Population Monitoring Work Group Meeting

September 4, 2019

Meeting Materials:

Meeting Agenda

Meeting Minutes

Brown Trout in Lees Ferry: Evaluation of Causal Hypotheses and Potential Interventions [presentation, not included]

Model Examples [presentation]

Middle Rio Grande Endangered Species Collaborative Program

Est. 2000

Population Monitoring Work Group (PMWG)

Wednesday, September 4, 2019 1:30 PM – 4:30 PM

U.S. Bureau of Reclamation, San Juan Room
555 Broadway Blvd NE, Albuquerque, NM 87102

Call-In Information: 712-451-0011; Code 141544#

Meeting Agenda

1:30 – 1:45	**Welcome, Introductions, and Agenda Review**	*Debbie Lee, Program Support Team*
1:45 – 2:15	**PMWG Administrative Items** • Work group chair(s) • Development of PMWG library ➢ **Decision**: Appointment of PMWG chair(s)	*Facilitated Discussion*
2:15 – 2:30	**Review of April 16, 2019 PMWG Meeting** • Review Action Items • Updates to meeting minutes ➢ **Decision**: Approval of April 16, 2019 meeting minutes	*Debbie Lee, Program Support Team*
2:30 – 3:00	**Strategic Planning for Yackulic Model Process**	*PMWG Chair(s)*
3:00 - 3:45	**Presentation: Bayesian Model of RGSM Length Data**	*Ara Winter, BEMP*
3:45 – 4:00	**Meeting Summary and Next Steps** • Next meeting date	*PMWG Chair(s)*
4:00	**Adjourn**	

Middle Rio Grande Endangered Species Collaborative Program

Est. 2000

Population Monitoring Work Group (PMWG)
Meeting Minutes

September 4, 2019
Location: Bureau of Reclamation
555 Broadway Blvd NE

Decisions:

- ✓ The September 4th meeting agenda was approved
- ✓ The April 16th meeting minutes were approved
- ✓ Joel Lusk, U.S. Fish and Wildlife Service (USFWS) and Rich Valdez, SWCA, were approved as the co-chairs for the PMWG

Actions:

WHO	ACTION ITEM	BY WHEN
Program Support Team (PST)	The PST will email Rich Valdez's presentations to the PMWG	ASAP
Eric Gonzales	Will update the PMWG on the status of American Southwest Ichthyological Researchers (ASIR) contract, and inform ASIR of the November 6th PMWG meeting	ASAP
PST and PMWG Co-Chairs	The PST and the PMWG co-chairs will develop a survey for the stakeholders to distribute to their managers	ASAP
All	The PWMG signatories will distribute the survey to their managers to complete by the deadline	October 15
PST	The PST will distribute the results of the survey to the co-chairs	October 22

- ➢ **Next Meeting:** November 6, 2019, 9:00am – 3:00pm

Meeting Notes

Welcome and Work Group Chairs Discussion

The attendees introduced themselves and reviewed the September 4th meeting agenda.

- ✓ **Decision**: The September 4th PMWG meeting agenda was approved
- ✓ **Decision**: The April 16th PMWG meeting minutes were approved

Two people volunteered to serve as the co-chairs of the PMWG: Joel Lusk, USFWS, and Rich Valdez, SWCA. Joel L. is eager to work with both Rich V. and Charles Yackulic, U.S. Geological Survey (USGS), in developing the integrated stock assessment model. He also expressed a need to operate beyond

just as an employee of the USFWS within this group, as others do. Rich V. stated that the purpose of the group is to provide scientifically-based information to managers to use in decision-making. He stated that at the moment, one of the group's primary roles is to support Charles Y. The group agreed with the co-chairs' statements about operating as a technical group, with members participating as scientists beyond just the agencies they represent.

- ✓ **Decision**: Joel Lusk and Rich Valdez were approved as the co-chairs for the PMWG

Integrated (Age-Structured) Stock Assessment Model Discussion

The group discussed the documentation of model development, and it was suggested that any resulting documents should aspire to be as transparent as possible. Documentation should include specific details of and justification for critical model-related decisions, and may even include meeting notes. There was interest expressed in working on some of these documents in an online platform, then scheduling regular conference calls to discuss progress.

Charles Y. stated he is close to having a beta version of the model together, but is still lacking some Rio Grande silvery minnow (RGSM) salvage data and some RGSM habitat availability data. He's using the Stan package in R to run the model. Charles Y. stated that it would be helpful to discuss what covariates should be included that would impact the RGSM's population dynamics. To inform this covariate discussion, the PMWG discussed surveying the Program's stakeholders to determine what they thought the utility of an integrated stock assessment model for RGSM would be.

