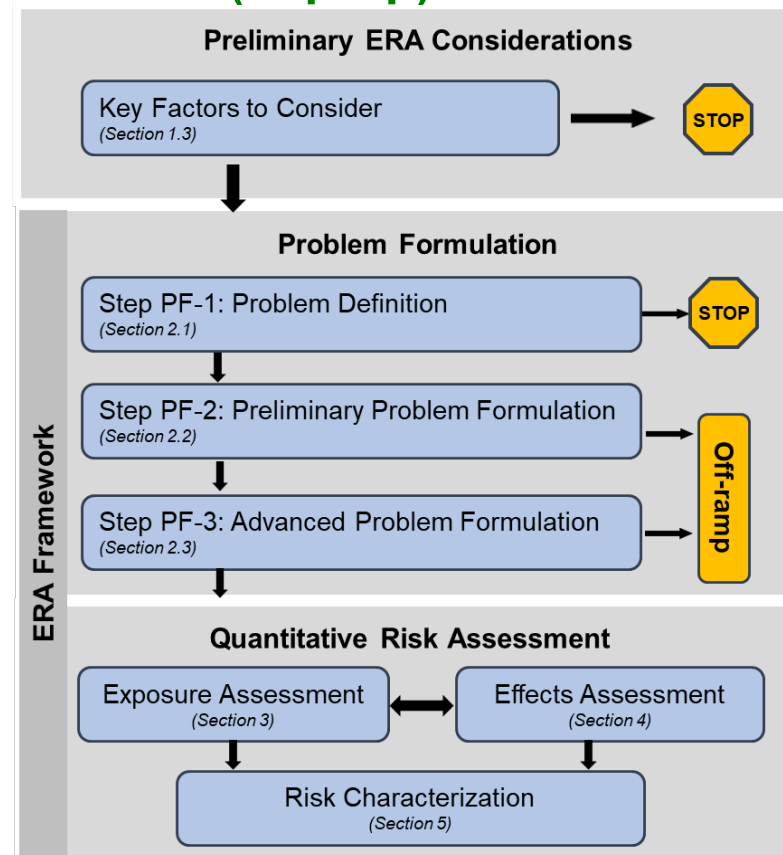
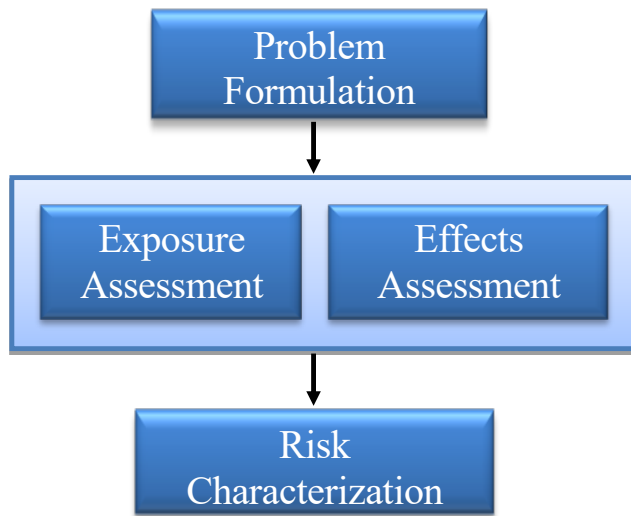
- Addition of **illustrative flowcharts**
- Expanded discussion of **key factors and roles of site managers** when conducting an ERA
- Revision of **Problem Formulation steps** (PF-1, PF-2, PF-3)
- Refinement of handling **Species at Risk** in an ERA
- Added clarity for defining **Acceptable Effect Levels (AELs)**
- Added information on **Considering Climate Change**

