Guadalupe-Coyote
Resource Conservation District (GCRCD)

An independent special district of the State of California

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Staff Report

Special Joint GCRCD/SCVWD Board Meeting
June 15, 2017

DATE: June 12, 2017

TO: GCRCD Board of Directors

FROM: Stephanie Moreno, Executive Director/District Clerk

AGENDA TITLE: Item 6: Presentation and Discussion on Fisheries and Aquatic Habitat Collaborative Effort (FAHCE)

RECOMMENDATION:

Receive and discuss information on Fisheries and Aquatic Habitat Collaborative Effort (FAHCE).

PRESENTERS:

Richard Roos-Collins, GCRCD District Counsel, Water & Power Law Group
Julie Gantenbein, GCRCD District Counsel, Water & Power Law Group
Dr. Joe Merz, GCRCD/NGO Consultant, Cramer Fish Sciences
Vincent Gin, SCVWD Deputy Operating Officer, Watersheds Stewardship and Planning Division

DISCUSSION:

The FAHCE settlement agreement was negotiated to resolve disputes regarding the Santa Clara Valley Water District's (SCVWD) use of its water rights on Coyote, Guadalupe, and Stevens Creeks in Santa Clara County. The parties to the agreement are Guadalupe-Coyote Resource Conservation District (GCRCD), SCVWD, U.S. Fish and Wildlife Service, National Marine Fisheries Service, California Department of Fish and Game, Trout Unlimited, Pacific Coast Federation of Fisherman's Associations, California Trout, Inc., San Francisco Bay Urban Creeks Council and Northern California Council of Federation of Fly Fishers. Although the agreement was initialed by all parties in 2003, it is not scheduled to be signed until after SCVWD obtains approval of the required water rights change petition, which it filed with the State Water Resources Control Board (SWRCB) in 2015 and for which it still is completing the required planning and environmental documents necessary to advance to a hearing.

In 2014, the parties agreed to change the regulatory pathway set forth in the original agreement in order to secure a more timely adoption of the SWRCB order needed to implement the programs and projects outlined in the settlement agreement. Since 2015, GCRCD and the NGOs have been working to develop a scientific record necessary to support the SWRCB decision on the water rights change petition. One of our consultants, Dr. Joe Merz, will present an overview of the science-based contributions GCRCD and the NGOs have made to FAHCE and TWG.

REFERENCES:

Guadalupe-Coyote Resource Conservation District
Santa Clara Valley Water District

ATTACHMENTS:

Technical Work Group (PowerPoint Presentation)

Technical Work Group

collaboration, progress, success, future

SCVWD, California Department of Fish and Wildlife, National Marine Fisheries Service, Trout Unlimited, CalTrout, and GCRCD.

Progress

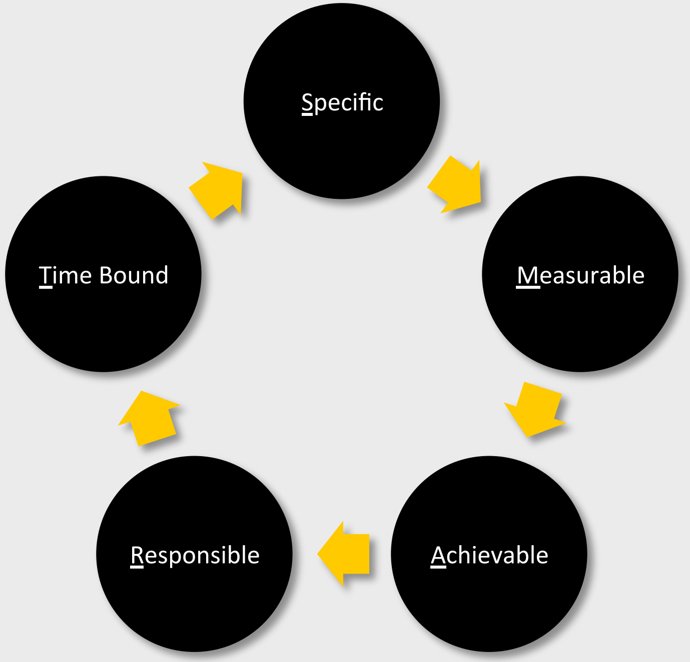
- Habitat restoration… relatively young, evolving science but numerous examples of successful implementation
- Completion of FAHCE Settlement and restoring populations to good condition are a reality
- TWG still has technical issues to work out but these can be resolved in timely manner

Quantifying goals

SETTING TARGETS AND MEASURING PROGRESS AND SUCCESS (SCVWD 2016)

- *Attribute: important characteristic that helps describe an objective. A useful attribute an be measured in a scientifically defensible way.*
- *Metric: parameter that can be measured to track the status of attributes. Each attribute will be measured and tracked via one or more metrics.*
- *Target- optimistic but achievable endpoint, quantified where possible to indicate success.*
- *Assess progress in meeting objectives by tracking attributes through specific metrics and targets.*