- **Action Item**: The PST and the PMWG co-chairs will develop a survey for the stakeholders to distribute to their managers
- **Action Item**: The PWMG signatories will distribute the survey to their managers to complete by the deadline
- **Action Item**: The PST will distribute the results of the survey to the co-chairs

The PWMG continued discussions about the details of the integrated stock assessment model. These details included the following:

- The inclusion of reaches
- The spatial grain, which is currently 15 locations binned by 10 miles
- The inclusion of fecundity information, which will not include modeling the egg stage
- The lack of high-flow data (>2000 cfs)

At the conclusion of this discussion, Charles Y. posed a question for the group to consider at future meetings: What type of data should be collected to get at some of the hypotheses and management questions the PMWG and others are interested in?

Discussion of Brown Trout Model

Rich V. walked the group through an example of a stock assessment model developed for brown trout in the Colorado River. The brown trout model made for a useful example for the PWMG to examine as there are similarities between it and the model Charles Y. proposed.

During the brown trout model discussion, the group reviewed examples of how structured decision-making was used to determine how different management options would impact different factors important to the fish population and hydrology of the river, including recreation, economics, and more. These efforts were led by Mike Runge, USGS.

See the presentation slides for more information.

Name of the Group

The PMWG discussed changing the name of the work group. Two different proposals were made, including:

- Population Science Team (PST)
- Aquatic Resources Team (ART)

It was decided that a discussion about a possible name change should be included on the November PMWG meeting agenda.

Next Meeting

The following items were discussed as agenda items for the next meeting:

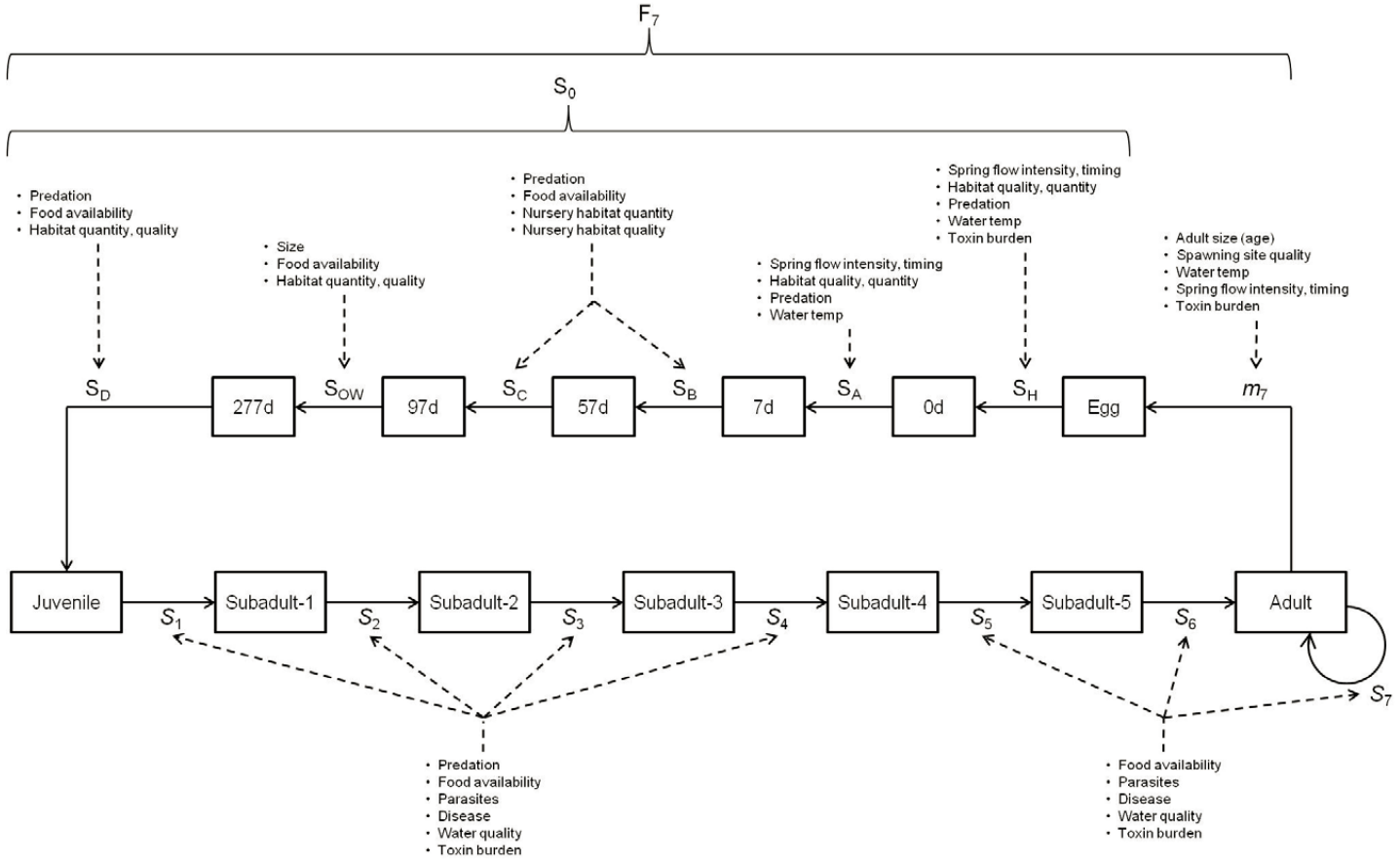
- Charles Y. model presentation (1.5 hours)
- Presentation from ASIR (1 hour)
- Potential presentation from Ara Winter, Bosque Ecological Monitoring Program (BEMP)
- PMWG discussion on the work group name

