

Riparian Vegetation and Associated Wildlife

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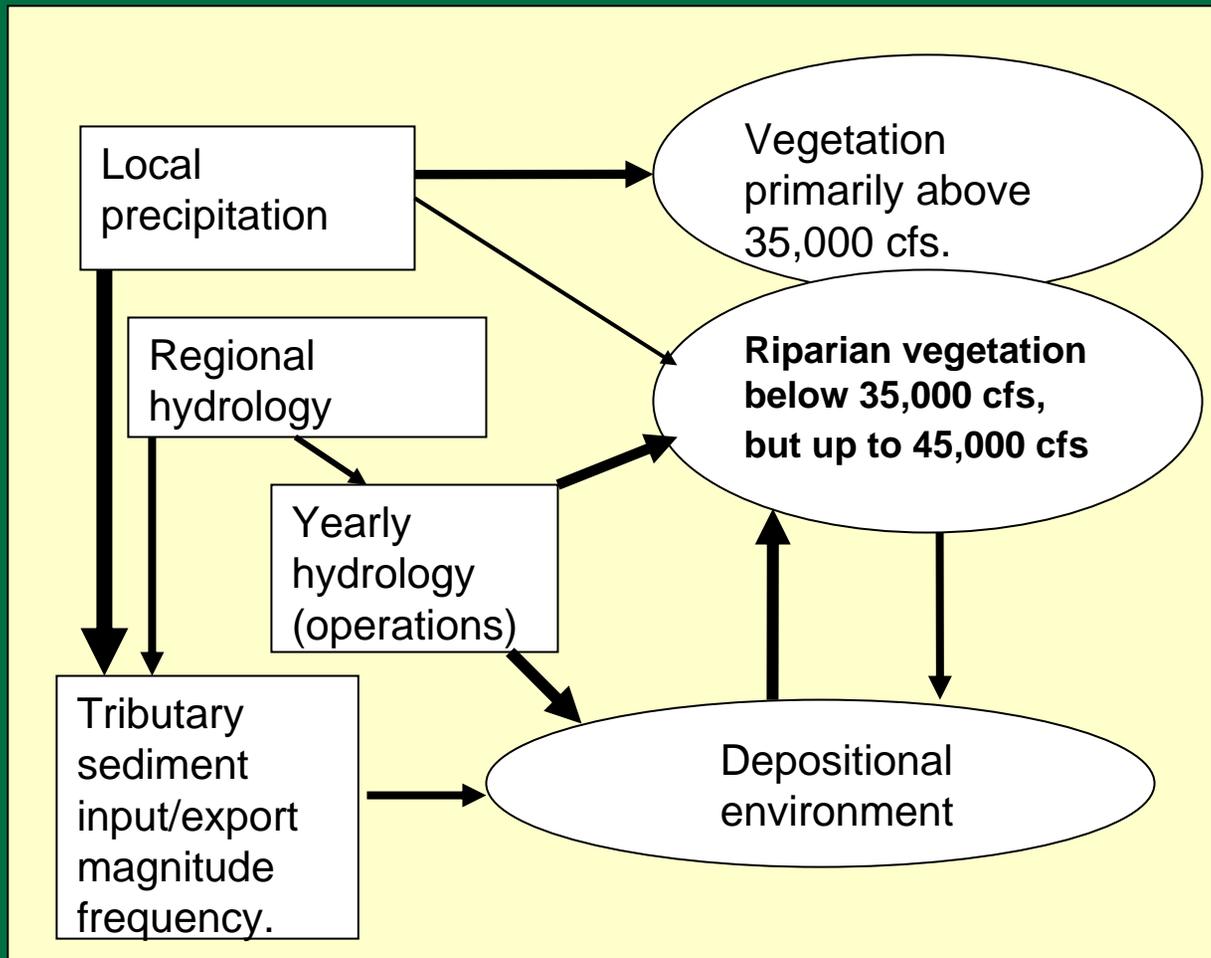