SMART Goals

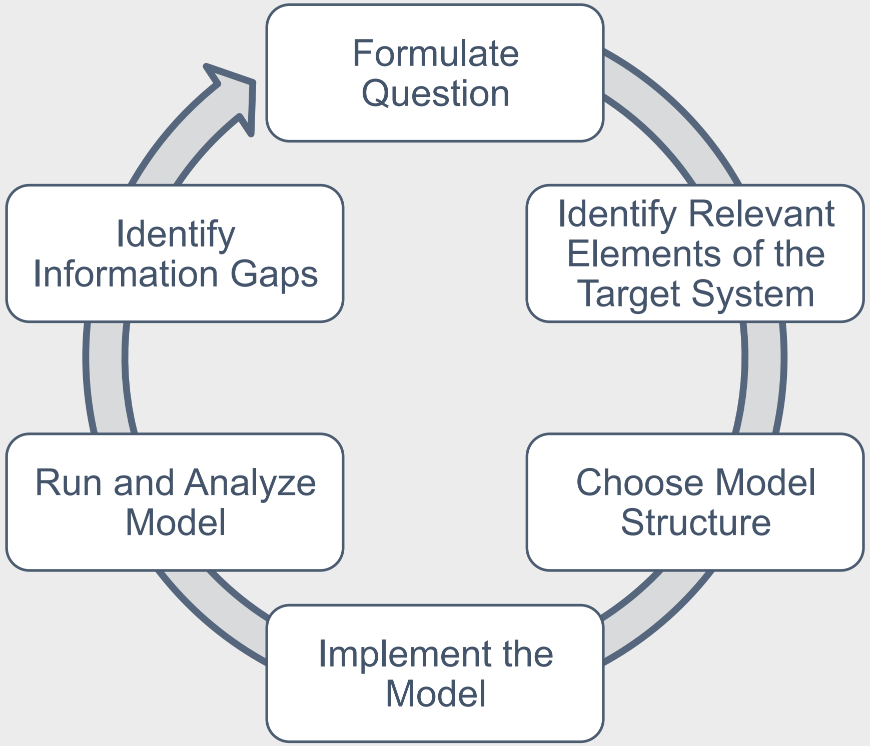


Measureable targets help us confidently determine what it takes to be successful.

Salmonid populations in good condition

- We have not determined overall population goals but we can use genetics to determine a minimum viable population (Frankham 2005; Frankham et al. 2015)
- We do not have exact population behaviors nor their response to Three Creeks environment but we do have general information from surrogate watersheds as a starting point
- In short, sustained populations require enough young from adults to support enough returning fish so that population will not go extinct in the foreseeable future

