

# Grand Canyon

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Grand Canyon National Park



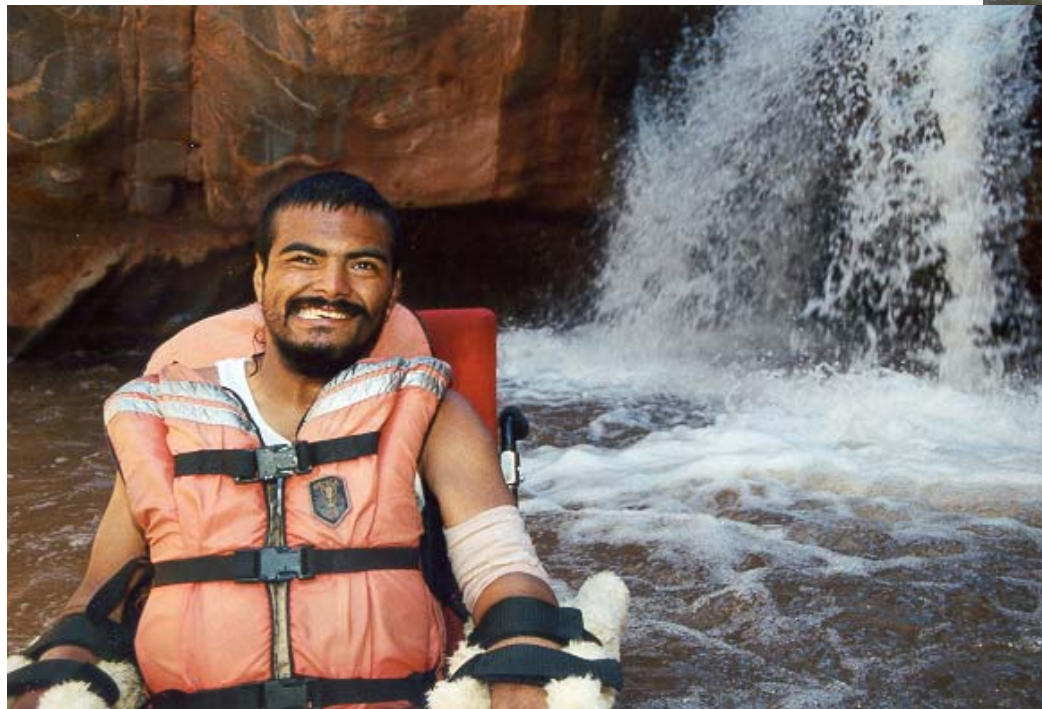
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## Implications of LSSF on Whitewater Boating Safety and other Recreational Attributes



**Linda Jalbert, Wilderness/Recreation Planner**







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## ***Recreation Studies: Colorado River in Grand Canyon National Park***

**Carrying Capacity (Physical & Social)**

**Visitor Use, Preferences & Trip Characteristics**

**Whitewater Boating Safety**

**Economics**



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**Impacts of Low flow rates on Recreational Rafting Traffic  
on the Colorado River in Grand Canyon National Park”**