Meeting Participants

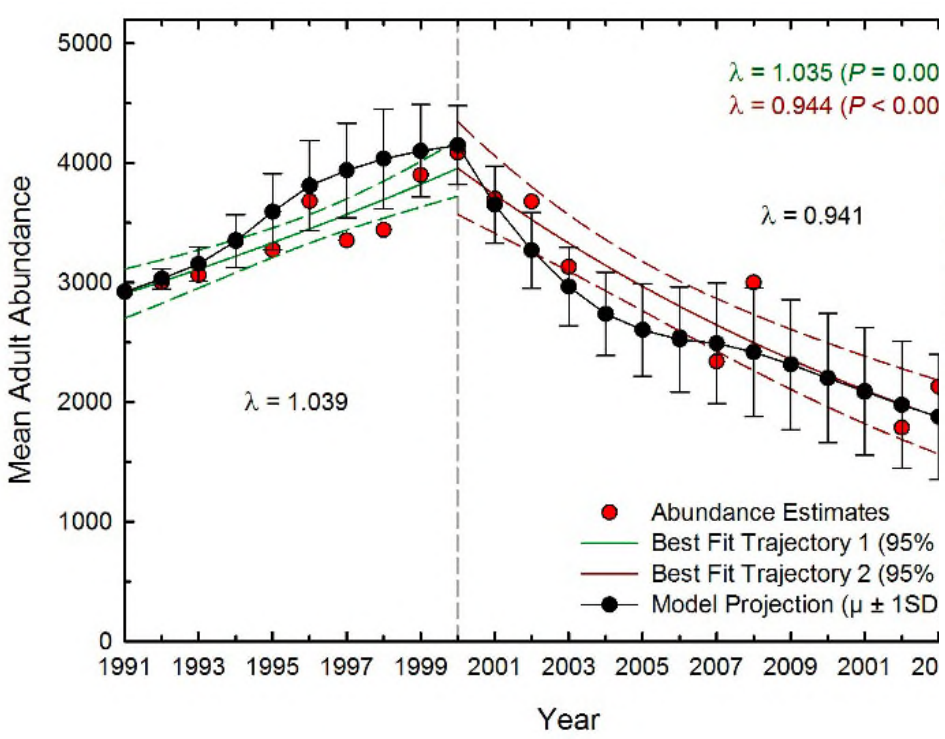
Participant	Organization
Anne Marken	Middle Rio Grande Conservancy District
Ashley Tanner	Western Ecosystems Technology, Inc. (WEST)
Charles Yackulic	USGS
Debbie Lee	WEST
Eric Gonzales	U.S. Bureau of Reclamation
Grace Haggerty	New Mexico Interstate Stream Commission
Joel Lusk	USFWS
Lynette Giesen	U.S. Army Corps of Engineers (USACE)
Mick Porter	USACE
Mo Hobbs	Albuquerque Bernalillo County Water Utility Authority
Rich Valdez	SWCA
Shay Howlin	WEST

