

## Social aspects associated with the continual spread of *Sagittaria platyphylla*

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**Summary** *Sagittaria* is an introduced, aquatic plant which has become widely dispersed in the irrigation systems and natural waterways of northern Victoria and southern New South Wales. Control methods and biology are well documented; however, *sagittaria* continues to spread, causing greater water supply and environmental problems. No previous studies have been undertaken into the social aspects of the weed control efforts. In light of this, the aim of this research project was to identify the social aspects associated with the continual spread of *sagittaria*, exploring issues which cross institutional boundaries. This research project uncovered a range of social factors associated with the continual spread of *sagittaria* including the diversity amongst stakeholders in terms of awareness of *sagittaria*, involvement in control efforts, factors impacting on involvement, attitude and commitment to the Taskforce and participation in cooperative approaches. However, given the complexity of these unresolved issues, further in-depth investigative research is warranted.

**Keywords** *Sagittaria*, arrowhead, multi-agency, social.

### INTRODUCTION

*Sagittaria* (*Sagittaria platyphylla* (Engelm.) J.G.Sm.) is an aquatic plant introduced into Australia as an ornamental from North America (Rataj 1972). It has since become widely dispersed in the irrigation infrastructure and many natural waterways of northern Victoria and southern New South Wales. From an irrigation perspective, *sagittaria* reduces or completely restricts water flow and hence the effectiveness of the water delivery system. In natural waterways, *sagittaria* competes with native water plants and has the potential to replace natural communities. Dense infestations can substantially alter the flow regime of many tributary streams, dramatically threatening biodiversity and stream health (APS 2004).

*Sagittaria* (known as arrowhead in Victoria) is a problem across a large geographic area with many stakeholders affected. These stakeholders include government and non-government agencies and individual landowners. Numerous efforts have been made by stakeholders to prevent the spread of *sagittaria*. A Taskforce was established in 2002 to encourage cross-agency involvement in *sagittaria* management with

one of its tasks being the development of a strategic plan. A range of literature has been written describing the problem, yet *sagittaria* continues to spread, causing further environmental, economic and water supply problems.

Effort to coordinate natural resource management programs among federal and state governments and the community in Australia is not new. Similar to *sagittaria*, many natural resource management issues ignore jurisdictional, land tenure and political boundaries. There are a range of examples available of natural resource management issues that have been successfully resolved or managed by utilising a multi-stakeholder, inter- and cross-agency collaborative approach.

Literature has been written documenting technical aspects of *sagittaria* including control methods and weed biology. However, no previous studies have been undertaken into the social aspects of the weed control efforts. In light of this, the aim of this research project was to identify the social aspects associated with the continual spread of *sagittaria*, exploring issues which cross institutional boundaries.

### MATERIALS AND METHODS

**Developing a methodology** Given the situations presented by Sarantakos (1998) in which a qualitative approach should be used, an exploratory qualitative methodology was considered most appropriate for this study. There was also a need to capture the full range of ideas, comments and thoughts of the interviewees. Consequently, themes would emerge of the most important issues as seen from the interviewees perspective, not that of the interviewer.

**Sampling procedure** Initially, the available literature was collected and reviewed, *sagittaria* was viewed in the field in various irrigation systems and a *sagittaria* conference was attended and many contacts were made. After this, informal conversations were held with representatives from various stakeholders. From this initial exploratory study and conference participation, key informants were identified who it was thought may contribute to this study. Members of the already-established Taskforce were also targeted. Initially, only the key informants were chosen for interview. However, at the completion of each of these (and subsequent) interviews, the interviewee was

asked to recommend any other persons they felt would be valuable to the research and who might be willing to participate. They were also asked to identify any individuals who they felt should not be interviewed, to ensure the full range of potential respondents was captured. When potential interviewees were revealed, each was approached and, if willing, interviewed. This process continued until the topic became saturated, that is, no more substantial information was obtained through additional respondents. This sampling procedure is not unlike those described by Sarantakos (1998) as purposive and snowball sampling.

**Method of data collection: semi-structured interviewing** Semi-structured interviews were used to collect data pertaining to the possible social aspects associated with the continual spread of sagittaria. The open-ended questions used in semi-structured interviews define the topic under investigation but provide opportunity to discuss some topics in more detail (Hancock 2002).