***Catherine Roberts, Ph.D. and Joanna Bieri***

**“Economic Impacts of the LSSF to Whitewater Boaters  
and Anglers” *Evan Hjerpe***

**“The Effects of the LSSF on Whitewater Boating Safety  
in Grand Canyon National Park” *Linda Jalbert***



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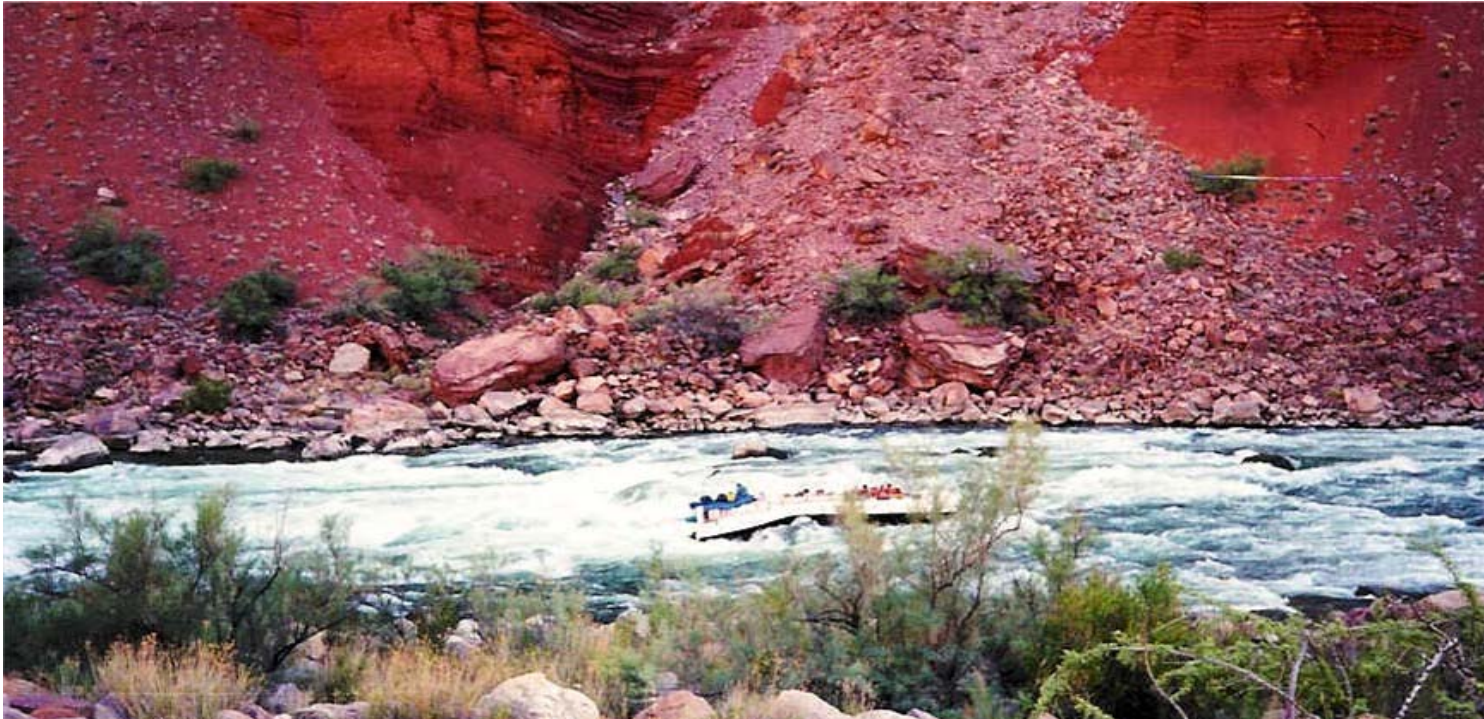
## ***Whitewater boating safety studies in GCNP:***