Value of Modeling Exercise

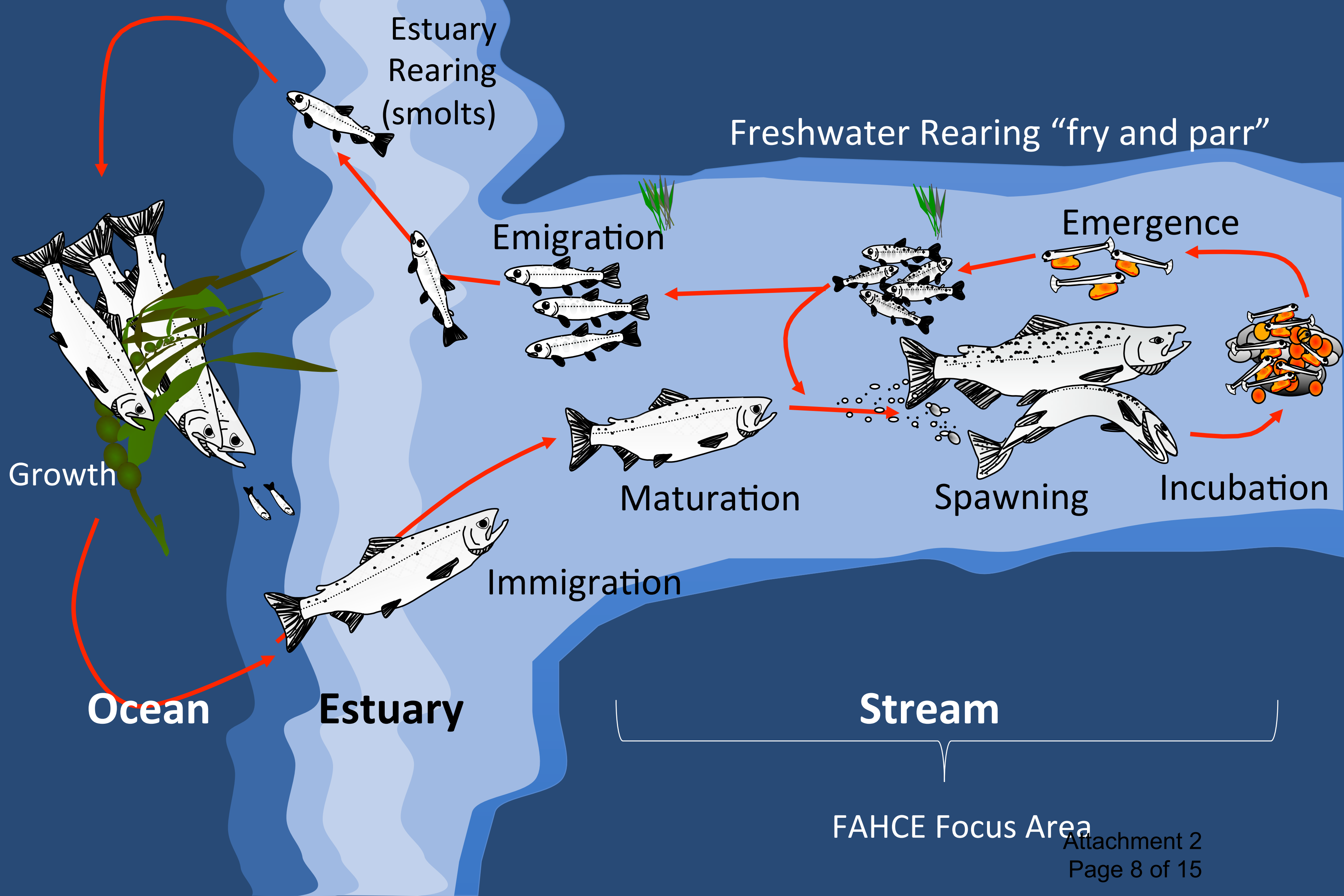


- Models help **quantify and visualize potential benefits of flow and non-flow actions** on target organisms
- **Quantify** lifestage-specific and **cumulative impacts of restoration actions** on each salmonid population
- Allows **comparison of benefits** identified **under different** flow/ management **alternatives**
- Helps **determine** when "**enough is enough**"
- Model **identifies gaps** in understanding
- **Iterative process** whereby new information will fill knowledge gaps
- Allows District and stakeholders to "game" habitat quality and available water to **wisely manage** flow and non-flow actions
- Provides **transparent process** to determine management actions
- Facilitates **adaptive management**

Model basis: Steelhead and Chinook must access and use a range of habitats to be successful...

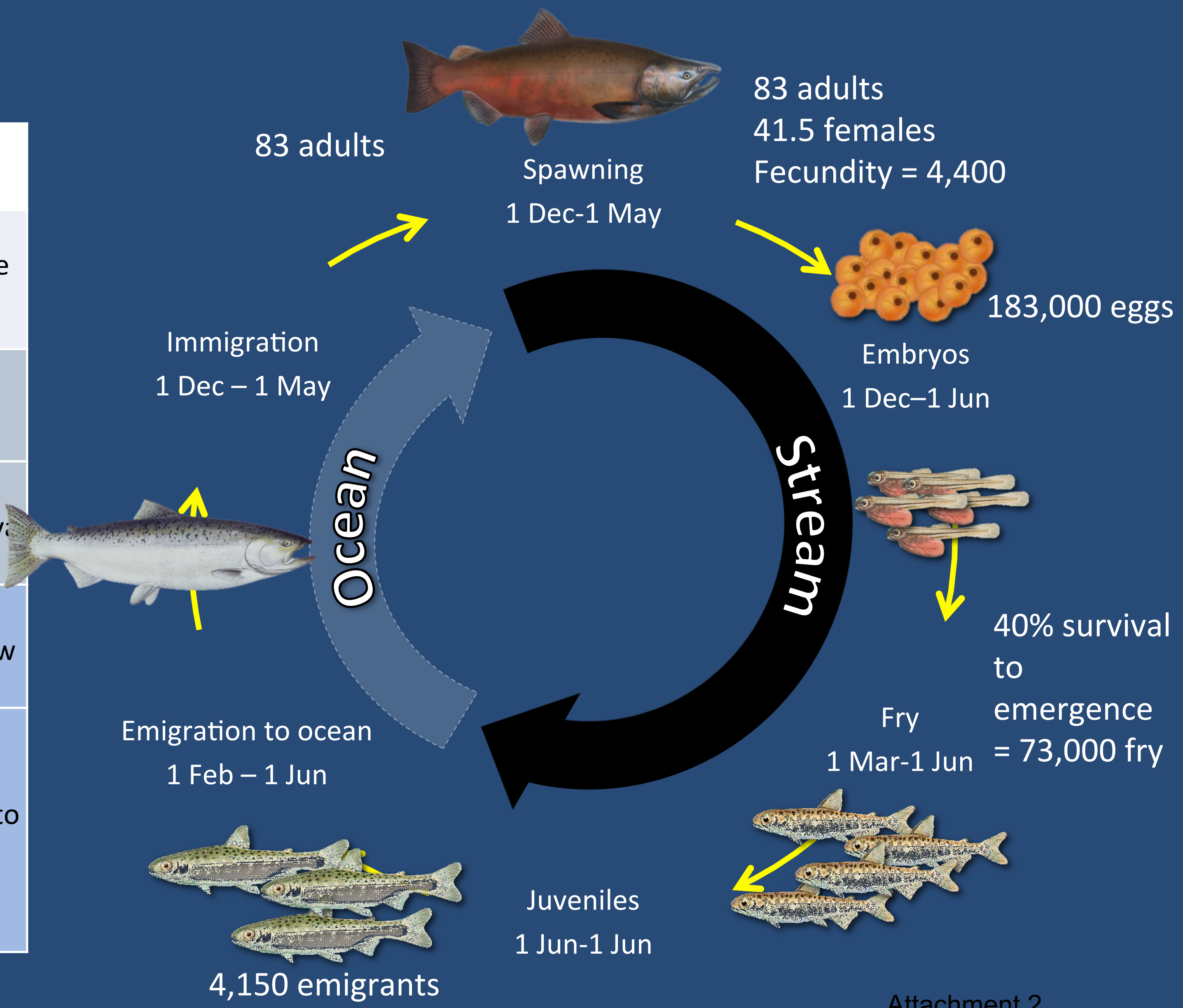
What is successful? Population target must be met for each life stage to maintain the quantity and quality of fish that is acceptable as... "in good condition"