Presentation Outline

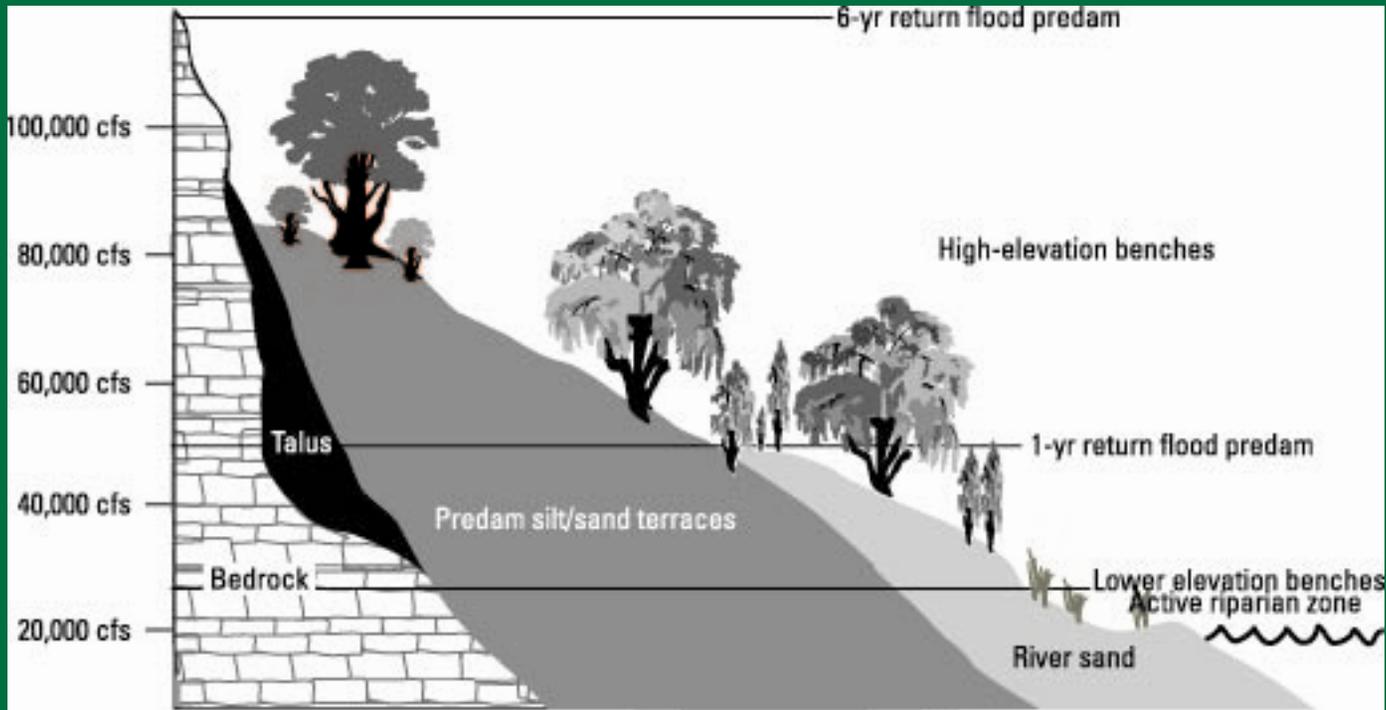
- Eras of riparian vegetation in Grand Canyon
 - Predam riparian vegetation and hydrology
 - Postdam decadal scale change of riparian vegetation
 - Trends in vegetation since 1991
- Rare and endangered species
- Future research needs



Some Variables Affecting Riparian Vegetation



Predam Riparian Vegetation



- Annual flood 50,000 cfs; 6-year 120,000 cfs
- Pre-dam fluvial zone is current active riparian zone
- Seep willows, arrowweed, salt cedar, mesquite, acacia

Postdam Decadal Scale Change of Riparian Vegetation

- **1963-1980 – Disturbance reduction\vegetation expansion**
 - Vegetation increased 100%
 - Woody species expansion
 - Emergent vegetation became more evident
- **1981-1990 – Inundation and habitat reworking**
 - Sustained inundation & reduced vegetation < 50,000 cfs
 - Redistribution of pre-dam high elevation vegetation constituents (e.g., mesquite, acacia)
 - Expansion of marsh area associated with fluctuations



