AMP GOAL 3:
ASSESSING RESTORATION POTENTIAL OF TAXA OF MANAGEMENT CONCERN IN THE COLORADO RIVER ECOSYSTEM DOWNSTREAM FROM GLEN CANYON DAM

Larry Stevens
Grand Canyon Wildlands Council, Inc.

- Committee efforts
- Taxon list and results
- Prioritization
- Restoration issues
- Motion to AMWG

AMP GOAL 3

Restore populations of extirpated species, as feasible and advisable.

The IN for Goal 3 is RIN 3.1.1:

What information (including technical, legal, economic, and policy issues) should be considered in determining the feasibility and advisability of restoring pikeminnow, bonytail, roundtail chub, river otter, or other extirpated species?

AMWG April 2009:

In recognition of GCDAMP goals toward management of the Colorado River through an ecosystem approach, AMWG directs the TWG to establish the Species of Concern Ad Hoc Committee (SMCAHC) and requests the participation of GCMRC in that ad hoc committee, to produce a draft report to be presented to AMWG on or before by May 1, 2011, that contains the following with regard to species of management concern in the CRE: A review of information about an assessment of the status of habitat needs and availability, and ecosystem roles of the species.

(NOTE: Extension granted to August 2011 AMWG meeting)

GOAL 3 AD HOC COMMITTEE MEMBERSHIP

Barbara Ralston, USGS/GCMRC
Kurt Dongoske, Pueblo of Zuni
Shane Capron, WAPA
Bill Davis, CREDA
Lori Caramanian, DOI
LeAnn Skrzynski, So. Paiute Consortium
Mike Yeatts, Hopi Tribe
Ted Melis, USGS/GCMRC
Todd Chaudhry, NPS
Jeff Sorensen, AZ Game and Fish Dept.
Marianne Crawford, USBR
Lori Makaric, NPS
Bill Persons, USGS/GCMRC
Shaula Hedwall, USFWS
Larry Stevens, Grand Canyon Wildlands
Martha Hahn, NPS
Brian Healy, NPS
Norm Henderson, NPS
Pam Sponholtz, USFWS
Jason Thiriot, Colo River Comm/NV
Sam Spiller, USFWS
Bill Stewart, AZ Game and Fish Dept.
John Jordan, Federation of Fly Fishers
Rick Moore, Grand Canyon Trust
Kelly Burke, Grand Canyon Wildlands Council
R. V. Ward, NPS
Melissa Trammell, NPS
David Ward, USGS
Scott Vanderkooi, USGS/GCMRC
Mary Orton, The Mary Orton Company
and numerous independent experts

AD HOC COMMITTEE MEETING DATES

2009: 30 Apr; 2010: 3 Jan; 2011: 27 Jan*, 23 Feb*, 12 May*, 9 Jun*
Many emails, expert interviews, individual Committee discussions

*** Conference call**

BIODIVERSITY AND ECOSYSTEM PROCESSES IN THE CRE

- ~ 800 plant taxa
- ~ 10,000 macroinvertebrate taxa
- ~ 350 vertebrate taxa
- Present AMP focus on HBC, KAS, SWFL

EXTIRPATED OR DECLINING TMC

- Which TMC have been lost in post-dam time, and why ?
- Which TMC are declining, why, supporting info?
- How to prioritize potential for restoring or rehabilitating TMC?