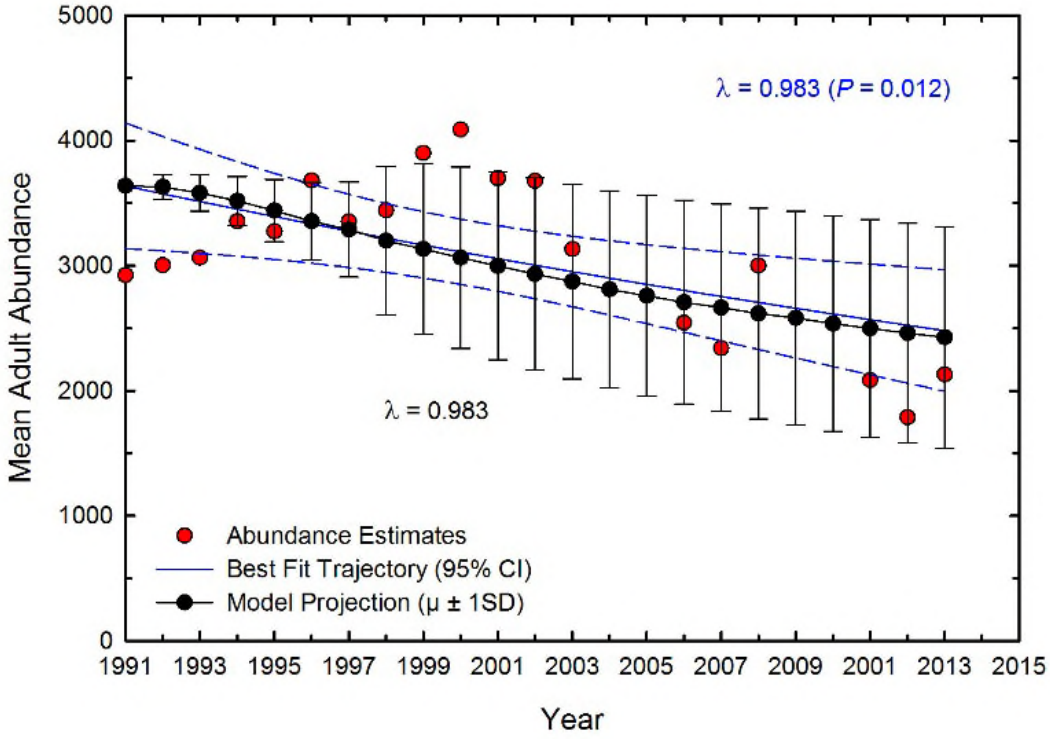
Model Examples

Miller, P.S. 2014. Current Progress: Population Viability Analysis for the Colorado Pikeminnow (*Ptychocheilus lucius*) in the San Juan River.

