



2014/2024 Review

Columbia River Treaty

Overview of Preliminary Phase 2 Alternatives

Stakeholder Listening Sessions:

Spokane, WA, September 27, 2011

Portland, OR, September 30, 2011

Boise, ID, October 13, 2011



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Presentation Topics

1. Treaty History and Background
2. Columbia River Treaty 2014/2024 Review Purpose and Objectives
3. Summary of Phase 1 and U.S. Supplemental Studies
4. Input from Sovereigns and Stakeholders in defining objectives and sideboards
5. Iterative Process for Formulating and Evaluating Alternatives
6. Description of Key Elements of Iteration 1 Alternatives
7. Conceptual Overview of Future Alternatives
8. Assessment and Evaluation of Alternatives

The Columbia River Treaty

“Relating to International Cooperation in Water Resource Development in the Columbia River Basin”

An agreement between Canada and the United States of America, signed at Washington, D.C., January 17, 1961



Libby Dam and Lake Kootenai, Montana and British Columbia

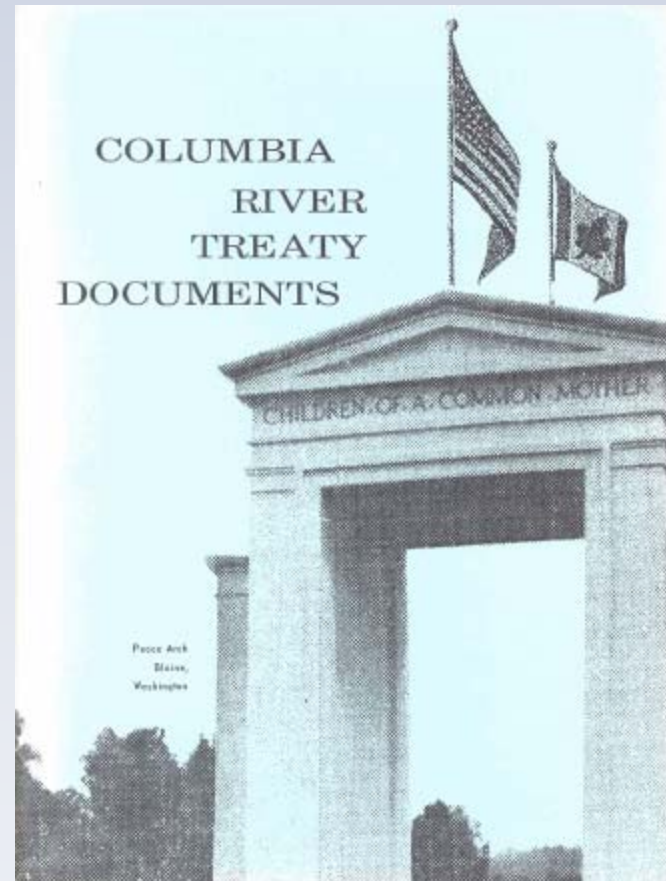
Key Treaty Provisions

- General
 - Canada built 3 dams (Mica, Keenleyside & Duncan) with 15.5 MAF storage
 - U.S. built Libby Dam with 5 MAF storage
- Power
 - Planned, coordinated power operations
 - U.S. and Canada share equally in the downstream hydropower benefits
- Flood Control
 - Canada provides 8.95 MAF assured flood storage under coordinated flood control operating plan
 - Changes to “Called Upon” after 2024



Why conduct a Treaty 2014/2024 Review?

1. The Treaty has no specified end date; however, either nation can terminate most of the provisions of the Treaty as early as Sep 2024, with a minimum 10 years' written notice.
2. Current assured annual flood control operating procedures will end in 2024, independent of the Treaty termination decision.



Columbia River Treaty 2014 / 2024 Review

Description

Studies jointly conducted by USACE and BPA on behalf of the U.S. Entity in collaboration with regional Sovereigns and stakeholders to evaluate the benefits and costs associated with alternative Treaty futures.

Purpose

Enable the U.S. Entity to make an informed recommendation, aided by the assistance of regional sovereigns, to the U.S. Dept. Of State by September 2013 as to whether or not it is in the best interest of the U.S. to continue , terminate or seek to renegotiate the Treaty.

Authorization

Columbia River Treaty executed between the U.S. and Canada in 1964 authorizes the U.S. and Canadian entities to conduct studies necessary to implement the Treaty.

Columbia River Treaty 2014 / 2024 Review Program Scope

1. Work Completed to Date
 - a) Phase I: U.S./Canadian Entities Joint Technical Studies
 - b) U.S. Entity Supplemental Studies
2. Work Currently Underway
 - a) Corps Flood Risk Management Studies
 - b) Regional Engagement with Sovereign and Non-sovereign Interests
 - c) Coordination with US Departments of State and Energy
3. Future Work (Currently Being Scoped)
 - a) Additional Technical Analysis
 - b) Evaluation of Treaty Alternatives

Regional Engagement Plan

Sovereign Review Team:

1. States: OR, WA, ID, MT
2. NW Tribes: 5 representatives (USRT, CRITFC, UCUT, Cowlitz, CSKT)
3. Federal Agencies: NMFS, USFWS, BOR, USACE, BPA, BLM, EPA, USFS, USGS, BIA, NPS)

Northwest Stakeholders:

- Regional Listening Sessions
- Listening sessions directly between the SRT and regional stakeholders and technical experts

SRT Framework Questions

1. What justification is needed to support a regional recommendation?
2. What are the benefits and costs to the U.S. of continuing the Treaty?
3. Is this significantly better compared to termination?
4. Are either of these scenarios acceptable from the perspective of ecological function, flood risk management, and power production?
5. As an alternative, the region may recommend modification or amendment to the Treaty. If that is the case:
 - a) What would the U.S. objectives be with this modification or amendment?
 - b) What justification would we need for this recommendation?