To do this, not only enough habitat is needed to support each life stage but habitat must be accessible and functioning when each life stage needs it.



Model basis is minimum population
Steelhead example

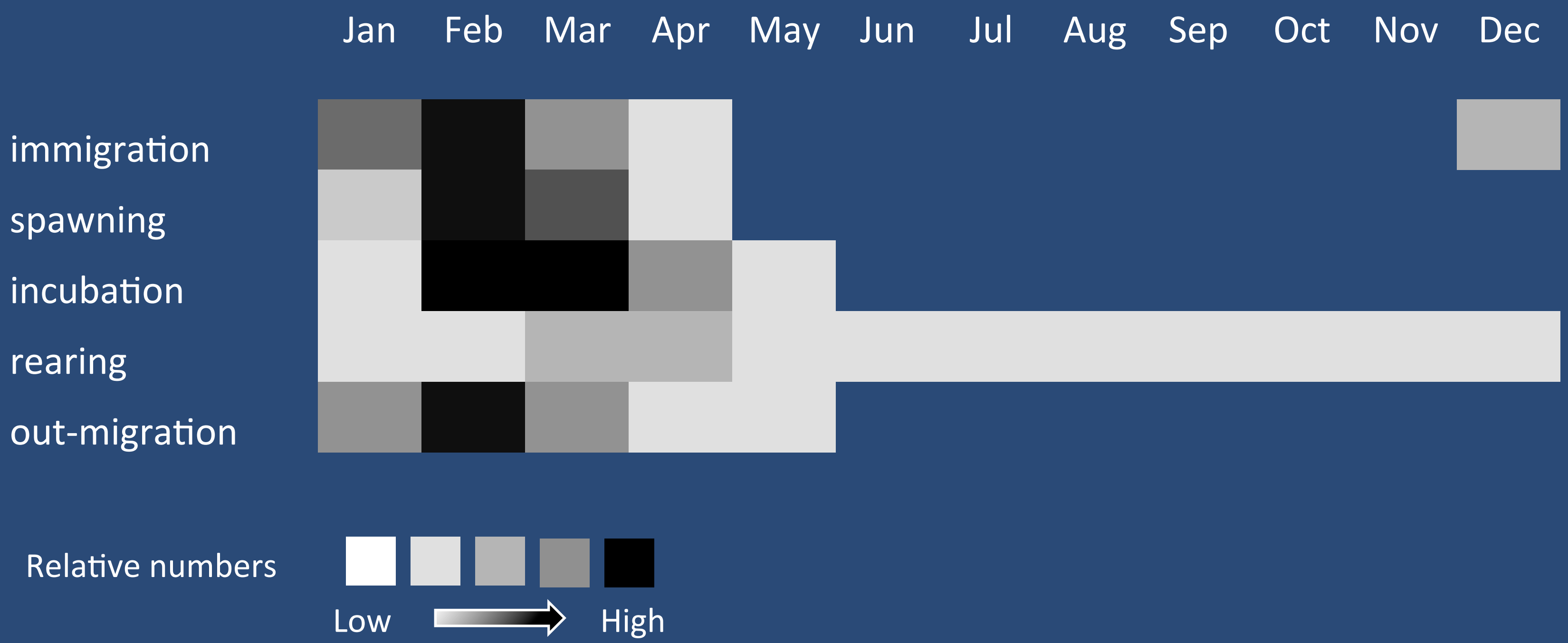
Function	Parameter	Data Source	Function of…
Initial Abundance	83 adults	NOAA (2008); Frankham et al 2015	Minimum viable population
Fecundity	4,400 eggs	Hodge et al 2014	Length to fecundity ratio
Fry abundance	73,000 fry	Coble 1961; Hobbs 1940; Dahlberg 1979	Incubation surviva
Emigration Rate	Migration Speed	Lagunitas Creek MCWD Rotary Screw Trap	Fish Length, Flow
Survival	4,150 emigrants	Hallock et al 1961; Thedinga 1998; Welch et al. 2000	Minimum population reaching ocean to facilitate adult escapement numbers



