GCDAMP FY2017 Knowledge Assessment Summary: Status and Trend

March 28, 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 |
| **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 |
| **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 |
| **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 |
| **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 |

## 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 aoelian 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** |  |