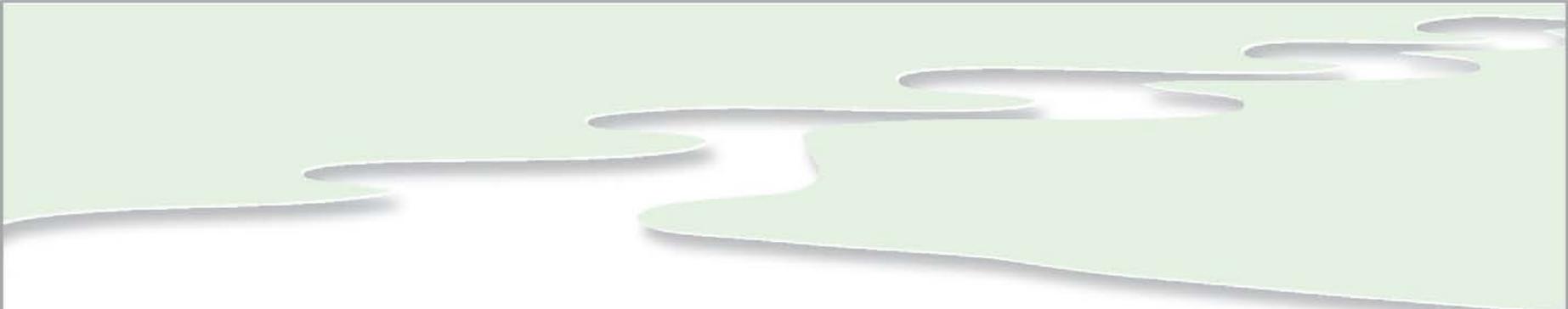


Making Effects Determinations for development in the floodplain

What Standard is Required?



What Effects Standard is required depends on where your project is located

In the **Protected Area**
the standard is:

“No Adverse Effect - No Mitigation except Avoidance”

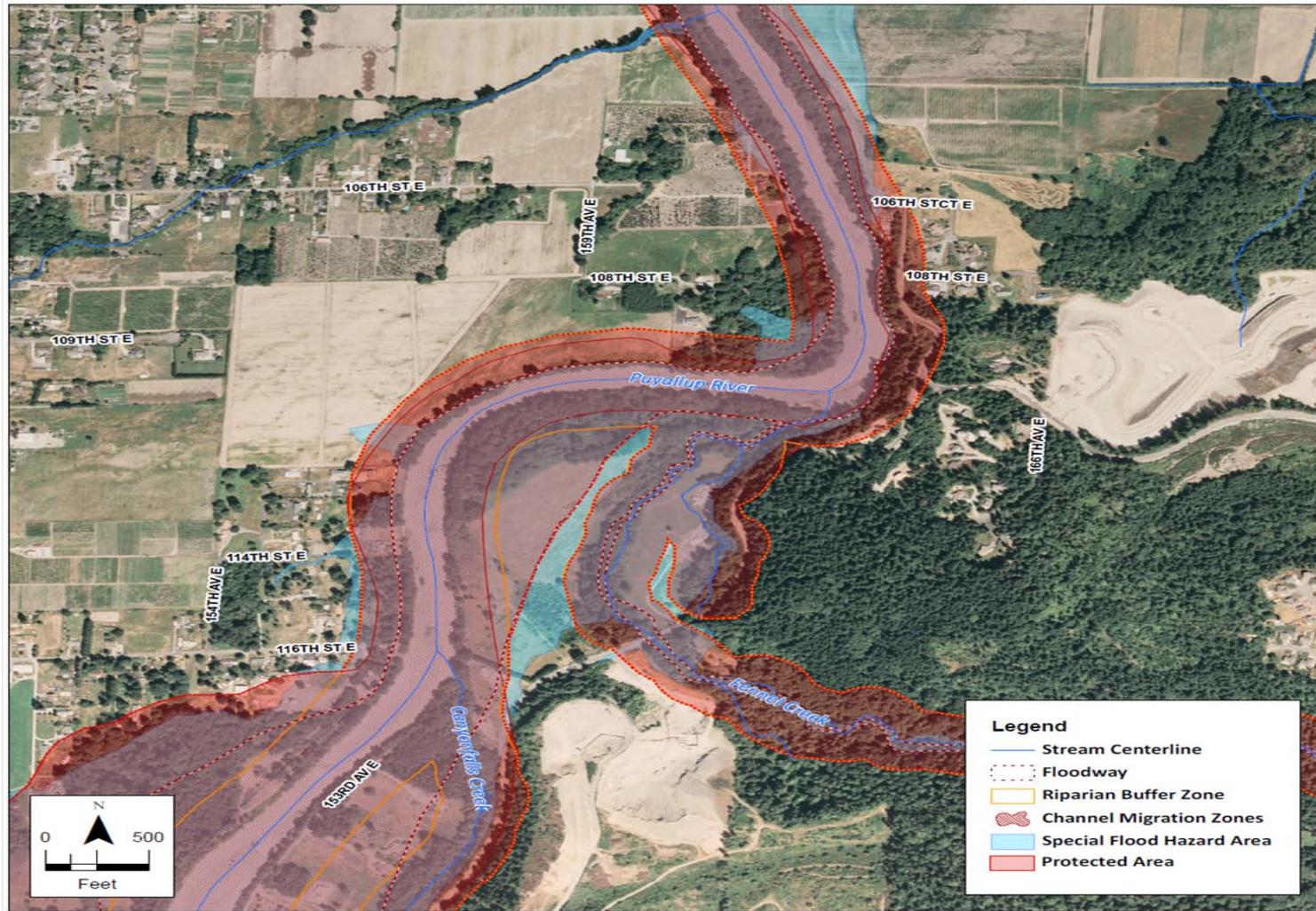
In the **remainder of the floodplain**, the standard is:

“Mitigate the Adverse Effects of Floodplain Development”



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The **protected area**, and the rest of the floodplain

The “Effects Spectrum”

No Effect



Not Likely To Adversely Affect

entirely beneficial effects (eg, levee setback when original levee is not at OHWM)

insignificant effects (effects ephemeral, e.g. removing a blocking culvert when fish are not present in the stream)

discountable effects (effects extremely unlikely, e.g. removing blocking culvert when the stream is completely dry)



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The “Effects Spectrum” cont.

Likely To Adversely Affect

adverse effects with *significant intensity* (e.g. impact pile driving noise that injures juveniles) *or duration* (e.g. riprap bank armoring harms juveniles the entire time it is there)



Jeopardy

when an *action harms, injures, or kills* individual fish, there may be *sufficient numbers* affected (at one time, or over time), *to change the population’s demographics* – which we call viability parameters (abundance, productivity, spatial structure, or diversity). If a Population is *weakened to the point that it may be extirpated*, it *increases the likelihood of jeopardy to the species* (ESU or DPS) because that loss alters the viability parameters of the species.



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The "Effects Spectrum" cont.

- The effects determination is heavily influenced by conditions present in the environmental baseline
- Habitat features must exist before they can be adversely affected
- The same action conducted in different landscape conditions can have different effects determinations





Multiple factors influence where on the Effects Spectrum a given project will land

1) What features of habitat are there?

What features of habitat are there?



**Riparian vegetation,
floodplain access/refugia,
suitable gravels for
spawning, forage, hyporeic
recharge/base flows,
channel forming
process/establishment of
channel complexity, large
woody debris**