SRT Sideboards for Study Alternatives and Impact Assessment

1. Support the September 2013 recommendation to the Department of State (DOS).
2. Focus on operation of U.S. and Canadian Treaty reservoirs, and potentially affected U.S. reservoirs.
3. Design and assess alternatives around three primary driving purposes: Flood Risk Management, Hydropower, and Ecosystem-based Function.
4. Impacts for other system uses assessed qualitatively at a minimum, quantitatively where information and tools are available to support the analysis.
5. Ecosystem function alternatives and impact assessments will be defined by water flow and timing, reservoir levels, water quality, contaminant fate and transport, survival and recovery of important fish and wildlife populations and the long-term sustainability of functions and processes related to riparian, floodplain, and estuary habitat, including cultural resources.

SRT Sideboards for Study Alternatives and Impact Assessment

6. Use tools, such as existing models or models under development that available for use within the limited timeframe of this Review.
7. Alternatives will attempt to be inclusive of each Sovereign's interests, but limited to a reasonable number that can be modeled and evaluated within the Treaty Review timeframe.
8. Environmental evaluation and documentation sufficient for the DOS Circular 175 process will support the overall recommendation.
9. Current regulatory and statutory requirements will be the default, but will not necessarily constrain the development of alternatives.
10. Climate change will be integrated in the alternatives evaluation.

Treaty Review Objectives

- Primary Driving Purpose Objectives
 - Hydropower
 - Flood Control
 - Ecosystem Function
- Impact Assessment Objectives
 - Navigation
 - Recreation
 - Water supply
 - Irrigation
 - Climate Change
 - Environmental Issues and Concerns

Ecosystem-Based Function Objectives

- Provide streamflows with appropriate timing, quantity and water quality in the basin to promote productive populations of native fish and wildlife.
- Provide reservoir conditions to promote productive populations of fish and wildlife.
- Provide for streamflow and reservoir conditions that protect and enhance cultural resources.
- Improve hydrology in the estuary to promote productive populations of native fish and wildlife.

Hydropower Objectives

- Provide an adequate, efficient, economical, and reliable power supply.
- Provide a flexible power system for integrating renewable resources.
- Ensure that the Canadian Entitlement accurately reflects the power value of the Treaty to the United States relative to termination.

Flood Risk Objective

- Provide an acceptable level of flood risk.

Impact Assessment Objectives

Navigation: Assess impacts on ability to

- Provide an authorized navigation channel and safe lockage.
- Provide reservoir conditions to allow for ferry operation.

Water Supply: Assess impacts on:

- Ability to provide current water supply reliability.
- Opportunities for additional water supply from Canada for instream and out-of-stream uses.
- Effective use of instream and out-of-stream uses for the Columbia River Basin.

Impact Assessment Objectives

Recreation -- Assess the impacts on ability to provide:

- Conditions to protect infrastructure related to reservoir and river recreation.
- Reservoir and river conditions for safe and enjoyable recreational activities.

Climate Change

- Assess opportunities to provide for operational flexibility and resiliency that allows the system to mitigate for and adapt to climate change.

