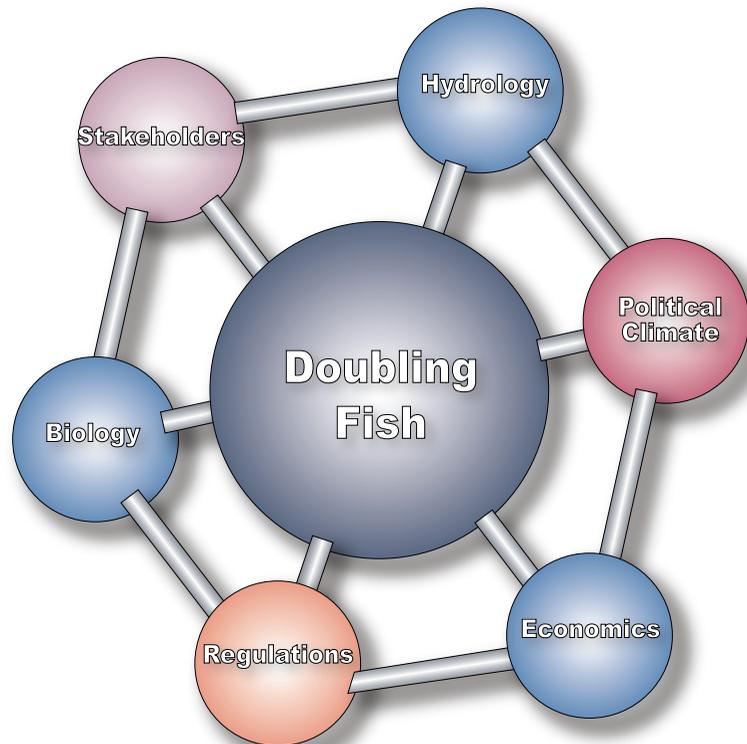
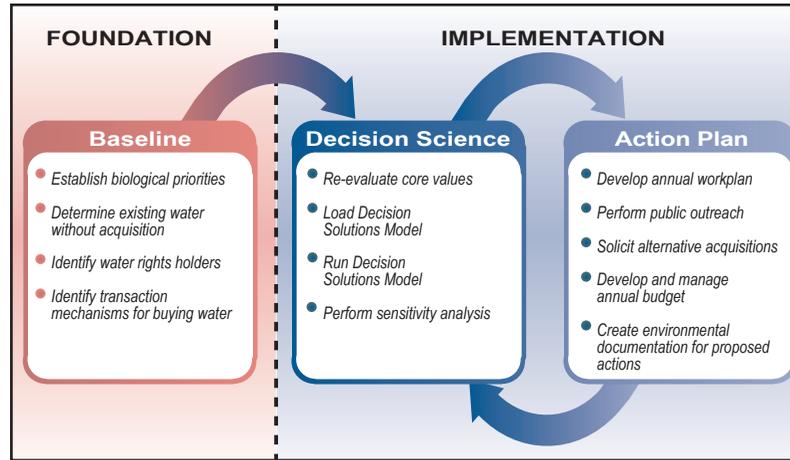


To ensure the successful acquisition of water for fish doubling objectives, the WAP must consider many influencing factors. These factors include the critical technical parameters of biology, hydrology, and economics, and subjective parameters of political and public acceptance. All are critical to the decisionmaking process. In addition, costs associated with the regulatory process and cost-related impacts must be evaluated. The current model illustrates the relationship of various factors and their influence on the overall Anadromous Fish Restoration Program (AFRP) goal of doubling fish.