Tolt River & Floodplain



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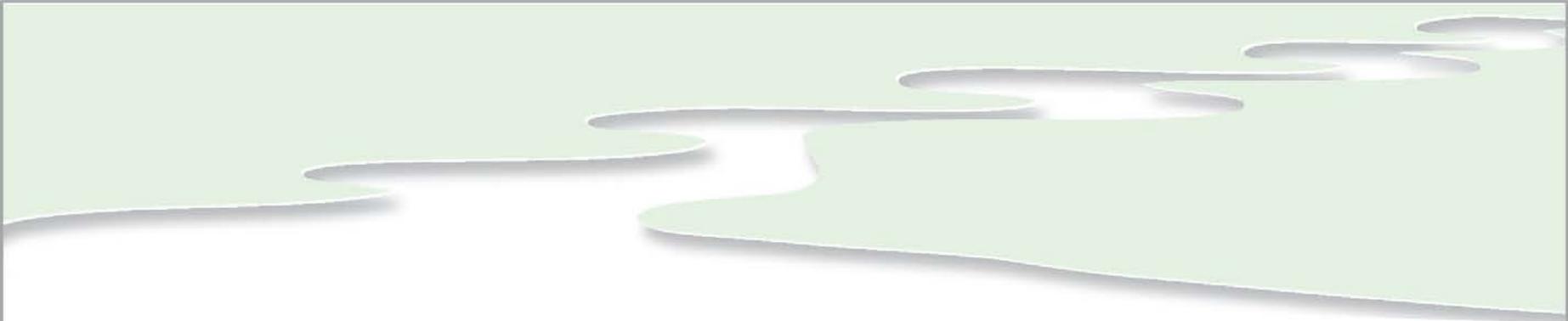


What features of habitat are there?



Flood storage, some low quality refuge, some groundwater recharge.

Chehalis River & Floodplain



Multiple factors influence where on the Effects Spectrum a given project will land

- 1) What features of habitat are there?
- 2) What purposes/functions do they serve?

What purposes/functions do they serve?



**Side channel
spawning and
rearing, forage,
cover**

Forston Cr.



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What purposes/functions do they serve?

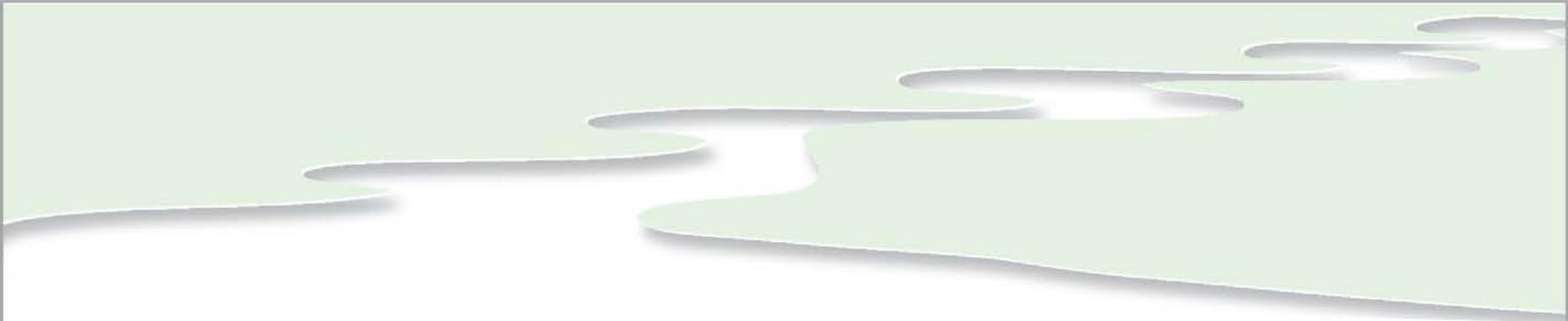


**Flood refuge
for freshwater-
rearing
juveniles, and
forage**



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Multiple factors influence where on the Effects Spectrum a given project will land

- 1) What features of habitat are there?
- 2) What purposes/functions do they serve?
- 3) How well and how often ?

How well are the functions served?



**Skagit River
1995 flood**

How well are the functions served?



