

Adaptive Management of the Tallapoosa River below R.L. Harris Dam Research & Monitoring Update

Kathryn Mickett Kennedy

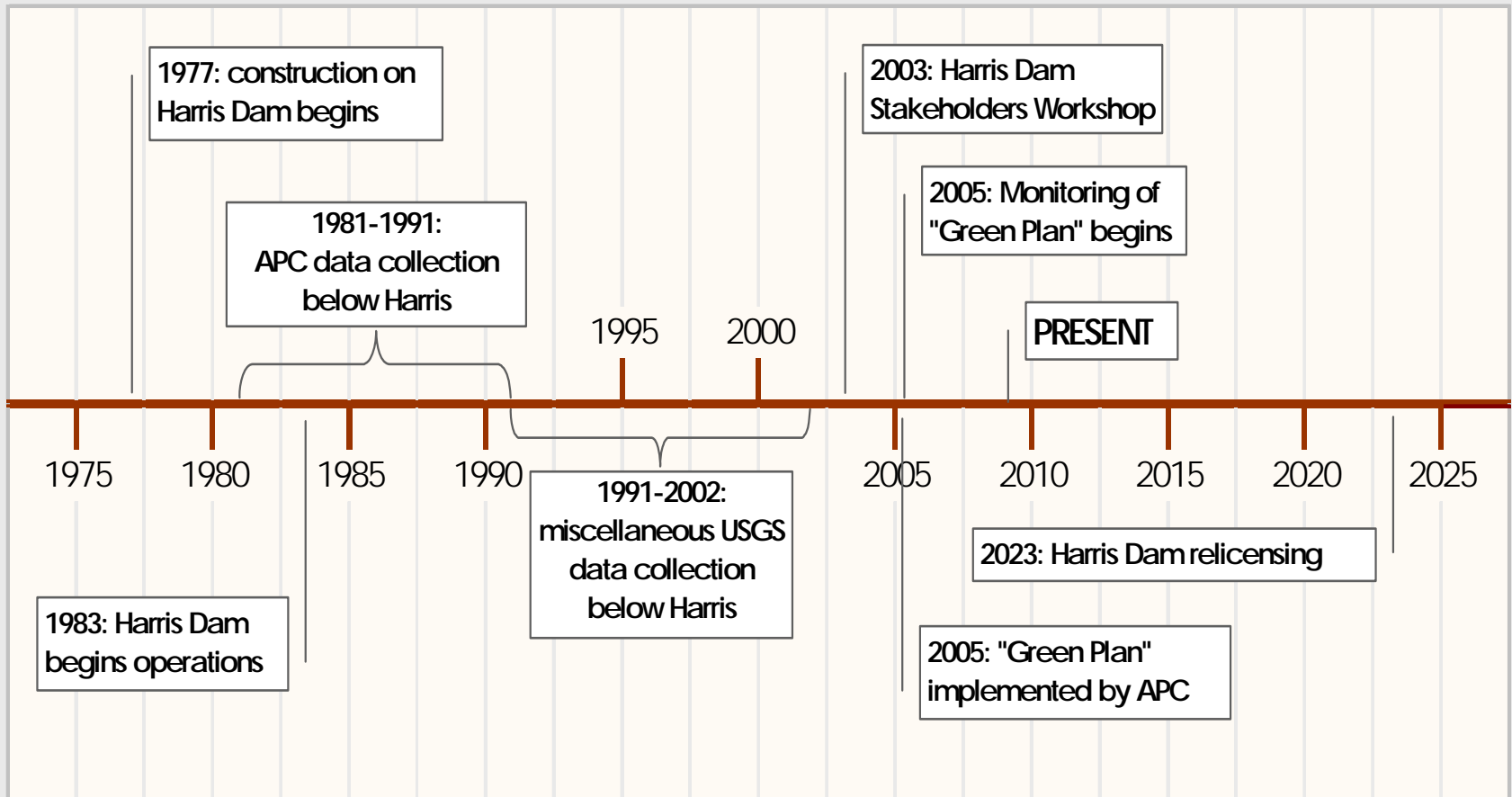
Alabama Cooperative Fish and Wildlife Research Unit

Elise Irwin

USGS

R.L. Harris Dam

Adaptive Management Timeline

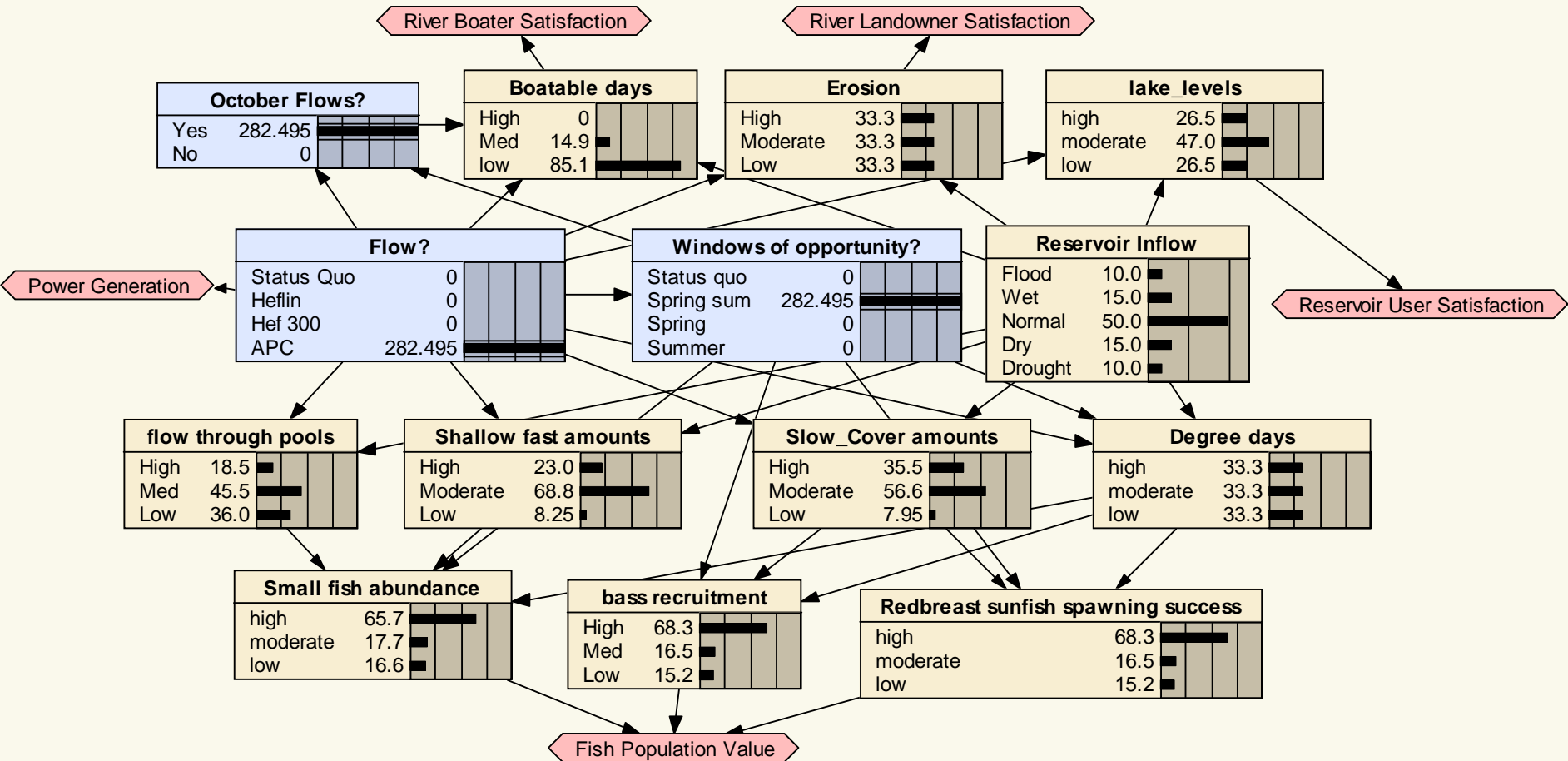


Adaptive Management

“...a systematic approach for improving management by learning from management outcomes” (USDOl 2007)






