Restoration of Secondary Channels in the Free Flowing Mississippi River

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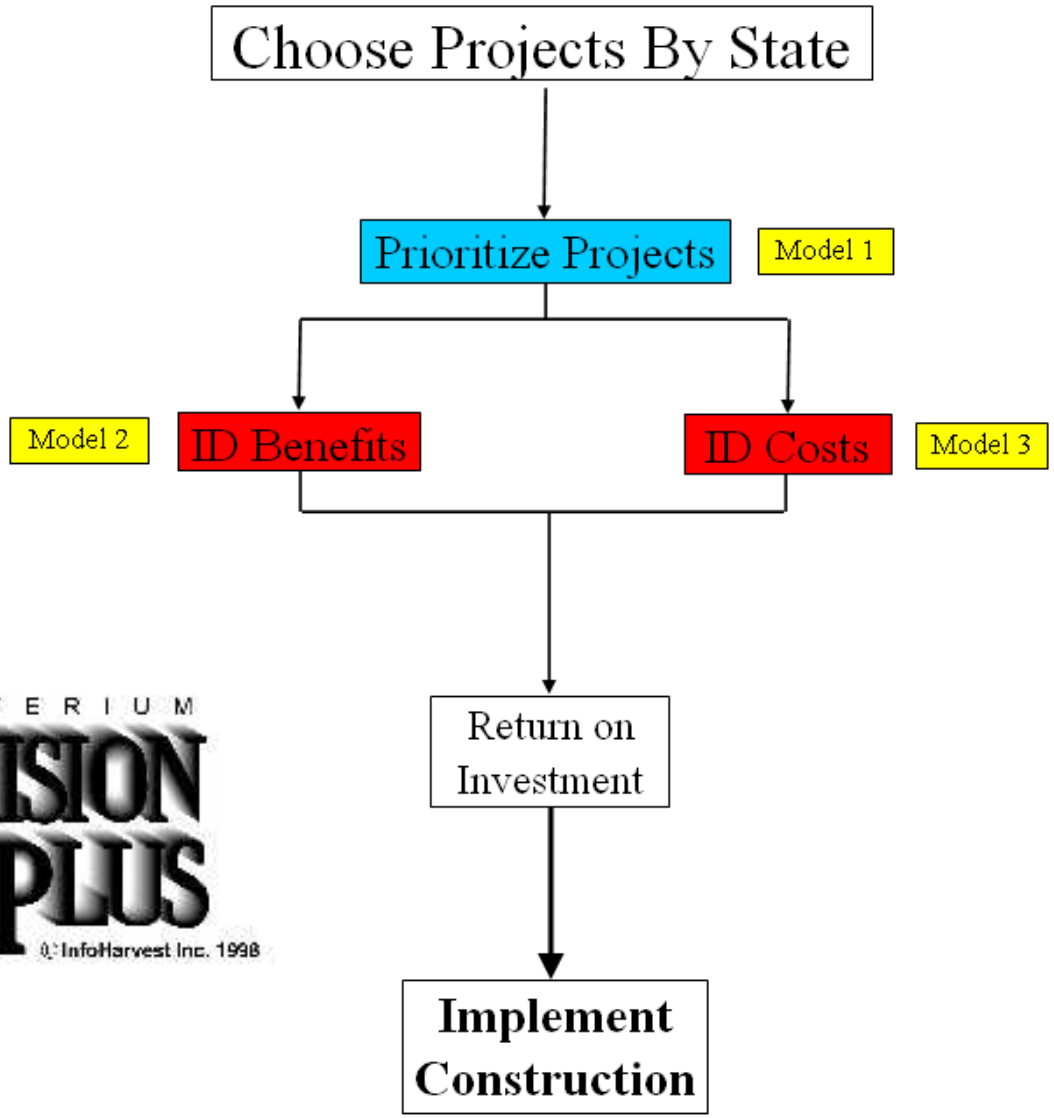
St. Louis District: Tom Keevin and Amanda Oliver
LMRCC: Ron Nassar

MVD, EMRRP– ERDC, and the States of LA, MS, AR, TN, MI, and KY

- 1,200 River Miles between St. Louis and the Gulf
- Approximately 120 side channels or chutes
- Over 80% have closing structures or some dikes