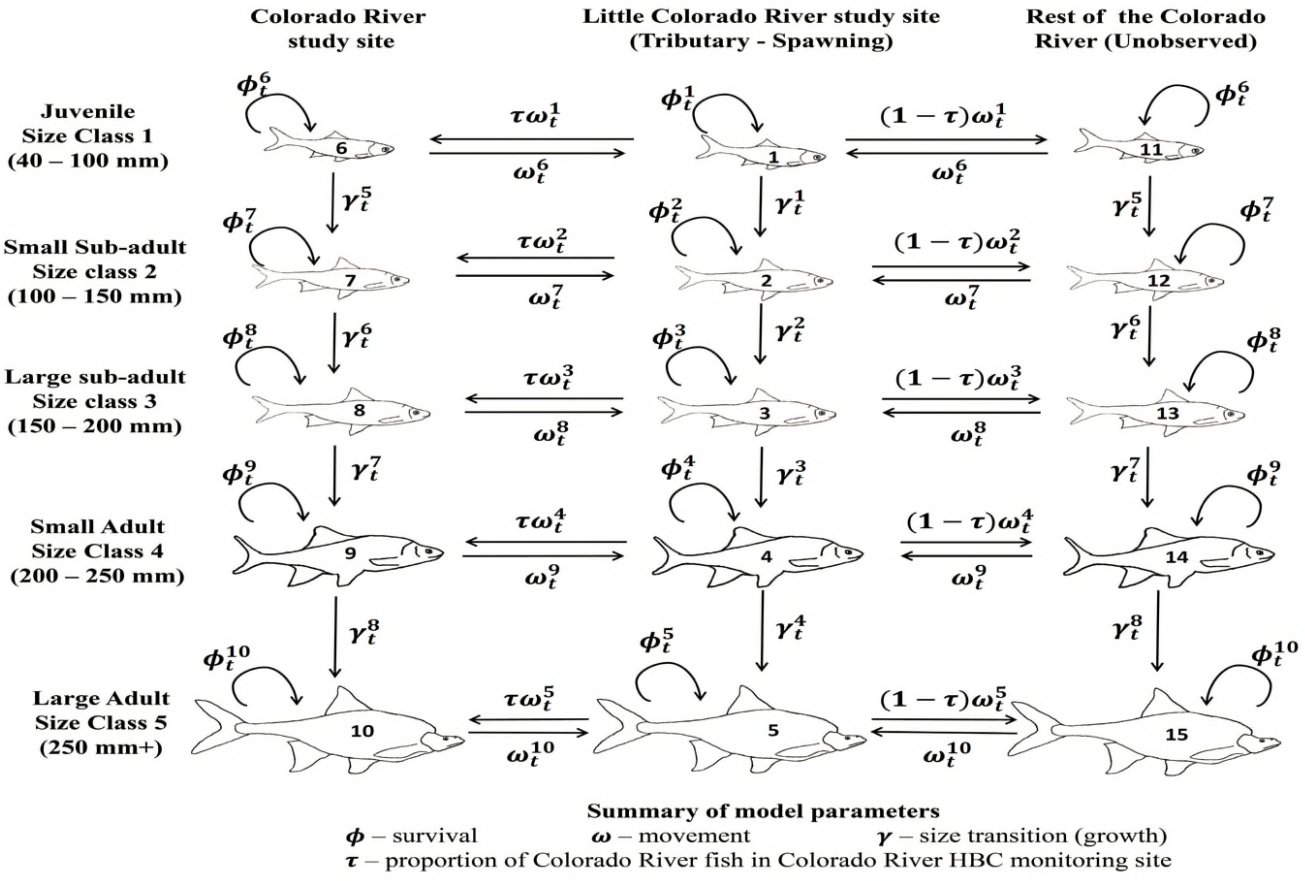


Miller, P.S. 2017. Population Viability Analysis for the Colorado Pikeminnow (*Ptychocheilus lucius*): An Assessment of Current Threats to Species Recovery and Evaluation of Management Alternatives





The model and its parameters (excluding capture probabilities). Yackulic, Yard, Korman and Van Haverbeke, *in press*



