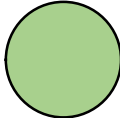
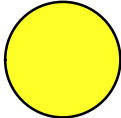

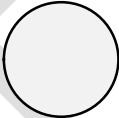



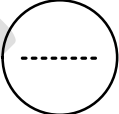





# GCDAMP FY2017 Knowledge Assessment Summary: Status and Trend

April 7, 2017

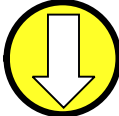


## Symbol Key

Status			
Good Condition	Moderate Concern	Significant Concern	Unknown
			




Trend			
Improving	Neither	Declining	Unknown
			

Confidence		
High	Medium	Low
		


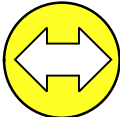

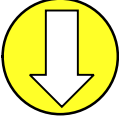

## AQUATIC FOOD BASE

Resource Characteristics	Resource Characteristic	(No. of specific measures)	Resource Topic
Food base diversity		2	
Secondary production		3	


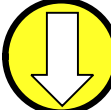






## ARCHAEOLOGICAL & CULTURAL RESOURCES

Resource Characteristics	Resource Characteristic	(No. of specific measures)	Resource Topic
Depositional Integrity (site stability)		1	
National Register Integrity		1	












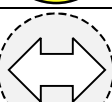
## HUMPBACK CHUB












Resource Characteristics	Resource Characteristic	(No. of specific measures)	Resource Topic
Adult population in western Grand Canyon		1	
Adult population that spawns in LCR		1	
Juvenile chub population in CR near LCR		1	
Juvenile chub population in western Grand Canyon		1	

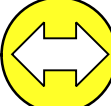





# HYDROPOWER & ENERGY

Resource Characteristics	Resource Characteristic	(No. of specific measures)	Resource Topic
Electric generation (capacity)		2	
Electric generation (energy production)		1	
Electric generation (energy value)		1	
Emissions		1	
Hydro-mechanical equipment		1	
Load following capability		1	
Net firming purchases		1	

# INVASIVE FISH SPECIES

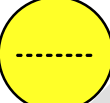
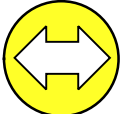





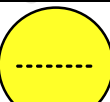

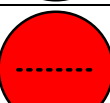
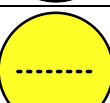
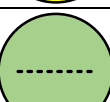
Resource Characteristics	Resource Characteristic*	No. of specific measures	Resource Topic
Black Bullhead		1	
Black Crappie		1	
Brook Trout		1	
Brown Trout at Lees Ferry Reach		1	
Brown Trout below Lees Ferry Reach		1	
Burbot		1	
Channel Catfish		1	
Common Carp		1	
Cutthroat Trout		1	
Fathead Minnow		1	
Flathead Catfish		1	

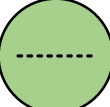

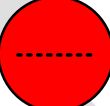



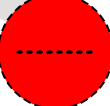
Resource Characteristics	Resource Characteristic*	No. of specific measures)	Resource Topic
Gizzard Shad		1	
Grass Carp		1	
Green Sunfish		1	
Largemouth Bass		1	
Mosquitofish		1	
Northern Pike		1	
Plains Killifish		1	
Rainbow Trout at Lees Ferry reach		1	
Rainbow Trout below Lees Ferry (< RM 0)		1	
Red Shiner		1	
Smallmouth Bass		1	

Resource Characteristics	Resource Characteristic*	No. of specific measures	Resource Topic
Striped Bass		1	
Threadfin Shad		1	
Tilapia		1	
Walleye		1	
Yellow Bullhead		1	
Yellow Perch		1	

\* Invasive fish species ratings refer to the level *of threat to priority fishes* (RBT, HBC, other native fishes). Thus, a status rating of “Good Condition” means a low level of threat, whereas a status rating of “Significant Concern” means a high level of threat. Similarly, a trend rating of “Improving” means a falling level of threat, beneficial to the priority fishes, whereas a trend rating of “Deteriorating” means a rising level of threat, detrimental to the priority fishes.


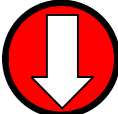






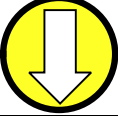



# RAINBOW TROUT











Resource Characteristics	Resource Characteristic	No. of specific measures	Resource Topic
LCR Inflow Area & Marble Canyon Rainbow Trout Fishery - Abundance		1	
LCR Inflow Area & Marble Canyon Rainbow Trout Fishery - Age distribution		1	
LCR Inflow Area & Marble Canyon Rainbow Trout Fishery - Growth		1	
LCR Inflow Area & Marble Canyon Rainbow Trout Fishery - Movement		1	
LCR Inflow Area & Marble Canyon Rainbow Trout Fishery - Piscivorous activity		1	
LCR Inflow Area & Marble Canyon Rainbow Trout Fishery - Recruitment		1	
LCR Inflow Area & Marble Canyon Rainbow Trout Fishery - Survival		1	
Lees Ferry Rainbow Trout Sport Fishery - Abundance		1	
Lees Ferry Rainbow Trout Sport Fishery - Age0 abundance		1	
Lees Ferry Rainbow Trout Sport Fishery - Age0 Survival		1	
Lees Ferry Rainbow Trout Sport Fishery - Condition		1	