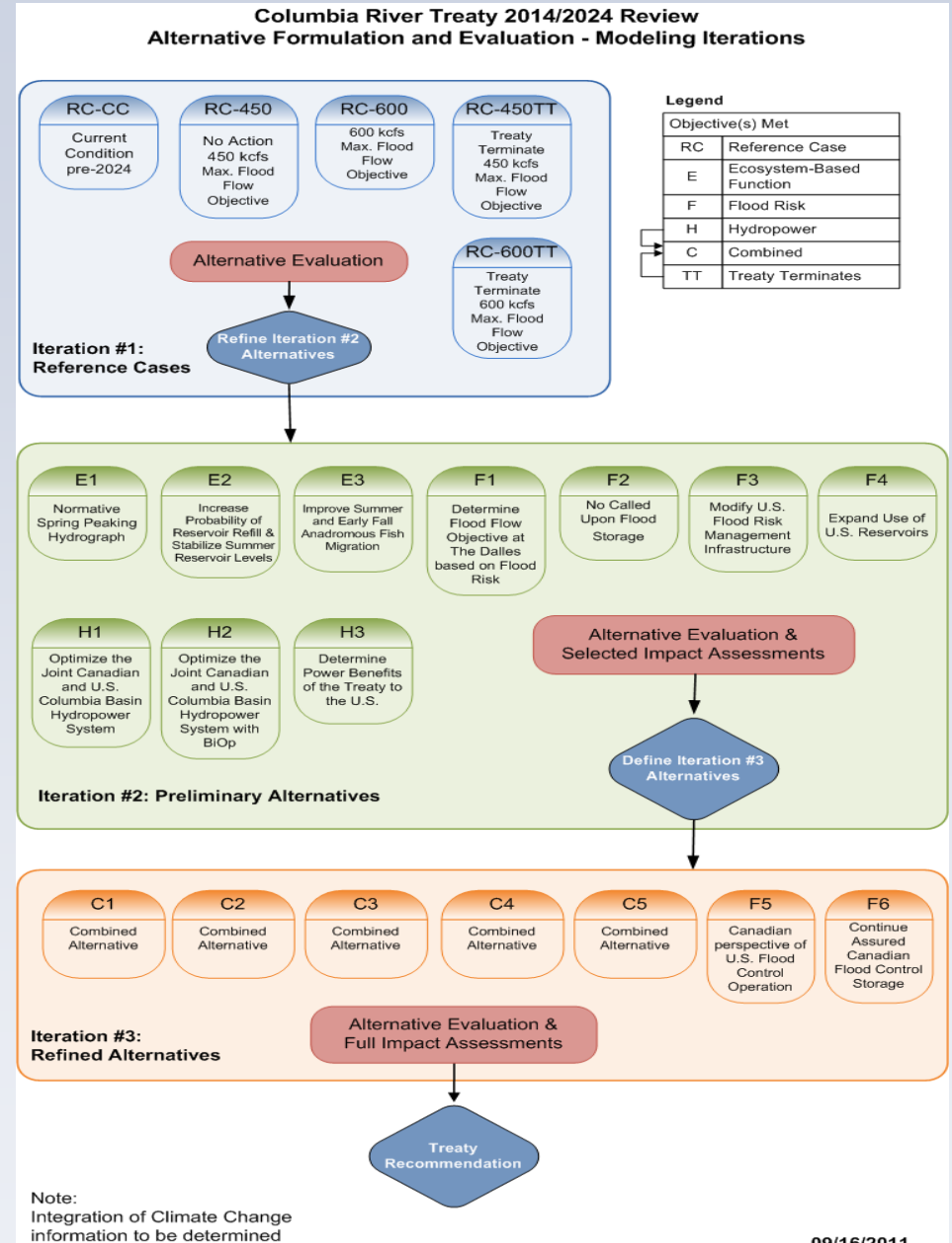
Environmental Issues or Concerns

- Assess the impacts on the ability to minimize contaminated sediments.

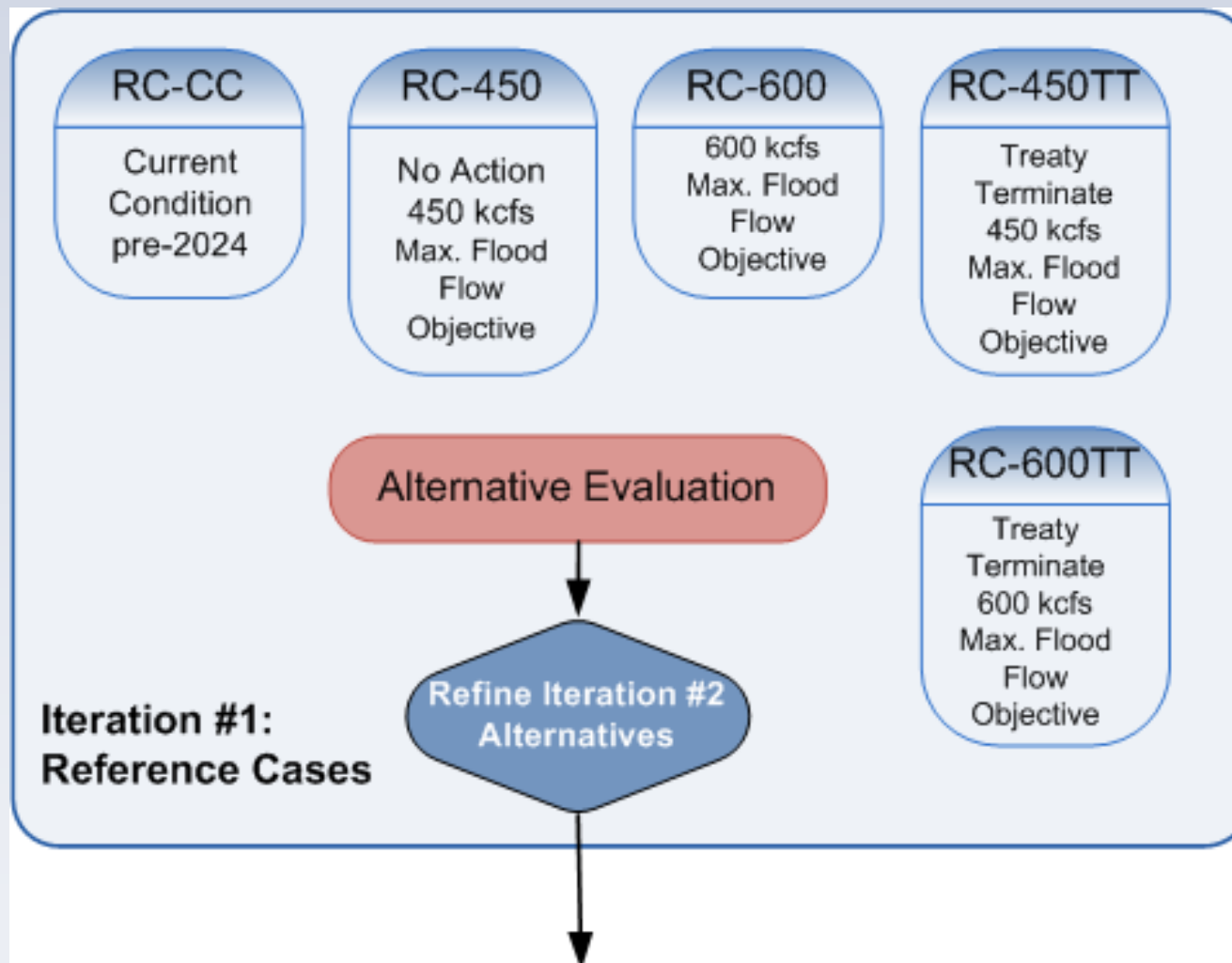
Summary of Stakeholder Input Received to date