Structured Decision Making





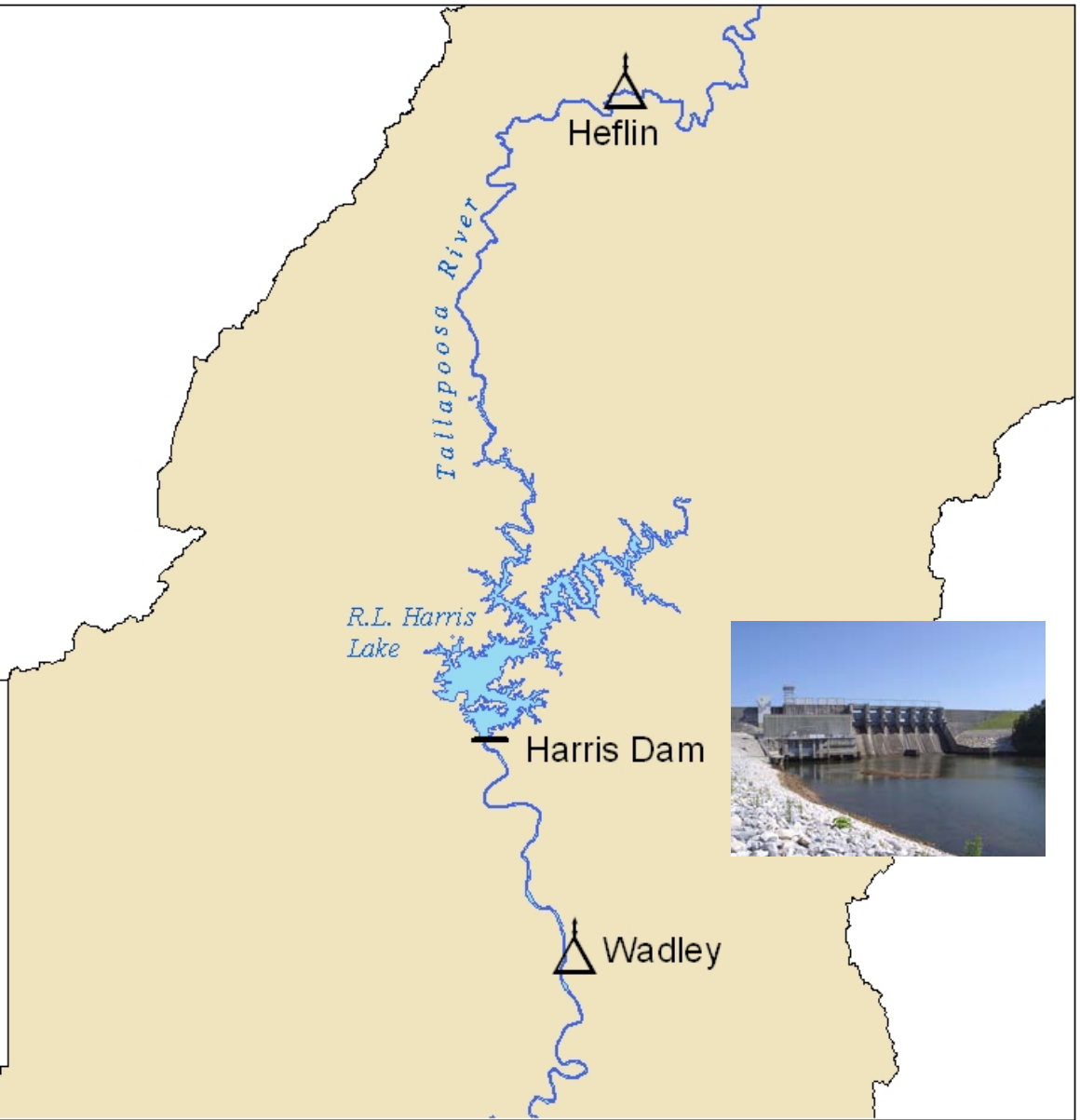
Key

-  USGS gage
-  Dam

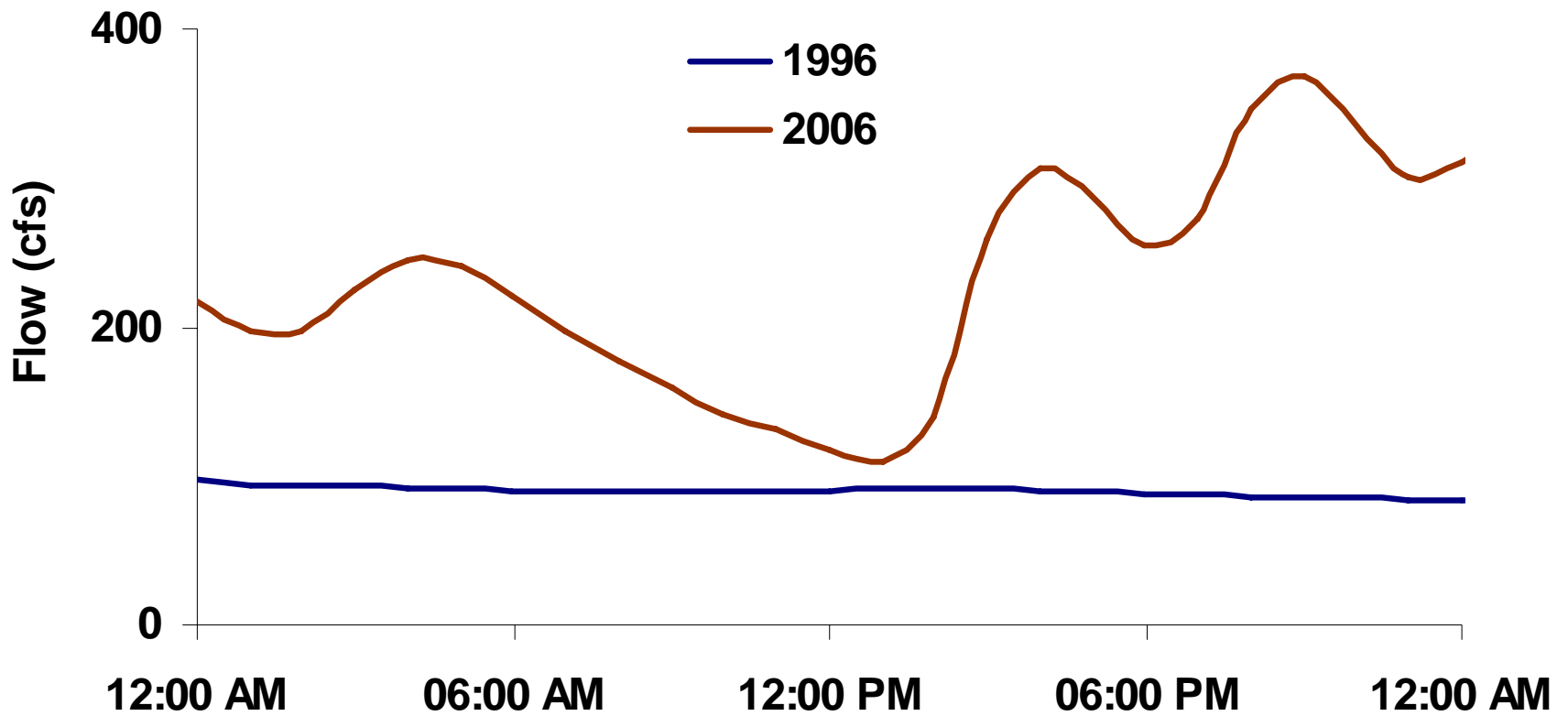


0 3 6 12
Kilometers

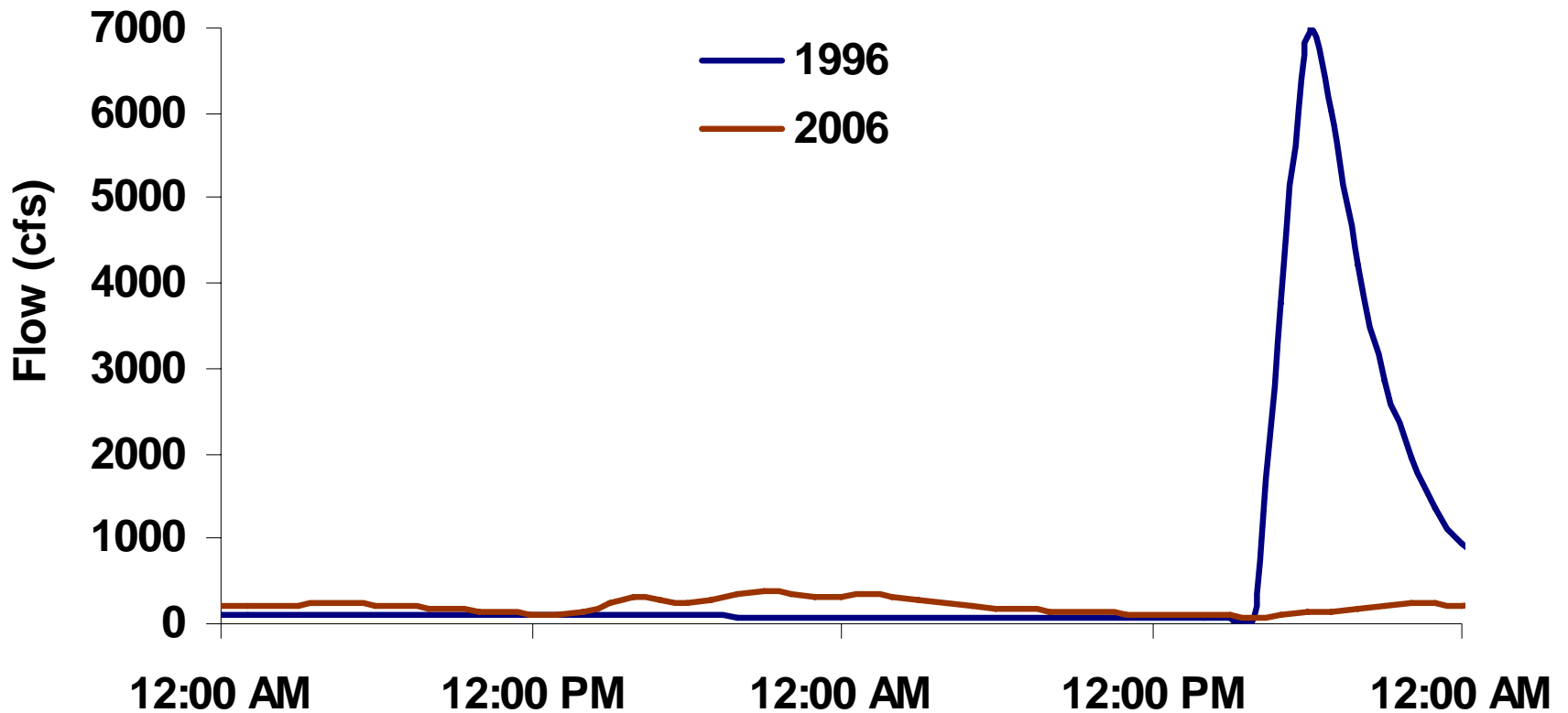
The key is enclosed in a black-bordered box. It includes a north arrow pointing upwards. Below the arrow is a scale bar with markings at 0, 3, 6, and 12 kilometers.