CRITERIUM DECISION PLUS

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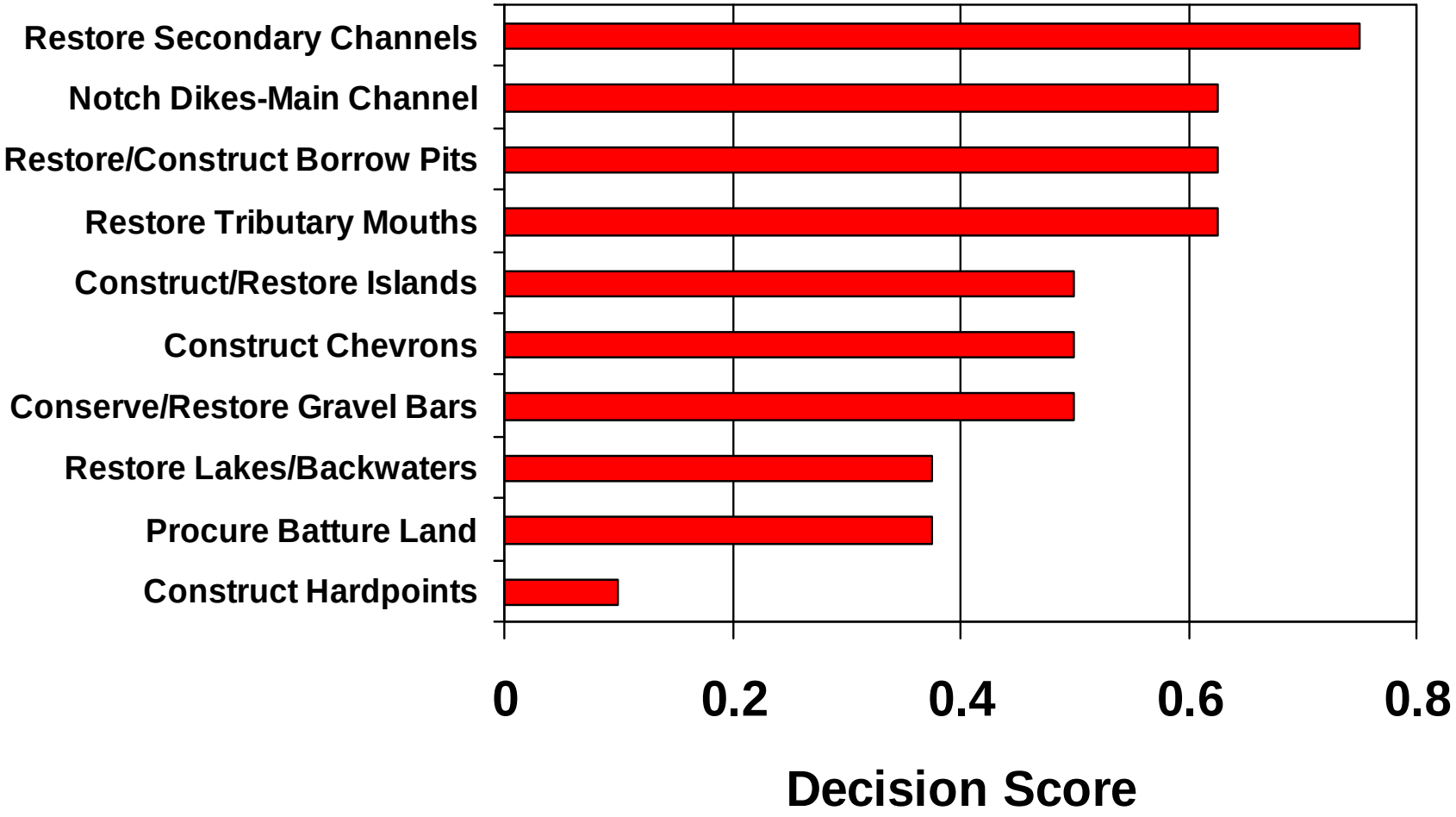