**GCES I** 1985 – 1987 (Low, Med, High, Flood 5,000 – 35,000 cfs)

**GCES II** 1991 – 1992 (Low 5,000 cfs)

**GCDAMP** 1996 BHBF (Flood @ 45,000 cfs)

2000 LSSF (Low @ 8,000 cfs)



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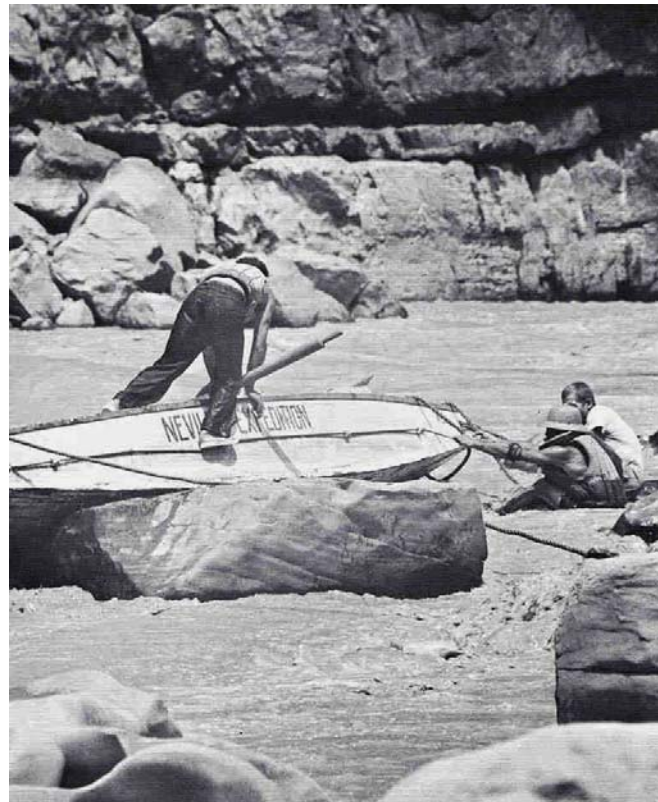
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## ***Objectives:***

- 1. Assess the effect of the LSSF on whitewater boating safety as measured by accident/incident rates***
- 2. Compare accident/incident rates at 8,000 cfs to rates at other flows***



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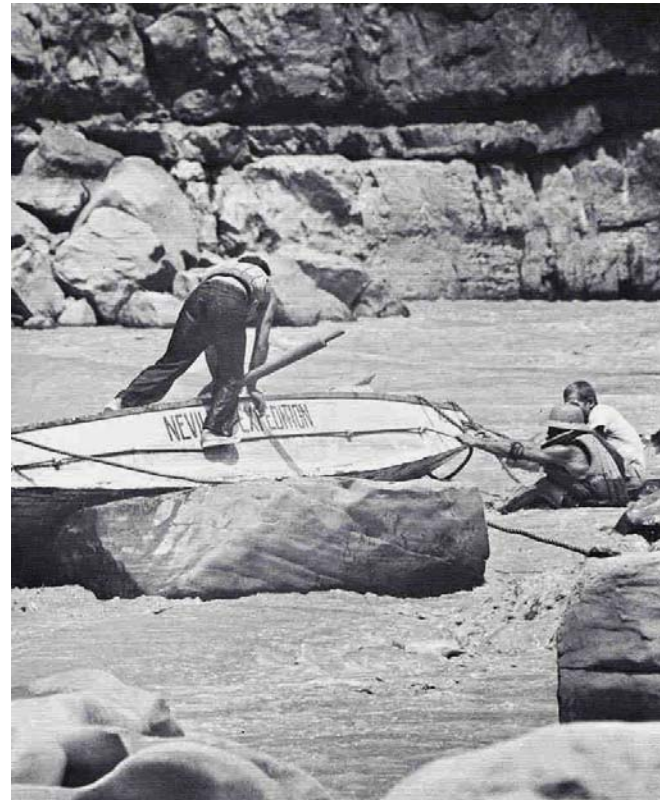
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## *Methods*

- 1. Observations at House Rock, Hance, Horn, Crystal, Dubendorff, Lava, 231 and 232**
- 2. Examine NPS records: River Trip Incident Reports and NPS Case Incident Reports**