Expanded Key Factors for ERA and Problem Formulation (PF) Steps

FCSAP 2012

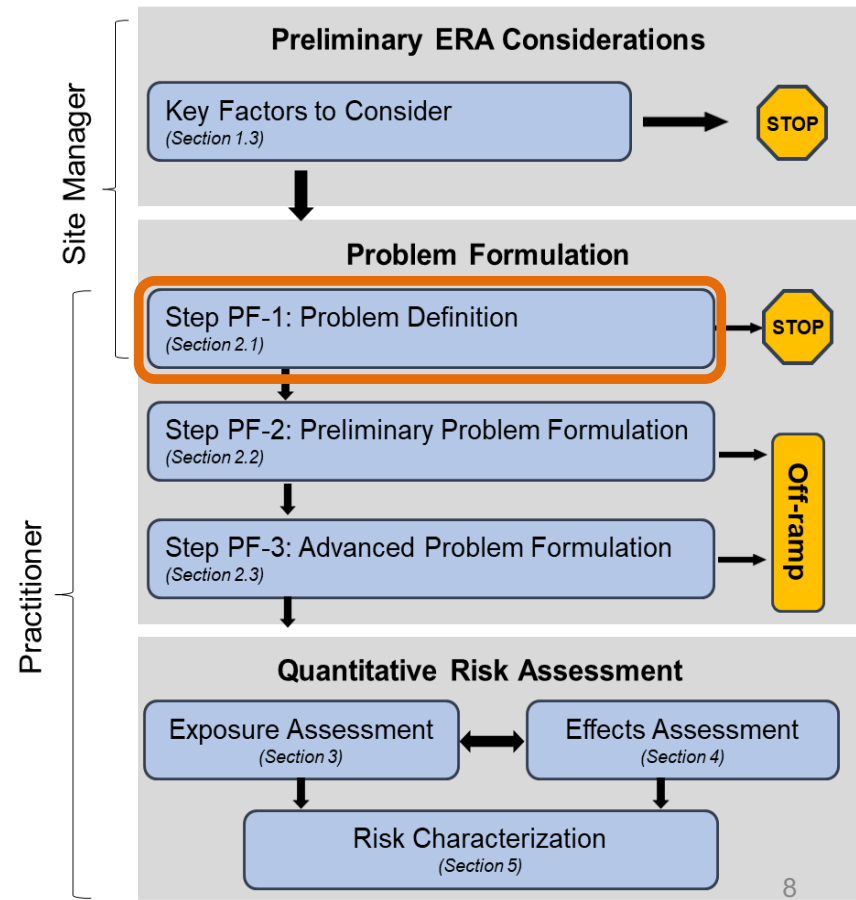


FCSAP (in prep)



PF-1: Problem Definition

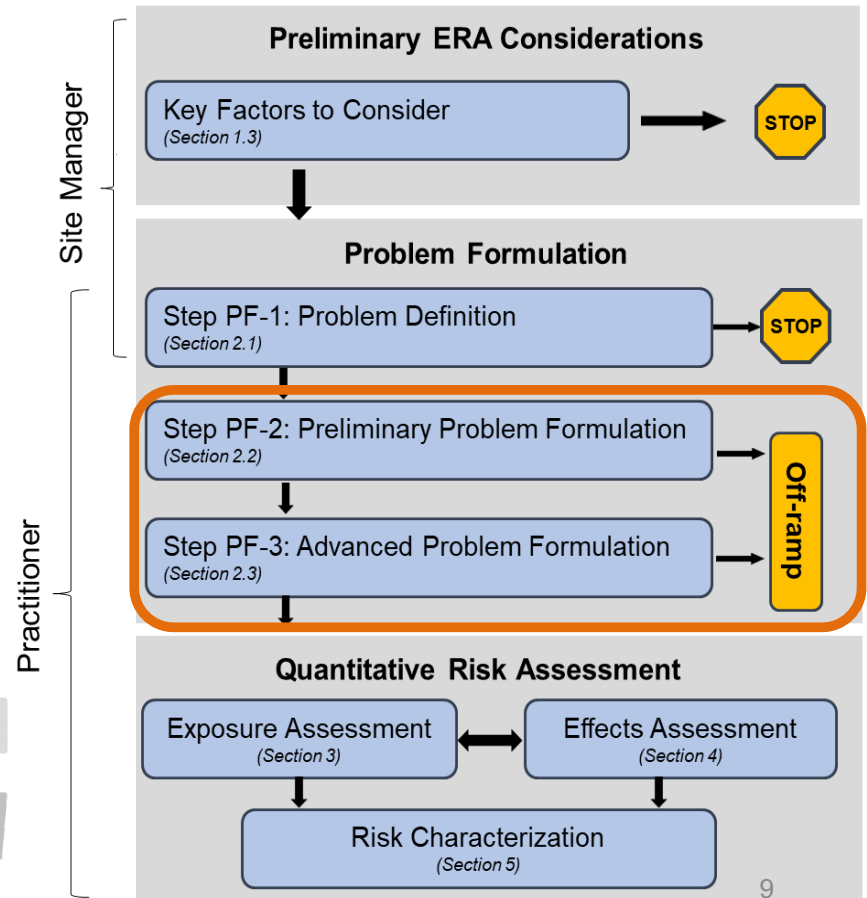
A framing step that evaluates whether an ERA is necessary or appropriate and clarifies the site management goal(s).



