

# What is APASS?

An Optimized Barrier  
Mitigation Planning  
Model

# Ways of going about barrier mitigation planning

- **Informal methods**

- Rely on expert judgement

- **Formal methods**

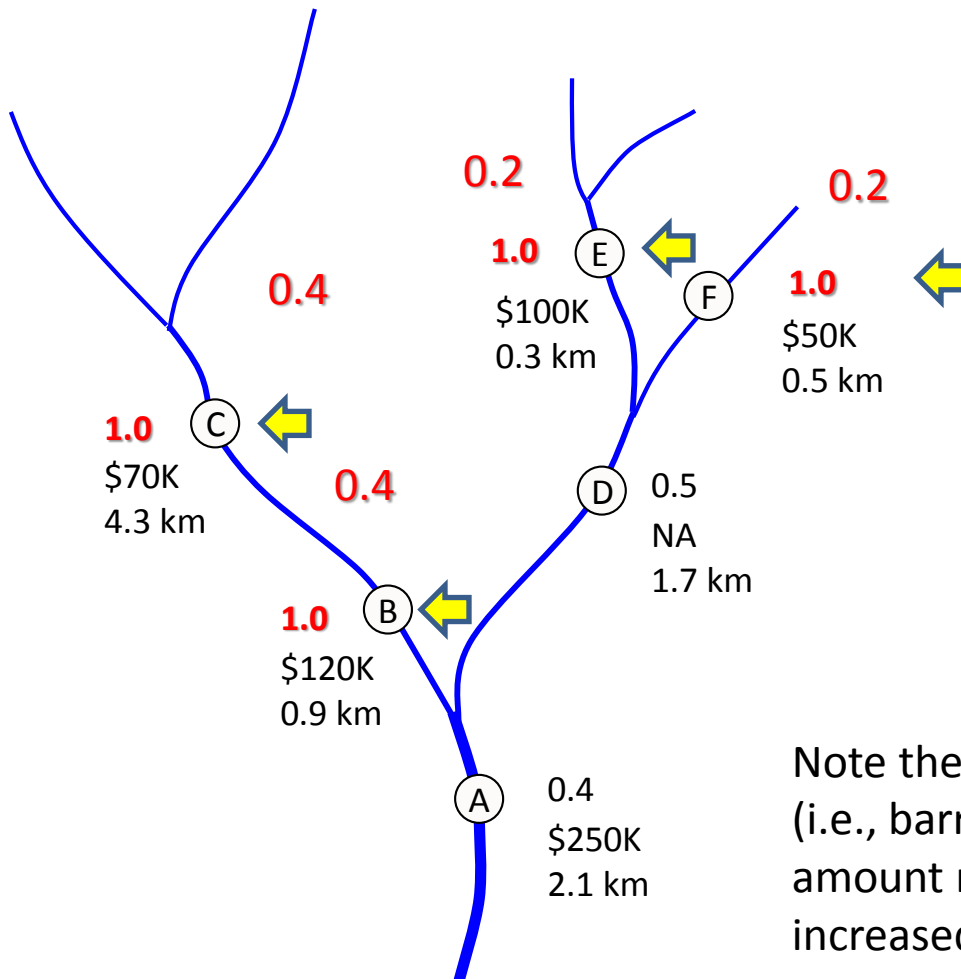
- Involves some sort of quantitative analysis

- Scoring-and-ranking

- Graph theory models

- Optimization models (e.g. APASS)

# Barrier optimization in action



Budget	Soln	Gain
\$50K	F	0.090
\$100K	E *	0.192
\$150K	B *	0.876
\$200K	B, C	2.080
\$300K	B, C, E	2.272
\$400K	A, B *	4.047

Note the lack of “**nestedness**” among solutions (i.e., barriers removed given a certain budget amount may not be removed when the budget is increased)

# Key APASS functionalities

- Friendly graphical user interface (GUI)
- Easy upload of barrier datasets
- Performs optimization runs for any desired budget
- Performs batch runs (i.e., run the model across a range of budget values in set increments)
- Saves solutions as simple text files
- Carryout basic “**what-if**” analyses
  - Limit analyses to a subset of selected watersheds
  - Create user-defined solutions in which one or a handful of barriers are forced in or forced out of the final solution
- Handles
  - Multiple species, guilds, etc. (aka **restoration targets**)
  - Multiple alternative mitigation projects at any given barrier (e.g., fix the barrier a little or fix a lot)

# Data formatting requirements

APASS requires the following data fields:

- **BARID**: barrier ID
- **BASIN**: watershed, subwatershed, etc.
- **DSID**: immediate downstream barrier ID
- **USHAB**: net upstream habitat (up to the next set of barriers or the limits of anadromy)
- **PREPASS**: current barrier passability
- **NPROJ**: number of mitigation projects that can be carried out (normally 0 for natural barriers)
- **COST**: the cost to repair/remove/mitigate a barrier
- **POSTPASS**: barrier passability following mitigation

# Future of APASS

- CA Fish Passage Forum will be reviewing and testing newest version of APASS through 2013
- We plan to incorporate APASS in 2014 project selection
- In the future, we plan to use APASS to potentially select projects, but also to develop priority future projects
- Dr. O'Hanley is highly optimistic that additional aquatic habitat restoration practices can be incorporated.