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User Study Contributes to Rio Grande Management

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A recently completed user study of the Rio Grande in Big Bend NP, undertaken in pursuit of a river use management plan, comprised four areas of investigation associated with river users:

- (1) a trend study of 16,500 river permits that documented river use from 1983 through 1992;
- (2) a survey of boaters who obtained private river use permits;
- (3) a survey of visitors who obtained overnight backcountry permits to camp at designated sites adjacent to the river, and

Raft in Boquillas Canyon, Big Bend NP.
This river section is also part of the Rio Grande Wild and Scenic River. El Pico, of the Sierra Del Carmens, is the prominent peak in the background.

- (4) a survey of patrons of commercial outfitters associated with float trips on the Rio Grande.

The forthcoming River Use Management Plan (RUMP) will be the first of its kind for the Rio Grande River in Big Bend NP. Big Bend's regulations pertaining to river operations heretofore have been contained in other

types of management plans. The RUMP is being developed as a response to specific questions regarding river management objectives and use procedures.

It also is being designed to provide standard operational information to patrol rangers, resource management, and visitor contact staff. In addition to the user study, an ongoing study regarding recreation and trespass-livestock impacts to the riparian ecosystem will provide research-based information to the developing RUMP.

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The Rio Grande is unusual among western rivers in that it can be accessed at several points along its course. Within Big Bend NP, a 118-mile stretch of the Rio Grande forms the international boundary with Mexico and cuts through three deep, steep-walled, limestone canyons: 8 miles in Santa Elena, 6 miles in Mariscal, and 32 miles in Boquillas. Two non-canyon river segments are: (1) between Santa Elena and Mariscal, referred to as the Rio Vista segment; and (2) between Mariscal and Boquillas, referred to as the San Vicente segment. Paved and unpaved roads provide several opportunities to access, launch-on, and take-out from these 5 segments of the river.

Results of the Trend Study

Of the 10 examined years, 1985 was the peak year for use. Approximately twice as many permits were issued in 1985 as for 1989, 1990, or 1991. A general drop in total number of permits since 1985 appears to be attributable to a drop in the number of *private* (compared to commercial) permits issued. (The proportion of private to commercial use permits in 1992 was about 50/50.)

Over the past 10 years, less than 4 percent of the permits issued were for more than one river segment. In other words, most users travel one canyon or segment at a time. The trend study indicates that the historic use patterns are different for each river segment. Santa Elena has been the most popular canyon to float, and is associated with four times the number of annual permits issued for any of the other four river segments.

In addition, day-use permits for Santa Elena increased dramatically in the mid-1980s and since have leveled off, whereas overnight permits for Santa Elena have decreased since the mid-1980s. Commercial use is primarily focused on Santa Elena Canyon. More than 85 percent of 1992 commercial permits were issued for Santa Elena, whereas private use in 1992 was spread evenly among the Santa Elena, Boquillas, and San Vicente segments. Private use levels in Mariscal Canyon, which is accessed primarily by unpaved or primitive roads, is about one-third the private use levels of the other river segments (most likely due to its remote access points).

Results of the Visitor Surveys

The social setting varied across the five river segments. Santa Elena Canyon was the segment associated with the most reported contacts with other rafters: 56 percent of Santa Elena private-permittee respondents indicated seeing more than 10 non-motor-

ized rafts. Boquillas was second in terms of contacts with other rafts, with 41 percent of private-permittees indicating they saw more than 10 rafts. Mariscal segment was associated with the least number of raft contacts; just 9 percent of private-permittees reported greater than 10 raft encounters.

The importance of solitude and being alone varied across respondents from the different river segments. Boquillas floaters were most likely to report solitude as extremely important; Santa Elena floaters were least likely to report solitude as extremely important.

The importance of fishing also varied across the river segments. Rio Vista and San Vicente permittees were more than twice as likely to fish as Mariscal floaters, and they were more than five times as likely to fish as either Boquillas or Santa Elena floaters.

The type of trip planning varied, with Rio Vista and San Vicente floaters indicating the least amount of advance planning for their trips and the most flexibility regarding the whereabouts of their river recreational experience.

Trespass livestock (mainly equine) has been a longstanding problem along the Rio Grande corridor of the park. The user study provided information as to the social impacts of trespass livestock. The apparentness of livestock impacts (e.g., trampling, grazing, and manure) varied across the river segments. Rio Vista and San Vicente permittees were least likely to perceive evidence of livestock; Boquillas permittees were most likely to note such evidence.

The perception of livestock impact varied by season, with fall floaters noting the most impact compared to either spring or summer floaters. These social impacts correspond with a seasonal "recovery" period noted in the study of impacts on biota. Summer rains renew the grasses and "sweep" clean the river corridor. In fall and winter, the corridor is less resilient, due to the absence of rains and subsequent renewed vegetative growth.

Management Recommendations

The primary recommendation from the user study is to maintain and explicitly develop the diversity of recreation opportunities afforded by the Rio Grande.

Maintaining diversity of recreation experiences entails recognizing the variety of river recreation opportunities associated with each segment of the river and establishing distinct management strategies for each segment. The results of research indicate that the recreation experience differs across the various river segments, that use levels have dif-

fered historically across the segments, and that users recognize differences across the river segments.

In the past, management operations implicitly have facilitated the provision of differing opportunities. Providing for the long-run continuation of such diversity is an important directive for Rio Grande management. Compared to other western rivers, recreational use of the Rio Grande in the park is not considered too high; however, recommendations are offered in preparation for changing (increasing) use levels in the future, should such occur. They are:

- Consider adopting a river permit process that allows for managerial control of private permittee use levels;
- Consider an advanced reservation system for river use permits;
- Insure that staff members issuing river use permits have field knowledge of the sites and conditions of the Rio Grande;
- Continue to work with Mexican authorities to direct the coordination of river management; and
- Insure the periodic clean-up of litter in the river corridor.

Development of the River Use Management Plan

A team has been developing the RUMP since June 1993 and the plan is scheduled for completion by fall 1994. Information from social and ecology-based research, commercial use licensees, private user groups, and Mexican authorities will contribute to its development. Following an in-house review, the first draft of the RUMP will be distributed for public comment by mid-1994. Workshops will be held to encourage public comments; information obtained from these workshops will be considered for incorporation into the plan.

For further information on the RUMP process contact Yarborough or Skiles, both at Big Bend NP, TX 79834; (915) 477-2251. For a copy of the user study technical report contact Stewart at College Station, TX 77843-2261.

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