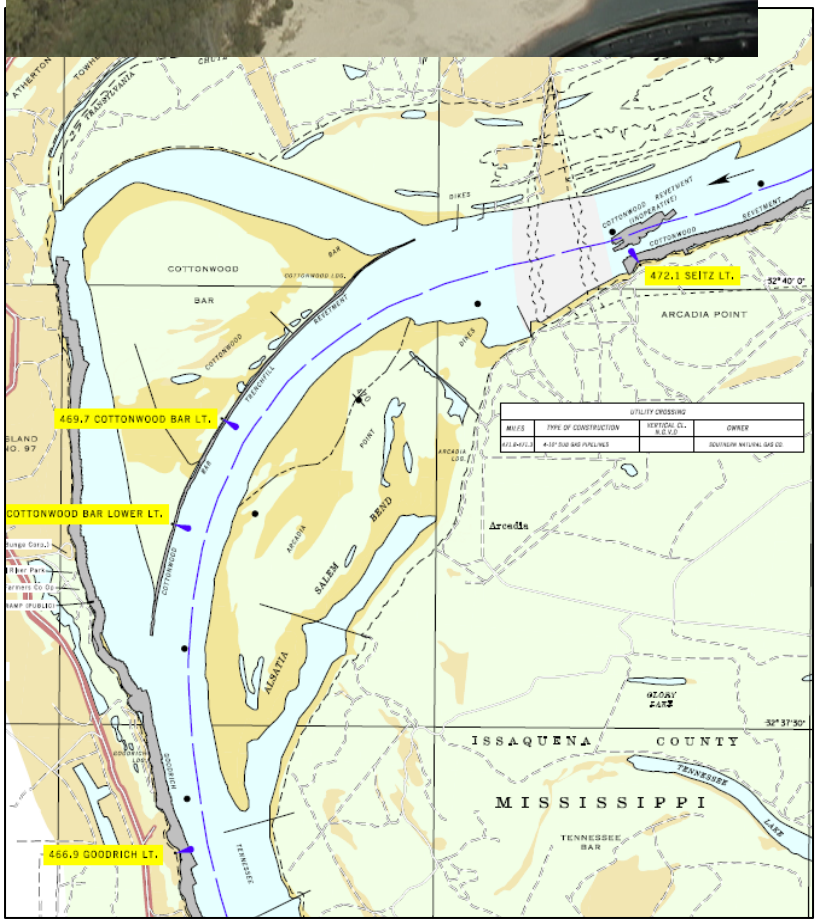
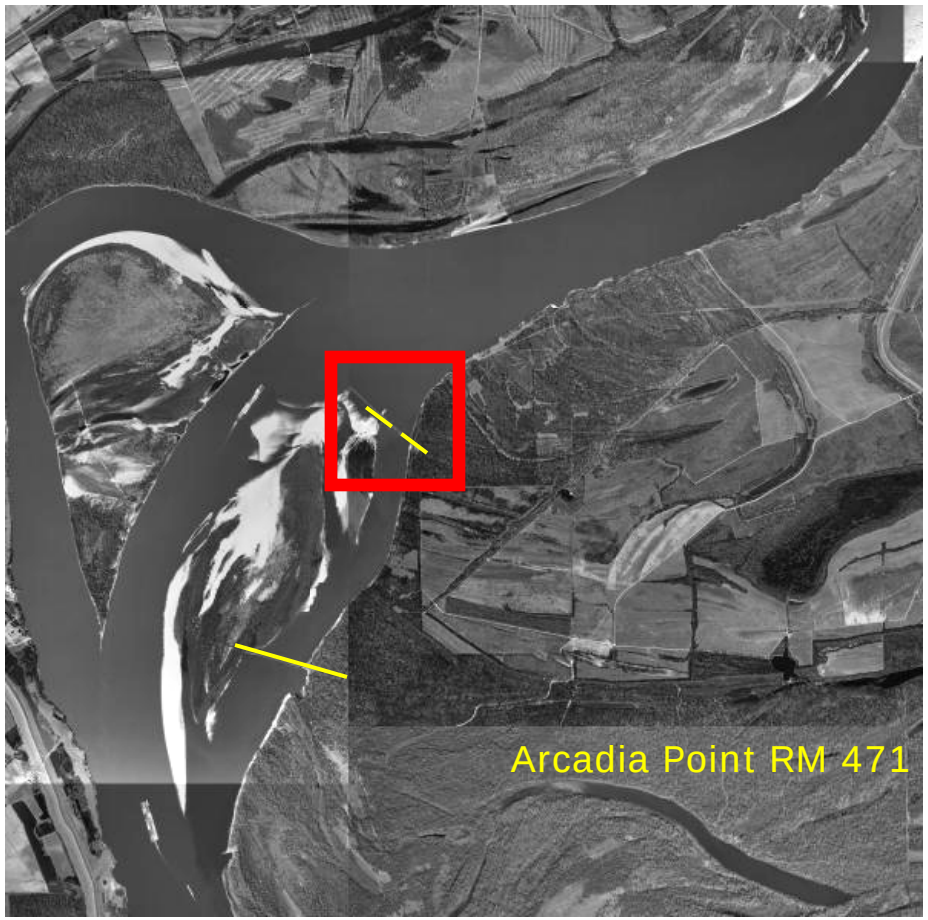
Decision Model Results