1. Listening Sessions
 - a) February 2011, Portland
 - b) June 2011, Spokane
2. SRT Panel Sessions, June and August 2011
 - a) Ecosystem Function
 - b) Flood Risk Management
 - c) Hydropower
3. See Summary Handout “Stakeholder Comments Incorporated Into Alternatives”

Alternative Formulation and Evaluation – Modeling Iterations



Alternative Formulation & Evaluation: Iteration #1

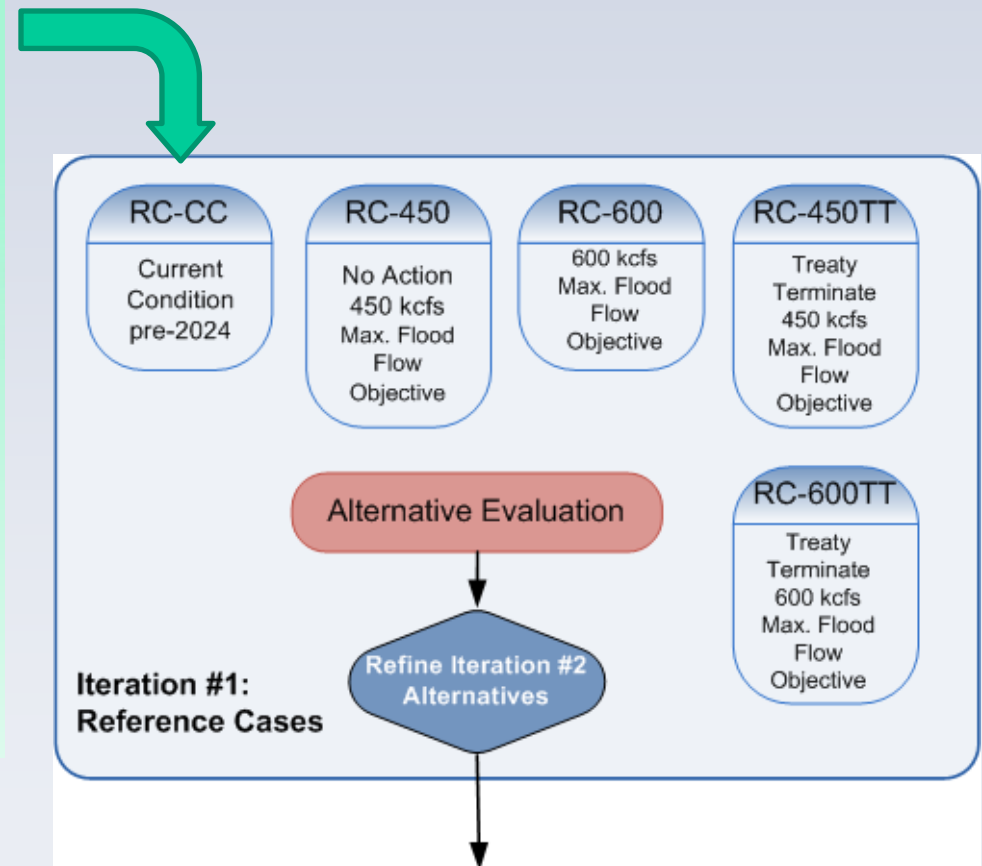


Summary of Iteration 1 Alternatives

Operating Criteria	RC-CC	RC-450	RC-450TT	RC-600	RC-600TT
Treaty Status					
Treaty Continues	✓	✓		✓	
Treaty Terminates			✓		✓
Treaty Modified					
Flood Control Operations					
FCOP with 8.45 MAF	✓				
Called Upon 450 kcfs		✓	✓		
Called Upon 600 kcfs				✓	✓
Power Operations					
Coordinated Treaty Planning (with DOP, AOP and TSR)	✓	✓		✓	
Uncoordinated Canadian Operation (2-3 Scenarios)			✓		✓
Ecosystem Function Operations					
1 MAF Supplemental Agreement for flow augmentation	✓	✓		✓	
BiOp Operations	✓	✓	✓	✓	✓