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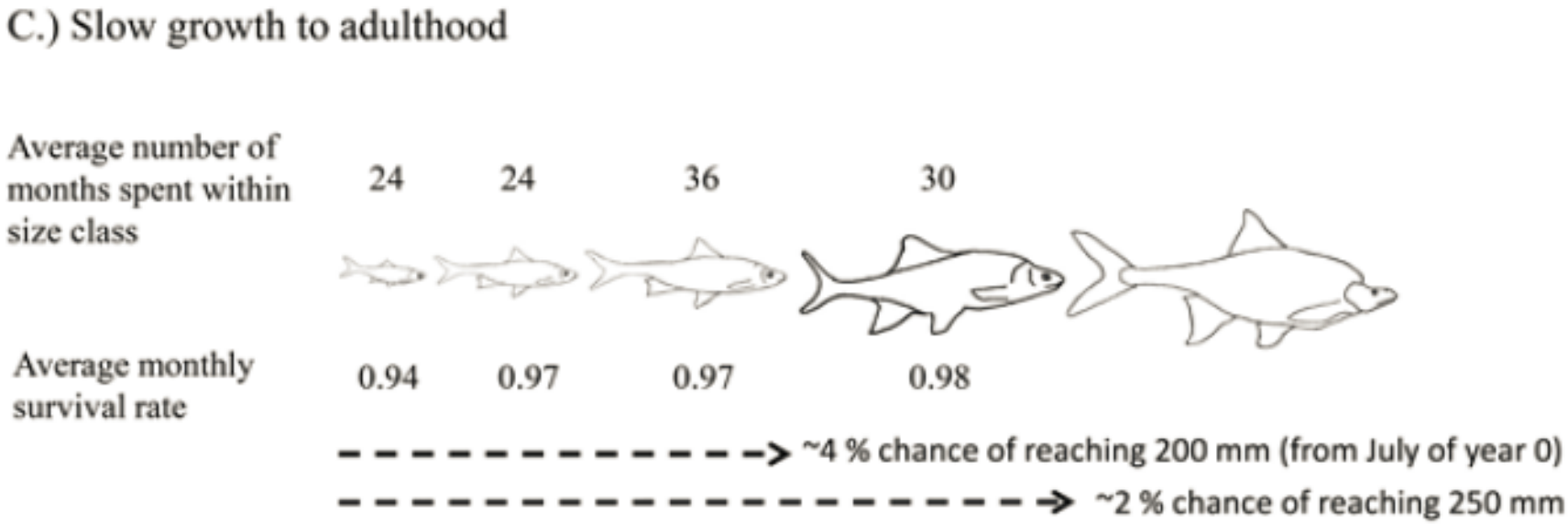
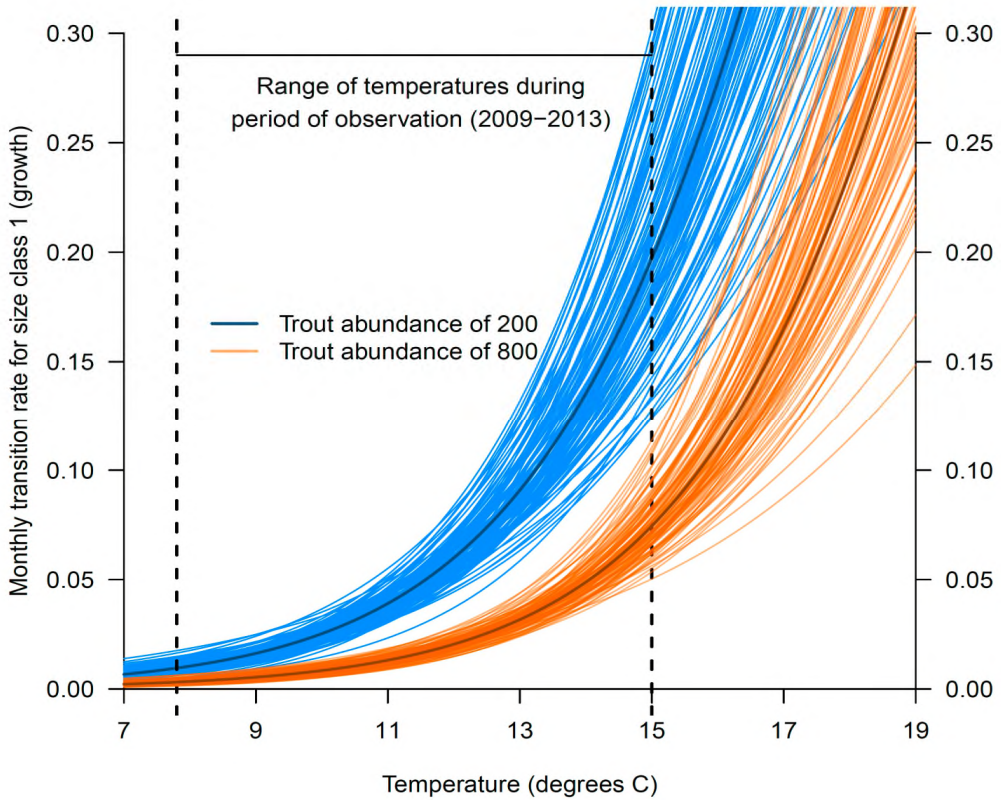
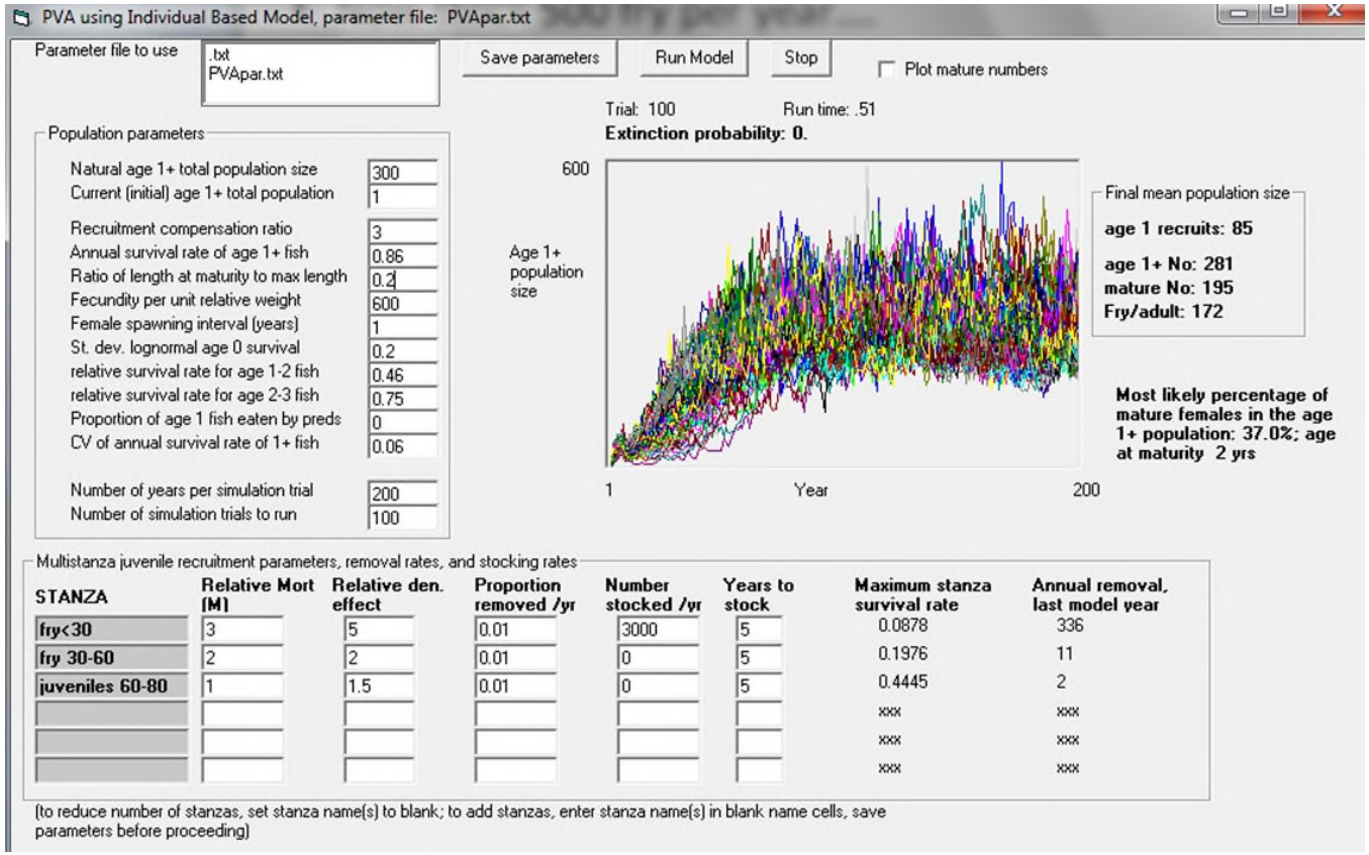


