

**Goal 10. Maintain or improve the quality of recreational experiences for users of the Colorado River ecosystem, within the framework of GCDAMP ecosystem goals.**

ID#	Perform some action	On some element	On some attribute	At some place	From the current level	To the target level	Comments
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MO 35: Maintain physical access and safety for visitors to the mainstem. ( recommend split into two parts, access and safety).							
35	Maintain	Visitor	Physical access	Mainstem	Information Need: Obtain from current GLCA and GRCA management plans: use 10 year average distributed by season of: user-days, # people, distribution.	Information Need: (subject to GLCA and GRCA river management plans in progress)	Need to define in glossary: user groups, non- user groups, physical access.
			Physical safety		Information Need: Use average of NPS Incident Reports from Myers et al for period 1988-92.	No more river-related deaths. Minimum flows 10k cfs. Max flows 35k cfs. BHHF flows OK with adequate warning time (Stewart et al 2000)	Integrate water quality/temperature issues with Goal 5. Prevent toxic spills from Page into river.
MO 36: Maintain or improve the quality of the recreational spectrum in Glen Canyon. (recommend split into two parts, GLCA and GRCA. Change wording to "recreational opportunity spectrum")							
36	Maintain or improve	Recreational opportunity spectrum	Quality and quantity	Glen Canyon	Information need: GLCA data: number and variety of recreational activities	GLCA Management Plan (in progress)	Trout (Goal 4) objectives need to be integrated here. Need to define in glossary: " recreation opportunity spectrum"
				Grand Canyon	Information need: GRCA data: number and variety of recreational activities	GRCA Management Plan (in progress - temporarily suspended)	Non-native fishing policy needs to be developed. Need to measure impact of science activities on ecosystem and visitor experience.

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MO 37: Maintain or increase camping beaches along the mainstem.  
 (Suggest deletion of "maintain" as both cannot be done at once. Suggest separating objectives into critical and non-critical reaches. Suggest eliminating MO 37c (number) as it is captured in MO 37d (distribution). Suggest adding MO 37C on advice of Riparian small group and concurrence of Recreational small group.

37A	Increase	Camping beaches in critical reaches	Size	Mainstem	Information Need: From Kaplinksi et al, in prep.	800 m2 (Stewart et al 2000)	
			Quality		Information Need	Information Need	Metric needs to be a "quality index". That includes parameters for: open sand area, <8 degrees slope, mooring, wind protection, ant colonies, degree of human impact (fire rings, trail erosion, litter, sanitation), vegetation encroachment, and shade. Also, need to assess and quantify the processes causing changes in beach quality and size (e.g. river flows, wind, tributary runoff, vegetation encroachment, human impact, other).
			Distribution		21 (+/- 5) beaches per critical reach above 10k cfs capable of accommodating 16-36 people (after Kearsley et al. 1999).	Minimum 21 (+/- 5) beaches per critical reach above max ROD flows (25k cfs) capable of accommodating 16-36 people (after Kearsley et al. 1999).	In critical reaches, the greatest concern is lack of sand. These numbers were confirmed through consultation with Grand Canyon River Guides, Inc.

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37B	Increase	Camping beaches in non-critical reaches	Size	Mainstem	Information Need: From Kaplin ski et al, in prep.	800 m2(Stewart et al 2000)	In non-critical reaches, the greatest concern is vegetation encroachment on existing campable sand. (Grand Canyon River Guides, Inc., personal comm.)
			Quality		Information Need	Information Need	See above
			Distribution		Information Need	Information Need	Suggest an average of one camping beach capable of accommodating 16-36 people every 2.0 river miles (Grand Canyon River Guides, Inc., personal comm.)
New MO 37C	Reduce	Camping beaches	Riparian vegetation below 90k cfs	Mainstem	Information Need; Use FY 2000 aerial data	A range using 1965 and 1984 aerial data	The primary area of concern is the NHWZ and lower beach areas.