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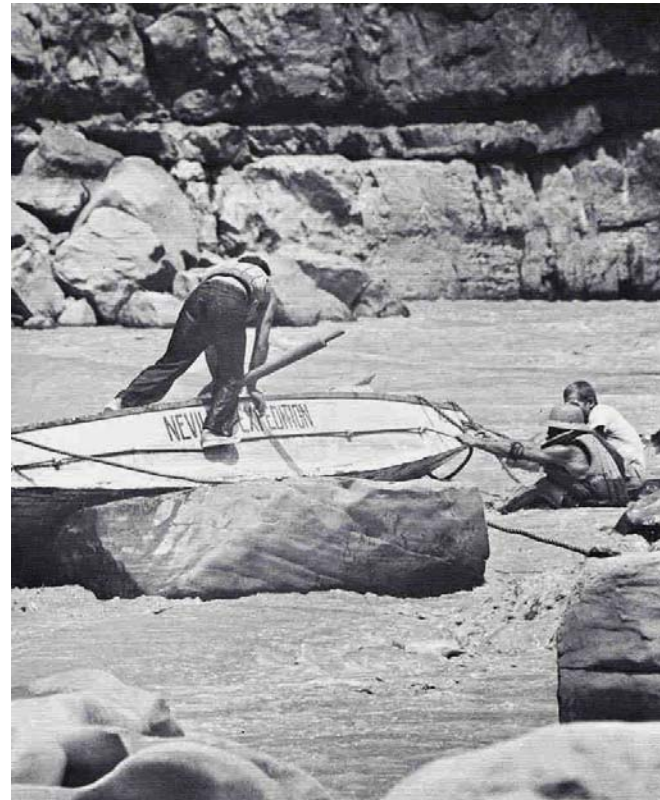
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## ***Results: Observed Boating Incidents***

- ***8 Rapids***
- ***314 Trips***
- ***1,025 Boats***

### ***Accident Variables:***

- ***Flips***
- ***Swims (w/out flip)***
- ***Hitting Rocks***
- ***Equipment Damage***
- ***Equipment Loss***
- ***Walking and/or Portaging***





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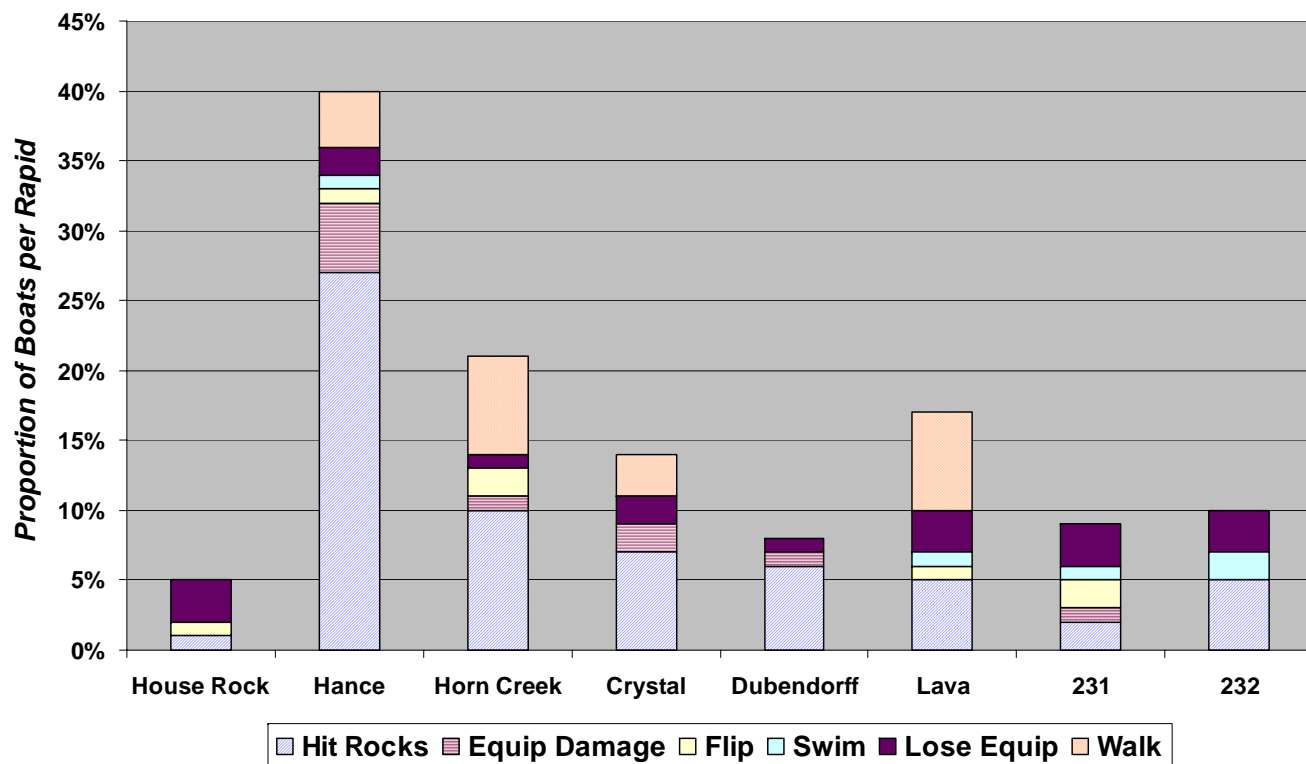
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## *Observed Rate of Incident by Rapid - All variables combined for all Boat Types*