Resource Characteristics	Resource Characteristic	No. of specific measures	Resource Topic
Lees Ferry Rainbow Trout Sport Fishery - Growth		1	
Lees Ferry Rainbow Trout Sport Fishery - Movement		1	
Lees Ferry Rainbow Trout Sport Fishery - Recruitment		1	
Lees Ferry Rainbow Trout Sport Fishery - RTELSS Age0 recruitment		1	
Lees Ferry Rainbow Trout Sport Fishery - Spawning magnitude/hatch success		1	
Lees Ferry Rainbow Trout Sport Fishery - Survival		1	
Rainbow Trout Maximum size		1	


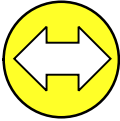









## RECREATIONAL EXPERIENCE

Resource Characteristics	Resource Characteristic	No. of specific measures	Resource Topic
Backpacking/day-use shore access		1	
Backpacking/day-use shore availability		1	
Backpacking/day-use usable campsite area		1	
Flatwater floating in Glen Canyon NRA		1	
Glen Canyon walk-in angling access and safety		2	
Glen Canyon walk-in angling trout abundance		1	
Glen Canyon walk-in angling trout condition		1	
Glen Canyon watercraft angling access and safety		2	
Glen Canyon watercraft angling trout abundance		1	
Glen Canyon watercraft angling trout condition		1	
Whitewater boat mooring (i.e., reduced beaching risk)		1	


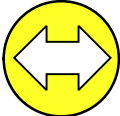










Resource Characteristics	Resource Characteristic	No. of specific measures	Resource Topic
Whitewater navigational risk		1	
Whitewater navigational risk Diamond down		1	
Whitewater river crowding (i.e., rapids, beaches)		2	
Whitewater river running experience (i.e., rapids)		1	
Whitewater time on river (i.e., less time on river leads to more off-river recreational time)		1	
Whitewater usable campsite area since 2002, critical reaches		1	
Whitewater usable campsite during HFE protocol non-critical reaches		1	
Whitewater usable campsite during HFE protocol, critical reaches		1	
Whitewater usable campsite since 2002, non-critical reaches		1	
Wilderness experience		2	

## RIPARIAN VEGETATION

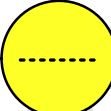
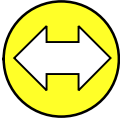




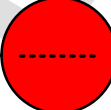
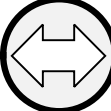
Resource Characteristics	Resource Characteristic	No. of specific measures	Resource Topic
Area of herbaceous marsh habitats		1	
Area of woody vegetation		1	
Community heterogeneity		1	
Functional group cover		1	
Native to non-native ratio		1	
Species richness		1	
Total vegetation cover		1	
Vegetation structure (vertical layering)		1	

The riparian vegetation team also states, “We know that vegetation, particularly woody vegetation, is increasing along the entire corridor. While there are many non-native species included in this expansion, much of the cover is composed of native species. Tamarix spp. is being defoliated by beetles along most of the corridor and is becoming progressively more widespread. Between 2012 and 2015, we recorded 230 different plant species in the annual riparian vegetation monitoring and expect to record new species each year. Currently, there is no consensus on whether or not increasing vegetation is good or bad or on what the preferred composition of the vegetation is (e.g., is Arrowweed good or bad?). Please see the spreadsheet for more detailed information on what is known, unknown, and what work is in progress.”



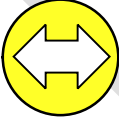
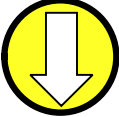

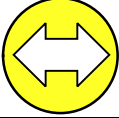

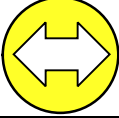
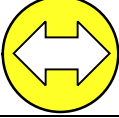
# SEDIMENT

Resource Characteristics	Resource Characteristic	No. of specific measures	Resource Topic
Amount of topographic change indicative of archaeological site stability and preservation potential		1	
Availability of sand for aeolian transport in support of archeological site preservation		1	
Sandbar volume during HFE protocol, Grand Canyon		1	
Sandbar volume during HFE protocol, Marble Canyon		1	
Sandbar volume since 2002, Grand Canyon		1	
Sandbar volume since 2002, Marble Canyon		1	
Supply of sand available for rebuilding sandbars, east central Grand Canyon		2	
Supply of sand available for rebuilding sandbars, eastern Grand Canyon		2	
Supply of sand available for rebuilding sandbars, lower Marble Canyon		2	
Supply of sand available for rebuilding sandbars, upper Marble Canyon		2	
Supply of sand available for rebuilding sandbars, west central Grand Canyon		2	

## WATER QUALITY

Resource Characteristics	Resource Characteristic	(No. of specific measures)	Resource Topic
GCD outflow concentrations of dissolved oxygen		1	
GCD outflow concentrations of metals (e.g., selenium, mercury, uranium, etc.)		1	
GCD outflow concentrations of nutrients (e.g., phosphorous, nitrogen)		1	
GCD outflow concentrations of phytoplankton, zooplankton, chlorophyll a		1	
GCD outflow salinity, TDS, specific conductance		1	
GCD outflow temperature		1	
GCD outflow turbidity/sediment load		1	

## ALL RESOURCES

Resource Topic	Status & Trend
Aquatic Food Base	
Archaeological & Cultural Resources	
Humpback Chub	
Hydropower & Energy	
Invasive Fish Species	
Rainbow Trout	
Recreational Experience	
Riparian Vegetation	
Sediment	
Water Quality	