July 10 Hourly Flow at Wadley 1996 vs. 2006



July 10-11 Hourly Flow at Wadley 1996 vs. 2006



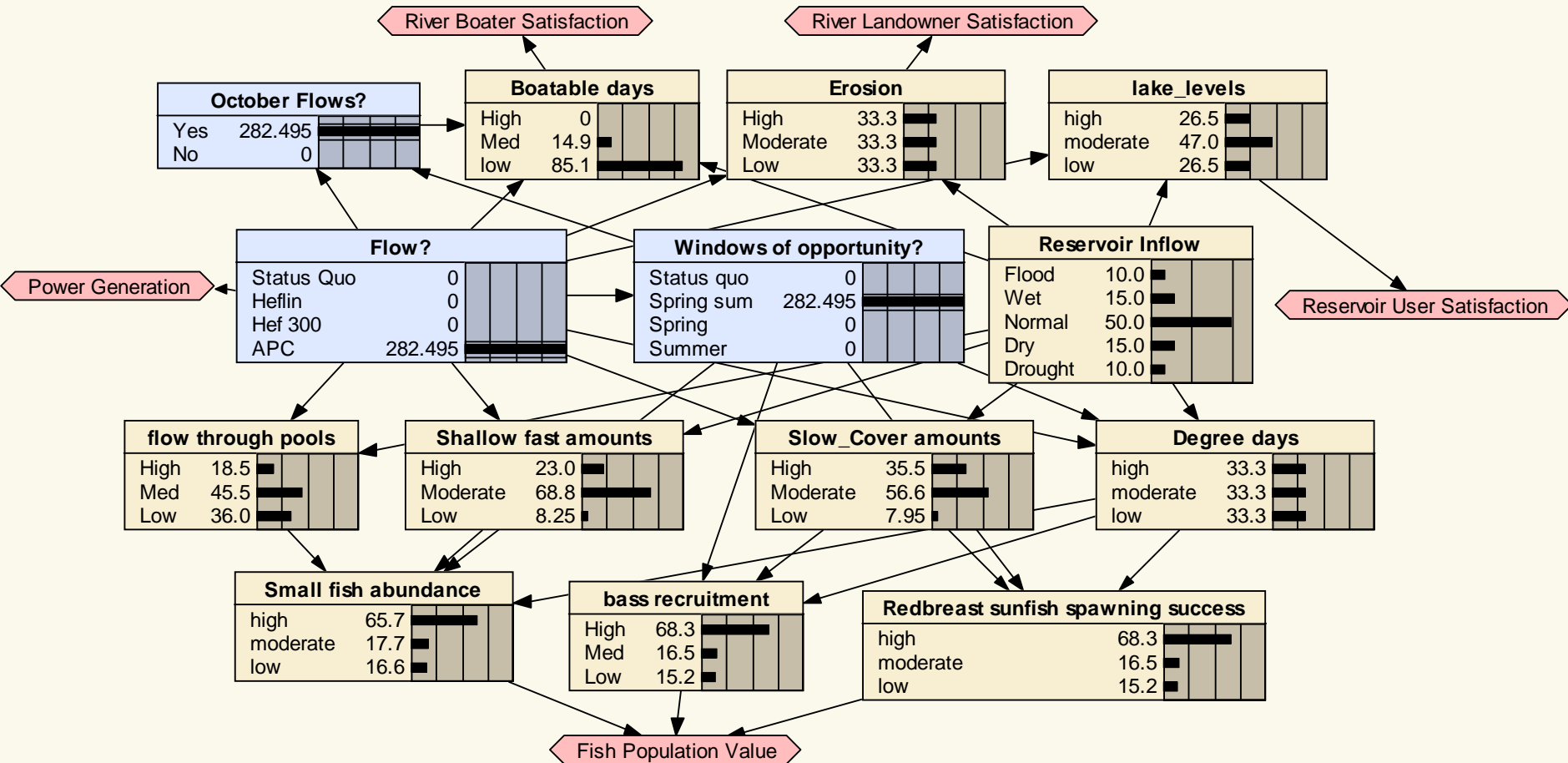
Fundamental Objectives

- River Boaters: Maximize boating and angling opportunities downstream from Harris
- Lake Landowners: Optimize water levels in the reservoir
- APC: Minimize cost; maximize flexibility
- Biota: Optimize native faunal diversity and abundance

A.M./S.D.M. Objectives

- Make management decisions that optimize stakeholder objectives
- Learn (Reduce Uncertainty)
 - Through monitoring
 - To make better decisions

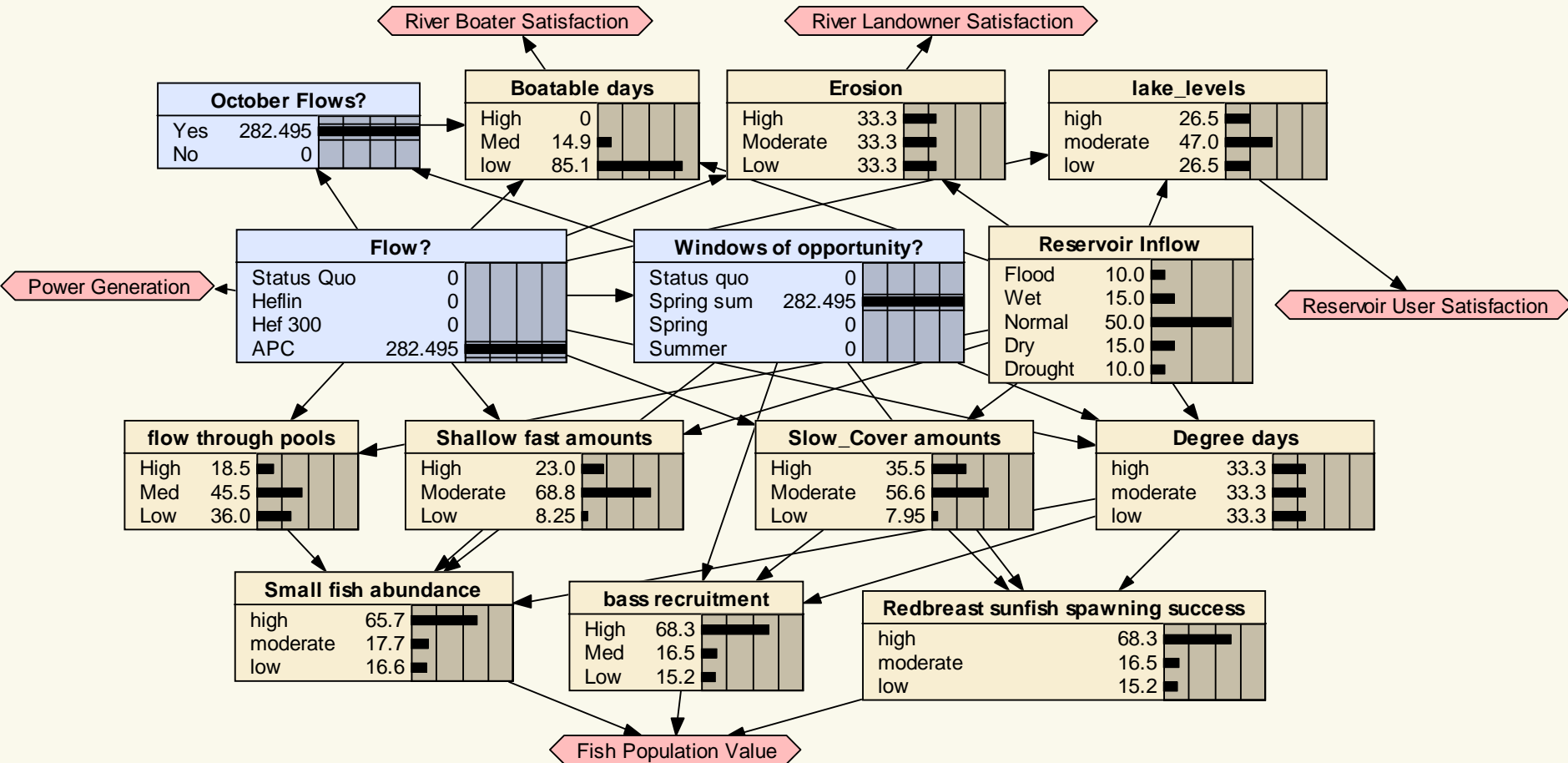
Structured Decision Making



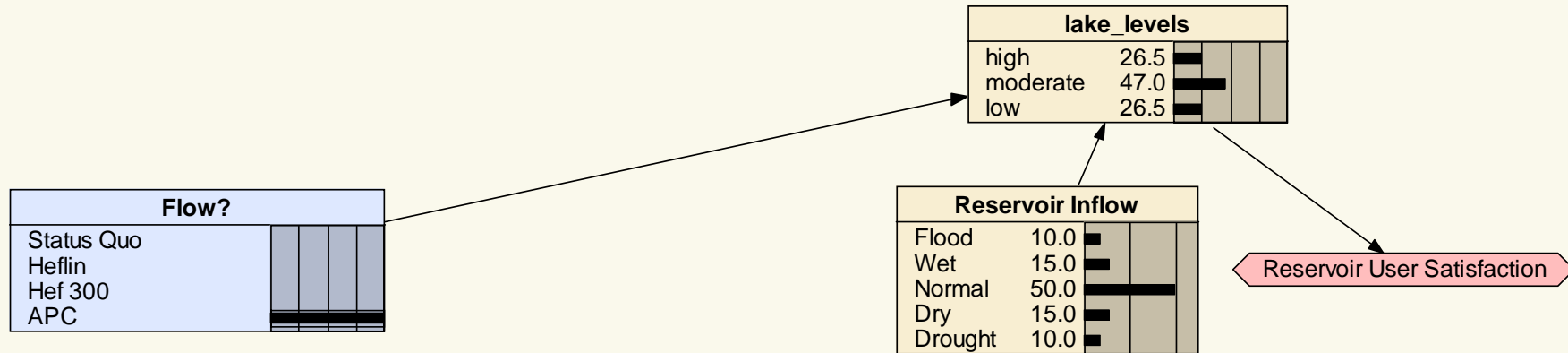
Utility Values

- Power Generation
- Reservoir User Satisfaction
- River Landowner Satisfaction
- River Boater Satisfaction
- Fish Population Value

