

ERTG Science Question

What is the role of floodplain lakes/ponds relative to juvenile salmon?

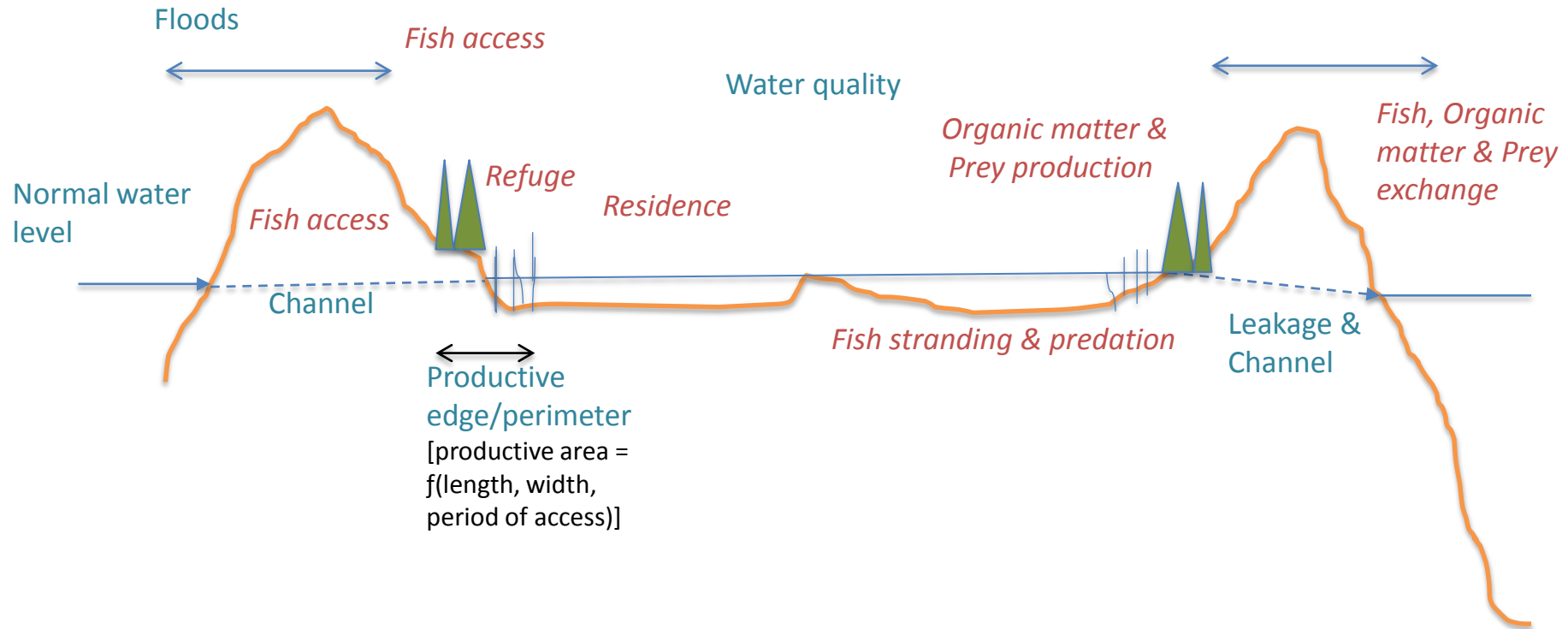
Historically there was substantially more access to floodplain lakes and ponds, but we know very little about their function for juvenile salmon or whether we can restore their historical functions in the presence of non-native warm water fishes, pollutants and water quality issues.

ERTG Project Scoring

- Developed method to score projects using three criteria
 - Certainty of Success
 - Opportunity/Access
 - Capacity
- Scores turned into survival benefit units in the *Calculator*
 - Juvenile salmonid *optimal* density contributes to weighting of scores

ERTG Floodplain Lake Conceptual Model

(7 January 2013)



Information needs

- Average fish density
- Fish growth rate
- Dissolved oxygen and temperature conditions
- 2-year flood event water level
- Variation in flooding levels and the location, area of the emergent vegetation
- Degree of connection to river
- Elevation range of 'productive edge/perimeter'
- Degree of stranding and predation
- Variation among floodplain lakes
- Duration of time benefits offered
- What life histories or stocks will benefit?
- Magnitude and dynamics of the export factor
- Beaver dam influence

Higher resolution questions include:

1. How do juvenile salmon use lakes and ponds?
 - What is the importance of edge habitat adjacent to lacustrine wetlands?
 - What is the importance of edge habitat adjacent to uplands?
 - Do juvenile salmon move into different vegetated edges, e.g., submerged aquatic vegetation, emergent aquatic vegetation, over-hanging or partially submerged shrubs?
 - Does the value of pelagic habitat vary depending on pond/lake depth?
 - What are typical juvenile salmon densities, residence times, growth rates, and diets in floodplain lakes and ponds? Do they vary with pond/lake size?
2. How do predators use ponds and lakes (bass, diving birds, wading birds)?
3. Is predation risk in ponds and lakes significant for juvenile salmon?
4. Are lakes and ponds too warm for juvenile salmon during their seaward migration?
5. Are there hyporheic interactions between the river and floodplain lakes and ponds that affect lake/pond temperature or water chemistry (nutrients) and plankton productivity?
6. Is the productivity of salmonids in floodplain lakes/ponds related to lake/pond size?
 - When is a floodplain lake/pond too large or too small to provide significant benefit to rearing juvenile salmon due to size-associated temperature constraints, prey availability, edge effects, or predator access/hunting efficiency?
7. How does location/distance from the main river channel or from salmon source populations influence salmon use or accessibility of floodplain lakes?
8. How does flow regulation influence salmon access to floodplain lakes?
9. What is the contribution of FPL organic matter, prey and water quality to the broader ecosystem?