

# **RECREATION IN THE LOCH LOMOND AREA: ECOLOGICAL AND PERCEPTUAL DIMENSIONS**

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## **AIMS OF MY RESEARCH**

- To study recreation in the Loch Lomond area, focussing on the water and the associated lake margin environment.
- To determine the more important factor to a Loch Lomond visitor, namely: perception and social dimensions of recreation (crowding, noise, visitor conflict) or the actual environmental conditions of a site.
- To investigate whether visitor perception of environmental damage differs from the actual levels of environmental damage, again focussing on the water and associated lake margin environment.
- To integrate perceptual and ecological findings in order to recommend future resource and recreation management options.

## **RESEARCH METHODS**

- Interviews (semi-structured) with managers from LLTNPA and the Forestry Commission. Also jet-skiers, local businesses, sailors and anglers.
- Questionnaire survey.
- Systematic observation (traffic counts and visitor damage survey).
- Documentary evidence (e.g. newspapers).
- Ecological surveys.

## **MAIN FINDINGS: QUESTIONNAIRES**

### **Descriptive Statistics**

- 70% of the 548 respondents were in the 25 to 54 years age bracket.
- 52% of respondents female, 48% male.
- Mean household income: £37,000.
- 92% arrived by car.
- 61% day-trippers, 39% tourists.
- Mean group size = 3.02
- Mean number of trips made in the previous 12 months = 6 (max. 30 trips).
- 96% said they would return to LLTNP in the future.
- 51% said activities undertaken by other people typically reduced their enjoyment of a day out on Loch Lomond.
- 63% believed jet-skis caused noise pollution; only 7% believed they caused water pollution.
- 81% said noise pollution affected the enjoyment of their visit.
- 80% said crowding affected the enjoyment of their visit.
- 79% said that environmental damage affected the enjoyment of their visit.

### **Travel Cost Model (TCM)**

- TCMs try to infer the value people place on environmental goods from their actual behaviour.
- Set up in order to predict recreation demand for visits to Loch Lomond and to estimate consumer surplus (CS) per trip, where CS is the difference between the most a visitor would pay (per trip) and what they actually pay.
- Three issues addressed: noise, crowding and environmental damage.
- Only noise is statistically significant (negative coefficient).
  - As noise level increases, the number of visits made decreases.
- A reduction in current noise level to no or very little jet-ski related noise would increase predicted visits to Loch Lomond by 4.2%.
- A ‘typical’ day at Loch Lomond is valued at £20.53, using 95% confidence level as much as £24.72 per person per trip could be gained by the Park Authority.

### **Contingent Valuation Model (CVM)**

- Asks a respondents about their willingness to pay for the option to use environmental resources or for a quality change to these resources. It is therefore based on people’s intentions (hypothetical).
- Aim is to determine the factors that influence a visitor’s willingness-to-pay for environmental improvements and to estimate this willingness to pay (WTP).
- Applicable only to environmental damage, did not apply CVM to either crowding or noise levels.
- Environmental damage included protection of ground vegetation and trees from, for example, fire circles (pictured below).



### **WTP question in visitor survey**

“Imagine that the NPA decided to undertake some environmental improvements at this site. These environmental improvements would consist of protection of ground vegetation and trees, the prevention of shore erosion, and a reduction in the level of water pollution. Imagine that the only way to pay for this programme was to introduce an on-site parking fee. The parking fee options are shown on this card. Thinking about how

much extra pleasure you would get from such environmental improvements, would you be willing to pay such a fee to visit the site?"

- If yes, respondent asked to state the most they would be WTP. If no asked why not?
- Income, sex and perception of environmental damage all significantly influence visitor WTP for improved environmental conditions (at  $P \geq 0.95$  or better).
- The most the 'average' visitor would be WTP to fund environmental improvements is £1.76 (minimum WTP is 50p, maximum is £5).
- 81.2% of visitors would be WTP a car parking fee, 18.8% would not be willing to pay.



Milarrochy Bay

### **Ecological Surveys**

- 6 different groups of field and shore plant communities were identified.
  - Geographical division between field and shore and more generally north and south basin of Loch Lomond.
- 5 main community types for the aquatics.
  - Invasive / Non-invasive division.
- Field and shore plants influenced by: exposure, shade, grazing, recreation pressure and visitor damage level.
- Lomond aquatics influenced by: exposure and recreation pressure.
- Recreation pressure appears to be an important influence on the vegetation communities of Loch Lomond.

### **Traffic Counts**

Aim: to establish a physical carrying capacity of each site and to determine whether this is being met or exceeded.

- Milarrochy Bay: exceeded during 1 of 6 survey days.
- Sallochy: exceeded on 1 of 6 days.
- Rowardennan: exceeded on 2 of 6 days.
- Firkin: physical carrying capacity was not met nor exceeded on any of 6 survey days.



## Interviews with management

Main themes from interviews:

- The need for management frameworks;
- Integrated planning and management;
- Information/Education;
- Visitor behaviour and conflict (including anti-social behaviour);
- Park management actions;
- Sustainability;
- Resource impacts and environmental damage;
- And conflict between the various land-uses of the National Park, including conservation and recreation.

## Interviews for 'jet-ski' (PWC) case study

32 interviews as part of my 'jet-ski' case study (each around 30 minutes duration).

- The numbers using PWC on Loch Lomond have significantly increased during the 1989 to 2001 period; this growth continues.
- PWC has the potential to cause environmental degradation, however this impact is not a serious problem at Loch Lomond at present.



- Perceived impacts are a greater problem to the typical Loch Lomond visitor than the actual environmental impacts of jet-skis.
- There is an extreme division between jet-skiers and non jet-skiers. While the jet-skiers themselves were more concerned with fun and enjoyment, non jet-skiers (sailors and anglers) were affected by noise, safety and environmental impact.
- Conflict appears to be asymmetrical (i.e. one-sided), from non jet-skiers. Jet-skiers themselves reported that they were not disturbed by the activities of others.

## Personal Watercraft ('Jet-Ski') At Milarrochy Bay, Loch Lomond

### Visitor Damage Survey

- Total shoreline included the total shoreline of the loch plus shores of all major islands (counted 10).
- 44% of shore zone experiences some level of visitor impact, with **just over 9% experiencing very high visitor impact levels.**

## Policy Implications

- The TCM estimated a CS per trip at £20.53 under current conditions.
- Using 95% confidence level, as much as £24.72 per person per trip could be gained by the Park Authority.
- Visitors would be WTP an additional £1.76 to fund environmental improvements.
- Figures suggest that there is an opportunity for the NPA to capture revenue and help conserve the natural environment through various environmental and noise reducing policies.
- In particular the LLTNPA should address the conflict caused by PWC noise. Possible management actions include: pricing (charging users to use the loch), zoning watercraft, banning PWC and education/information. It is argued that pricing and education/information are the best mechanisms by which to deal with this conflict.

## Conclusions

- Econometric models: 3 issues of noise, crowding and environmental damage.
- Conflict exists (one-sided) between jet-skiers and other recreationalists.
- Ecological surveys indicate that recreation pressure significantly affects the presence/absence of plant communities.
- Visitor damage survey illustrates that just over 9% of Loch experiences high visitor impact levels ('real' environmental damage).
- Research provides information on the social and ecological impacts of recreation in the Loch Lomond area.
- An overall conclusion to the project is yet to be reached, however it appears that a sustainable approach to recreation management, one that encompasses the perceptual and ecological dimensions of recreation, is an important way to maintain the beauty and enjoyment of Loch Lomond for future generations.



Drumkinnon Bay