Comprehensive Evaluation of Information/Education Programs to Reduce Recreation Impacts on the Lower Salmon River

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River(s):	Salmon River (Lower)
Research Topic(s):	Human waste, Public education techniques, Monitoring recreation use/impacts
Type of Publication:	Journal

1. Study Purpose

- To evaluate "an ongoing river management program to reduce impacts from human waste along a portion of the Lower Salmon River in Idaho" (p. 19)
- The river management program has three parts:
  - "educating recreationists about the problems posed by human waste in a pristine river corridor" (p. 19)
  - "informing users about methods for reducing these impacts" (p. 19)
  - "distributing equipment with which users can implement those methods" (p. 19)
- A field experiment was designed to examine "both the extent to which this management program actually reduced recreation impacts and the cost effectiveness of that program" (p. 20) with the following objectives:
  - Reduce number of human waste sightings by 10% in study area
  - Compare management efforts (1983 - 1985) to ascertain any improvement (i.e., reduction in campsite impacts) since implementation of the program
  - "Determine the cost-effectiveness of personnel and supplies used to implement the 1985 information/education program" (p. 21)

2. Findings

2.1. 1985 Human Waste Carryout Program

2.1.1. Visitors Contacted

- During the treatment period, 83 overnight boating parties were contacted and given the information/education brochure and carryout equipment
  - 28% commercial outfitter floaters (23 parties)
  - 1% commercial outfitter jetboat (1 party)

- 71% non-commercial floaters (59 parties)

- 35% (8 parties) of commercial outfitters avoided campsites due to human waste, 14% (8 parties) of non-commercial floaters avoided sites for same reason

2.1.2. Human waste reduction of 10%

- "The absolute number of human waste impacts…increased by 135%" (p. 24)
- When weighted by user days, there was also an increase in impacts, though not significant between control and treatment periods

2.2. Comparison of Campsite Ratings 1983-1985

- From 1985 control to treatment periods, two (14%) campsites improved, four (29%) stayed the same, and eight (57%) saw deteriorating conditions
- Comparing 1985 results to 1984 campsite ratings, two (14%) improved, five (36%) stayed the same, and seven (50%) deteriorated
- Comparing 1985 results to 1983 campsite ratings, four (29%) improved, six (43%) stayed same, and four (28%) deteriorated

2.3. Cost-Effectiveness Ratio

- Ratio was calculated by dividing effectiveness/importance rating by cost
- The most cost-effective option was information/education program only (no maintenance), which was 10% better than maintenance only, and 72% better than combining maintenance and information/education

3. Key Discussion Points

- Information/education program (without maintenance) was considered the cheapest management scenario, but also the least effective
- Results of the experiment (no reductions in impacts from control to treatment) support the manager's low effectiveness ratings, as did the campsite rating comparison from 1983-1985
- "Visitors may be less concerned than managers about management problems" (p. 26)
- Maintenance occurring on the river may be taking care of enough of the impacts that boaters "remain unpersuaded that human waste poses a serious problem" (p. 26) despite the education efforts
- Changing behaviors is difficult requiring continuing efforts to examine other methods of instituting change

4. Management Recommendations/Future Research Needs

- Further action should be taken to convince river users that human waste is indeed problem (e.g., "placing illustrated displays at launch sites and education articles in newspapers" (p. 26))

- "Better monitoring of boater's actual behavior is needed" (p. (26)
- More methods for reducing impacts need to be considered, for example year round contact with boaters through "special user group meetings" (p. 27) could reinforce the message communicated during the summer
- Future research should include a post-trip survey to test how much boaters learned from the brochure and informational contacts to determine if the intended management message was getting across
- "Future research is needed to determine if boaters using the corridor perceive [human waste] impacts as problems and, if not, why not" (p. 26)

5. Research Design

Quasi-experimental design

5.1. Study Area

Lower Salmon River, Idaho from Hammer Creek to the Snake River

5.2. Data Collection

5.2.1. Experiment

- Two distinct boating seasons occur during the summers on the Lower Salmon River, an early and late summer boating period. Boater characteristics were considered the same for these two periods based on past use information. These periods were used for control and treatment, with the treatment comprising distribution of human waste information/education brochures and equipment.
  - Control Period – July 2 to July 23, 1985 – no information/education or equipment distributed
  - Treatment Period – July 24 to August 13, 1985 – information/education brochure and equipment distributed to boating parties

5.2.2. Impact Measurement

- Same procedures for measuring campsite impacts and human waste were used as those in 1984
- Unobtrusive methods were used to collect data
- "Physical trace data were collected by systematically surveying each test beach and recording sightings of toilet paper, latrines and improperly disposed of waste" (p. 22)
- Campsite ratings were also included in documentation

5.2.3. Cost-Effectiveness Analysis

Three alternative management approaches were analyzed

5.3. Study Population

All overnight boating parties launching at Hammer Creek Recreation Area and weekend overnight boating parties launching at Pine Bar Recreation Area during the 1985 summer

5.4. Sample Size

15 campsites were surveyed twice during control period and twice during treatment period (10-day intervals)

5.5. List of Variables and Operational Definitions

5.5.1. Campsite condition

Each campsite was given an overall condition rating on a scale of "1 (signifying no noticeable human waste impact) to 4 (indicating a high occurrence of toilet paper and latrines on the beach)" (p. 22)

5.5.2. Physical traces

These data were collected "by systematically surveying each test beach and recording sightings of toilet paper, latrines and improperly disposed of waste" (p. 22)

5.5.3. Cost-Effectiveness

- River manager analyzed three different options to managing human waste on the Lower Salmon River
  - Maintenance only (approximate cost=$1600)
  - Information/education program only (approximate cost=$1270)
  - Combination maintenance and education program (approximate cost=$2870)
- A cost-effectiveness ratio was calculated by dividing an overall subjective effectiveness rating (combined rating of option meeting several management objectives) by the actual cost of that option
- Subjective rating consisted of the following:
  - Seven-point rating scale from 0 (Never) to 6 (Always) that indicates how well the option achieves that particular management objective
  - Management objectives included the protection of wild and scenic values, campsite sanitation, water quality, protection of cultural resources, reduction of wildfire hazards, agency image and relations, and minimum regulation policy
- An importance ranking was also calculated to give the appropriate weight to the effectiveness rating for each management objective
  - Rank was from 1 (Least Important) to 5 (Most Important)

6. Theories Used in Study

N/A

7. Cautions or Limitations

- During low water flow times, boaters more commonly put-in at a launch point that was not included in the study – "the majority of impacts and beaches with high-impact ratings were observed downstream from that put-in site" (p. 27). Future studies should include this put-in location.
- Although the early and late season boaters were deemed similar enough for this study, there may be differences in the two populations of boaters that could have affected results of the study. Future studies should consider looking into possible differences.