PF-2 and PF-3: Preliminary and Advanced Problem Formulation Steps

Key Aspects

- Screen Contaminants of Potential Concern
- Identify Exposure Pathways
- Identify Receptors of Concern
- **Off-ramp** inoperable pathways and irrelevant receptors
- Develop a Conceptual Site Model (CSM)



PF-2 and PF-3: Why Have Separate Problem Formulation Steps?

- The purpose is to **simplify**
- Separates **required fundamentals (PF-2)** from the **advanced content (PF-3)**
- **Only apply the advanced PF concepts when they are needed**

	PF-2 (Preliminary)	PF-3 (Advanced)
Receptors	Broad groups only, not species	Full discussion, including surrogate species/groups and Species at Risk
Conceptual Site Model	Affected media and main pathways only	Detailed discussion of partitioning and environmental fate
Detailed Endpoints and Formal Lines of Evidence	Not included	Included

Refinement of Handling Species At Risk in ERA

Likelihood of occurrence can be: Not Expected, Unlikely, **Potential, Expected, Confirmed.**

- For preliminary assessment → Desktop search
- For detailed assessment → Desktop search AND Field Survey

Species designated **Extirpated, Endangered, or Threatened*** under Schedule 1 of the *Species at Risk Act* require special protection.

- Level of protection in an ERA differs from non-listed species (e.g., organism level versus community or population level)



What if Conservation Listings Differ for a Species?

For federal sites SARA designation remains the legal standard

- Scheduled listings of “threatened” or greater require evaluation at the level of individuals.

COSEWIC vs. SARA:

- Species down-listed (lower risk) *OR* up-listed (greater risk) in the COSEWIC relative to SARA:
 - Recommend that **the higher designation of risk apply**
 - Designation of “special concern” under SARA is considered on a case-by-case basis

Federal vs. Provincial and Territorial designations:

- Recommend also consider the most local designation
 - E.g. red and blue-listed species in BC

Clarity on the Most Appropriate Acceptable Effect Levels (AELs)

For Common Species:

- Only minimal to low effects; no long-term, adverse effects on the local populations or ecosystem functions.
- If toxicity testing is conducted:
 - < **EC/IC₂₅ for terrestrial species** or
 - < **EC/IC₂₀ for aquatic species**

For Species at Risk:

- Any selected statistical endpoint must represent a “no-effects threshold”
- CCME (2006, 2007) considers an effect level of 10% to represent a no-effects threshold *unless a more appropriate threshold is defined for a test species.*



Considering Climate Change Implications in ERA

FCSAP is committed to evaluating the implications of climate change on management of federal contaminated sites

- Key areas where risk assessments may be affected by climate change scenarios are identified
- Climate data can be integrated into modelling, and evaluate environment changes that may apply to future site conditions, such as:
 - potential for increased infiltration or increased runoff
 - potential changes to contaminant migration or receptor migration
 - potential for land use changes, saltwater intrusion, or changes in plume dynamics