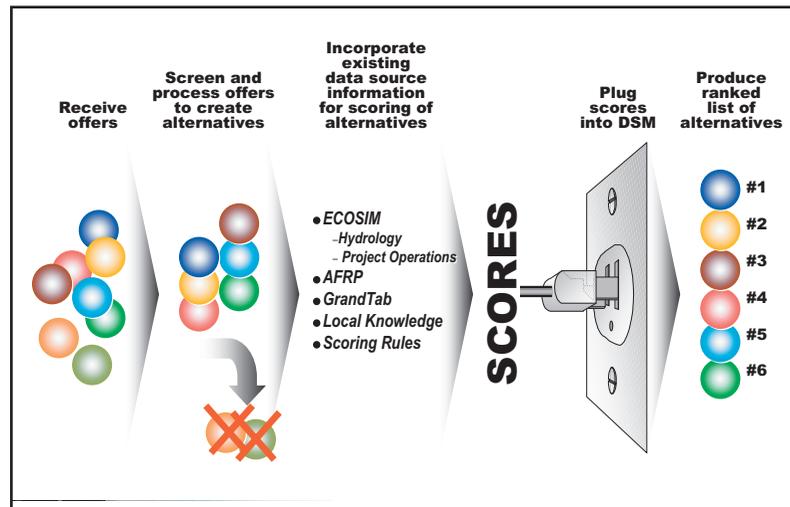


The WAP decision support tool provides an integrated framework by which to consider acquisition alternatives.



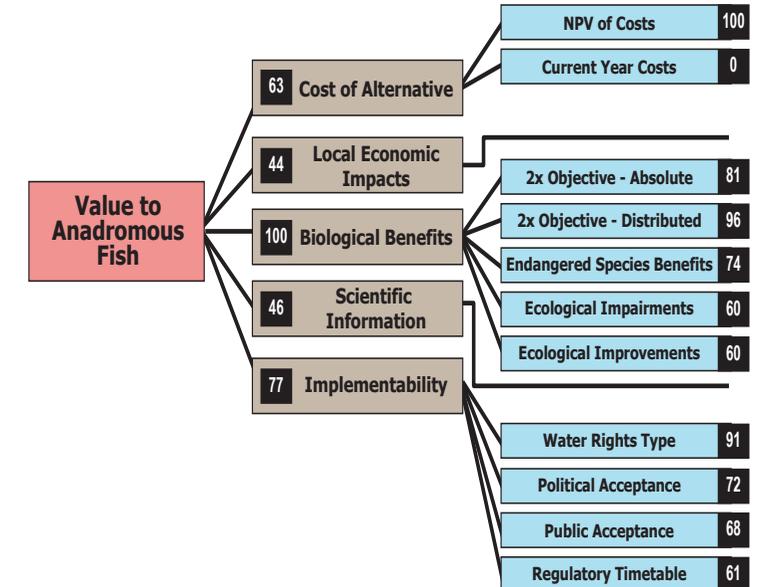
Building from a foundation of technical data, the DSM offers a flexible and robust method for supporting the implementation of a WAP that will be successful for buying water and doubling fish.

Successful water acquisition decisions rely on sound technical data, and effective implementation of decision science and the action plan. The DSM incorporates an existing base of knowledge and technical data to produce a ranked list of acquisition alternatives.



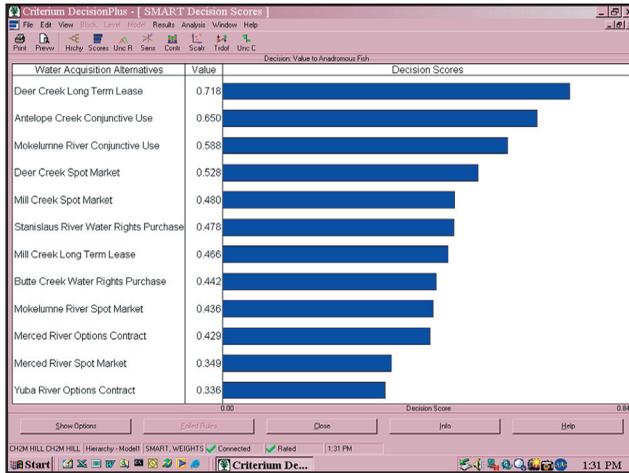
The DSM streamlines the process of filtering and analyzing solicited acquisition offers.