Structured Decision Making

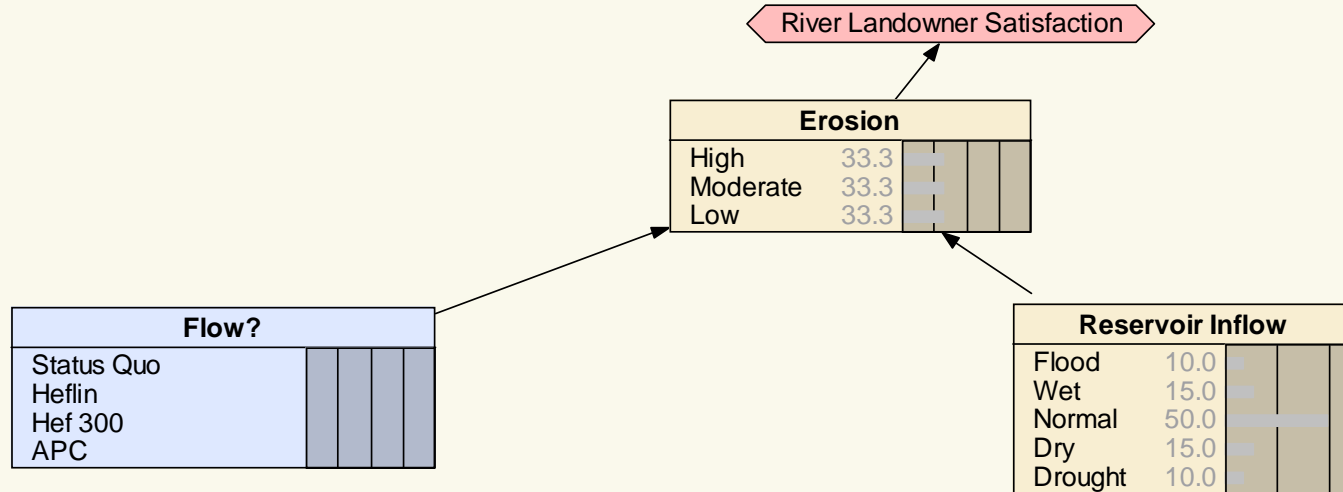


Reservoir User Satisfaction

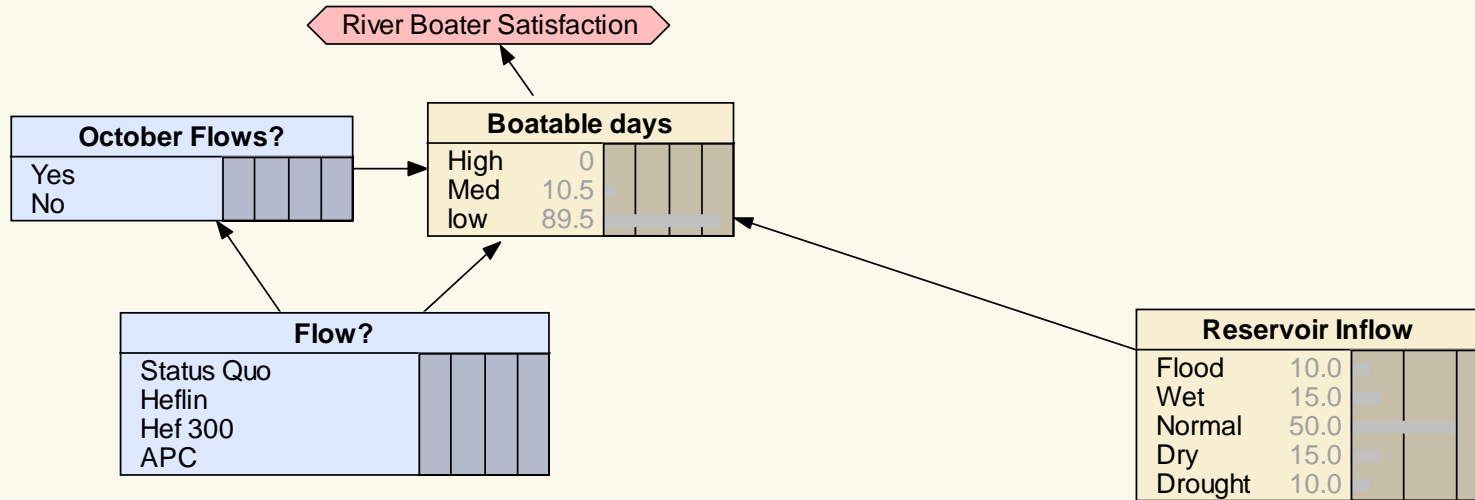


<u>Year</u>	<u>Reservoir Inflow</u>	<u>Lake Levels</u>
2005	1602.3 cfs = Wet	352 days = Low
2006	967.3 cfs = Dry	365 days = Low
2007	476.8 cfs = Drought	343 days = Low
2008	436.9 cfs = Drought	262 days = High