Fitted relationship between monthly size transition rate (~growth) of juvenile HBC and temperature at two different RBT densities.

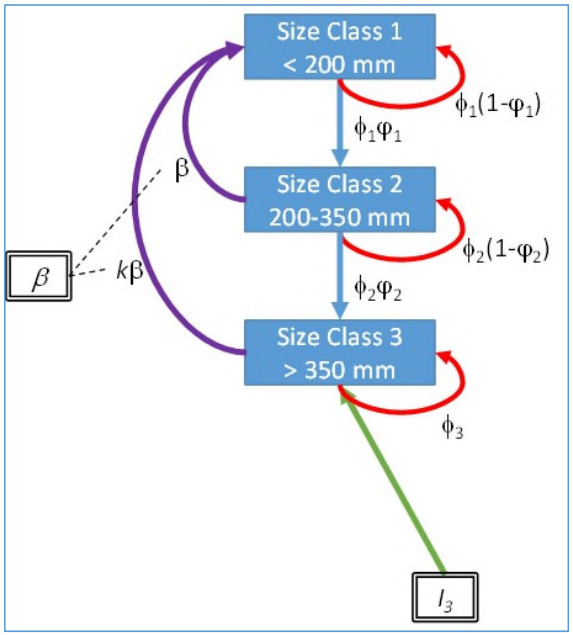


Pine III, W., B. Healy, E. Omana Smith, M. Trammell, D. Speas, R. Valdez, M. Yard, C. Walters, R. Ahrens, R. Van Haverbeke, D. Stone, and W. Wilson. 2013. An individual-based model for population viability analysis of Humpback Chub in Grand Canyon. North American Journal of Fisheries Management 33(3):626–641.