RC-CC: Current Condition Through 2024

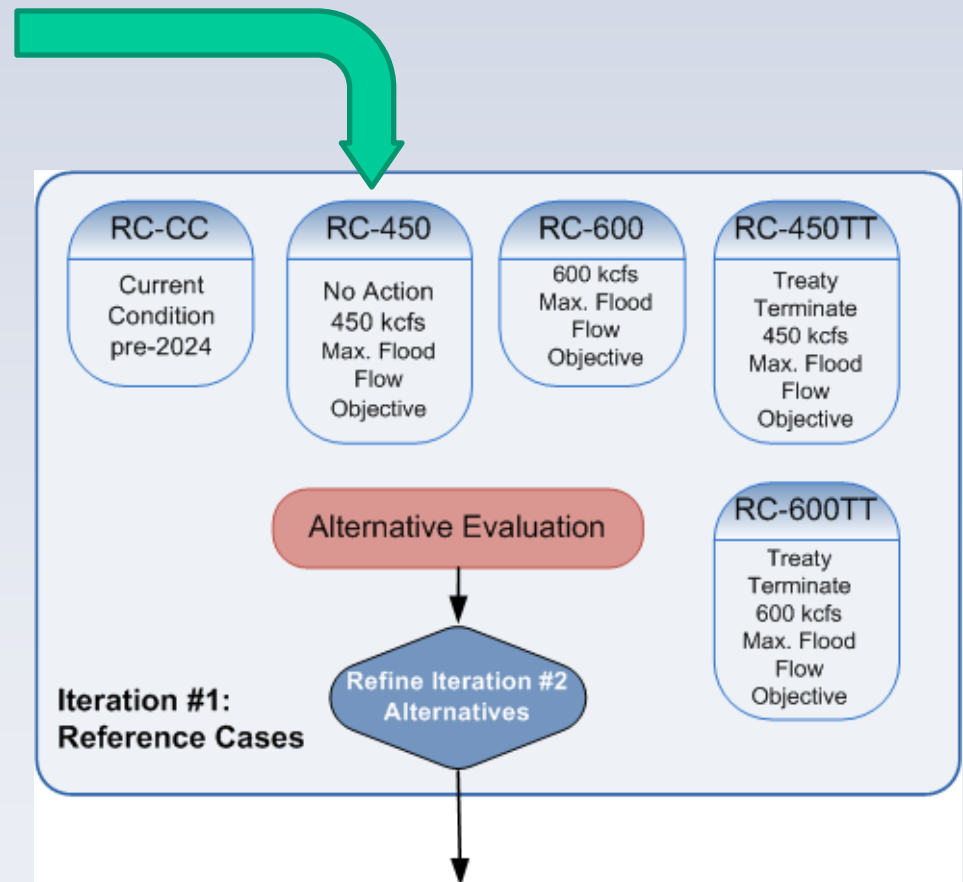
- Follows current operating protocols and procedures to 2024:
 - Coordinated Treaty Power Planning Continues: AOP, DOP and TSR
 - Canadian Entitlement continues
 - Flood control follows current FCOP
 - BiOp operations at US reservoirs
- Treaty Nexus: Models current operations; allows us to measure other alternatives against “what we have now”



RC-450: No Action/Called Upon Flood Control

- Considered the most likely to occur alternative if neither Nation takes Treaty action:
 - Coordinated Treaty Power Planning Continues: AOP, DOP and TSR
 - Canadian Entitlement continues
 - Flood control operations shift to Called Upon with 450 kcfs flood flow objective
 - BiOp operations at US reservoirs

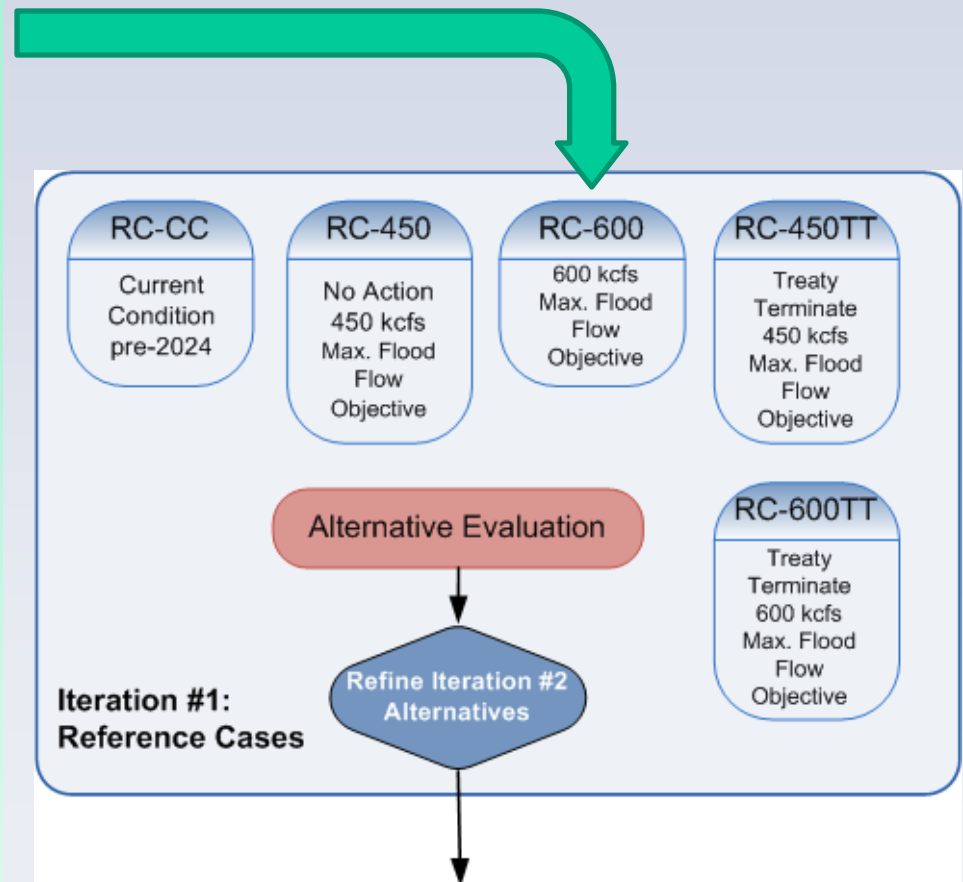
- Treaty Nexus: Provides the reference case for other future alternatives