**Research participants** Participants in this research project who were interviewed included representatives from a range of government and non-government organisations and agencies. Those from New South Wales included Department of Primary Industries, Department of Environment and Climate Change, Department of Lands, Catchment Management Authorities and New South Wales Forests. Local control authorities who participated included Central Murray County Council, Wakool Shire, Jerilderie Shire and Greater Hume Shire Council. Representatives from the Rural Lands Protection Board and Murray Wetlands Working Group also participated. Government agencies from Victoria who participated included Department of Primary Industries, Catchment Management Authorities and Parks Victoria. Irrigation companies who participated were Coleambally Irrigation, Murray Irrigation Limited and Goulburn-Murray Water. The Murray-Darling Basin Commission was also involved.

**Data analysis** The data collected from the interviews were qualitative and therefore, qualitative analysis and interpretation principles and methods were used. The recorded data from the interviews were transcribed, then analysed using NVivo (a computer software program designed to analyse very rich, text based data) (QSR International Pty. Ltd. 2007) which allowed the data to be assembled under a series of headings reflecting the key themes that emerged from the interviews. This revealed a range of social aspects associated with the continual spread of sagittaria. The validity of this

analysis is based on an iterative process of discussion and cross-checking with the raw data (Patton 1990).

## RESULTS

The major findings from this research project related to the diversity amongst stakeholders in terms of awareness of sagittaria, involvement in control efforts, factors impacting on involvement, attitude and commitment to the Taskforce and participation in cooperative approaches.

**1 Awareness of sagittaria** There was considerable variation in awareness of sagittaria. Several stakeholders allocate resources to raising the profile of the sagittaria, while others do not understand sagittaria as an issue. Some respondents were not even aware sagittaria was a weed.

**1.1 Control difficulty** Factors such as limited access to infestations, weed biology, legislation, a lack of an effective control technique and insufficient resources limits the control efforts of stakeholders:

*"You can't do anymore than the money allows you to do".*

However, one interviewee made the following comment:

*"You could throw heaps of money at it but it may not do anything".*

Several interviewees believed the Federal Government should fund sagittaria projects because the Murray River is the source of infestation for channels and waterways downstream:

*"...it [sagittaria] has actually come from natural streams upstream. And therefore government should share the cost of the control"*

**1.2 Environmental impacts** While several interviewees were unaware of sagittaria, others understood the problems sagittaria caused for irrigation, but were unaware of the environmental problems it caused.

Those stakeholders who perceived sagittaria as an irrigation problem only, believed the problem should be solved by the irrigation companies in the irrigation areas.

**2 Involvement in control efforts** One interviewee stated there was intent to manage sagittaria but no uniform commitment from all stakeholders to effectively control sagittaria across all jurisdictions.

*"To control a weed everyone has to get in and have a go".*

Several interviewees felt they were wasting their resources controlling sagittaria because of infestations

upstream which were a continual source of sagittaria for their systems. A few stakeholders continue to control sagittaria regardless of the efforts of those upstream, however:

*"...sometimes you lose a bit of vigour after a while...when you know no one else is doing it".*

### 3 Factors impacting on involvement

**3.1 Apathy** Apathy was captured in the following quote:

*"I don't think I can help you, we don't really do anything in regards to weeds. Weeds don't really concern us".*

**3.2 Indifference** Many stakeholders were not inspired to act and resolve the sagittaria issue because the weed did not directly impact on their primary operations. The notion 'it's not worrying me, therefore it is not my problem and I'm not going to do anything until it does affect me' was present. One interviewee had never conducted any sagittaria control because it did not impact on their main priority – timber harvesting. Now their land is so infested with sagittaria; there is not much they can do to control the weed.

**4 Tri-state Sagittaria Taskforce** Opinions of the Taskforce were extremely diverse. One interviewee said 'Taskforce meetings are very informative' while others believed meetings were not held often enough and there was no progress between meetings. This view is captured in the following quote:

*"[The] Taskforce talks about an idea for a year before they actually do anything".*

While there were some positive comments, there was also a lot of criticism and not one interviewee said the Taskforce had been a success:

*"...each time I attended the meetings, there wasn't anybody represented apart from irrigation and councils".*

One interviewee said:

*"no-one is taking responsibility and running it [the Taskforce]"*.

Another interviewee asserted the reason the Taskforce has not been successful was because it had no direction. Most interviewees felt Taskforce membership was too dynamic and this was contributing to the lack of success of the Taskforce.