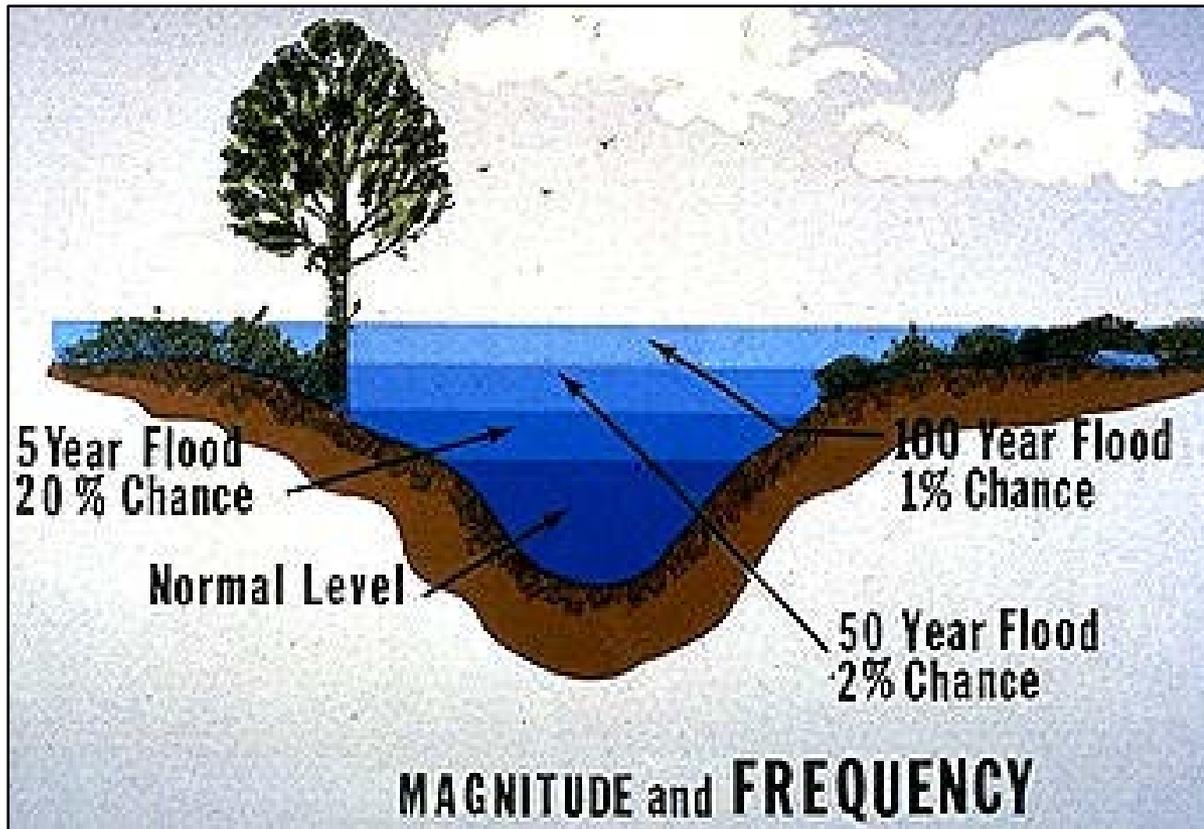
**Flooding in
Seattle**



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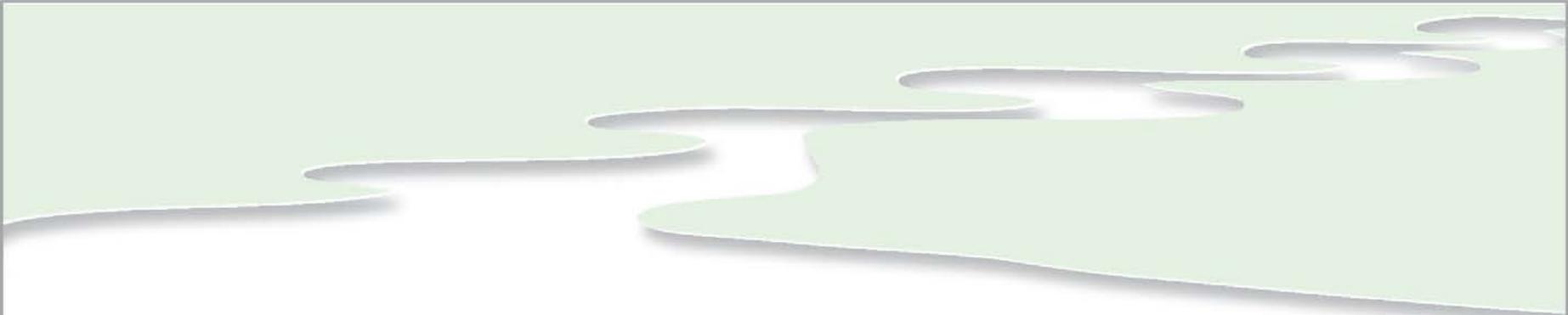


How often are the functions utilized?