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<p>MO38: Maintain or improve navigability of rapids in the mainstem.                  (It was suggested that this objective could be placed under MO35 on access and safety. It is retained, however, because it integrates with Goal 6 (sediment) and proposed MO for monitoring coarse sediment deposits from debris fans / rock falls and cobble bar substrate for the trout fishery (see Proposed MO x below) . The verb "maintain" was removed because two verbs confuse the MO.</p>							
38	Improve	Rapids	Navigability	Mainstem	Information Need:	Information Need :	Target level to be developed from NPS on-river Incident rates. See Myers et al. <sup>(2)</sup> See Incident rates/flow level during the late 1980's and Interim Flow period. Also use Haberline study for a reference.
<p>MO39: Maintain or enhance the Wilderness experience in Grand Canyon.                  (This was divided into three components per GRCA management policy. These elements are categorized to ensure that maintaining a wilderness physical, biological, and environmental realm through natural processes is the primary consideration.)</p>							
39A	Maintain or enhance	Biological / ecological component	Wilderness qualities	Grand Canyon	See current levels for all GCDAMP ecosystem goals	See target levels for all GCDAMP ecosystem goals	Metric to include all parameters for accomplishing GCDAMP ecosystem goals.
39B	Maintain or enhance	Experiential / sociological component	Wilderness qualities	Grand Canyon	Information Need: Need index that includes: group size, boat type, distribution of use (to be determined by CRMP revisions)	Information Need	Metric to include parameters for primitive character, unconfined experience, undeveloped natural and wild character, opportunities for solitude, sounds of nature, watchable wildlife, protection from wind/sun, and scenic beauty. See Stewart, Hall, Shelby, Haberline, etc.
39C	Maintain or enhance	Application of Minimum Requirement Analysis	Wilderness qualities	Grand Canyon	All river trips satisfy Minimum Requirement Analysis	All river trips satisfy Minimum Requirement Analysis	Minimum Requirement Analysis for all administrative trips is done on a case by case basis. Current and target levels are the same but may change during revision of the CRMP.

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There is a need for integration with these Management Objectives from other Goals.							
Goal 4 Trout. How does cobble bar substrate and distribution of sand in the Lees Ferry reach impact the downstream resources in Grand Canyon?							
Goal 5 Water. How does the need for preventing toxic spills into the river from Page interface with Goal 5 (Water)?							
Goal 6 Sediment. Assess debris flow / rock fall rates and occurrences for their effects on; rapid navigability (inGRCA), and aquatic habitat, (esp. cobble bars in GLCA).							
Goal 9 Riparian. There is a need in Goal 10 for a new MO that calls for the reduction of vegetation on sand bars below the 35k cfs stage (see above). We still need to know range of natural variability for marsh habitats and other nearshore habitats important as rearing grounds for native fish.							
Goal 13 Administration. There is a need to fairly evaluate the relative socio-economic impacts to various public sectors as outlined in MO46. Several Recreational MOs integrate with this socio-economic management objective.							

**Amended Minutes of the Recreation Small Group Meeting on  
Quantifying Management Objectives for the  
Adaptive Management Program Strategic Plan,  
USGS, Flagstaff, Oct. 30 2000**

Amendments from comment period through  
Nov. 23, 2000

Meeting participants:

Andre Potochnik (Grand Canyon River Guides-AMWG)  
Mark Grisham and Kristin Ross (Grand Canyon River Outfitters Assoc.)  
Kim Crumbo (Southwest Forest Alliance)  
Linda Jalbert (GRCA Recreational Resource Planner)  
Lisa Leap (NAU-NPS Archeology)  
Larry Stevens (Grand Canyon Wildlands Council)  
Rick Johnson (Southwest Rivers TWG)  
Matt Kaplinski (NAU Sediment Research)  
Wilbert Odem (Grand Canyon Private Boaters Assoc.)  
Jeff Behan (Recreation Consultant)  
Lynn Hamilton (Grand Canyon River Guides, Administrative Assistant)  
Kenton Grua (Grand Canyon River Guides, President)

**To all Recreation small group members:**

Thanks for your input. Our primary objective is to quantify the current and target levels for these Recreational Management Objectives. Following are the combined notes of Lynn Hamilton and Andre Potochnik from our meeting in raw form. The next step is to refine this statement with data not available during the meeting. Information Needs should be clearly identified. Please fill in the blanks, make corrections, add suggestions and references. Each of you has something to bring to some part of this project that we would very much like to know. This is a "straw man": get out your red pen and don't hold back. Send your comments to me via email by Nov. 17. I will compile and integrate them. This document still needs some work. Contribute where you can.

Thank you!

-Andre Potochnik  
Adaptive Management Work Group

**1) MO 35: MAINTAIN PHYSICAL ACCESS AND SAFETY FOR VISITORS TO THE MAINSTEM.**

Group consensus was to separate this MO into two parts: access and safety.

**A) MO 35a Access**

Metric: Access levels are subject to management priorities of GLCA and GRCA pending management plans. User days, # of people, and/or distribution levels depending on outcome of NPS Management Plans.

Current level: Long term averages should include 10 year average as base line rather than a single year. Could be use distributed by season. Need this data from Jalbert or Leap. 169,000 user days/year (GRCA only, Linda?).