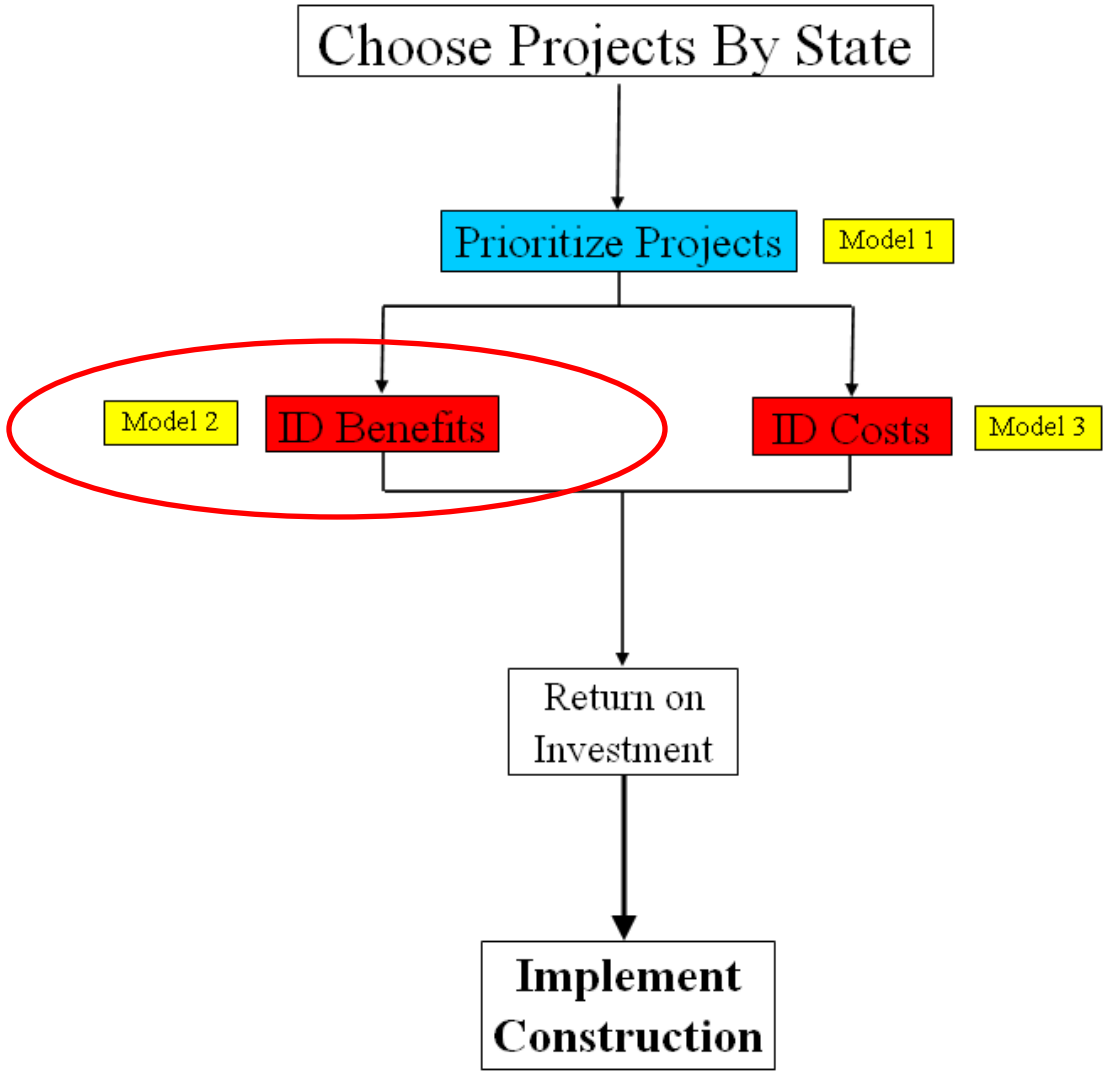
Ranking of Project Categories



Restoring Flow in Side Channels






Choose Projects By State
Prioritize Projects
Model 1
Model 2
ID Benefits
ID Costs
Model 3
Return on Investment
Implement Construction