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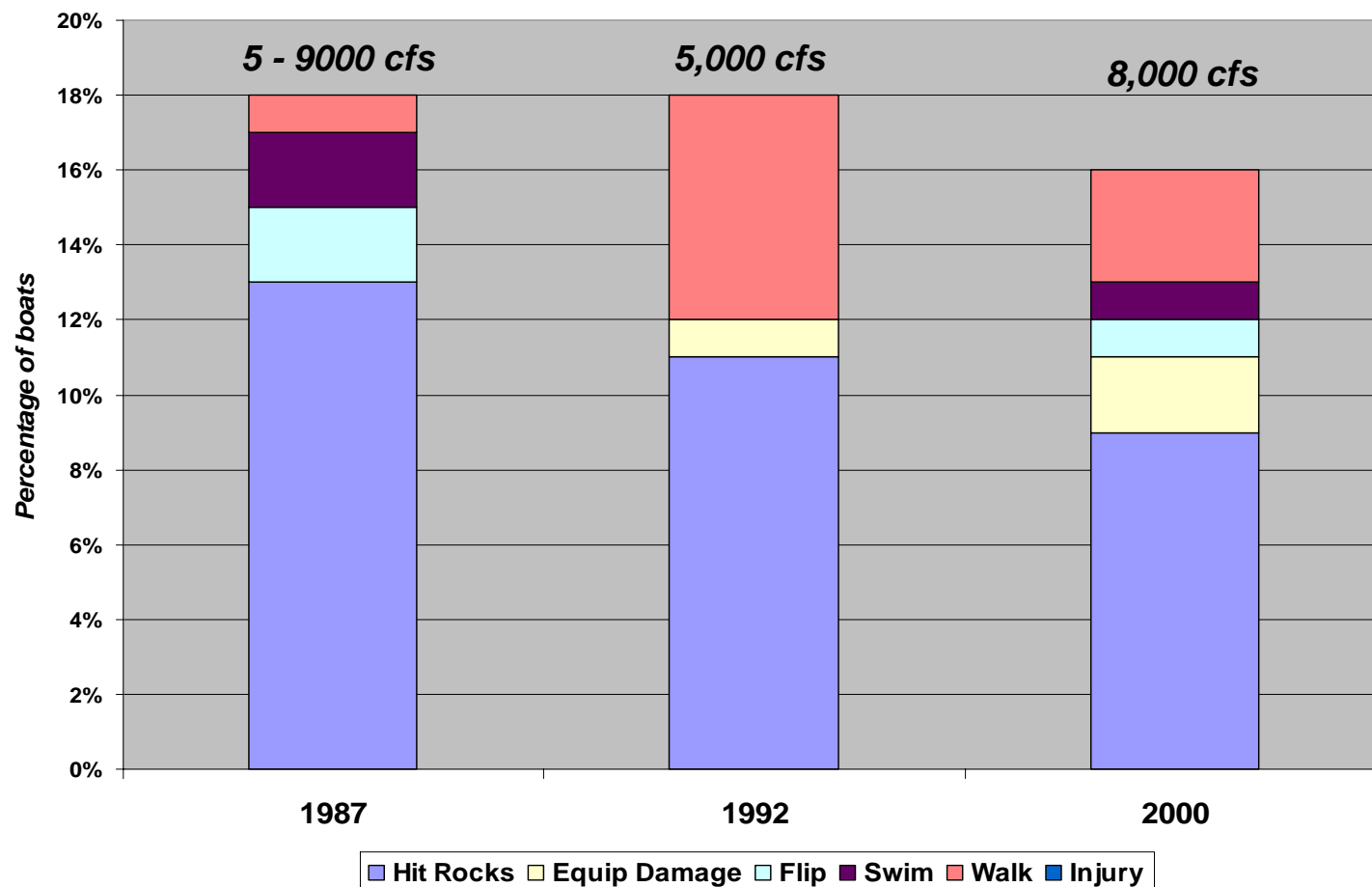
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## *Observed Incident Rates at Low Flows: 1987, 1992, and 2000*