RC-600: No Action/Called Upon Flood Control

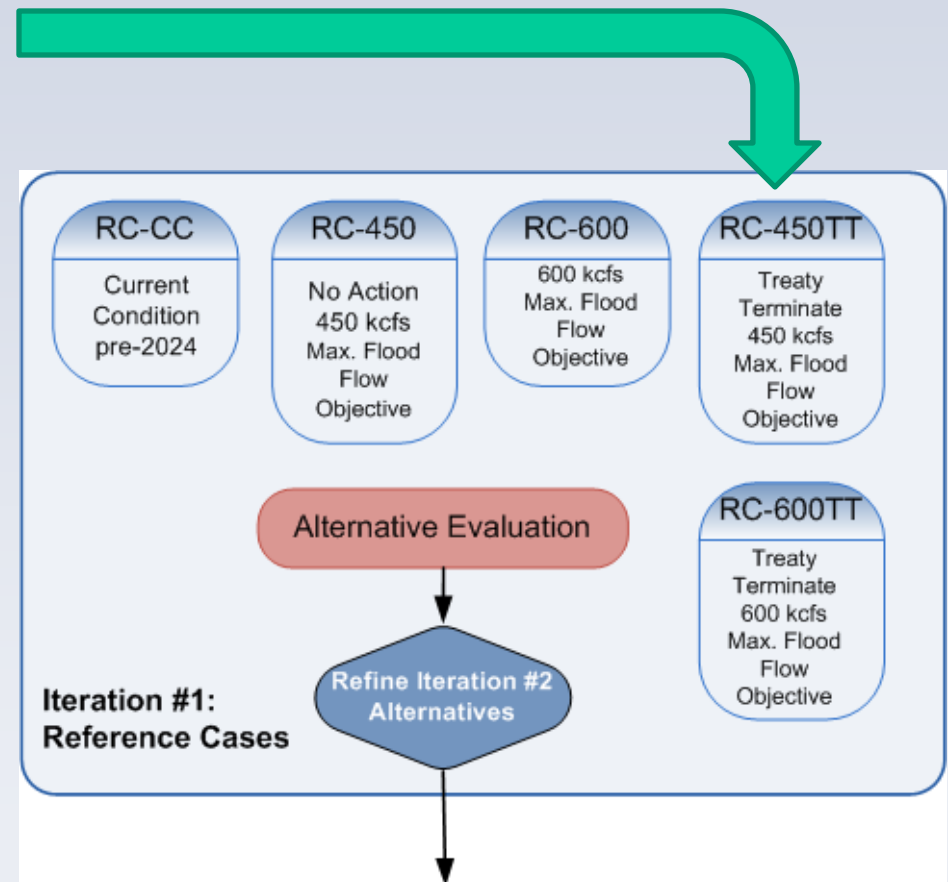
- Similar to RC-450 but increases maximum flood flow objective to 600 kcfs:
 - Coordinated Treaty Power Planning Continues: AOP, DOP and TSR
 - Canadian Entitlement continues
 - Flood control operations shift to Called Upon with 600 kcfs flood flow objective
 - BiOp operations at US reservoirs

- Treaty Nexus:
 - Tests the flexibility of the system to adjust to a higher flood flow objective.
 - Considered more consistent with probably Canadian view of Treaty post-2024 flood control



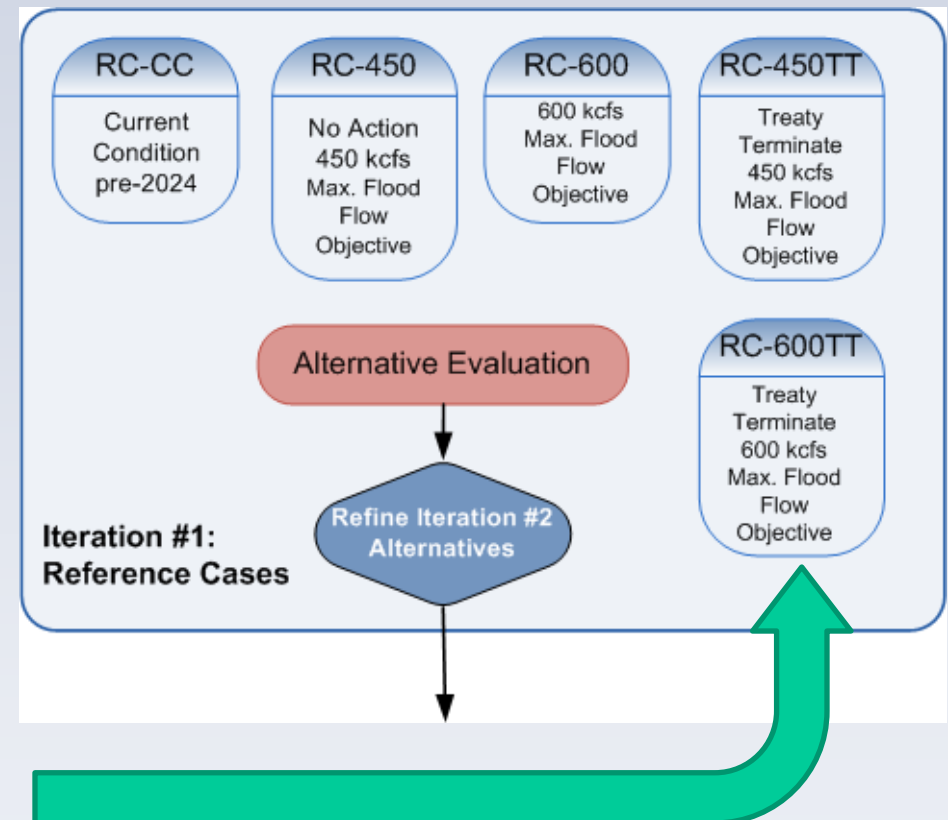
RC-450/TT: Treaty Terminates with Called Upon Flood Control