ISLAND 63
HABITAT RESTORATION PROJECT

ISLAND 63 CHANNEL – UPSTREAM

PROJECT PLANNING

PROJECT CONSTRUCTION

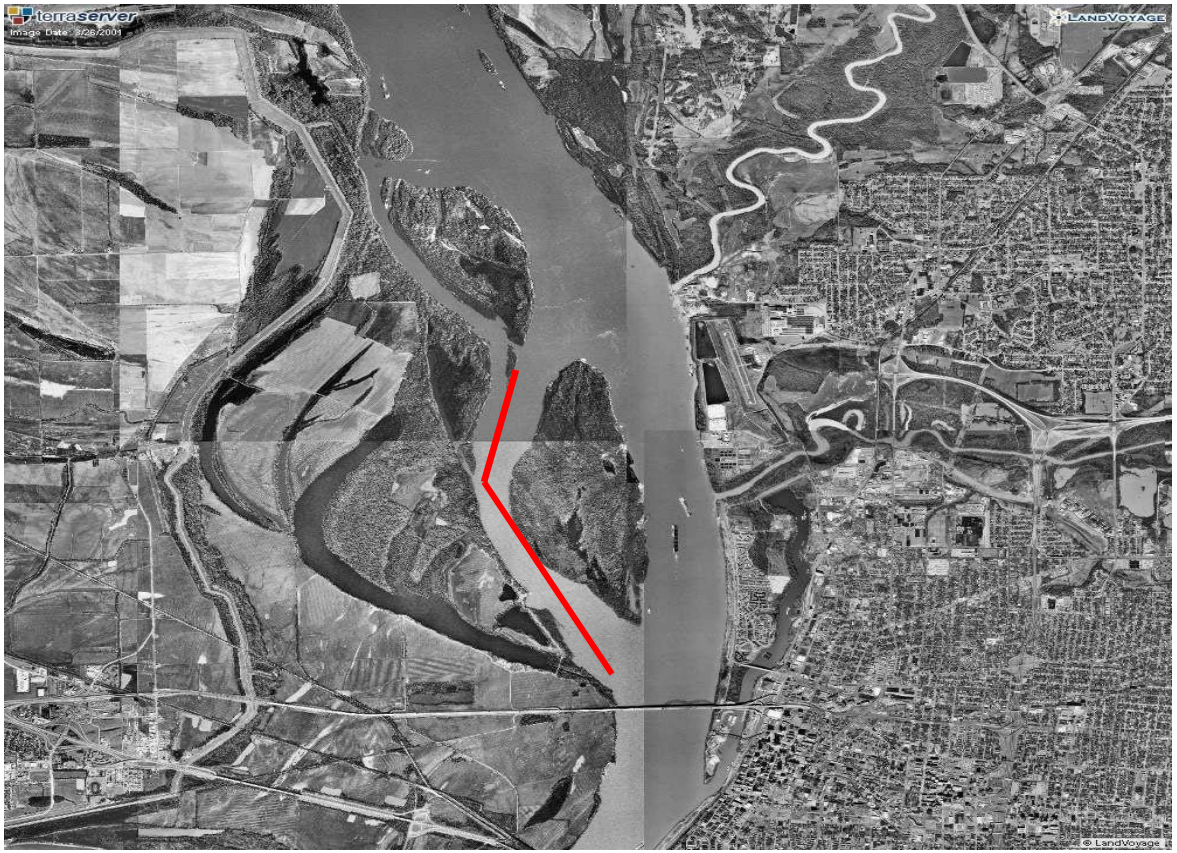
ISLAND 63 PROJECT BENEFITS

- **RESTORED FISH PASSAGE IN 5.47 MILE CHANNEL**
- **INCREASED HABITAT FOR FEDERALLY ENDANGERED PALLID STURGEON**
- **IMPROVED AQUATIC HABITAT & ENHANCED WATER QUALITY**
- **INCREASED PUBLIC RECREATION OPPORTUNITIES WITHIN THE CHANNEL & ACCESS TO THE RIVER**
- **POSITIVE PUBLIC RELATIONS BENEFITS FOR FEDERAL / STATE AGENCIES & NGO PARTNERS**