River Landowner Satisfaction

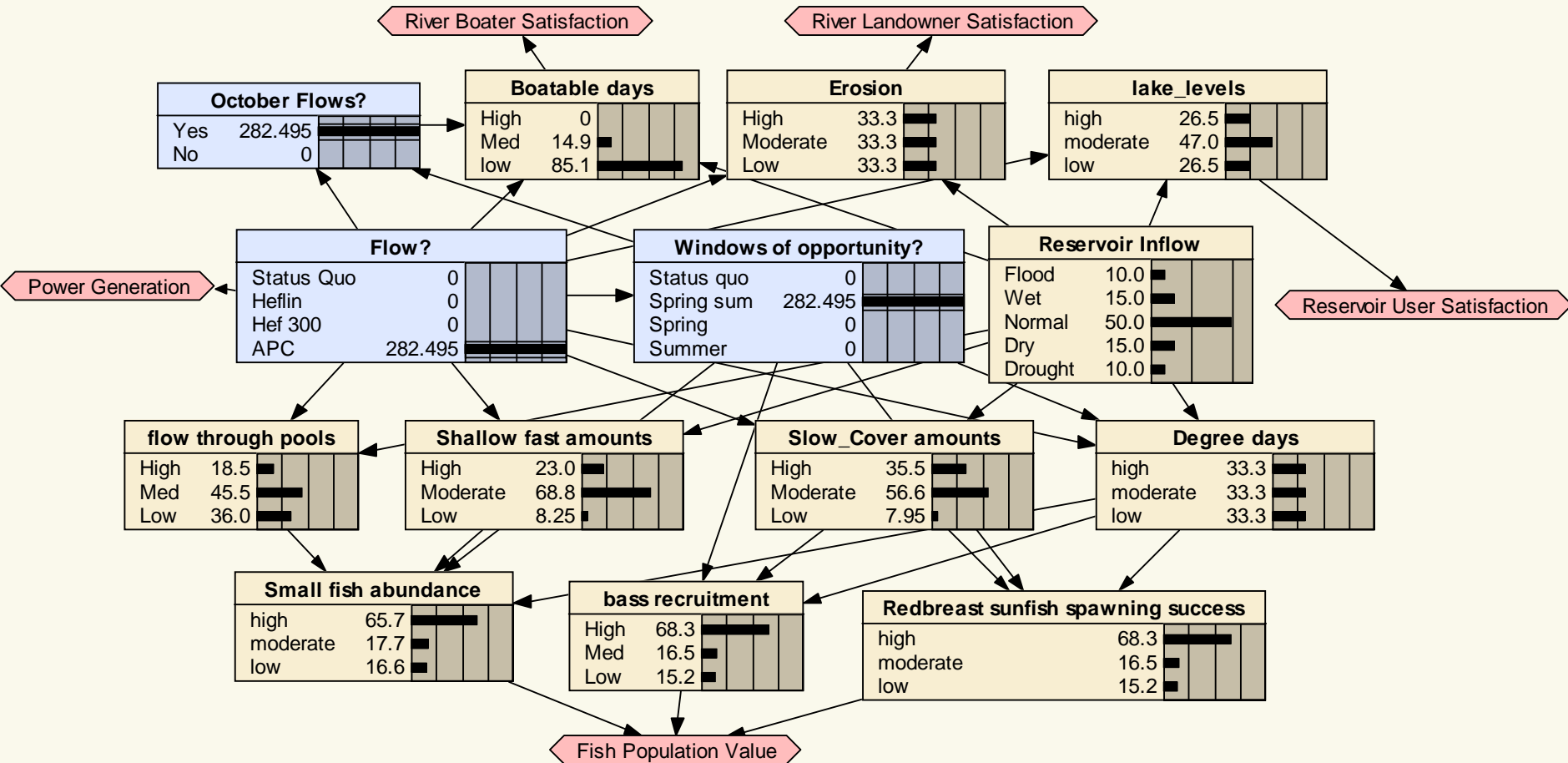


River Boater Satisfaction

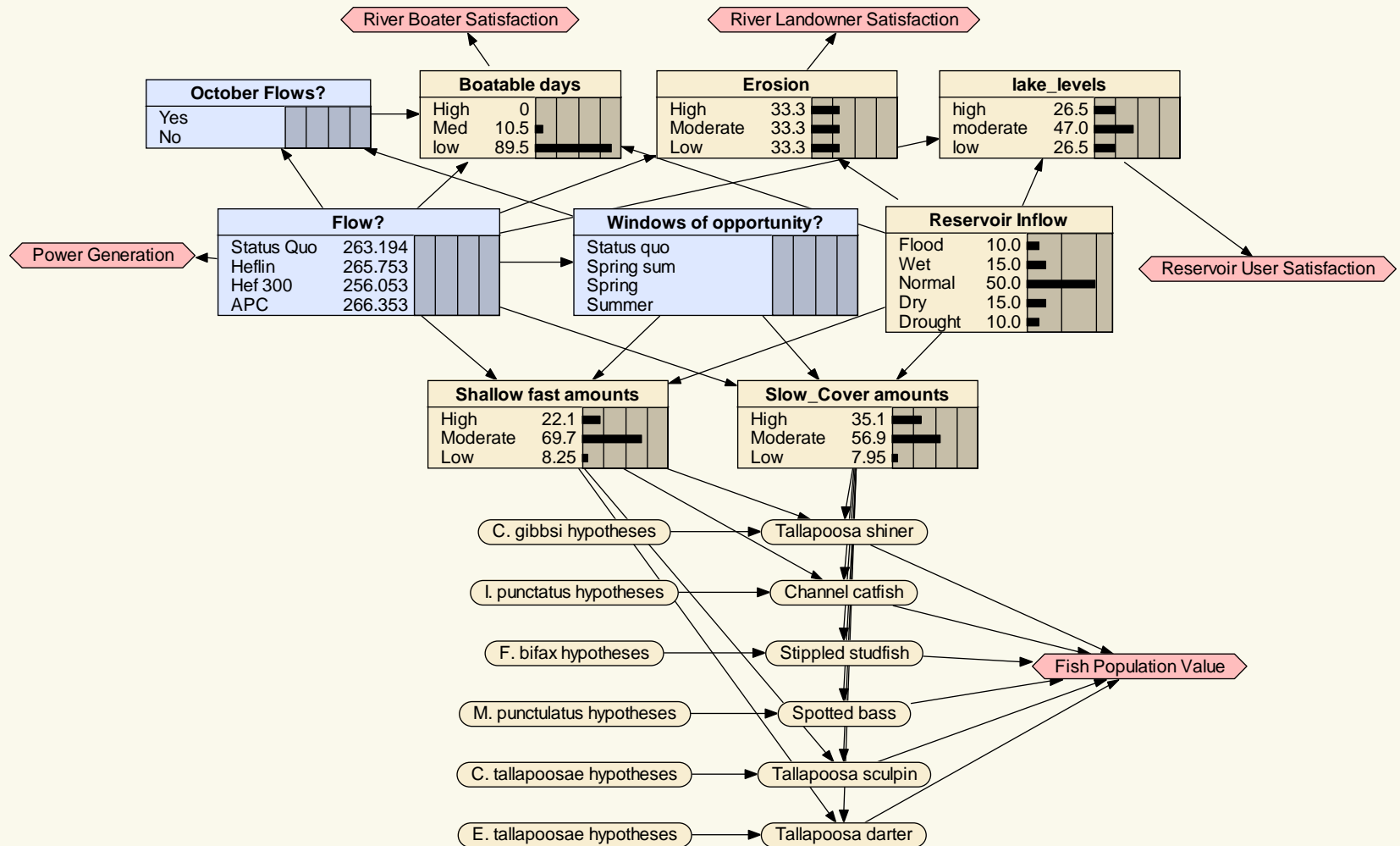


<u>Year</u>	<u>Reservoir Inflow</u>	<u>Boatable Days</u>
2005	1602.3 cfs = Wet	41 days = Moderate
2006	967.3 cfs = Dry	38 days = Low
2007	476.8 cfs = Drought	24 days = Low
2008	436.9 cfs = Drought	30 days = Low