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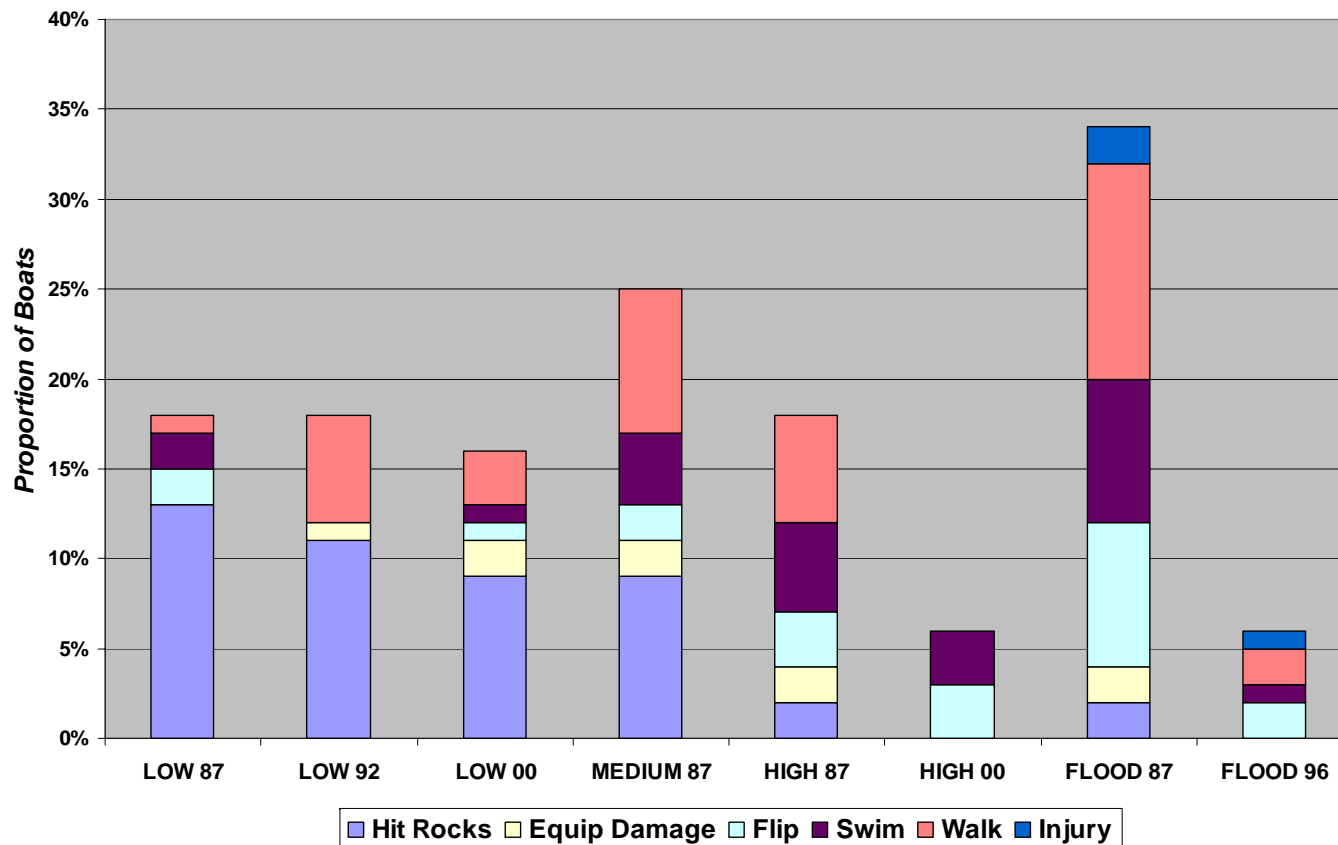
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## *Observed Incident Rates for all Study Flows: 1987, 1992, 1996, 2000*