METHODS AND ASSUMPTIONS

Development of the List

- Document rare, declining, or ecologically influential CRE taxa
  - Literature review
  - Expert opinions (not all experts agree)
- No non-listed non-native species
- List repeatedly reviewed

AMP Issues, Possible Benefits

Advisory value to SOTI

No commitment to restoration funding

Useful information for monitoring AMP resources of concern

Prioritization Approaches

- Legal obligations
- General policy review
- Conservation status (NatureServe)
- Committee ranking - 18 variables
  - Scored by experts
  - Unweighted summary score
  - Arbitrary 50% score considered as TMC
- Trophic position – ecosystem approach
- Policy “Reality Check” and Committee discussion

Prioritization Categories
Influence of Glen Canyon Dam on population
Conservation relevance
Quality of background information
Stock availability for restoration
Legal mandates, requirements
Habitat availability under present dam operations
Habitat availability under realistic future dam operations
Technical feasibility
Agreement among stakeholders
Inexpensiveness (low cost=high score)
Time-frame for success (short=high, long=low)
Logistical ease
Ease of compliance
Are genetics issues easily resolved?
Lack of disease transmission potential
Urgency in relation to climate change impacts
Beneficial interactions with other species

Criterion	Number of CRE TMC									
	Plants	**Trematode**	**Insects**	**Snails**	**Fish**	**Amphibians**	**Reptiles**	**Birds**	**Mammals**	**Total**
Extirpated	2?	0	2?	0	4	2	2	3 (4)	8	14-23
Federally ES or recent ES	0	0	0	1	5	2	0	9	1	18
Composite Score ≥50	0	1	3	1	8	3	3	9	19	47
3a. TMC about which little is known	1	0	9	0	3	2	5	6	26	52
3b. TMC of individual agency concern	6	0	3	1	8	4	3	16	21	62
3c. Rare or endemic TMC	1	1	3	1	0	1	0	5	2	14
3d-e. TMC affected by dam, (+ increasing or - decreasing)	6	1	4	1	8	4	4	13	11	52
Reality Check ("yes")	4	0	0	1	6	0	0	2	0	13
Reality Check ("mixed")	3	1	9	0	2	4	6	17	31	73
Total number TMC *	**7**	**1**	**9**	**1**	**8**	**9**	**6**	**19**	**31**	**91**

PLANTS

Taxon	Common Name	Total Score (percent of scores for non-blank categories; excluding stakeholder agreement scores)
PLANT	Goodding's Willow (SAGO)	75.8
PLANT	Fremont Cottonwood (POFR)	60.9
PLANT	Western Honey Mesquite	Unscored but high
PLANT	Netleaf Hackberry (CELA)	56.3

Goodding's Willow (*Salix gooddingii)*

Once relatively common along wide reaches of the Colorado River in Grand Canyon; now gone from 7 of 18 post-dam sites, with most plants in poor health and no recruitment; losses due to increased beaver attack and recruitment impacts due to flow alteration.

GCD Impacts on CRE Plant Diversity?

- Dam may be interrupting long-term colonization
  - particularly downstream and downslope movement
- Result: Loss of rare plant species over post-dam time

INVERTEBRATES

Taxon	Common Name	Total Score (percent of scores for non-blank categories; excluding stakeholder agreement scores)
GAST	Kanab Ambersnail (KAS)	65.6
HEX	Vulcan's Well waterbug (BEFL)	62.5
HEX	Viceroy Butterfly (VBF)	56.25
HEX	Masked Clubskimmer	51.6

