Grand Canyon Monitoring and Research Center

Preliminary Results of Low Steady Summer Flows Test

- Programs of study
  - Abiotic effects (temperature and velocity)
  - Primary and secondary productivity (aquatic and terrestrial)
  - Fish (Native & non-Native)
  - Socioeconomic effects
  - Physical Resources (Sediment storage and transport)
    - Lake Powell

Planning and Implementation

- Request by USBR in February 2000 for LSSF study plan.
- **Study Planning** - Development of hypotheses, proposed plan and budget Feb. - May 2000.
- Implementation of studies begun in mid-March 2000, some field work continuing through 2001.
- Majority of reports on LSSF due by 12/31/00.
- Contracting process ongoing. Reiterates need for "lead time" to plan subsequent tests.
- Trip permitting process greatly accelerated by NPS.

Preliminary Observations

- No analyzed data available at this time.
- Researchers are in the field.
- Findings to date are based on trip reports and field observations.
- Treat as preliminary at best!!!

Preliminary Observations

Little Colorado River

- Size distribution indicates possibility of late winter (1999) spawn or fish over-wintering in the LCR.
- Not a big spawn, expect average recruitment.
- Spawning that did occur in 2000 was early spring.
- Sampled 718 HBC in hoop-nets

Preliminary Observations

Steady 8,000cfs flows

- Some stranding of fish (RBT & FMS) in Lees Ferry reach.
- Lower water has resulted in larger available camping area.
- Steady flows are reducing amount of suspended sediment in water resulting in greater water clarity. May change when/if the monsoons begin.
- Shoreline and mainstem water temperatures have increased, particularly in low-no velocity areas.
- Measured water temperatures of 9 - 10° C at GCD with increases to 18 - 19° C at Diamond Creek.

Preliminary Observations

SPRING 31,000cfs spike

- The spring spike displaced ground-nesting birds in Lees Ferry and downstream. Spike may have been early enough so that a second hatch may have taken place.

- The spike redistributed sand to some extent. The staggered flows (17,000 - 31,000 -17,000 cfs) have created accessible camping beaches.

- Minor scouring of the aquatic foodbase in Lees Ferry.

- Field observations made on June 1 suggest healthy Cladophora and abundant Gammarus.

Preliminary Observations

FISH

- Rainbow trout are distributed throughout the river corridor, their condition varies within the corridor with bigger fish in the western canyon. Stripers in western Grand Canyon, carp at bottom of rapids.

- Brown trout are more site specific–mostly in the gorge between Unkar (RM 72) and Phantom Ranch (RM 90).

- Many small sized fish are using return current channel habitats.

- Not encountering many "small bodied" fish until Unkar rapids (RM 72). May be an effect of the 31,000 cfs displacing these fish.

Preliminary Observations

TERRESTRIAL RESOURCES

- Lower flows have resulted in big horn sheep crossing from Skull Cove over to Vasey's Paradise and potentially foraging in the spring area.

- KAS population abundance estimates within expected range.

- SWWF: 1 breeding pair observed at RM 50 but no successful reproduction was recorded. Individual males heard singing around RM 190.

Preliminary Observations

SOCIO-ECONOMIC RESOURCES

- Some boats have experienced trouble in some rapids.
- Warmer water has resulted in reduced shock (i.e., more swimming) associated with cold water & rafting.
- Trout guides did lose business during the 4 day spring spike. Fishing and business was good in June.
- GCMRC has experienced average damage to skegs and props. One motor lost due to extensive damage. Trips have been able to keep to planned schedules.

Long-term fish monitoring development

- Defining sampling universe for fish – developing sampling strategy for mainstem, LCR and other tributaries.
- AGFD with Carl Walters (UBC) using sampling effort to determine population estimates for rainbow and brown trout.
- SWCA, USFWS and AGFD with Carl Walters (UBC) using sampling effort to calibrate gear-types to get at abundance estimates for fish. Methods include:
  - **Depletion efforts in defined areas of river**
  - **Mark/recapture.**
- Increasing sampling throughout river
  - **150 electroshocking samples/trip**
  - **50 net sets/trip.**

- GCMRC developing common data sheets.
- GCMRC providing aerial photographs and moving to GPS located sites to reference sample sites and data sheets.
- GCMRC developing field datalogger for data entry.
- Data is being delivered to GCMRC central database for multiple user access.
- Examining fish stomachs to determine predation rates on all fish.
- Fall (December) training in stock assessment and for development of a common report format.
- Anticipate having a sampling protocol and draft plan developed for Aquatic PEP.

Late Summer Data Collection

- Lees Ferry Trout
- Aquatic food base: July - paired comparison of AGFD and NAU methods, continued NAU downstream data collection.
- Downstream fish
  - LCR in Oct. / Nov.
  - Mainstem in July, August, & September.
- Sediment transport model calibration—collaborative sediment research (NAU, USGS, USU).
- Velocity/ponding at LCR in Sept. @ 8K and 31K cfs.
- Continued safety and recreation studies.
- Over-flights in support of sediment studies.