U.S. Geological Survey file photograph



U.S. Geological Survey file photograph

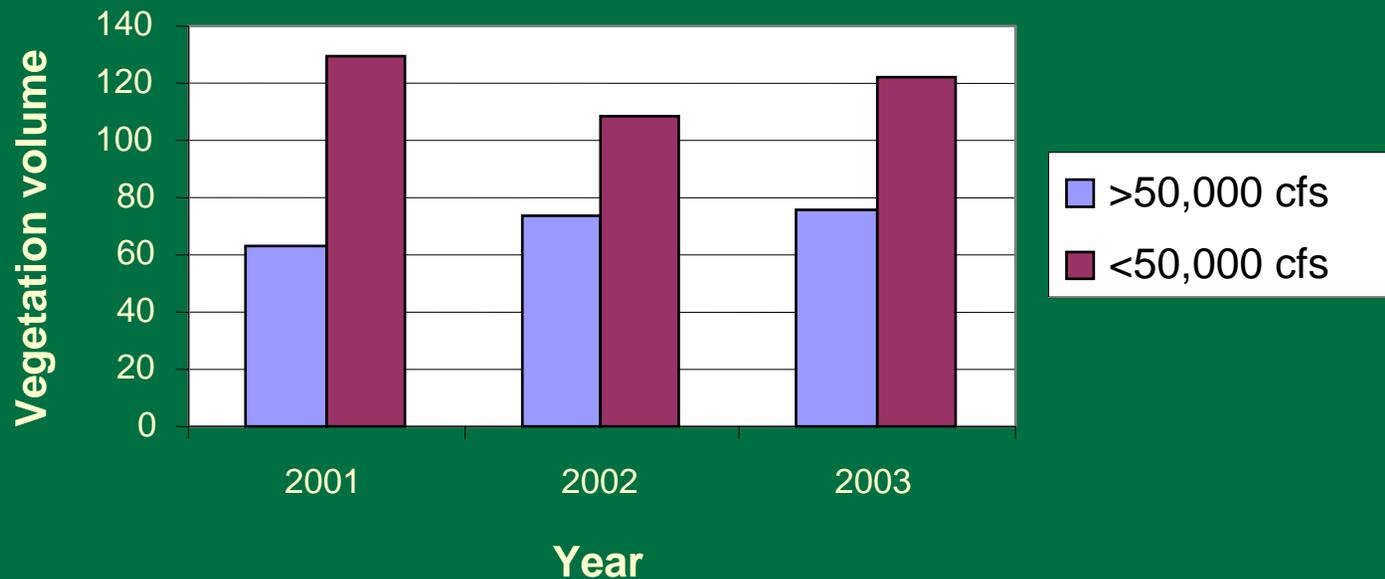
Riparian Vegetation Change

- **1991 to Present - Low Fluctuating Flows and Experimentation**
 - Stabilization & reduced magnitude and frequency of peak
 - Reduced active riparian zone
 - Further expansion of vegetation
 - Affecting wildlife habitat & camp site area



Recent Monitoring Results 2001 – 2003

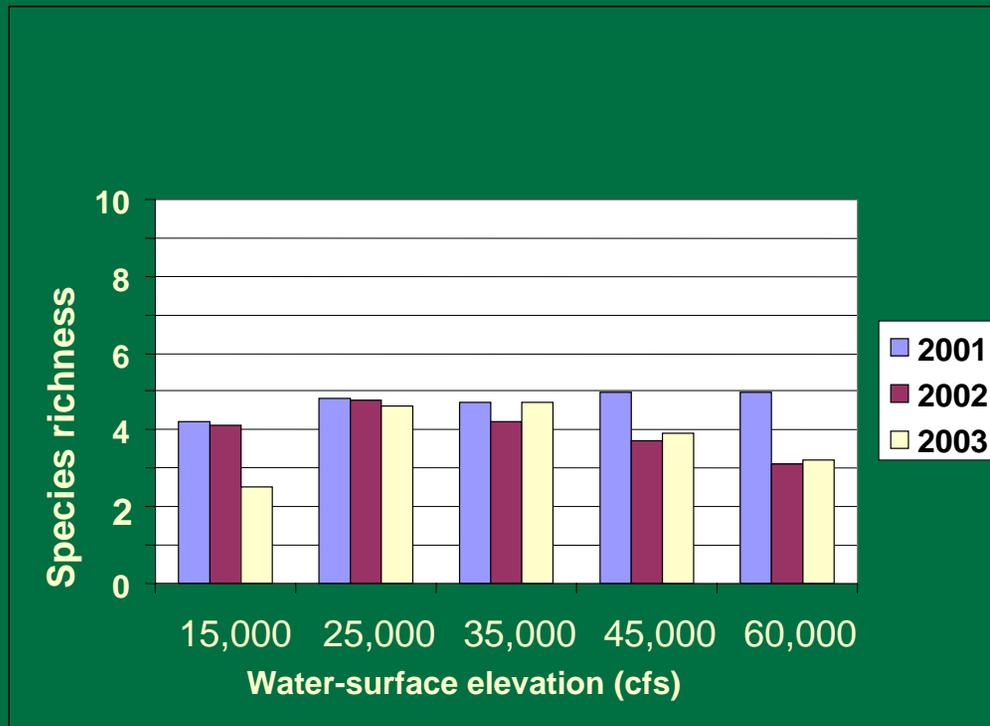
- Volume of woody vegetation <50k cfs responded to changes in operations in 2003.



Adapted from Kearsley and others, 2004

Recent Monitoring Results 2001 – 2003

- Herbaceous vegetation <35k cfs influenced by operations, while vegetation >35k is influenced by local precipitation



Threatened and Endangered Species

- **Kanab Ambersnail at Vaseys Paradise**
 - Discharge from the spring and river stage affect habitat
 - Snail numbers have not changed significantly since 1998
- **Amphibians with a focus on Leopard Frogs (Drost 2005)**
 - Woodhouse toads, red-spotted and canyon treefrog and tiger salamanders have healthy widespread populations
 - Northern leopard frog have declined from 70% of sites previously located (side canyons of reservoir and Colorado River).
 - Contraction of range in Glen and Grand Canyon and isolation of populations



Photo by Roy Averill-Murray,
AGFD



Photo by C. Drost, USGS

Future Research Needs

■ Riparian Vegetation

- Understanding of change in riparian communities is hampered by the lack of a long term data stream focused on trend detection
 - Trend detection should focus on local and regional scale change
 - Yearly data collection of cover, species richness/diversity
 - Semi-decadal vegetation mapping for large scale trend detection
- Incorporate and integrate faunal components to begin to establish trophic linkages in terrestrial and aquatic systems
- Continued loss of sediment along the shoreline will result in changes in species found within the riparian zone
- Reduced disturbance frequency will result in denser vegetation that may benefit birds, but will also cause encroachment into camp sites.

Acknowledgements