Population and WEAP models support efficient water management

If we only use a general concept of when steelhead migrate, how much water is needed for immigration?

Generalized California steelhead timing



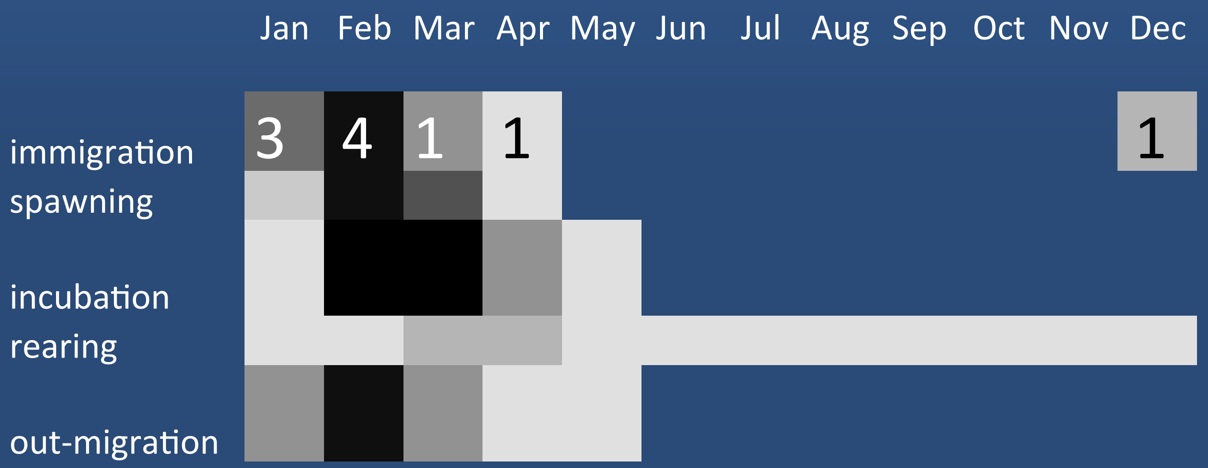
Guadalupe Creek passage = ~150 days of passage

Under FAHCE agreement 0.8 ft of water needed in channel to pass steelhead.

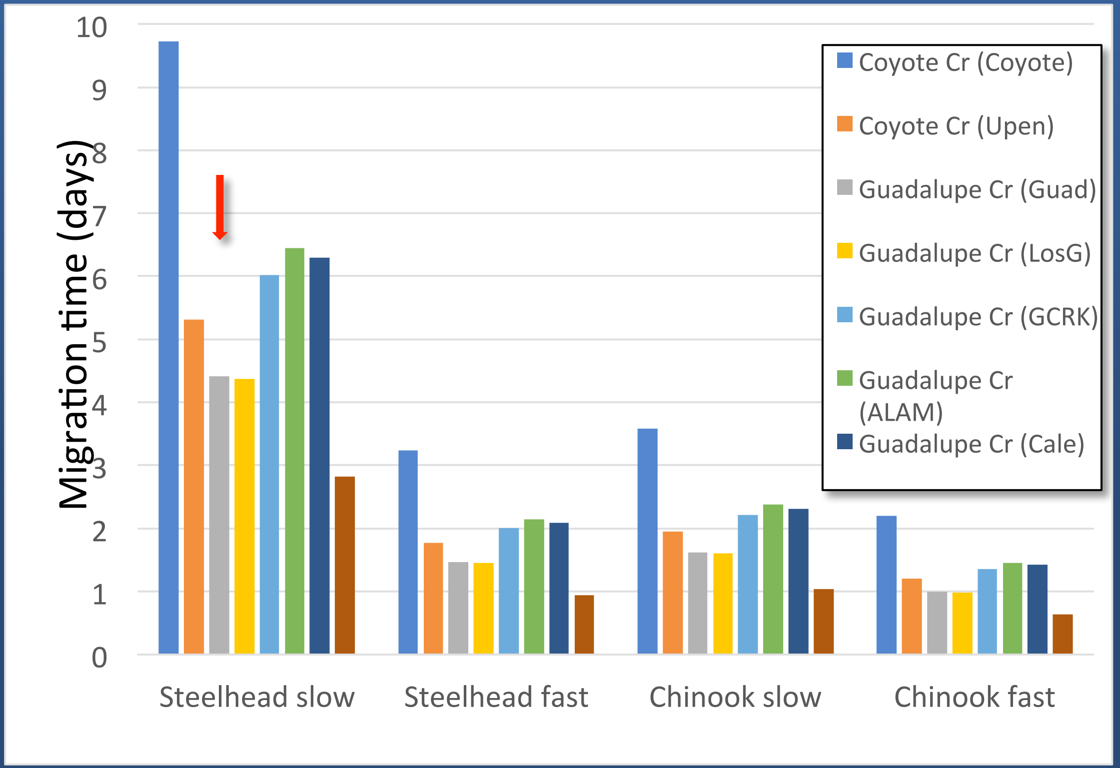
Requires ~41 cfs = 81.3 ac ft/d = 12,198 ac ft