Additional Changes to the Updated ERA Guidance

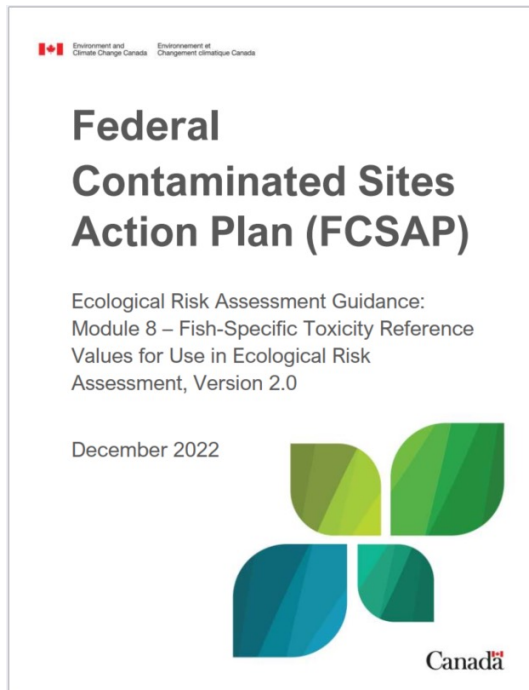
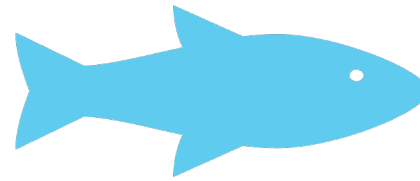
Additional information:

- Aquatic examples
- Conceptual site models
- Levels of biological organization
- Effects assessment methods for terrestrial communities
- Bioavailability and exposure point estimates
- Choosing bioavailability tools

Reorganization and streamlined:

- Risk Characterization (defined Steps RC-1 to RC-7)
- Weight of Evidence (WoE) procedure
- Probabilistic risk assessment discussion
- Detailed technical content moved to appendices

Updated methods and reference lists to reflect current knowledge



Federal Contaminated Sites Action Plan (FCSAP)

Ecological Risk Assessment Guidance: Module 8 - Fish-Specific Toxicity Reference Values for Use in Ecological Risk Assessment, Version 2.0



Overview:

- ▶ Conceptual exposure models
- ▶ Information about fish-specific TRVs
- ▶ Suggested fish-specific TRVs
 - ▶ A synthesis of literature on existing fish-specific TRVs and water quality guidelines
 - ▶ Technical supporting information
- ▶ Developing or refining existing TRVs
- ▶ Resources for toxicity data

TRVs = Toxicity Reference Values



Training on Guidance

Pre-recorded training available:

- [GeoPro Talks](#) (GeoEnviroPro)
- [GCExchange](#) (Federal government employees only)

Reptiles in Federal ERA (Module 9 Status Update)

WHY CREATE a MODULE

- Reptiles are resident throughout much of Canada. **British Columbia has the greatest number of reptile species not found elsewhere in Canada**
- Most of Canada's 48 reptile species are listed as Species at Risk (SAR)
- Promote a better approach to including reptiles in ERA (i.e., inclusion of reptile specific data)



Reptiles in Federal ERA (Module 9 Status Update)

- Insufficient data available to create any SSD curves or develop TRVs.
- Emphasis is given to understanding reptile life history, conducting detailed exposure assessment and how this can inform risk assessment.



This module will provide guidance on:

- When to include reptiles in an ERA
- Relevant biological and toxicological data
- Considerations for exposure assessment
- Considerations for use of surrogate species (caution against the default use of birds)
- Information on developing lines of evidence

Reptiles in Federal ERA (Module 9 Status Update)

Where are we at?

- Continued edits and formatting from reviews
- Gather most recent data
- QA/QC summarized data
- Translation and FCSAP partner review (~2025)



Questions?

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