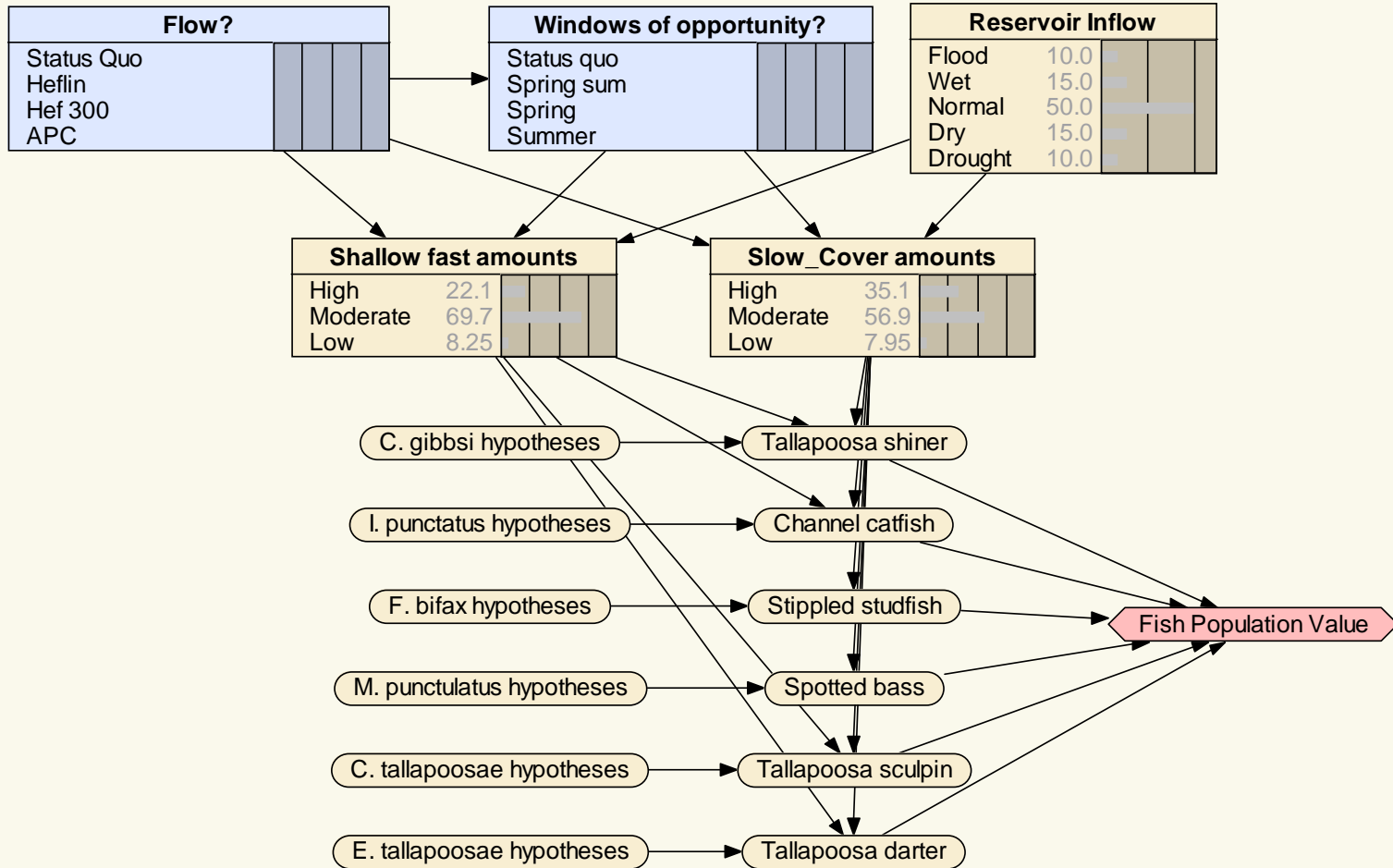
Fish Population Value



Fish Population Value



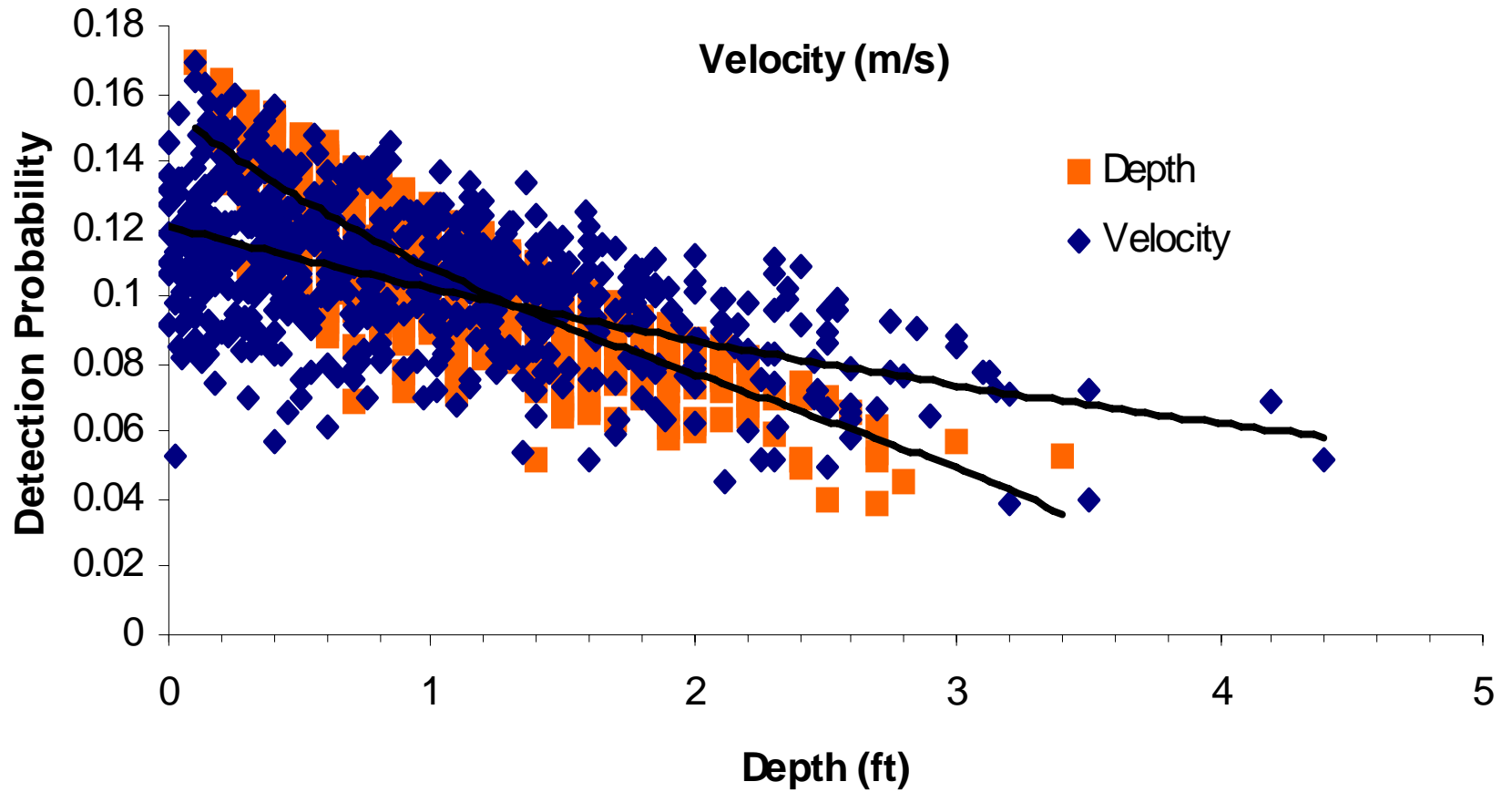
Fish Population Value



Fish Population Value

<u>Year</u>	<u>Reservoir Inflow</u>	<u>Channel Catfish</u>
2005	1602.3 cfs = Wet	49% Occupancy = Moderate
2006	967.3 cfs = Dry	60% Occupancy = Moderate
2007	476.8 cfs = Drought	56% Occupancy = Moderate
2008	436.9 cfs = Drought	

Channel catfish *Ictalurus punctatus* Detection vs. Depth and Velocity

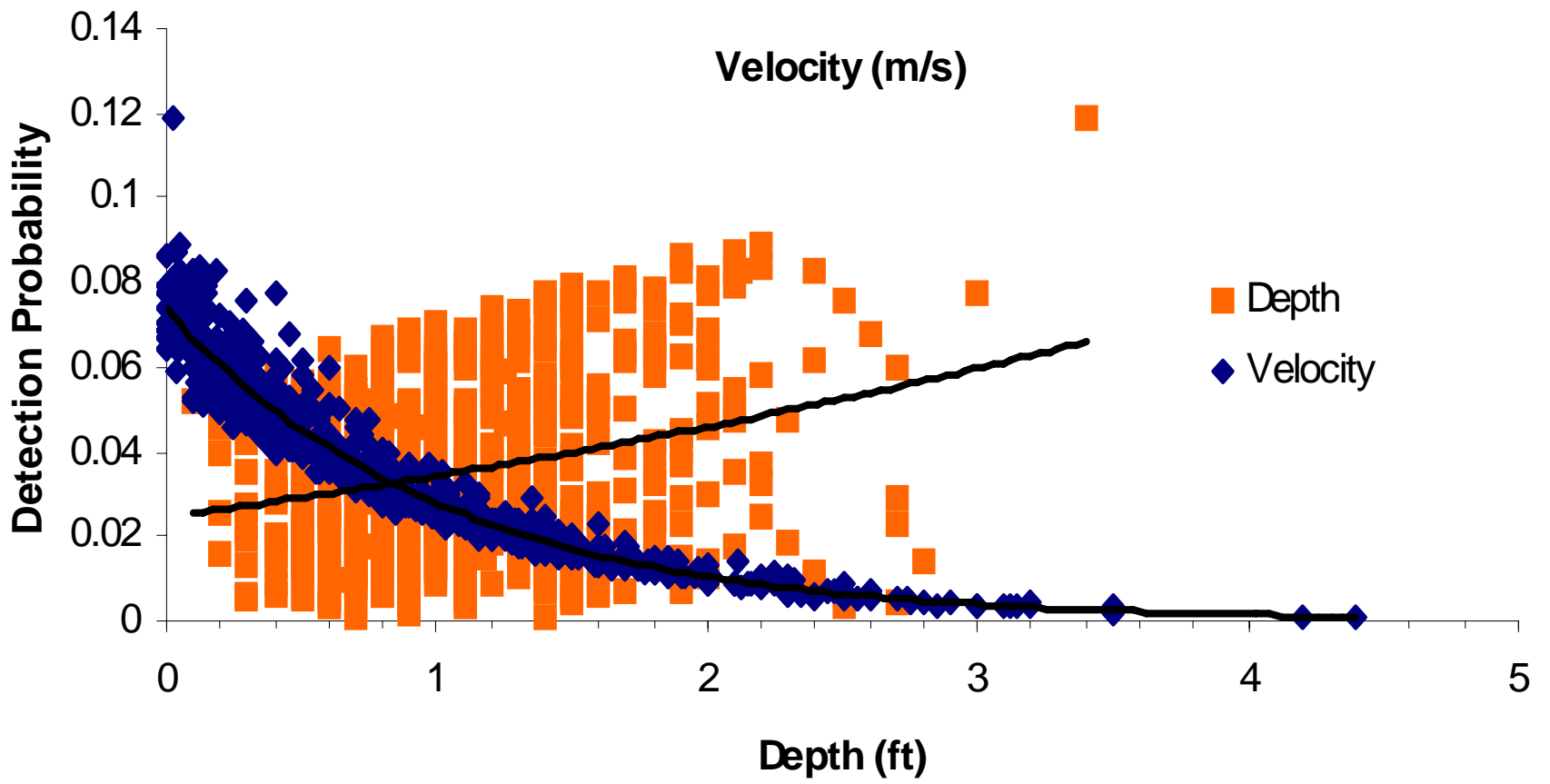


Fish Population Value

<u>Year</u>	<u>Reservoir Inflow</u>	<u>Spotted Bass (juvenile)</u>
2005	1602.3 cfs = Wet	58% Occupancy = Moderate
2006	967.3 cfs = Dry	25% Occupancy = Low
2007	476.8 cfs = Drought	98% Occupancy = High
2008	436.9 cfs = Drought	

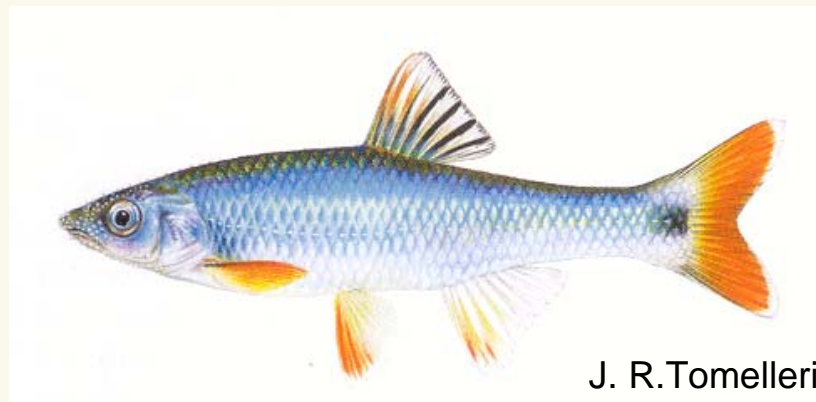


Spotted bass *Micropterus punctulatus* Detection vs. Depth and Velocity



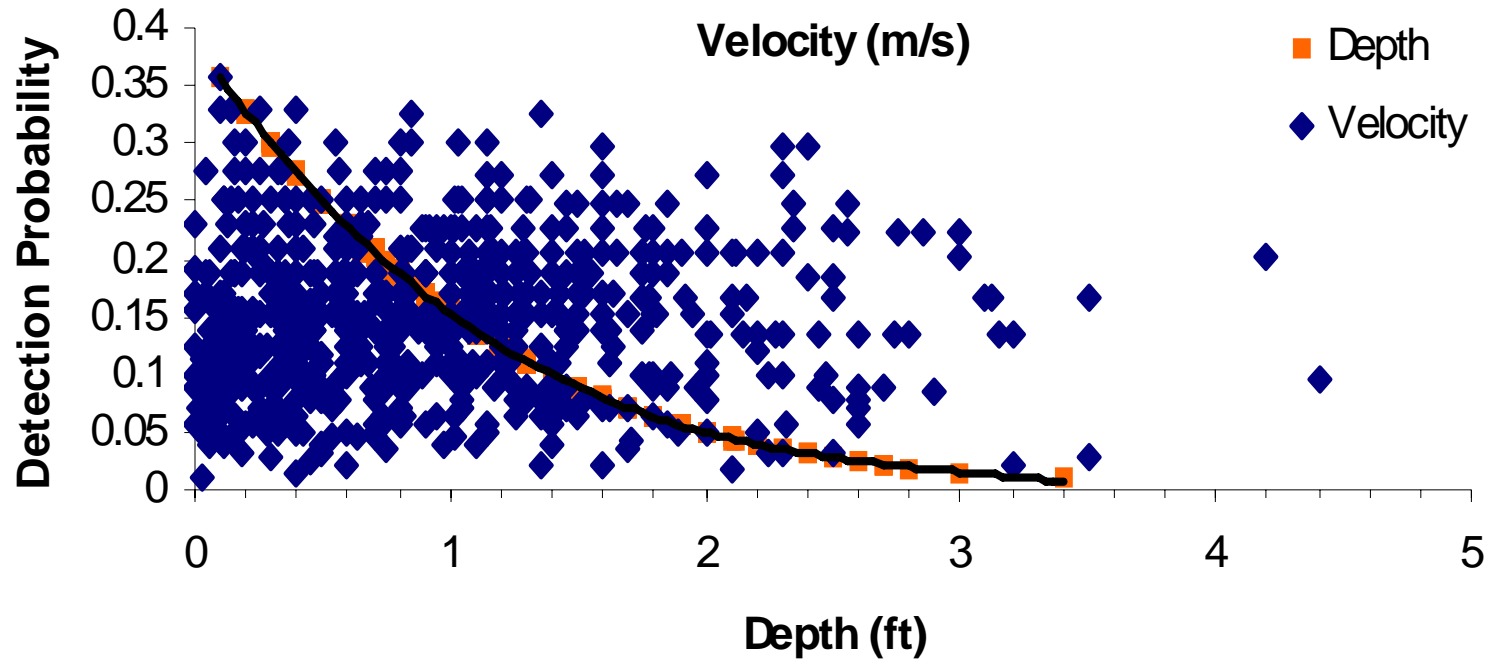
Fish Population Value

<u>Year</u>	<u>Reservoir Inflow</u>	<u>Tallapoosa shiner</u>
2005	1602.3 cfs = Wet	74% Occupancy = Moderate
2006	967.3 cfs = Dry	58% Occupancy = Moderate
2007	476.8 cfs = Drought	42% Occupancy = Moderate
2008	436.9 cfs = Drought	