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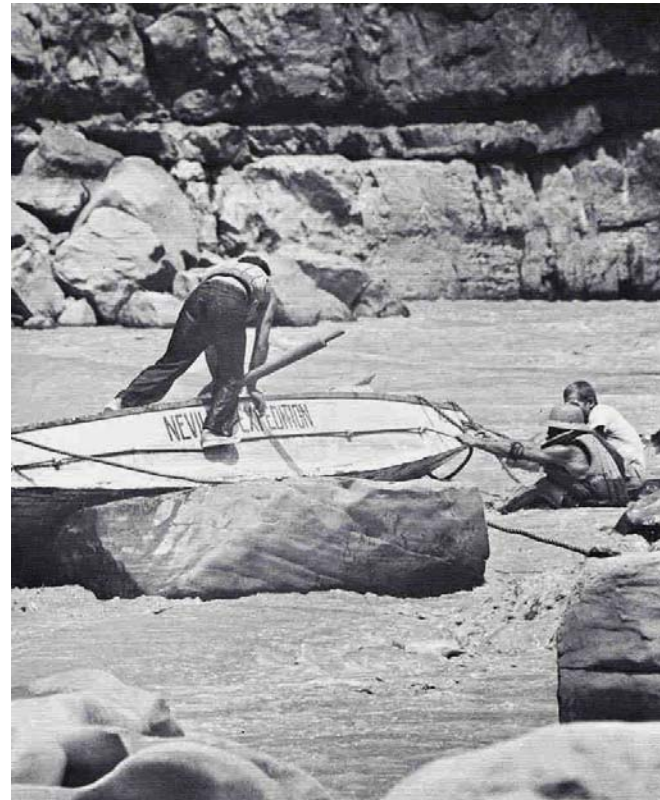


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## ***Results***

### ***Reported Incidents***

- ***NPS case files – filed following response to incident***
- ***River Incident Reports – typically filed after trip, especially w/ equipment damage***





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## ***REPORTED BOATING INCIDENTS: Percentage of Hours, percentage of incidents, and number of incidents by Flow Category: June - Sept 1999 and June - Sept 2000***

	Low (<10kcfs)	Medium (10-16kcfs)	High (16-31.5kcfs)	Flood (>31.5kcfs)
% hours				
1999	0%	5%	95%	0%
2000	96%	0%	4%	0%
% incidents				
1999	0%	37%	63%	0%
2000	100%	0%	0%	0%
# incidents				
1999	0	3	5	0
2000	18	0	0	0

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## ***Results: Reported Incidents – 1999 vs 2000***

***1999: 8 incidents → NPS operations***

***7 injuries***

***1 boat Grounding @ Crystal***

***2000: 18 incidents → NPS operations***

***9 injuries***

***7 Boat Groundings***

***4 Short Haul/Evac***

***3 Trips terminated***





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## ***Findings/Implications:***

***Compared to flows in previous years, the 8,000 cfs flow had the greatest impact on motorized rafts and visitors participating in those trips***