Target level: subject to GLCA River Management Plan (recently initiated) and GRCA Colorado River Management Plan (ongoing).

Comments:

- Discussion ensues as to whether we should differentiate between Lees Ferry reach and downstream reach but, decision is to leave the MO area as the mainstem.
- define user groups and non-user groups in Glossary.
- long term averages should include historical data (e.g., a 10 year average as a base line rather than using last year.
- Recommend to NPS to do optimal redistribution of people. Need Glossary description of "recreation spectrum" and "recreation experience". Should include, at least: recreationists, shoreline and boater fishermen, whitewater people, day trips from the dam, science trips (Fritz has #'s on this).
- need definition of "physical access".

Information Needs:

- identify numbers of people for each user group.

## **B) MO 35b Safety.**

Metric:

Number of documented incidences/year (average). Safety data is available from Grand Canyon clinic. Navigability could include HBRS, 1991 (what's that?) for Lees Ferry reach (min. 5000 cfs for common size boat). A second metric could be number of gastrointestinal cases/year (average)

Current level:

Look at Myers et al. info from 1988-92 as a baseline. Possibly choose 1990 as an average year or 1992 (interim flow year).

Target level:

No more deaths or,

-minimum flows 10k cfs

-maximum flows 35k cfs

-BHBF flows: 35k to 90k cfs, with adequate ~~minimum one week~~ warning time for all recreationists-visitors and user groups.

Comments:

Refer this to small group for Goal 5 Water integration of ideas.

Information Needs:

Need information on temporal variation in other safety factors including: biting flies, Africanized bees, harvester ant concentrations, warning time for Beach Habitat Building Flows.

**2) MO 36 MAINTAIN OR IMPROVE THE QUALITY AND QUANTITY OF THE RECREATIONAL OPPORTUNITY SPECTRUM IN GLEN CANYON.**

a) Grand Canyon National Park (GRCA)

Metric:

Number and variety of recreational activities.

Current level:

GRCA data.

Target level:

GRCA Management Plan (~~recently initiated~~ temporarily suspended).

Comments:

~~We first need a Glossary definition of "recreation spectrum". Objectives of the Goal 4 for Trout need to be integrated here.~~

Information Needs:

GRCA input on management plans.

b) Glen Canyon National Recreation Area (GLCA)

Metric:

Number and variety of recreational activities.

Current level:

GLCA data.

Target level:

GLCA Management Plan (recently initiated).

Information Needs:

GLCA input on management plans.

Comments:

-We first need a Glossary definition of "recreation opportunity spectrum". This term was apparently used primarily by BLM and USFS, due to their emphasis on visitor use and resource extraction as opposed to an emphasis on resource protection (NPS).

-Objectives of the Goal 4 for Trout need to be integrated here. Trout fishing policy in GRCA needs to be addressed here (AZGF policy).

-Maintain or Improve suggests we need a target level for each.

-Need to integrate existing work to define "quality". Hall and Shelby, 2000 use visitor expectations, satisfaction levels, etc. Heberlein et al 1985 uses flow-related attributes; Stewart et al 2000 uses camping beach quality and flow-related attributes. Measures of crowding include: # camps / critical reach, double-camping, altering trip plans, # of contacts with other groups, vegetation cover / campable area per beach.

-need spectrum of guide services, low cost concessions trips, institutional use trips.

-need assessment of impacts of science activities to the ecosystem.

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Information Needs:

GRCA input on management plans.

GLCA input on management plans.

### **3) MO 37 MAINTAIN OR INCREASE CAMPING BEACHES ALONG THE MAINSTEM.**

#### **A) MO 37a Size**

Metric:

Square meters of campable beach as a function of stage height or above a given stage (e.g. 250,000 cfs (max. flows, GCDEIS Record of Decision, 1996).)

Current level:

Kearsley et al 1994 data.

Same as metric (all campable).—Qualifiers here are 1) range of size will depend upon reach—geomorphic criteria constraints may not allow for bigger beaches within certain reaches like that from (e.g. Lees Ferry to Bright Angel Ck.), 2) flow levels drive beach availability (e.g. Clear Creek and Zoroaster camps).

Target level:

Greater than or equal to Minimum 800 m<sup>2</sup> /camping beach (Stewart et. al.; 2000).

Comments:

Information Needs:

Need a range determined according to group size and reach.

#### **B) MO 37b Quality**

Metric:

Need "quality index" based on: open sand area, slope <8 degrees (Kearsley et al), mooring, shade, wind protection, ant colonies, degree of use (impact), vegetation encroachment, fire rings, trail erosion, litter.