Analytical Procedure to Document Habitat Quality

- Index x Area = Habitat Unit
- Habitat Units/Cost = Return on Investment

TerraServer – Calculate Area



Red Hen Video

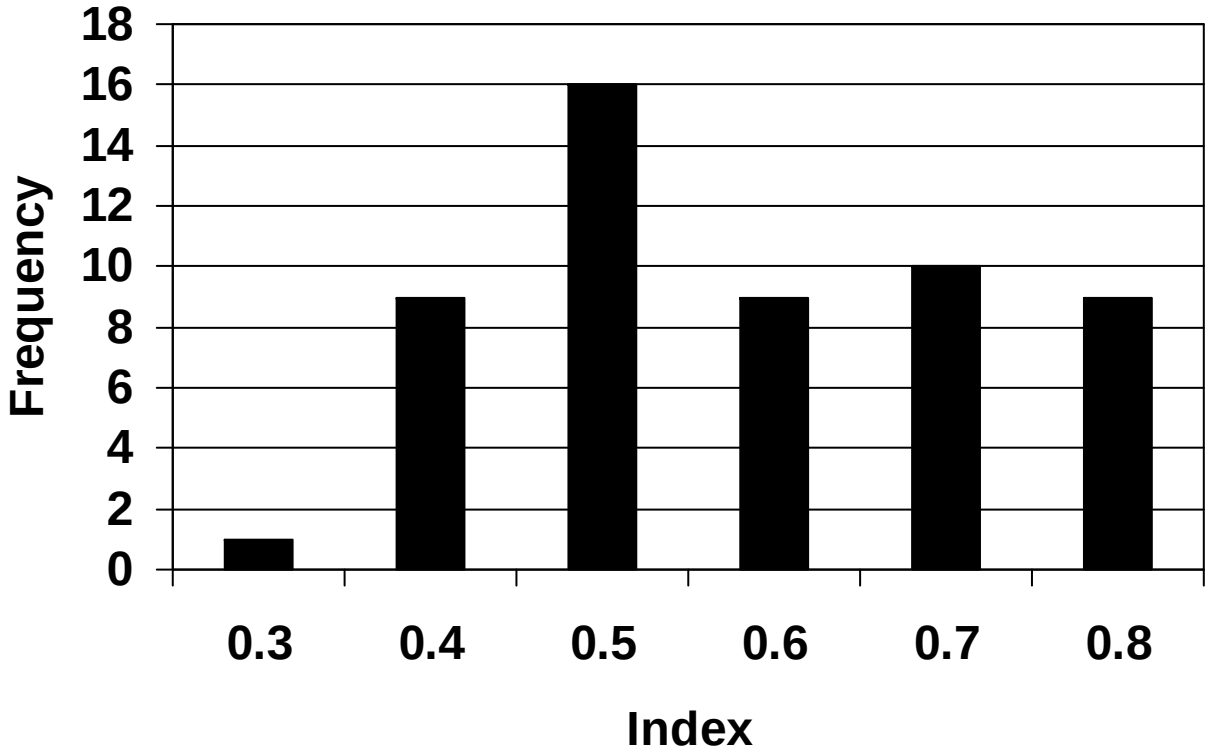
Secondary Channel Habitat Quality Index

Metric	Metric Implications
Number of Dikes	Greater number of dikes, less value and more difficult to restore
Number of Habitats	Greater habitat diversity=greater faunal diversity
Percent Stable Habitats	Habitat stability increases long-term benefits of restoration
Percent Sedimentation	Sedimentation impedes faunal access and movement, and decreases habitat diversity
Percent of Channel with Water	Isolated pools degrade water quality and impede faunal movement
Percent of Forested Riparian	Trees provide shade and woody debris, filter sediment-laden water, and stabilize banks

Secondary Channel Habitat Quality Index n=54

Metric	Metric score		
	1	**3**	**5**
Number of Dikes	>5	3-5	<3
Number of Habitats	<3	3-4	>4
Percent Stable Habitats	<30	30-80	>80
Percent Sedimentation	>50	30-50	<30
Percent of Channel with Water	<25	25-50	>50
Percent of Forested Riparian	<45	45-65	>65

Index of Secondary Channel Quality



Calculating Numerical Benefits of Restoring Flow in Island 63

Length = 8344 m
Width = 232 m
Area = 1,936,853 m^2 (478 acres)
Pre-Index=0.53 (253 Habitat Units)
Post-Index=0.73 (349 Habitat Units)
Net Increase = 27%
Cost: $36,000

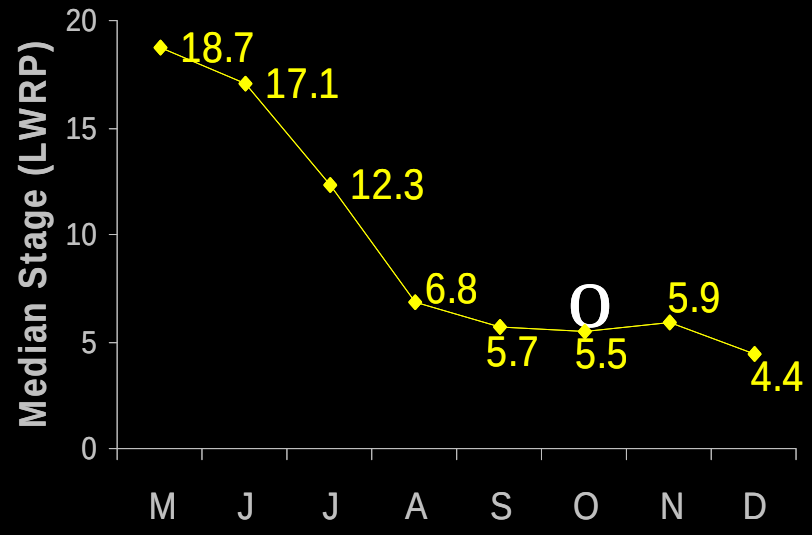
No action: Loss of all or part of 478 Acres?????