KANAB AMBERSNAIL

ENDEMIC, SMALL POPULATIONS, NO MONITORING, STATUS UNCERTAIN

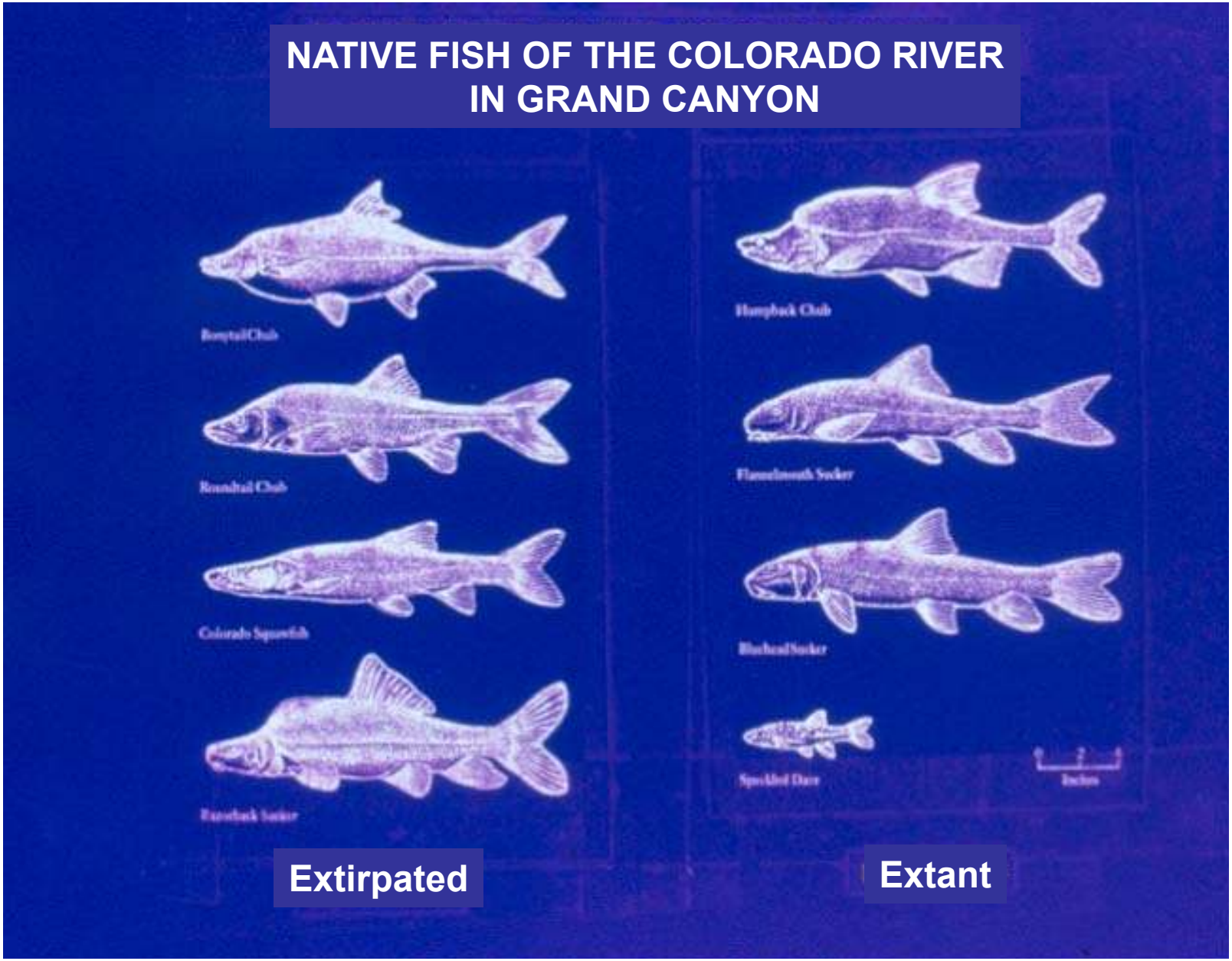
Vulcans Well Giant Waterbug
(*Belostoma flumineum* new ssp?)

Viceroy Butterfly

Limenitis archippus

Taxon	FISH Common Name	Total Score (percent of scores for non-blank categories; excluding stakeholder agreement scores)
ICHTH	Humpback Chub (HBC)	71.9
ICHTH	Razorback Sucker (RBS)	66.7
ICHTH	Colorado Pikeminnow (CPM)	63.5
ICHTH	Bonytail Chub (BTC)	55.2
ICHTH	Roundtail Chub (RTC)	53.1
ICHTH	Flannelmouth Sucker (FMS)	89.1
ICHTH	Bluehead Sucker (BHS)	89.1
ICHTH	Speckled Dace (SPD)	87.0