WAP stakeholders include policy advisors and program managers from the Department of Interior and California Department of Fish and Game, and representatives of Central Valley Project contractors and environmental interest groups. In a series of interactive workgroups, these stakeholders determined the critical criteria for doubling fish. In subsequent workshops they developed weights to reflect the importance of each criterion.



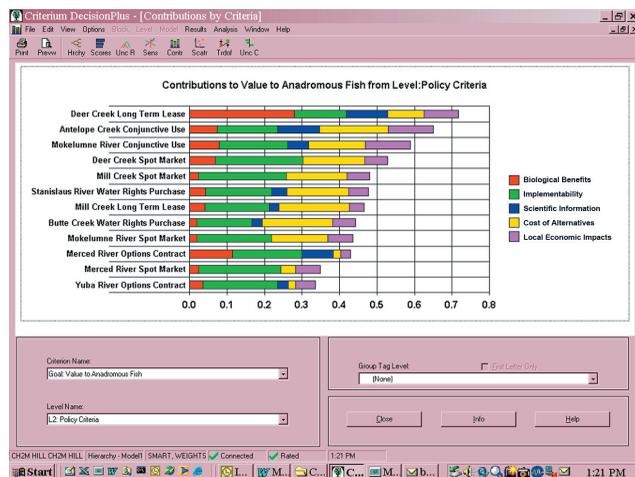
The DSM structure accounts for the relationship of stakeholder-determined criteria and relative weights to the goal of increasing anadromous fish.

Criterion DecisionPlus, a decision support software package, is used in the DSM to rank acquisition alternatives based on the stakeholder-determined weighting structure and scores for each alternative. The software uses the Simple Multi-attribute Rating Technique (SMART). It provides an overall numeric score and a graphical representation of how the alternatives rank against each other.



**DSM provides an overall score and ranking for each water acquisition alternative.**

The software also provides a graphic to illustrate the contribution of each criterion to an alternative's overall score (see image below). For example, with the Deer Creek Long-Term Lease alternative, the extensive biological benefits push this alternative to the top of the list. Alternatively, on Butte Creek, there are relatively fewer biological benefits, but such a transaction is easy to implement and inexpensive, when costs are discounted over the 20-year analysis period.



**DSM displays relative rankings of contributions for each alternative.**

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The Central Valley Project Improvement Act (CVPIA) mandates that the Secretary of the Interior acquire water to further the goal of at least doubling the historical populations

The National Science Foundation has been funding research in decision science since the 1950s and believes that it and related areas have helped to solve practical problems once thought too complicated to analyze.

of anadromous fishes in California's Central Valley. As a result, the Water Acquisition Program (WAP) has to acquire water to augment instream flows on 18 rivers and creeks, benefiting 10 anadromous fish species. To ensure that optimal solutions are provided, the Fish

and Wildlife (FWS) team wanted a transparent and intuitive process for selecting among water acquisition alternatives and documenting decisions.

CH2M HILL was retained to help develop the tools and strategies for identifying water needs and evaluating acquisition alternatives. Using decision science to integrate biology, hydrology, economics, and social values into a collaborative, stakeholder-defined decision framework, the Decisions Solutions Model (DSM) was developed. DSM output provides straightforward documentation of the decision process, a ranked list of alternatives, justification for budget discussions, and input for the successful implementation of the WAP.

**For more information:**

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**Making the Best Use of Limited Water Supplies to DOUBLE Anadromous Fish Populations**



Problem: Water Acquisition Needs Exceed Water Acquisition Program (WAP) Budget Capabilities, Requiring an Effective Method for Making Choices



**Solution: The Decision Solutions Model (DSM) Integrates Hydrologic, Biologic, and Economic Data with Policy to Support Transparent and Defensible Water Acquisition Decisions to Meet Anadromous Fish Needs**