Conceptual model example supports 70% less water used

Generalized California steelhead timing. Number of steelhead passage events under unimpaired flows for below normal water year.



Numbers are estimated average monthly passage events under unimpaired flow



Estimated number of days for steelhead and Chinook to immigrate from bay to spawning grounds for reach creek using migration speeds of Keefer et al. (2004).

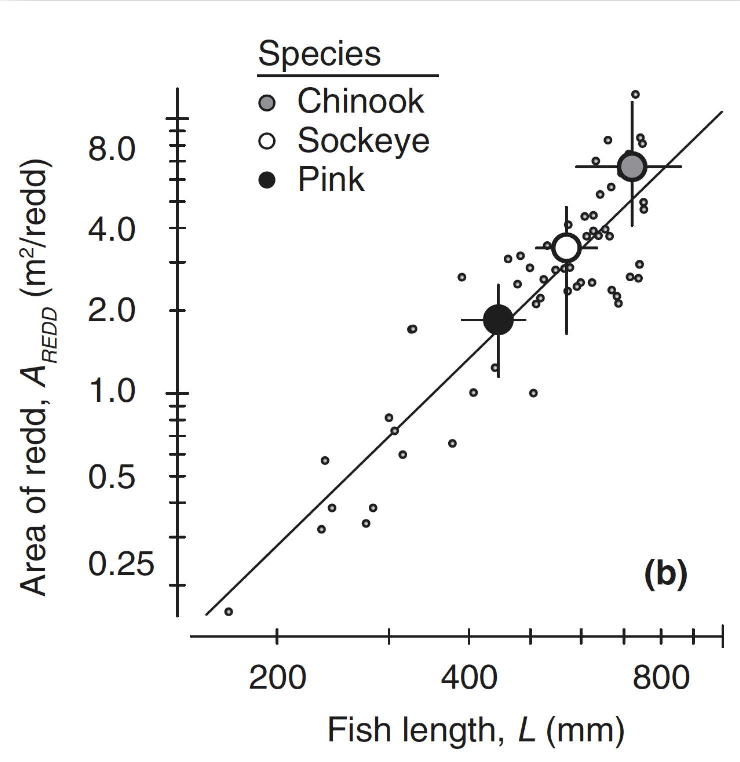
Under unimpaired flow, a total of 10 passage events occur during steelhead immigration period (below normal WY). Using steelhead migration speeds assume 4.5 days for average fish to reach spawning grounds = 45 days of passage
45 days of 41 cfs = 3659 ac ft.

Fundamental concept relating salmonid production to stream habitat

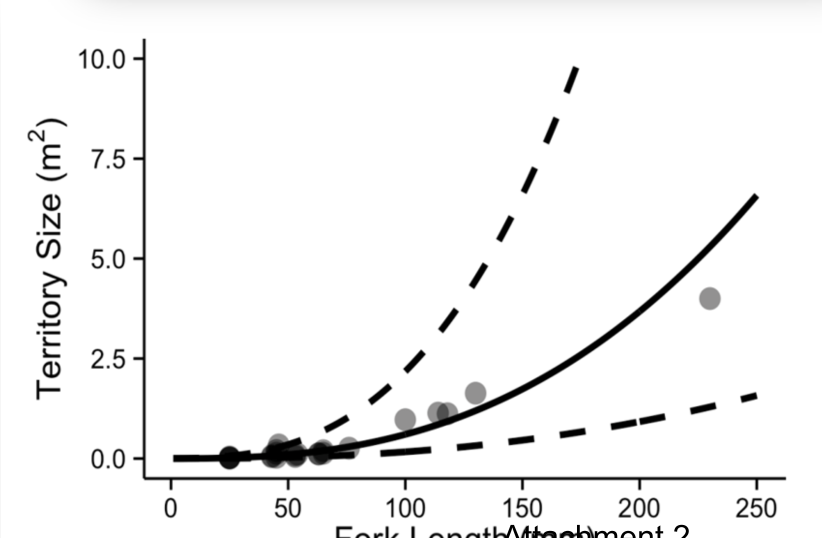
- Stream-dwelling salmonids either defend or rely on food from a characteristic area of territory.
- We assume maximum number of individuals a habitat area can support is limited by territory size of fish and amount of available suitable habitat (ASH):