- Similar to RC-450 but Treaty is terminated after 2024
- Alternative Features
 - Coordinated Treaty Power Planning discontinued.
 - Canadian entitlement discontinued
 - 2 to 3 Scenarios for possible Canadian operations.
 - BiOp operations continue at US reservoirs
- Treaty Nexus:
 - Considered the most likely alternative if either nation takes action to terminate the Treaty



RC-600/TT: Treaty Terminates with Called Upon Flood Control

- Treaty is terminated after 2024 with Maximum Flood Flow Objective of 600 kcfs
 - Coordinated Treaty Power Planning discontinued.
 - Canadian Entitlement discontinued
 - 2 to 3 Scenarios for possible Canadian operations.
 - BiOp operations continue at US reservoirs
- Treaty Nexus:
 - Considered more consistent Canadian view of operations most likely alternative if either nation takes action to terminate the Treaty



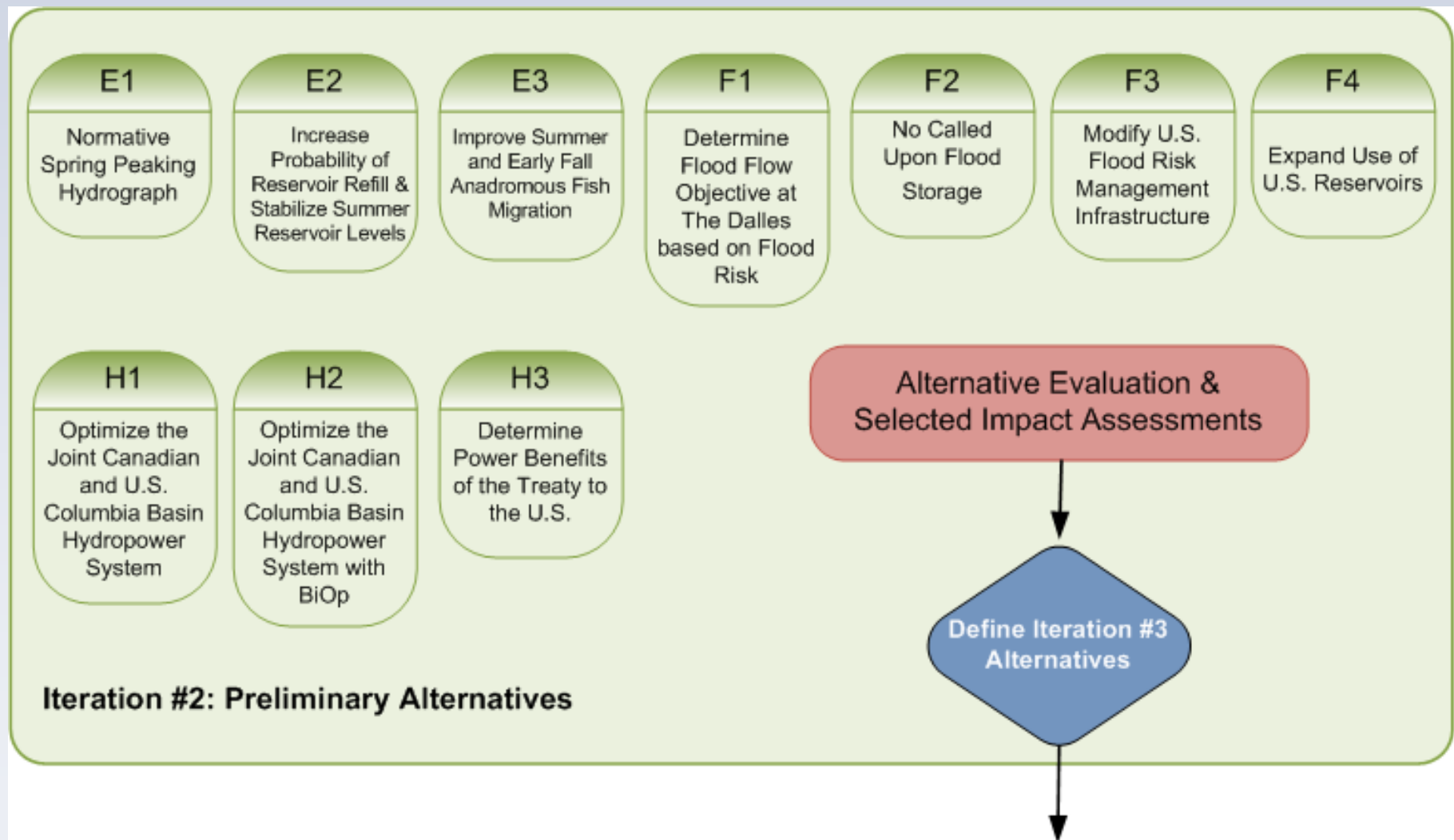
Iteration 1 Impact Assessment

1. Hydroregulation Models
 - a) HydSim: BPA, Monthly (14-period) outputs
 - b) ResSim: Corps, Daily outputs
2. Hydroregulation metrics to be used in Iteration 1 assessment
 - a) Reservoir Inflows (monthly 14-period)
 - b) Reservoir Outflows (monthly 14-period)
 - c) Peak Discharge (Daily)
 - d) Reservoir Elevations (end of month)
 - e) River Stage (Portland/Vancouver)
 - f) Spill (% and/or kcfs)
 - g) Generation