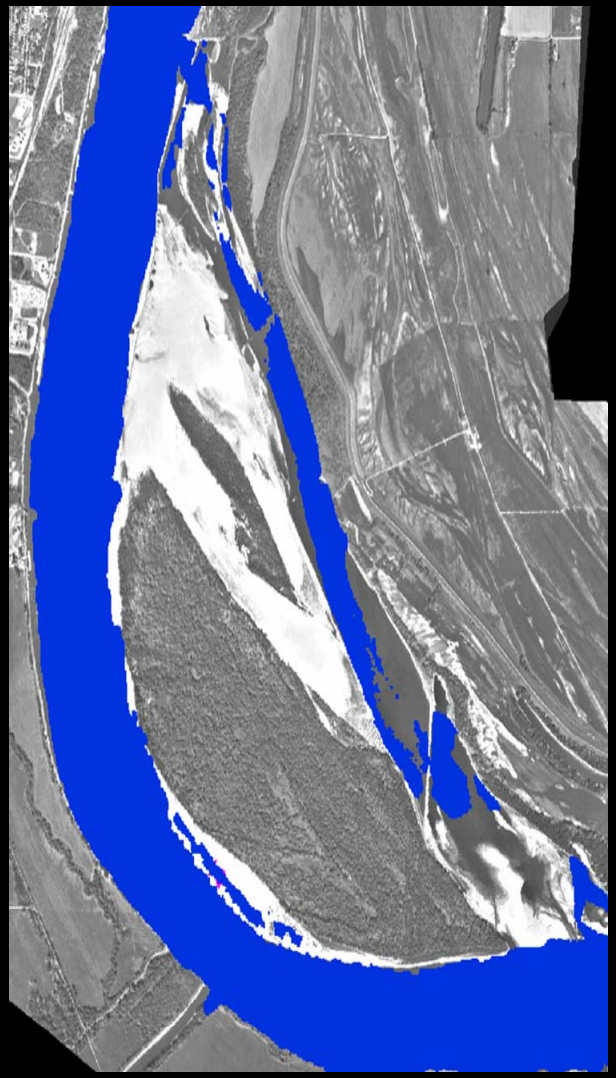
Other Factors to Consider

Middle Mississippi River

Connectivity

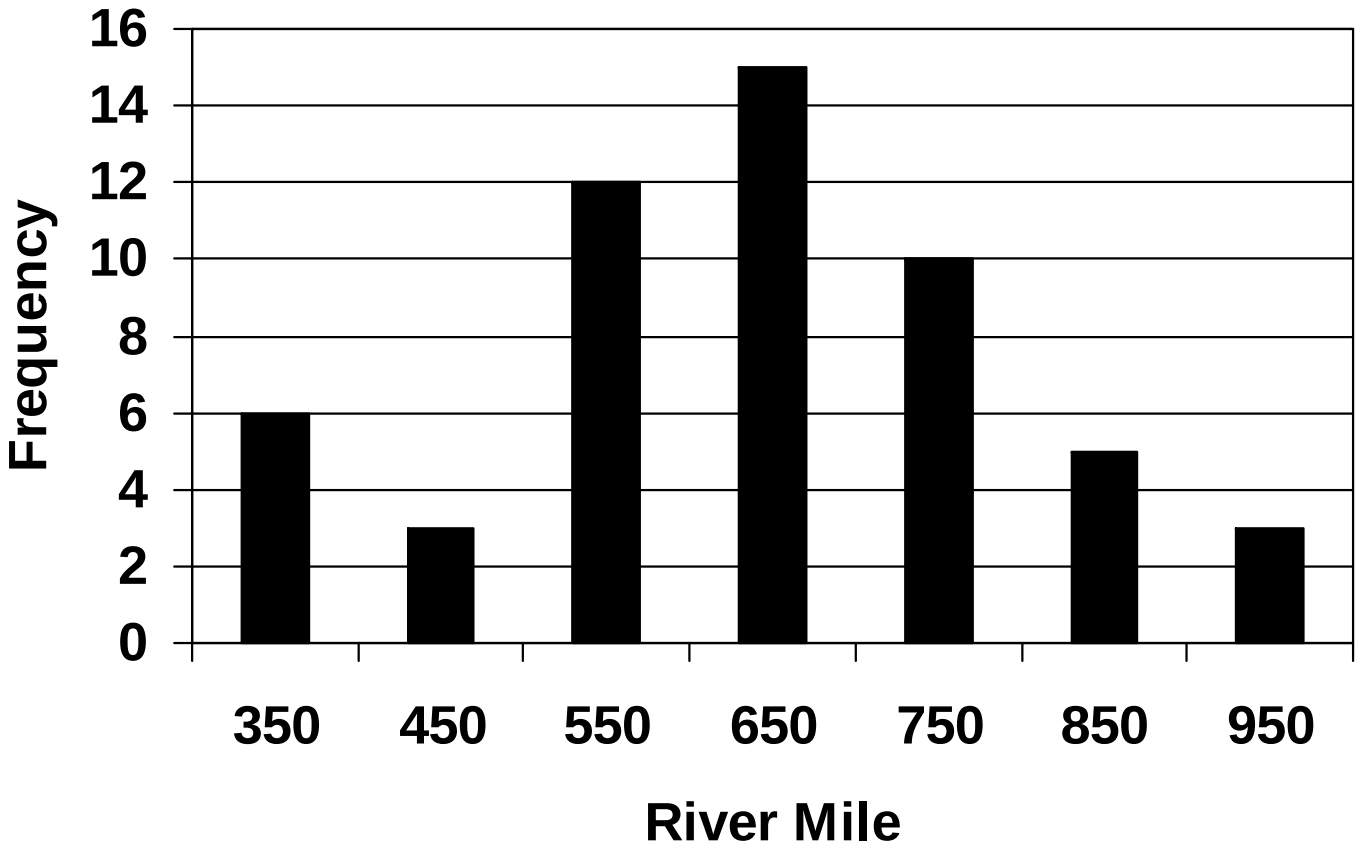
Marquette Chute
RM 50





- Bathymetry acquired during the spring high water season of 2001
- Data were triangulated forming a Topological Triangulated Network (i.e., grid models of bottom surface)
- UNET Model used to determine “controlling elevation”