Capacity = ASH / Territory Size

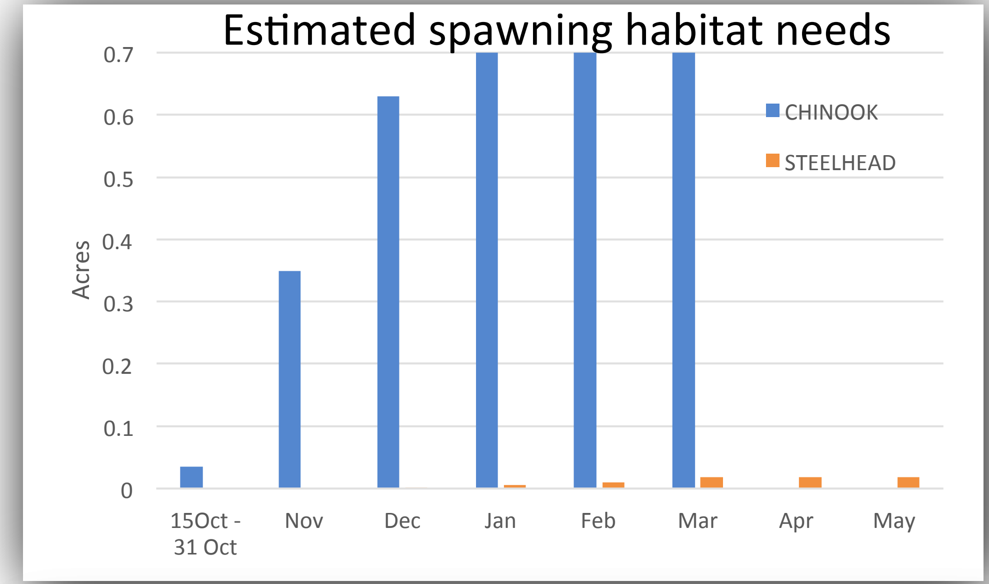
Riebe et al. 2014

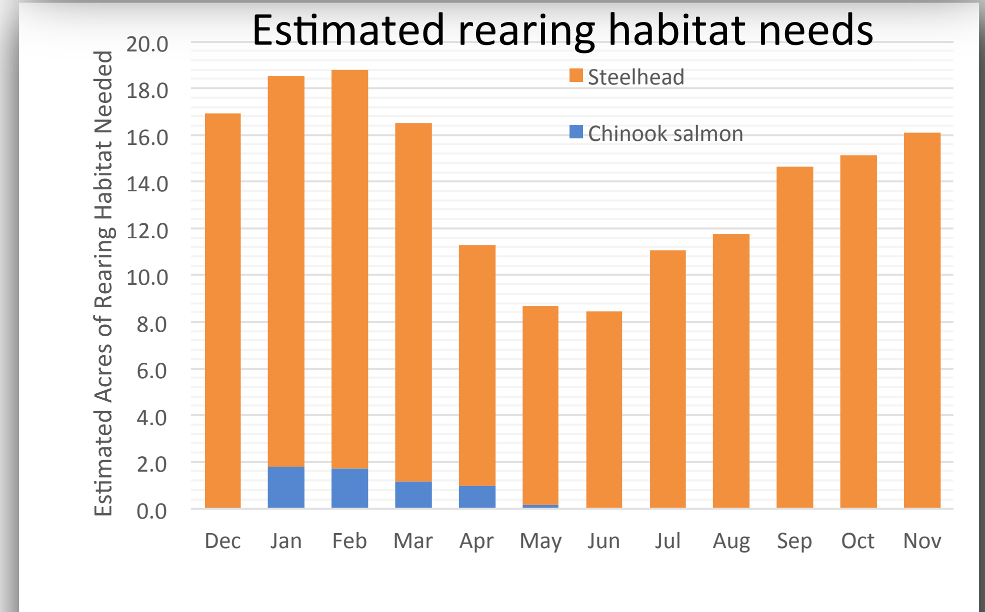


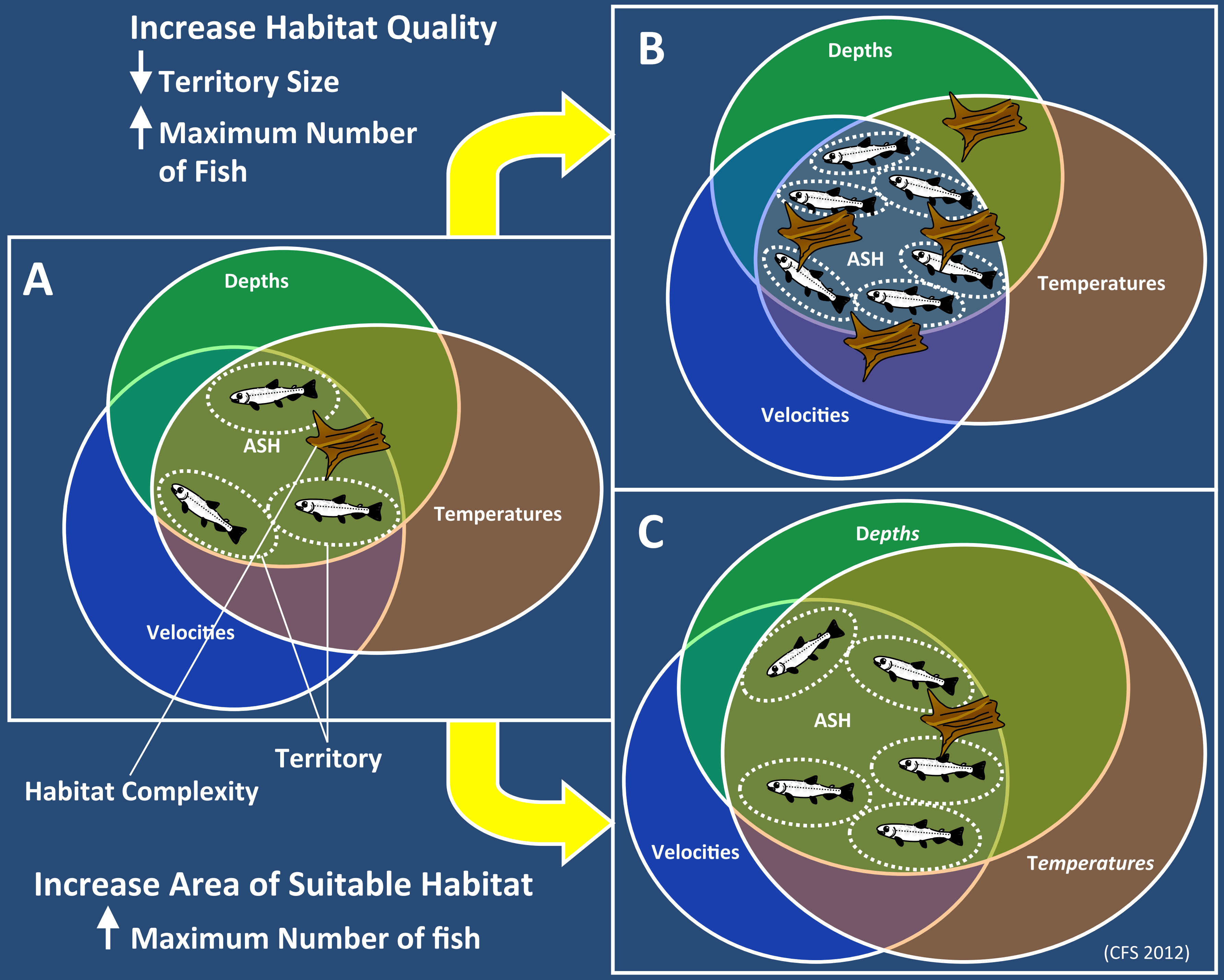
Grant and Kramer 1990



Territory and Habitat needed






Increase Habitat Quality
Territory Size
Maximum Number of Fish
A
Depths
ASH
Temperatures
Velocities
Territory
Habitat Complexity
B
Depths
ASH
Temperatures
Velocities
C
Depths
ASH
Velocities
Temperatures
(CFS 2012)
Increase Area of Suitable Habitat
Maximum Number of fish

Recommended Next Steps

- Study Plan backbone is the Water Evaluation And Planning (WEAP) Model
- WEAP model produces time series simulating reservoir storage, streamflow, temperature, diversions, and operational variables, and is used as a comparative model.
- When synced with habitat suitability and 1-D (HEC-RAS) modeling, the tool could potentially predict the quantity of habitat available for target life stages of steelhead and Chinook.
- Modeling exercises require validation- Part of validation exercise is comparison of model results against a time period in which operations are known.
- Team agreed that work plan will have a validation component and a decision point regarding model uncertainty. Flows, in particular, will be validated. These data will be used to predict habitat availability and ability to pass fish under alternative flow schedules.
- This modeling, once validated, could be an invaluable tool for future assessment of operation performance including support of adaptive management and biological monitoring.