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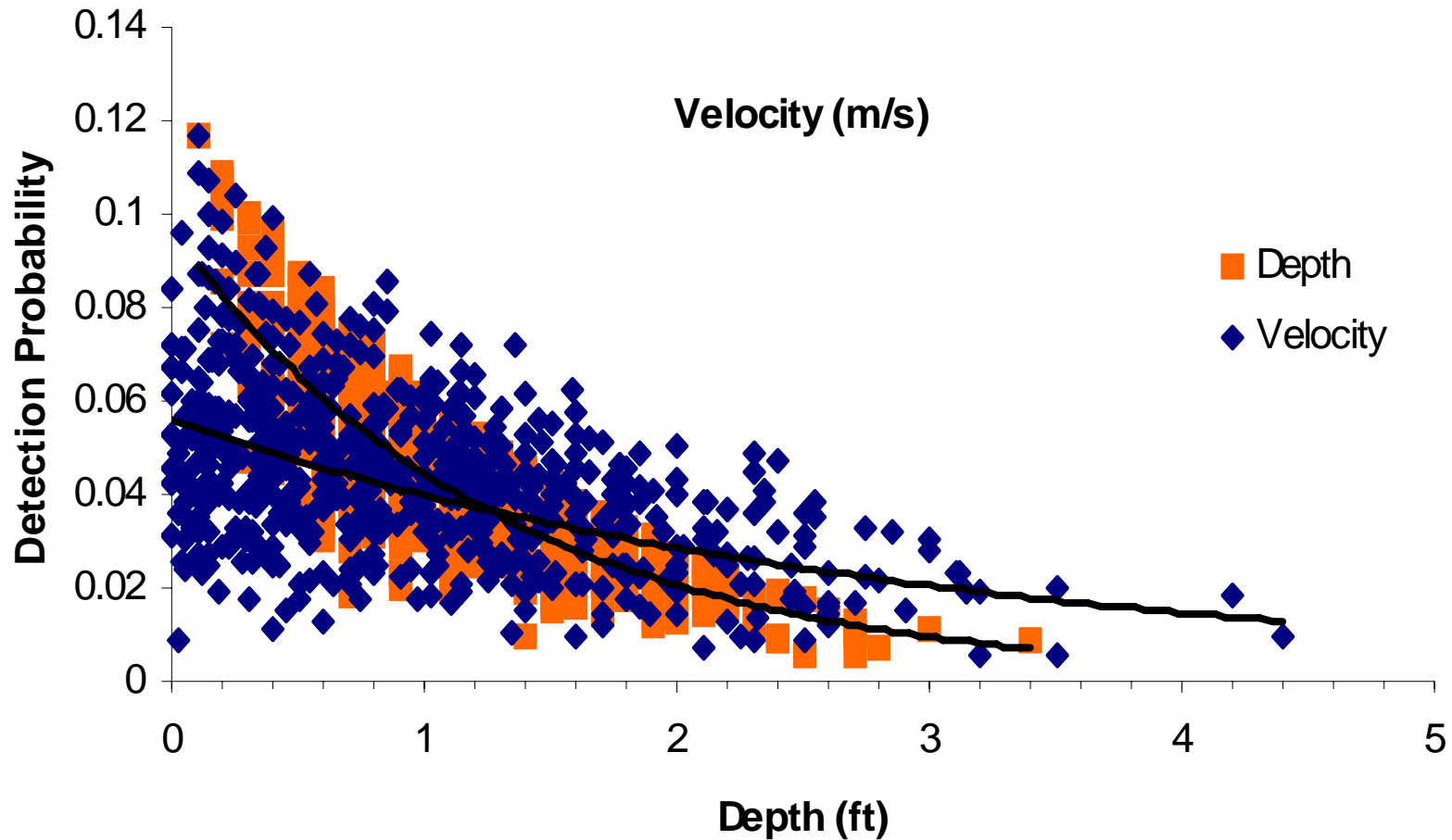
Tallapoosa shiner *Cyprinella gibbsi*
Detection vs. Depth and Velocity



Fish Population Value

<u>Year</u>	<u>Reservoir Inflow</u>	<u>Stippled Studfish</u>
2005	1602.3 cfs = Wet	0.4% Occupancy = Low
2006	967.3 cfs = Dry	0.1% Occupancy = Low
2007	476.8 cfs = Drought	0.4% Occupancy = Low
2008	436.9 cfs = Drought	

Stippled studfish *Fundulus bifax* Detection vs. Depth and Velocity



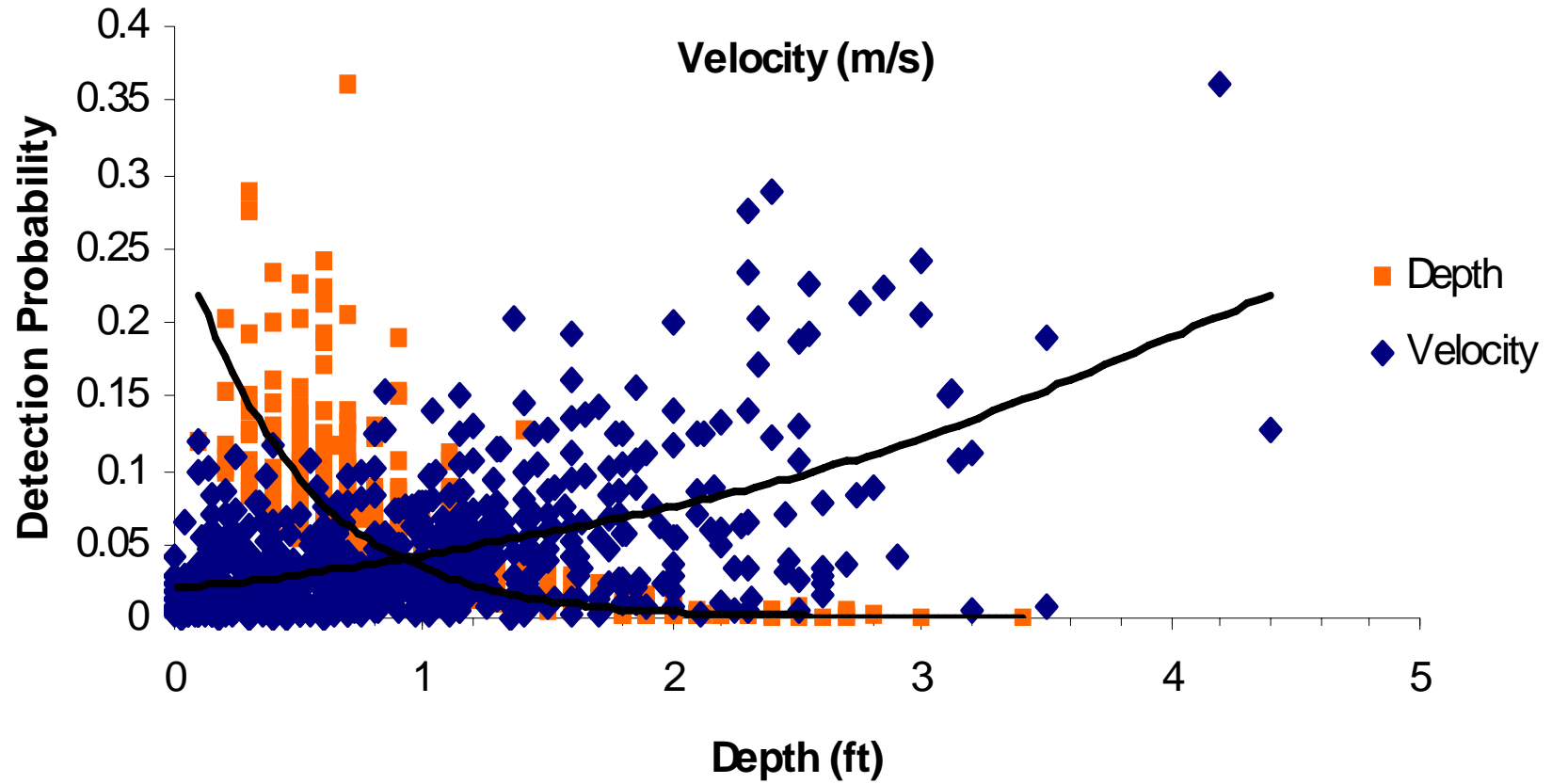
Fish Population Value

<u>Year</u>	<u>Reservoir Inflow</u>	<u>Tallapoosa sculpin</u>
2005	1602.3 cfs = Wet	44% Occupancy = Moderate
2006	967.3 cfs = Dry	0.2% Occupancy = Low
2007	476.8 cfs = Drought	11% Occupancy = Low
2008	436.9 cfs = Drought	



