

Involving recreational users in environmental management: invasive aquatic plants in lakes on France's Atlantic coast

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Introduction

Biological invasion is a major threat to biodiversity globally. In the scientific literature, an 'invasive' species is one that is not indigenous to a given ecosystem, and whose introduction is likely to cause harm to ecosystems and (potentially) human health and they can be introduced into new environments intentionally and/or unintentionally. Not all non-indigenous species become 'invasive'. Some fail to thrive in their new environment and die off naturally. Others survive, but without destroying or replacing native species. Invasive aquatic plants (i.e. weeds) can severely impact lake ecosystems and related human uses, notably recreation and nature based tourism ([Villamagna et Murphy 2010](#)). Many activities are affected, such as watersports, fishing and hunting. Dealing with such plant infestations is complex. Often, preventing infestation in the first place is more cost efficient than trying to remove plants once established although views on this vary among stakeholders. In addition, the results of technical intervention are often disappointing.

In this context, recreational users play a mixed role. For instance, anglers and owners of pleasure boats may contribute to the spread of invasives as the plants can become stuck on propellers. However, these same users can also help to reduce invasions by monitoring conditions in lakes, removing exotic plants from lakes, and/or taking particular precautions to limit their spread. While the advantages of involving users in the management of recreation and/or conservation of natural sites is increasingly recognized ([Granek, Madin et al. 2008](#), [Newsome, Stender et al. 2016](#)), it has yet to be examined in the context of complex environmental issues such as the spread of weeds in lakes.

Methods

This presentation is based on an ongoing multidisciplinary research project (AquaVIT), combining scientists from the fields of economics, geography, sociology and ecology. It focuses on the ecological and socio-economic impacts of four macrophytes, i.e. *Egeria densa*, *Lagarasiphon major*, *Ludwigia*, *Myriophyllum aquaticum*, within freshwater Atlantic lakes in France. The lakes are used for a variety of recreational activities, including sailing, wind and kite surfing, fishing, hunting, scuba diving, swimming, or simply walking. These activities are affected by the spread of the four weeds to different degrees. In some areas, the weeds have been present for over forty years, while in others, they are relative newcomers. A number of techniques have been tried to remove these weed since the 1980's, sometimes involving end users.

The social scientists within the project share two objectives among others: i) describing individuals' activities and perceptions (in particular those related to the weeds) ii)

understanding how recreational users are (or are not) associated into the current management processes.

Our preliminary results are based on

- an extended bibliography (scientific, technical, internet websites) on the social issues associated with the weeds,
- a socio-historical analysis of the management of the lakes,
- participation in various local meetings and councils (including participation in cleaning operations)
- a set of semi-structured interviews with recreational users (lakeshore homeowners, anglers, hunters, boat owners) and managers (natural reserves, public administration, cities and local public organization, etc).

Results and discussion

Our preliminary analysis identified numerous types of organization, with equally varied levels of public involvement. In some cases, lake users themselves (i.e. home owners, members of fishing clubs, etc.) decide to clean a particular area using a particular technique. In other cases, work takes place based on a traditional “top-down” system of action, with little (if any) involvement of the public. We identified a number of factors which may impact on the ability of recreational users to take part in conservation programs.

Some factors are linked to institutional issues, such as property rights and environmental regulations, responsibilities (who is in charge ? who pays?) and, to a certain extent, management goals, i.e. total eradication, occasional cleaning. Physical attributes (e.g. plants, hydrology, topography) also play an important role in selecting the methods to be employed.

Some other factors appear to be more subjective, as they derive from the representations and attitudes of recreational users toward invasive plants. The attitudes among interviewees varied greatly. For example, while *Egeria densa* and *Lagarasiphon major* are frequently seen as a “pest” by many stakeholders, many anglers think the plants may play a positive role in ensuring an abundant supply of fish. This belief would appear to be based on personal observations or ‘alternative’ sources of information (personal networks) rather than “official” ones (i.e. environmental norms, scientific sources). Broadly speaking, it is possible to connect such categorization of plants with the overall perception of the natural environment by individuals. Interestingly, the range of representations between users does not fit into standard categories. For instance some hunting associations, which are usually opposed to environmental organizations, now exhibit very ambitious ecological goals. At the same time, other users (i.e. practitioners of nature-based sports), who are frequently presented as “environmental” citizens, pay little or no attention to the problems.

Another group of factors seems to depend heavily on place-based values. In many cases, the implications of users reflect a strong attachment to places, which is built up over time, based on individual (i.e. personal experiences) and social (relationships) considerations. While this kind of attachment would appear to be of great interest when measuring user involvement, (e.g. people volunteering regularly), it is generally limited to a very small area, and is difficult to reproduce. This is critical when considering the potential replication of previous policy models.

While results at first appear promising, the above mentioned assumptions need to be confirmed with additional research including

- An additional quantitative survey to improve the representativeness of our sample, focusing particularly on “floaters” – i.e. individuals who are present in and around a lake but who are not involved with local associations and user groups. Among other things, the analysis we have already carried out allows us to relativize the importance of individual decision making when faced with social norms and collective organizations.
- Interviews with stakeholders in charge of the invasive “problem” (managers, policy makers). Our study focused mainly on whether or not users are willing to become involved in issues relating to invasive plants, but it is important to also focus on how managers are willing to work with end users. In this regards, our preliminary works suggest that new barriers have to be overcome too!

References

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