The 5-year floodplain has a 20% chance of being inundated /accessed by fish) in any given year.

The 100-year floodplain has a 1% chance of being inundated/accessed by fish in any given year.



Multiple factors influence where on the Effects Spectrum a given project will land

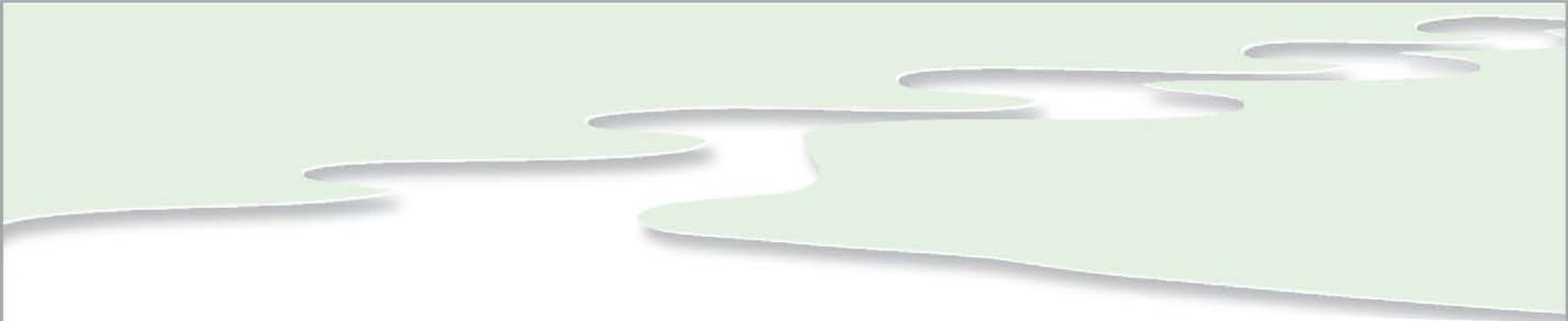
- 1) What features of habitat are there?
- 2) What purposes/functions do they serve?
- 3) How well and how often ?
- 4) What habitat features will the project impact?

What habitat features will the project impact?



Development proposed for **floodway** and **floodplain** areas. Impacts to: floodplain refuge, forage, riparian vegetation, cover, water quality, groundwater recharge, stream velocity, side channel formation, floodplain connectivity.

(Yakima River).



Multiple factors influence where on the Effects Spectrum a given project will land

- 1) What features of habitat are there?
- 2) What purposes/functions do they serve?
- 3) How well and how often ?
- 4) What habitat features will the project impact?
- 5) Will the impacts coincide with fish presence?

Will impacts coincide with fish presence?



**Work in the dry.
Construction impacts
will not overlap with
fish presence.**

Will impacts coincide with fish presence?



Naches River bank repair. Construction impacts (noise, turbidity, placement of rock in aquatic habitat) overlap with fish presence. Also riparian vegetation /cover impacts, forage reduction, hydrology and channel process impacts.

Will the impacts coincide with fish presence?