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Tallapoosa sculpin *Cottus tallapoosae* Detection vs. Velocity and Depth



Fish Population Value

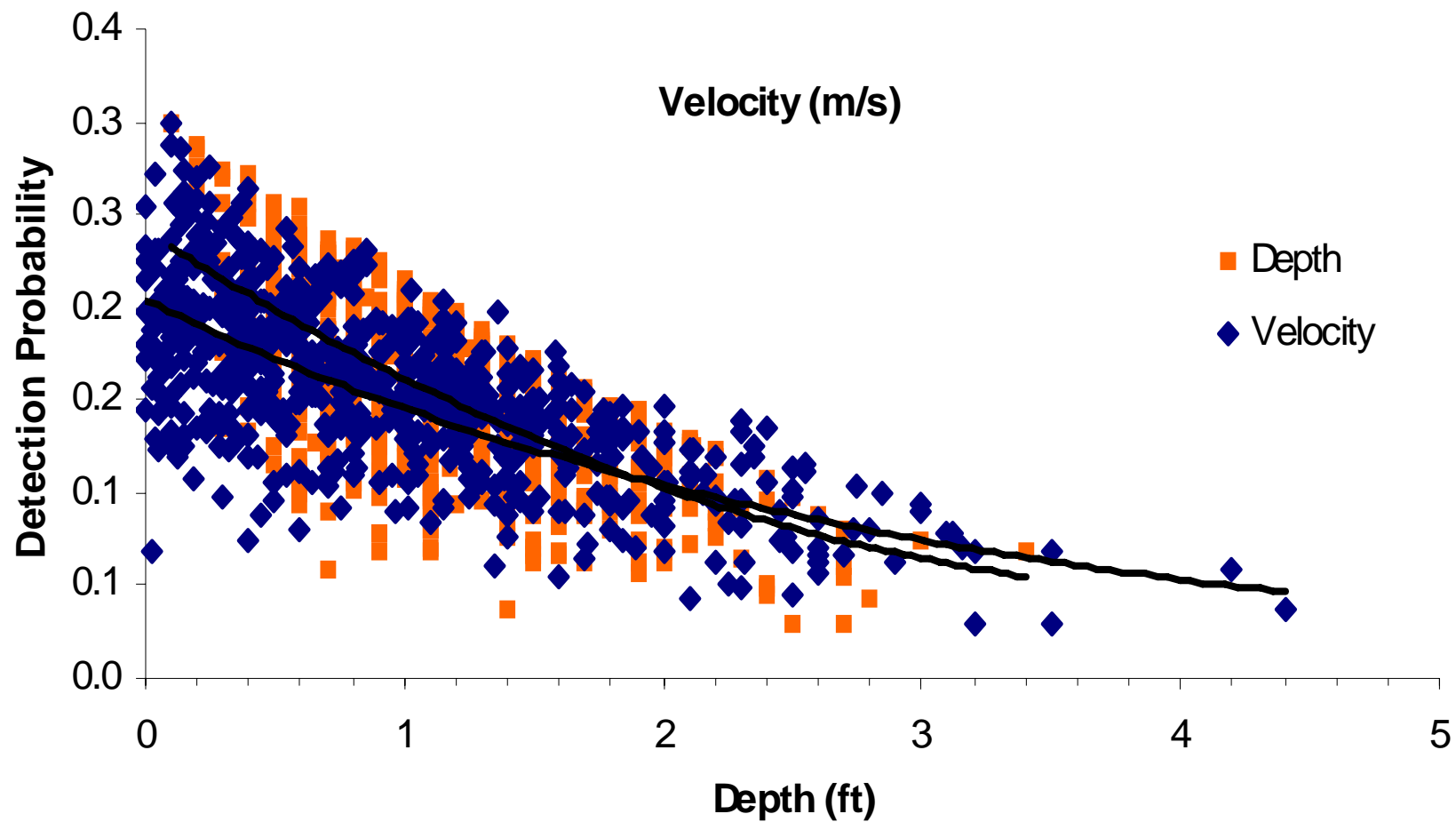
<u>Year</u>	<u>Reservoir Inflow</u>	<u>Tallapoosa darter</u>
2005	1602.3 cfs = Wet	62% Occupancy = Moderate
2006	967.3 cfs = Dry	83% Occupancy = High
2007	476.8 cfs = Drought	92% Occupancy = High
2008	436.9 cfs = Drought	



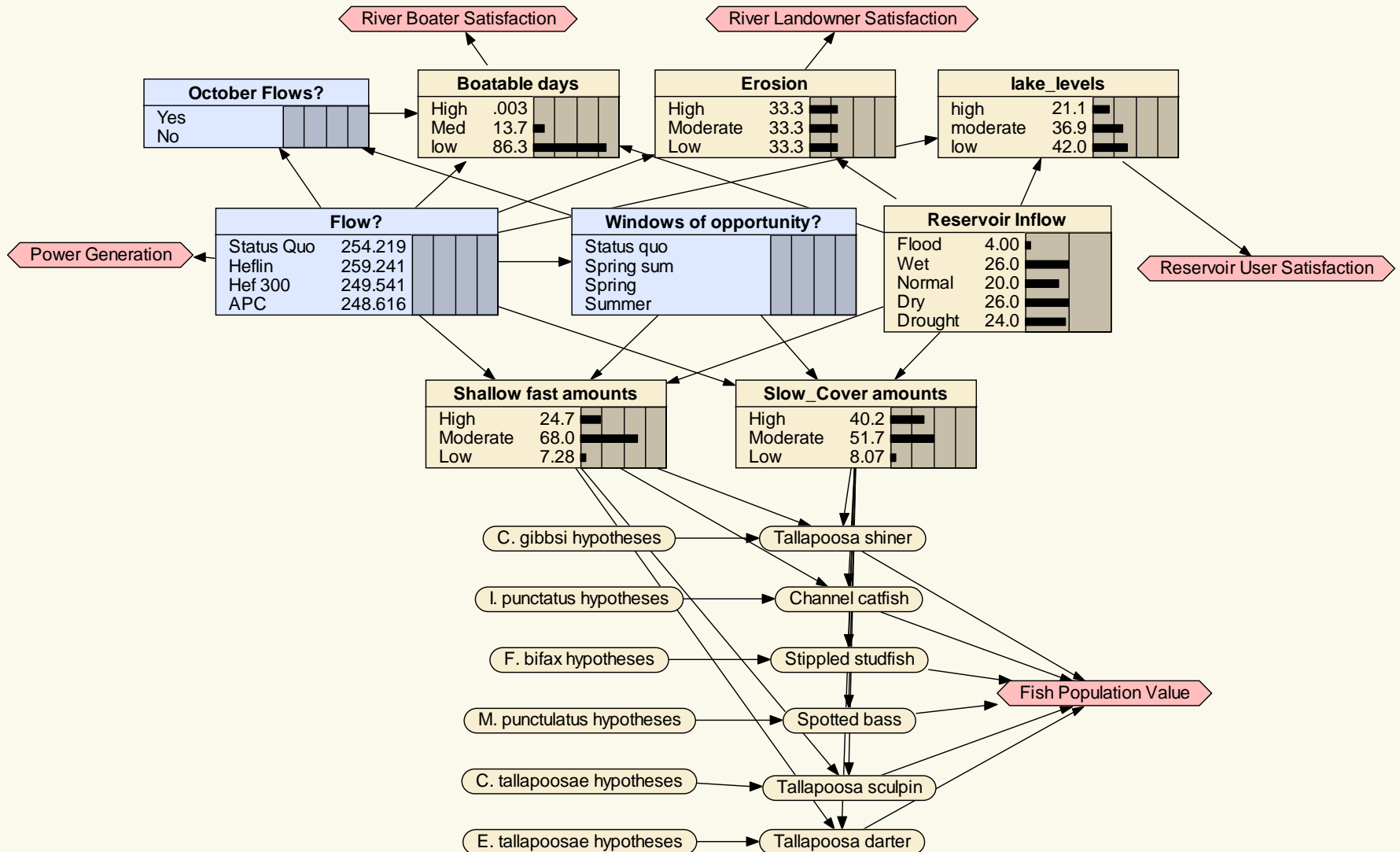
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Tallapoosa darter *Etheostoma tallapoosae*

Detection vs. Depth and Velocity



2007 Updated Model



Utility Values

	2005	2007	
		Predicted	Learned
• Power Generation	100	94	94
• Reservoir User	50	50	31
• River Landowner	50	50	50
• River Boater	4	12	17
• Fish Population	59	60	57

Utility Values

	<u>Flood</u>	<u>Wet</u>	<u>Normal</u>	<u>Dry</u>	<u>Drought</u>
• Power Generation:	94	94	94	94	94
• Reservoir User	88	40	50	20	6
• River Landowner	50	50	50	50	50
• River Boater	5	20	7	37	2
• Fish Population	56	70	58	64	56

Summary

- Model leaning toward other management options

Because:

- Uncertainty / Reduced Uncertainty
 - Environmental effects (Drought)
 - Updated probabilities of lake levels

Discussion

- Drought:
 - Compare to unregulated sites
 - Compare to non-drought years
- Results report soon
- 2 more years of data before decision
 - All results late 2010 / early 2011
 - A vote mid 2011

Discussion

- Survey: Continuing (yearly)
- Recreational Flows
- Volunteer Day: September/October
- Adaptive Management input

Next Steps



Thank You!

Taconya Piper

Ben Martin

Molly Martin

Ryan Kennedy

Jeff Holder

Elliot Broder

Peter Sakaris

Gareth Turner

Allen Nicholls

Dan Catchings

Rob Andress

Kevin Baswell



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