- risks for visitor & NPS w/ heli-ops
- costs to outfitters, visitors, NPS

## ***Higher rate of:***

***Hitting Rocks***

***Grounding***

***Equipment Damage***

***Injury***



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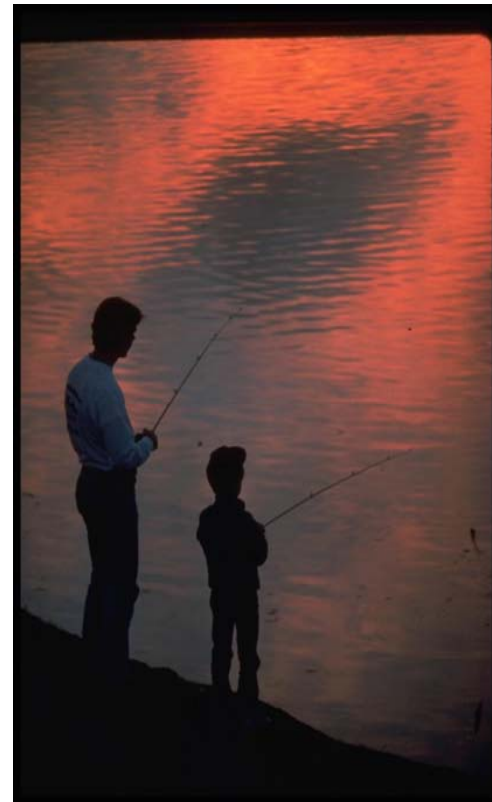


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## ***Findings:***

***Aggregated LSSF-related expenses incurred by rafting concessions totaled over over \$70,000.***

***Angling outfitters benefited slightly from improved fishing during low flows & anglers reported a loss of \$33,000 during spike flows.***





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## ***Findings:***

***No change in the number of activities/day***

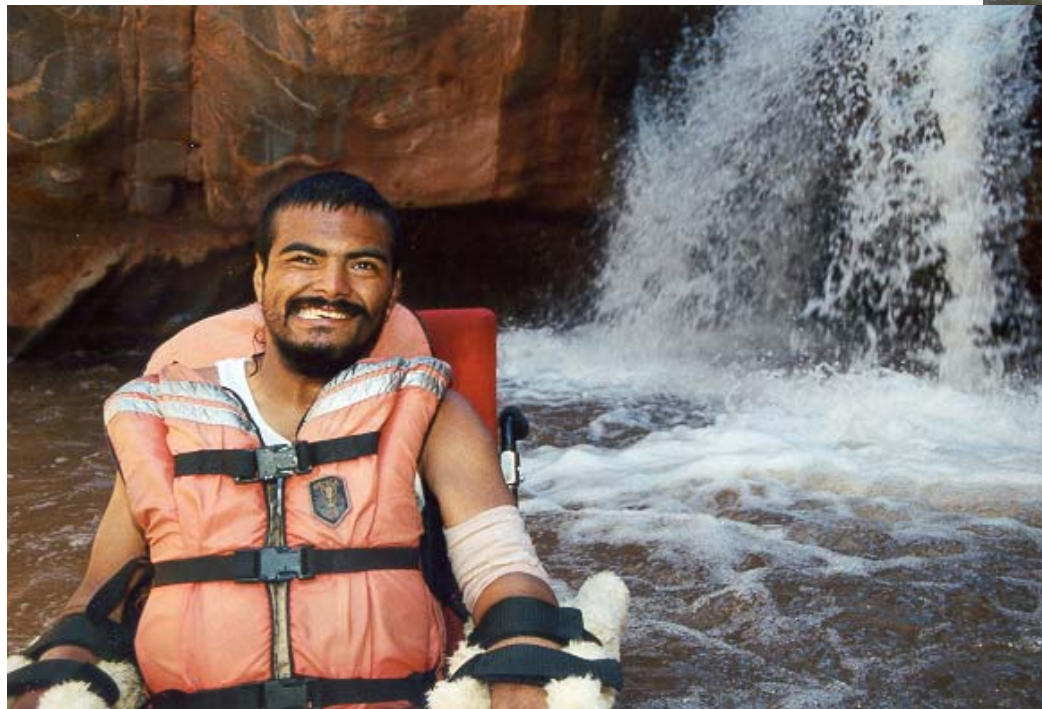
***Boats spent more time on water/slower speed***

***50% Reduction in time spent on activities***

***More camps to choose from at low flows***









***NOW WHAT?***