NATIVE FISH OF THE COLORADO RIVER IN GRAND CANYON



HERPETOFAUNA

Order	Common Name	Total Score (percent of scores for non-blank categories; excluding stakeholder agreement scores)
HERP	Zebra-tailed Lizard (ZTL)	79.7
HERP	Relict Leopard Frog (RLF)	69.5
HERP	Gila Monster	65.6
HERP	Northern Leopard Frog (NLF)	61.7
HERP	Rocky Mountain Toad	56.3

Grand Canyon Pink Rattlesnake

Northern Leopard Frog
-9 Mile Spring and Cardenas Marsh

Relict Leopard Frog at 248R

BIRDS

Order	Common Name	Total Score (percent of scores for non-blank categories; excluding stakeholder agreement scores)
AVES	SW Willow Flycatcher (SWWF)	63.8
AVES	Prairie Falcon (PRFA)	56.9
AVES	Bald Eagle (BAEA)	56.5
AVES	Gambel's Quail (GAQU)	55.4
AVES	Waterfowl	54.7
AVES	Golden Eagle	54.4
AVES	California Condor (CACO)	52.3
AVES	Osprey	50.0

Southwestern Willow Flycatcher

- One of ~ 24 nesting neotropical migrant bird spp. in GC – an umbrella species?
- Extirpated from historic range, occasionally breeding on upper Lake Mead
- BH Cowbird brood parasitism
- Commonly nest in non-native Tamarisk – habitat changing

Bald Eagle

* Winter along CR in GC upstream from LCR and at several tribs downstream
* Feed on trout
* Feeding aided by fluctuating flows
* Easily disturbed by passing boats
* Present status in GC?

Peregrine Falcon

* Largest breeding population on any land management unit in the 48 states
* 90 % of prey biomass is waterbirds, mostly related to post-dam clearwater flow

What about Prairie Falcon?