**Katrina Response –
this is so obviously
wrong - we'd *never*
do this here....**



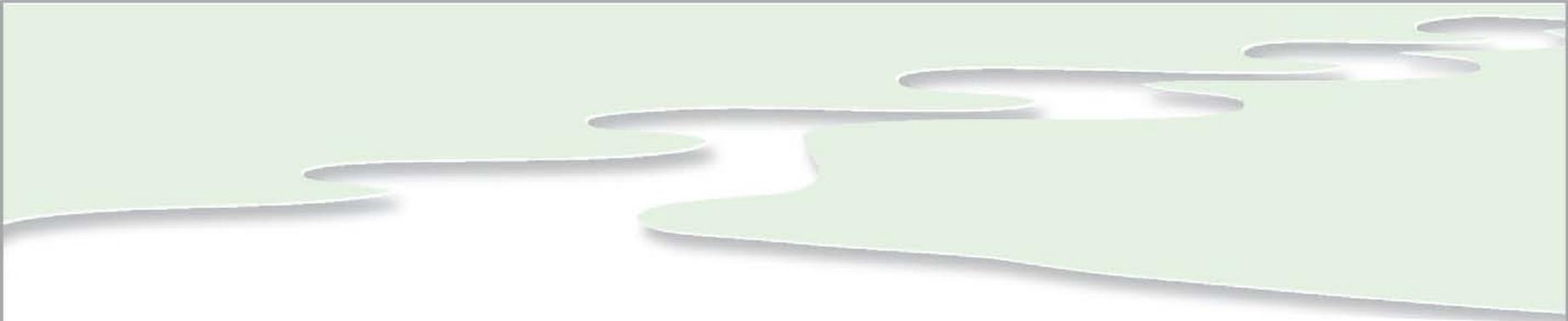
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Will the impacts coincide with fish presence?



Construction impacts will not, but impacts to flood refugia, water quality, floodplain connectivity, natural bank conditions and groundwater recharge, and channel complexity will coincide with fish presence, when the water rises.



Impacts and Fish Presence

Steps that keep habitat impacts from overlapping with fish presence are

“avoidance measures”

e.g: working when fish aren't present avoids construction-related impacts



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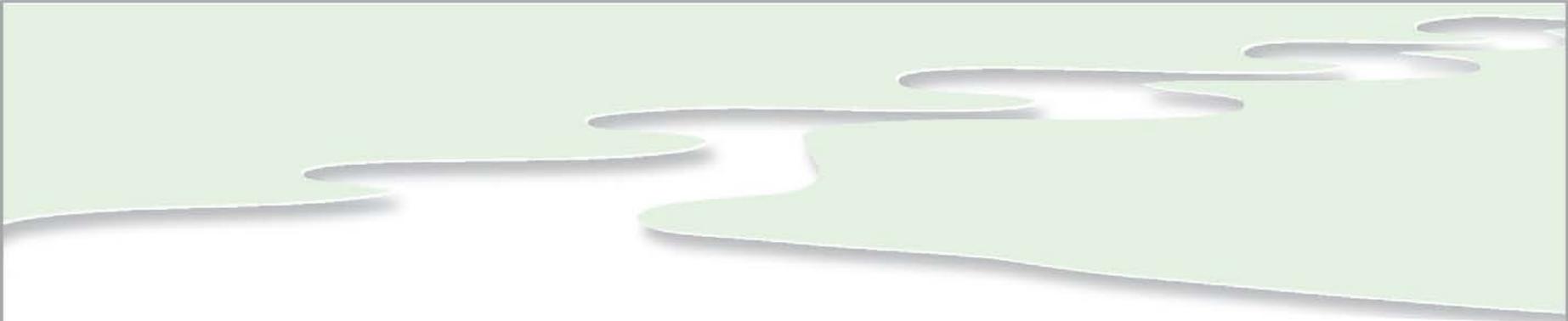
Avoidance Measures for Intermediate- to Long-term habitat effects

- What duration are the effects?
- What frequency of fish presence?
- Get your “offsetting+” measures in place and make sure they are effective before fish are reasonably expected to experience the impacts - (it must be equivalent or better habitat)



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Why do we have to do this?

- Juvenile salmonids need floodplain habitat for refuge, to feed, and to grow.
- Bigger juvenile salmonids are less vulnerable to predation.
- Bigger juvenile salmonids survive better when they reach the estuary and move into the ocean.

Fish without
flood plain
rearing

Fish with
flood plain
rearing



Fig. 7 Comparison of a single enclosure of fish reared in intertidal river habitat below floodplain (*left*) and a single enclosure of fish reared in the floodplain vegetation (*right*) after 54 days in respective habitats at the end of the second year of the study