Current level:

Stan Beus "litter surveys" in 1980's under GCES (need this reference).

Target level:

Comments:

Information Needs:

Need to develop a "quality index" based on GRCA, GLCA, Beus, Kearsley et al., Hall and Shelby 2000, and Stewart et. al. 2000 work (others?).

**C) MO 37c Number (suggest eliminating this as it is captured in Distribution)**

Metric:

Number / geomorphic-geomorphic reach.

Current level:

See Kearsley, et. al 1994, 1999, and Quartaroli.

Target level:

Information Need.

Comments: Discussion ensues on the average number of campable beaches per critical reach (approx. 20?). Furthermore, the number of beaches is closely tied to distribution for any considerations. M. Kaplinski will confirm a number based on previous sediment studies.

Information Needs:

Use 1965 air photos to provide total number of campable beaches at the close of the dam.

**D) MO 37d Distribution**

Metric:

Minimum # of campable beaches in both critical and non-critical camping reaches.

Current level:

During high use season and at 25k cfs:

About 20/critical reach at 8,000 cfs (needs to be refined). Information need (Kearsley, et. al 1994, 1999)

Target level:

Critical camping reaches: About 20/critical reach above 25,000 cfs stage height for each of four critical reaches (RM4.5-41.5, 75.5-114.5, 130.5-166.5, 215.5-246.0).

Non-critical camping reaches: Average one camp / two river miles.

Comments:

Distribution and size are most crucial to visitor experience. Need to continue annual air photos of entire river corridor, not just part of it. Don't lock these numbers in yet! More info needed from T. Melis and others on how to define reaches, as geomorphic reaches or critical/non-critical reaches?

Information Needs:

Use 1965 air photos to provide number of campable beaches/reach at the close of the dam.

**4) MO 38 MAINTAIN OR IMPROVE NAVIGABILITY OF RAPIDS IN THE MAINSTEM** (this MO could be a component of MO 35 on access and safety)

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Metric:

Possible metric: incident rates at certain flow levels as a measurable indicator. Possibly use information from the late 80's and early 90's (interim flow years as base line). Also, refer to Habeline study which examined different flow levels and attributes as related to the recreational experience.

Current level:

Would be determined by results of IN or could be late 80's and Interim Flow data.

Target level:

After determining the results of the IN, target level could be a percentage lower than the current level. IN determines rates and do comparative analysis at different flow levels.

Comments:

-Navigability has two aspects: flow level of river and scouring of new debris flow material from rapids.

-The dam can affect navigability of rapids as seen with the changes in Lava Falls and Crystal rapids after the BHBF in 1996. The qualifier here is that while major flow events such as the BHBF seem to have cleared out some rapids, general characteristics of rapids will change according to the flow level at any give time (as evidenced by the LSSF this summer). Look at emergency criteria for GCD. Can an experimental flow or an emergency flow be generated through the AMP if a rapid becomes un-runnable due to a natural event such as a tributary debris flow?

Information Needs: Compare accident rates at different flow levels. In the event of a major debris flow that blocks channel, does the Emergency Exception Criteria hold?

**5) MO 39 MAINTAIN OR ENHANCE THE WILDERNESS EXPERIENCE IN GRAND CANYON.**

This MO is broken into three components.

**a) MO 39a Biological and ecological integrity component.**

Metric: measured by attainment of other GCDAMP Ecosystem Goals.

Current level:

See current levels for all ecosystem management objectives.

Target level:

See target levels for all ecosystem management objectives.

Comments:

Information Needs:

**b) MO 39b Experiential/sociological component (NPS management plan revision process).**

Metric: Index that includes: group size, boat type, distribution of use (to be determined by CRMP revisions).

Current level:

Target level:

Comments:

These elements are categorized purposefully to ensure that maintaining a wilderness physical, biological, and environmental realm through natural processes is the primary consideration. For the experiential component, studies have shown that watchable wildlife and protection from wind/sun are primary concerns of river runners. Data may be attained from studies such as those by Bill Stewart, Troy Hall, Bo Shelby, Haberland, etc. All of these references should be included in the References section of the Strategic Plan.

Information Needs:

**c) MO 39c Application of Minimum Requirement Analysis.**

Metric:

Current level:

All river trips satisfy Minimum Requirement analysis.

Target level:

All river trips satisfy Minimum Requirement analysis.

**Comments:**

Minimum requirement analysis for all administrative trips done on a case by case basis. For this element, current and target levels are the same, but may change due to CRMP revisions.

**Information Needs:**