Dispersion



LA ----------

MS ----------

AR ----------

TN ----------

KY ---------

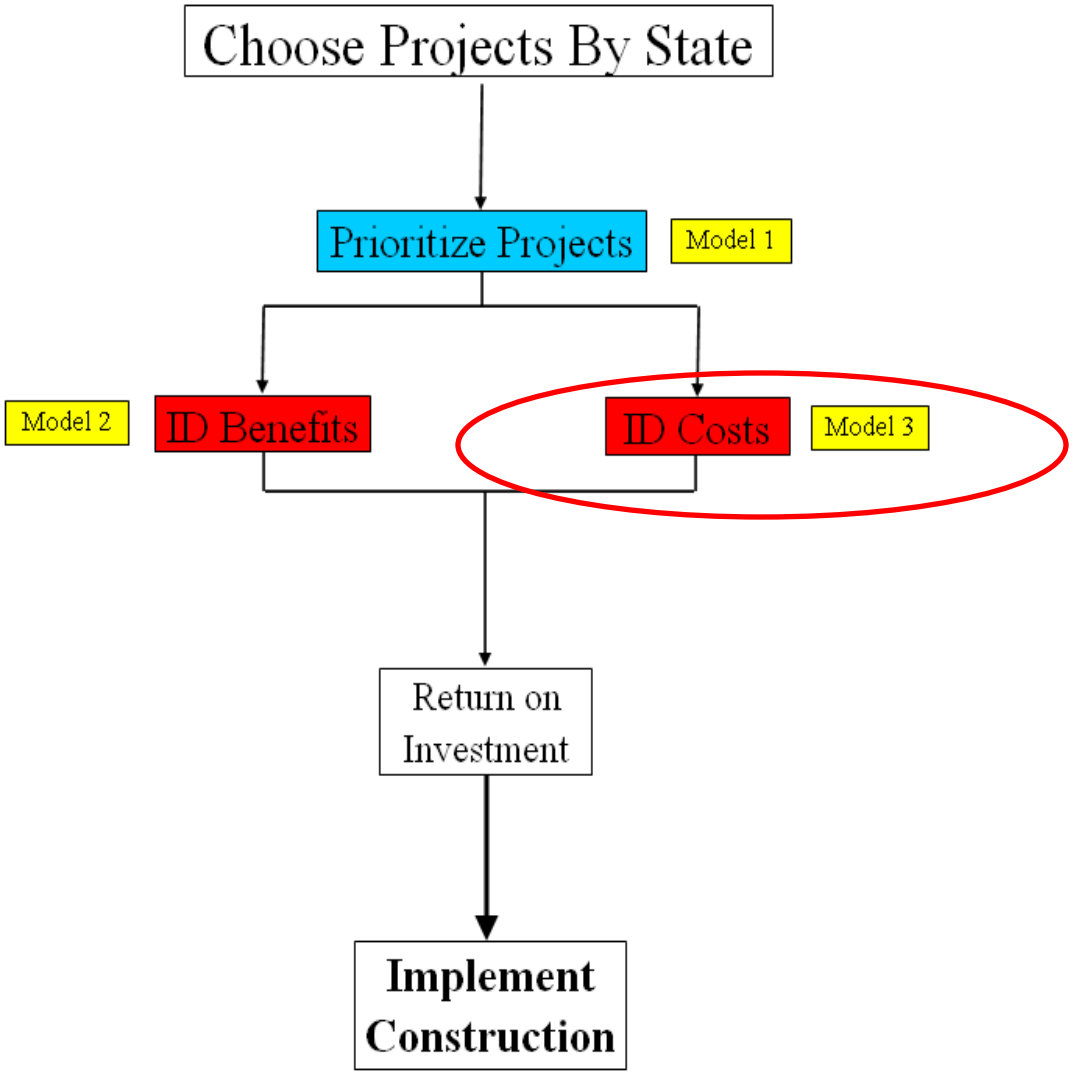
Biological Benefits

Factors to Consider

- Biological Diversity
- Endangered Species
- Non-Consumptive Opportunities
- Consumptive Opportunities

Top Ten in the Lower Mississippi River

SITE	RM	ACRES	Index	HU
Wolf Island	935	708	0.94	668
3 States Towhead	915	2455	0.83	2034
Old White River	597	1466	0.83	1215
Kentucky Bend	519	1387	0.83	1149
Redman Lossahatchie	743	1628	0.77	1256
Lower Cracraft	510	1444	0.77	1114
Island 64	630	783	0.77	604
Sunflower Cutoff	626	397	0.77	306
Chicot Landing	558	2751	0.71	1965
Island 21	829	958	0.71	684
Island 63	637	478	0.71	342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Conclusions

- **Secondary channels can be restored relatively inexpensively**
- **Large aquatic areas can be re-watered**
- **Most secondary channels are within the Corps' authorized boundaries**
- **There is considerable interagency support for these types of projects.**
- **Benefits can be quantified**