Most interviewees also felt there were too many representatives and thus too many opinions to the extent that meetings accomplished nothing. One interviewee suggested Taskforce membership should be reduced. Several other interviewees did not believe this was feasible and as many stakeholders needed to be

represented as possible to heighten awareness.

At present, several stakeholders have two or three representatives on the Taskforce and several interviewees suggested they should only have one. This would ensure attendance was manageable whilst maintaining awareness. However, one interviewee made the comment:

*"It's not about how many; it's got to be the right people".*

While opinions of the Taskforce varied, many interviewees felt it was the best approach to the sagittaria issue:

*"Because sagittaria is present over cross-jurisdictions and there are so many stakeholders involved, a State-based approach wouldn't work".*

**4.1 The Arrowhead Strategic Plan** Many interviewees stated the Taskforce was behind schedule in achieving the recommendations outlined in the strategy and a review of the strategy was necessary because the goals of the Taskforce had changed since its development.

*"I really need to have a good look at the strategy and work out how it is going to apply to what we're doing now".*

### 5 Cooperative approaches

**5.1 Involvement** Sagittaria is an issue which crosses jurisdictional boundaries. This added complexity to a difficult situation is captured in the following quote:

*"Sagittaria is a problem in two states with the potential to become a problem in a third [South Australia]. There needs to be liaison between the two states and it needs to be coordinated".*

Most interviewees believed both states needed to work together to solve a problem which affects them both:

*"The best way to manage it [sagittaria] would be an integrated weed management plan that is cross-jurisdictional that is adopted in both New South Wales and Victoria. It [sagittaria] needs to have the same status in each State in the Basin. The management of it needs to be consistent across State borders".*

Several interviewees asserted this was not currently happening:

*"...New South Wales have their own control programs in place, Victoria have their own control programs in place, but what isn't in place is something for the Murray which is a conglomeration of the different organisations".*

A concern of several interviewees was the difference in legal status of sagittaria in New South Wales and Victoria. Sagittaria is declared noxious in New South Wales but not in Victoria. Most interviewees regarded the declaration of sagittaria in Victoria as an important action.

**5.2 Communication** Many interviewees believed there was currently a lack of communication between stakeholders. Several stakeholders felt 'left out of the loop' and often were not aware of what was happening. Many interviewees believed a lack of communication between stakeholders had contributed to the continual spread of sagittaria. Several resolutions were recommended for this issue:

*"Well, definitely building on the tri-state group [the Taskforce]. Having a database set up so that you can just email information out to all of the stakeholders...The key to any good management of any issue is communication and having effective communication channels. And I guess that is what we need to continue to work on is good communication with all the different agencies".*

One interviewee mentioned they often only become aware of an issue or discussion which has been occurring for months when someone from another stakeholder group happens to forward an email.

There are constant changes in staff within organisations and this has resulted in a loss of contacts, knowledge and information. However, one interviewee did not see staff changes as an issue or an excuse for poor communication. This interviewee believed it was only necessary to have one person keeping in contact with everyone else.

There is a lack of information on sagittaria available and the information available is not readily accessible. This issue is noted by one particular interviewee:

*"More information on sagittaria needs to be available to farmers".*

## DISCUSSION

The major findings from this research project related to the diversity amongst stakeholders in terms of awareness of sagittaria, involvement in control efforts, factors impacting on involvement, attitude and commitment to the Taskforce and participation in

cooperative approaches. Several interviewees did not regard sagittaria as an issue due to ignorance, indifference or an apathetic perception. Presently, only a small group of stakeholders appreciate the seriousness of the sagittaria issue. Despite insufficient resources and technical issues associated with control, the problem will not be resolved until all stakeholders accept responsibility.

While the existing Taskforce has its limitations, the group appears to be the most suitable approach to resolve the issue, with its capacity to cross institutional boundaries. To improve the Taskforce's effectiveness, it is recommended that: (1) a steering committee be established for the Taskforce with the responsibility of making decisions; (2) an effective communication strategy be adopted as a first step towards encouraging cross-institutional cooperation; and (3) cooperation between stakeholders be improved to combine resources and expertise in order to more effectively and efficiently manage the issue.

This research project uncovered a range of social factors associated with continual spread of sagittaria. However, given the complexity of these issues, further in-depth investigative research is warranted.

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