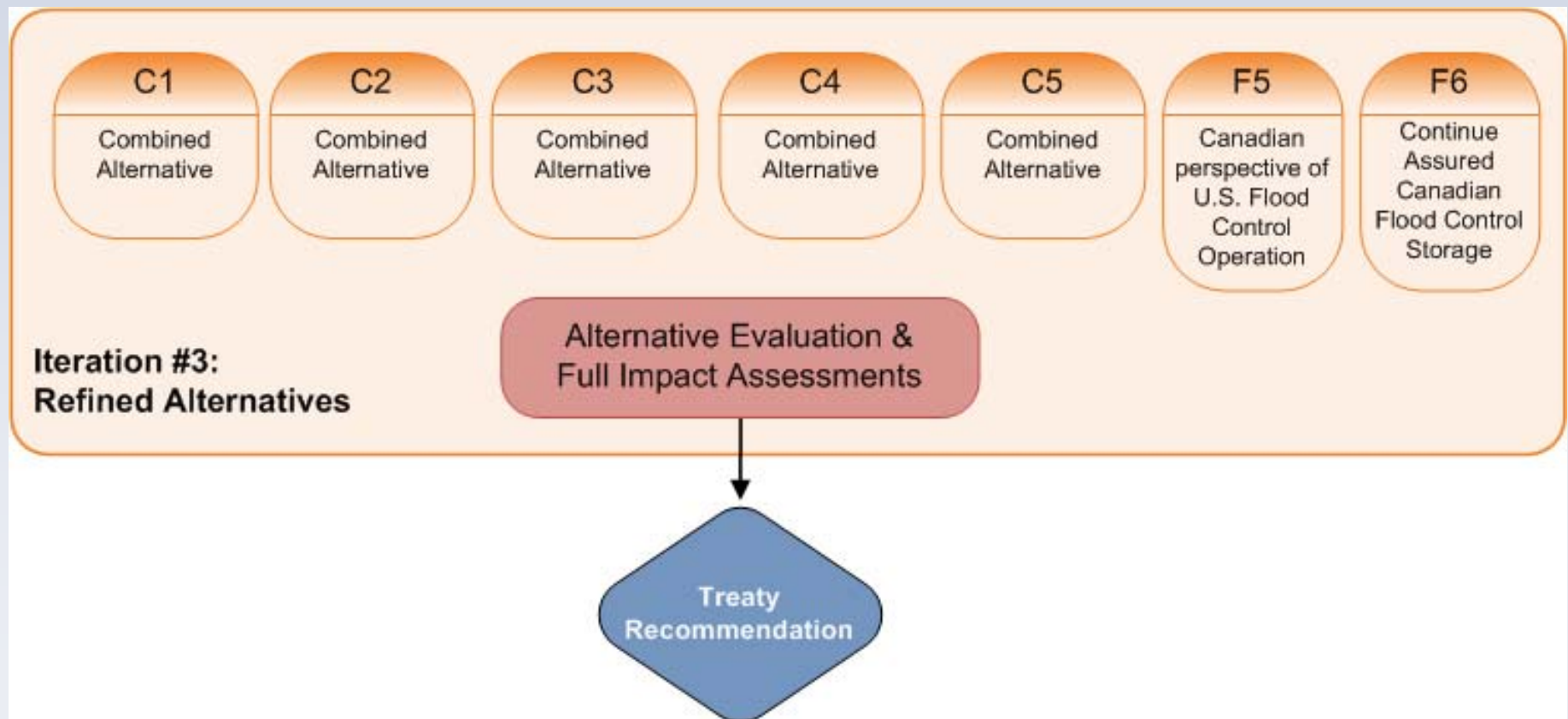
How will Iteration 1 Impact Assessment be Used to Inform Iteration 2?

- a) What are the possible flood and other impacts associated with a 450 vs 600 kcfs flood flow objective?
- b) Is there a better flood flow objective to use in future iterations?
- c) How frequently do we need to “Call Upon” Canadian reservoirs for flood management after 2024 and what is the effect on those reservoirs?
- d) What are the relative impacts of Called Upon operations and “Effective Use” on U.S. reservoirs associated with those alternative operations?
- e) What are possible downstream effects of those alternatives of those alternatives on other river uses?
- f) Does a higher flood flow objective provide a more desirable ecological operation or provide more flexibility in reservoir operations to meet fish and other environmental needs
- g) How do possible changes in Canadian operations if the Treaty is terminated after 2024 affect overall system operations

Alternative Formulation & Evaluation: Iteration #2



Alternative Formulation & Evaluation: Iteration #3



Our Questions to You

1. Do the alternatives adequately capture the concerns and questions you have raised about the Columbia River Treaty?
2. If not, what is missing from the alternatives?
3. As we move forward into the modeling and analysis, what information will be of most interest to you? What are the modeling metrics that you are most concerned about?

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