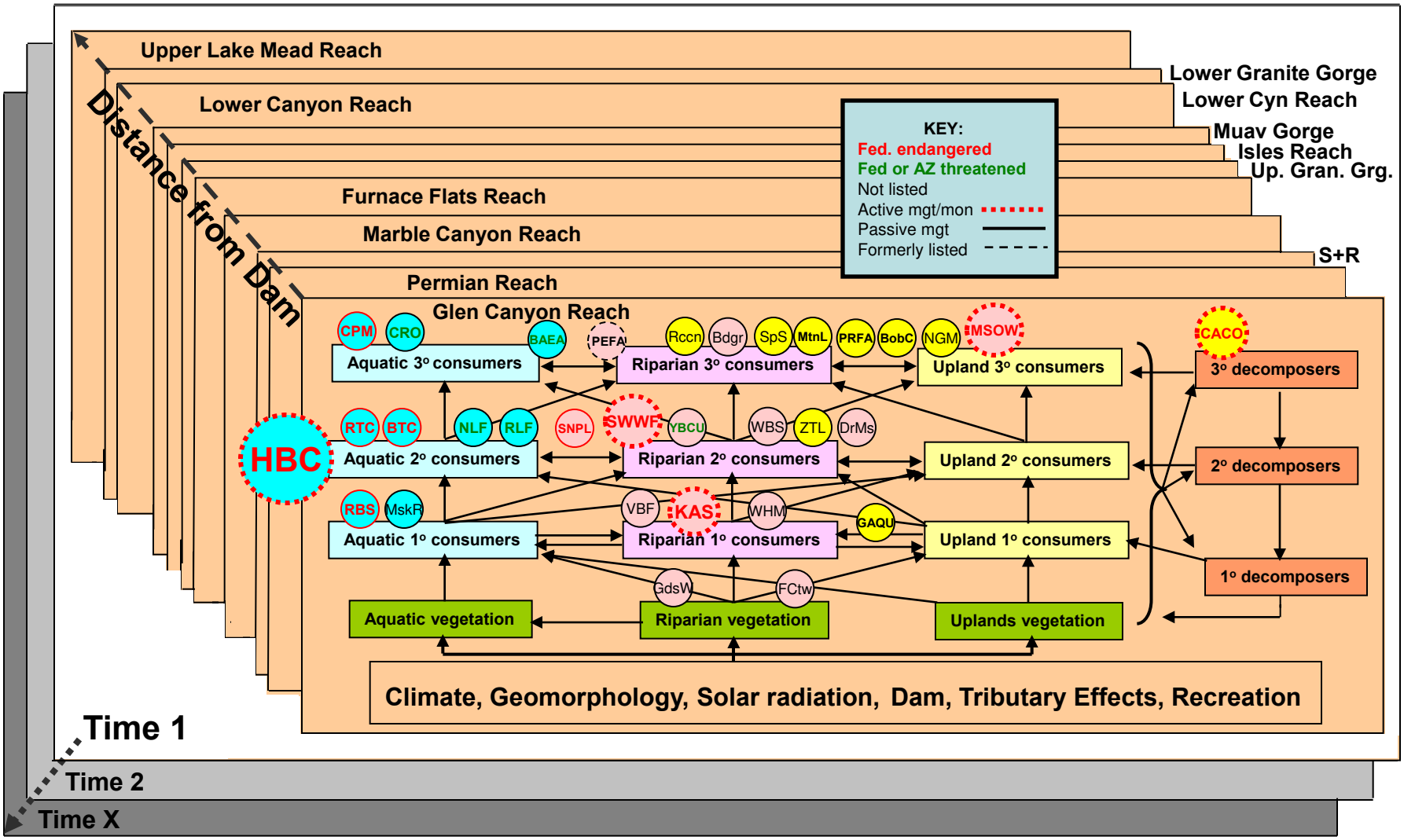
MAMMALS

Order	Common Name	Total Score (percent of scores for non-blank categories; excluding stakeholder agreement scores)
MAMM	Yuma Myotis	65.8
MAMM	Badger (BDGR)	62.5
MAMM	Fringed Myotis	61.7
MAMM	Spotted Skunk (SpSk)	60.9
MAMM	Western Harvest Mouse (WHM)	60.2
MAMM	Allen's Big-eared Bat	60.0
MAMM	Long-eared Myotis	60.0
MAMM	Long-legged Myotis	60.0
MAMM	Western Pipistrelle	59.4
MAMM	Western Small-footed Myotis	58.3
MAMM	Arizona Myotis	56.7
MAMM	Gray Wolf (GW)	55.7
MAMM	Bobcat (Bobc)	55.5
MAMM	Southwestern River Otter (CRO)	54.8
MAMM	Spotted Bat	51.8
MAMM	Northern Grasshopper Mouse (NGM)	50.8
MAMM	California Mastiff Bat	50.0
MAMM	California Myotis	50.0

MISSING MAMMALS

Colorado River Otter
Extinct? Role as mammalian fish predator

SIMPLIFIED CONCEPTUAL MODEL OF THE COLORADO RIVER ECOSYSTEM, SHOWING THE TROPHIC POSITION OF EXTIRPATED AN LISTED FAUNA



ECOSYSTEM STEWARDSHIP IMPLICATIONS

- **Restoration – Which, if any, TMC?**
  - **NPS, Cooperating Agencies, AMWG discussion and coordination**
- **Monitoring**
  - **Which taxa**
  - **Whether and how to include in future work planning**
- **Future budget and flow implications?**
- **Recommendations to AMWG**

PROPOSED MOTION

TWG recommends that AMWG accept the report of the Species of Concern Ad Hoc Committee entitled, "Assessment of Taxa of Management Concern in the Colorado River Ecosystem, Glen and Grand Canyons, Arizona, USA: Habitat Needs, Availability, and Ecosystem Roles" dated 15 June 2011, which meets the criteria set forth in the AMWG motion of April 2009, calling for "a review of information and assessment of the status of habitat needs and availability, and ecosystem roles" of native species of management concern.