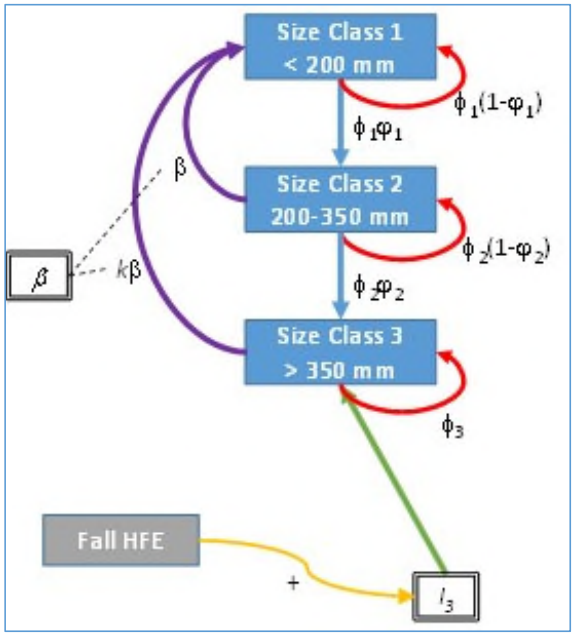


Grand Canyon Brown Trout Model

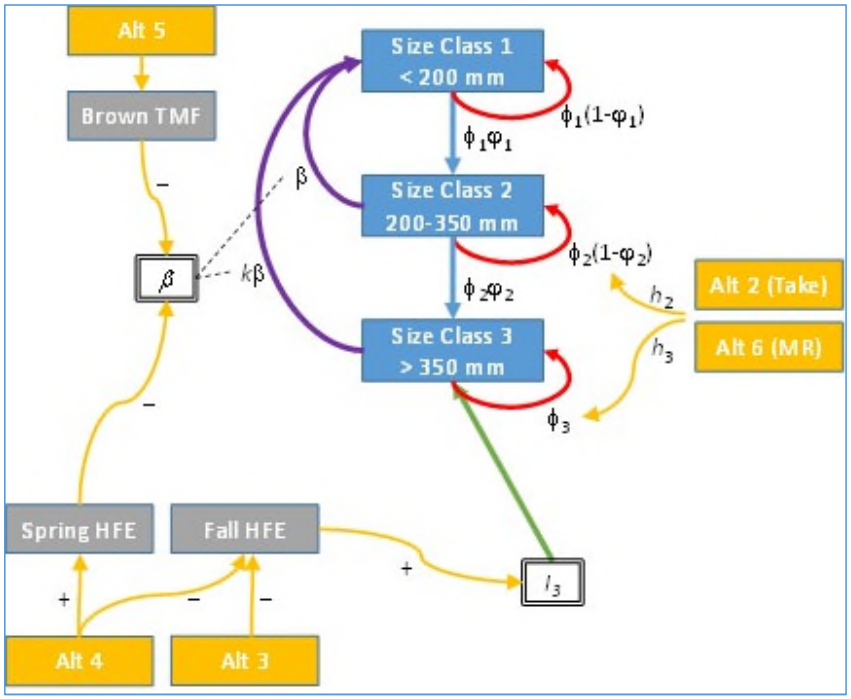
Core Model



Immigration Driven by Fall HFEs

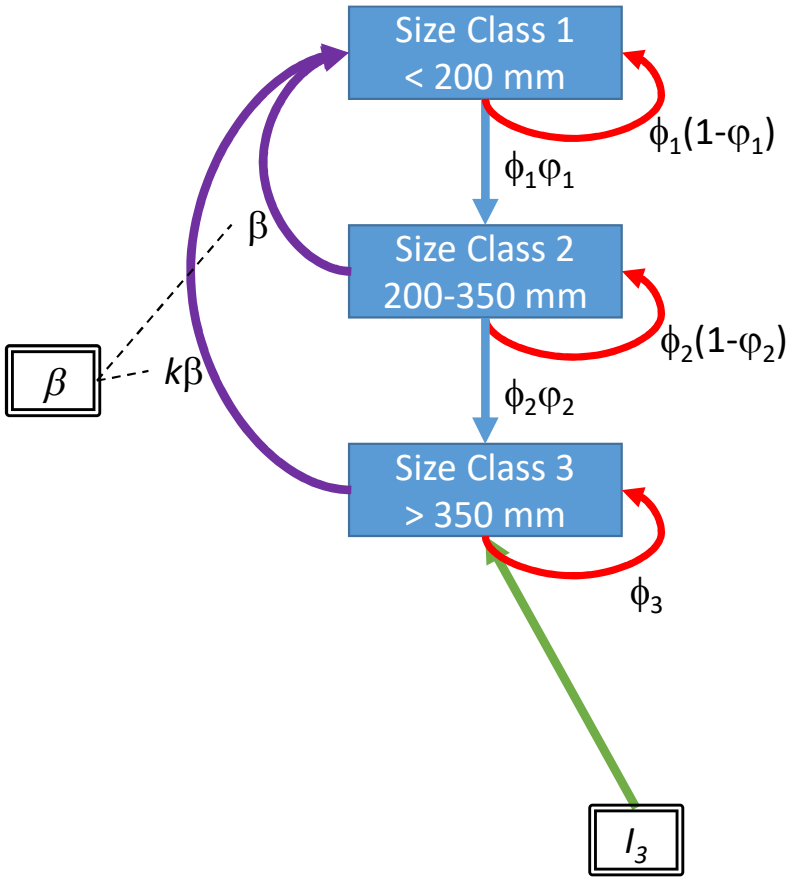


Interaction of 5 Management Actions



Michael C. Runge, Charles B. Yackulic, Lucas S. Bair, Theodore A. Kennedy, Richard A. Valdez, Craig Ellsworth, Jeff L. Kershner, R. Scott Rogers, Melissa A. Trammell, Kirk L. Young. 2018. Brown Trout in Lees Ferry: Evaluation of Causal Hypotheses and Potential Interventions. USGS Open File Report.

Brown Trout Population Model



ϕ_i survival rates

φ_i growth rates

β reproductive rate

I_3 immigration rate