

MANAGEMENT PLAN

Salvinia

Salvinia molesta Mitchell



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Revised by H.E.Neale (1986)

Advisory Services Division
Ministry of Agriculture and Fisheries
Hamilton

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SALVINIA MANAGEMENT PLAN

1. INTRODUCTION AND OBJECTIVES

Salvinia (*Salvinia molesta*) is a large free-floating aquatic fern which has recently established in New Zealand in field situations. It is a native of Brazil and has been spread to other countries for use as an ornamental in outside ponds and aquaria. It is now found in many tropical and subtropical regions where it causes weed problems on waterways and in irrigated crops.

Salvinia causes problems in New Zealand by forming a thick mat of vegetation over the water surface. This cover physically restricts the use of the water and has secondary deleterious effects on water quality.

Salvinia has no seeds or viable spores but is very well adapted for asexual propagation and dispersal by vegetative fragments. Its rapid growth rate, in NZ conditions, allows it to quickly colonise new areas or reinfest areas which have been previously cleared.

Salvinia is, as of 15 December 1983, a class A noxious plant (Noxious Plants Act 1978). The Ministry of Agriculture & Fisheries (MAF) is responsible for its eradication from New Zealand.

The presence of the plant in private collections and its potential for explosive growth in the field situation necessitates the following steps to achieve eradication:

- (a) Both the public and field personnel employed by other government departments, local authorities, etc, must be aware of the legal status of the plant and the reporting requirements for new sightings.
- (b) The propagation, planting, sowing, sale and distribution of any plant, or part of the plant must be prevented.
- (c) All known field sites must be cleared, and then regularly inspected for regrowth from small fragments.

An intensive campaign to control vegetative material over the first growing season of the eradication programme for each new site will substantially reduce the time needed to achieve eradication from the site.

This management plan provides background information on the plant and the proposed eradication programmes for the 8 Advisory Services Division (ASD) regions with MAF.

(Brett Miller has recommended.)

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2. BIOLOGY OF SALVINIA MOLESTA

2.1 Description

Plants

Salvinia is a *free-floating fern* with a branched horizontal stem which lies just below the water surface. Each node of the stem gives rise to a pair of opposite floating leaves and a finely dissected submerged, root-like organ which is considered to be a modified leaf. The plant has *no true roots*. The growth form of the plant varies with environmental conditions. In the primary uncrowded, or colonising stage, the plant leaves lie flat on the water surface. As the plant becomes crowded, there is a continuum through to a tertiary compact mat-form with upright folded leaves. The *apical bud* or growing point is hidden between and *protected by the two youngest leaves*.

Leaves

The foliage is green to golden brown in colour. The shape and orientation of the leaves vary with the age and environment of the plant. Primary stage leaves are rounded, 1-2 cm long, have an obvious midrib and lie flat on the water surface. Tertiary stage leaves are 2-4 cm long, and folded along the midrib so that the upper surfaces are pressed together. An opened leaf appears bilobed. On its upper surface, the leaf has dense rows of *basket hairs* - upright hairs each topped by an egg-beater like structure which is visible to the naked eye. The under surface has simpler brown hairs. The *hairs* are *water repellent* and aid flotation of the plant.

Fruiting body

Salvinia is a fern and therefore does not produce flowers. *Infertile spores* are produced from nodular sporocarps which resemble strings of beads associated with the underwater "root" mass.

2.2 Propagation

Vegetative

There are two means of producing new plants from the parent material.

- The main stem can "shed" daughter plants off the older end of the horizontal axis. This tends to happen after a branch has developed from a side bud.
- Death and decay of the older connecting part of the plant leads to separation of the younger branches and portions.

Any fragmentation of the stem increases the production of new plants from previously dormant buds.

Salvinia has a doubling time of less than two weeks in summer conditions in Northland.

Sexual

Salvinia has no sexual propagation. It is a polyploid and produces only infertile spores.

Dispersal

Dispersal of the mat, parent plant or parts of the plant can occur by:

- water movement
- movement of machinery and equipment
- planned or accidental planting and release by man

The last method described has been the principal means of plant dispersal.

3. DISTRIBUTION

3.1 Known distribution

Salvinia, as at 1 January 1986, had been recorded at 69 locations in 17 counties. Only 28 of these sites have supported Salvinia growth in the last 3 months with the remaining 41 under surveillance for regrowth and minor control measures. Appendix 1 shows the distribution of salvinia sites in relation to county boundaries.

Site records for all known infestations are included at the back of this management plan and includes all infestations reported since Tanner* compiled finite distribution data up to mid 1981. The dune lakes at Waipapakauri and Western Springs Lake are the only large natural waterways affected by salvinia. Other infestations consist of a number of associated water bodies: the Wairuhe river system (Bay of Islands), the Glenbrook site (Franklin) and the Te Kauwhata site (Waikato). The remaining infestations are all in small waterbodies such as farm dams, ponds or drains.

3.2 Potential distribution

Salvinia can invade all sheltered slow moving waterbody types; lakes, dams, ponds, fringe wetlands and drainage systems.

The fern has been found in NZ as far south as Matamata. In areas south of Auckland, winter conditions and frost damage cause foliar dieback but the plant regrows from protected buds in the spring. Localised warm conditions, such as coastal, thermal or vegetation sheltered areas could enable the plant to successfully overwinter in areas south of its present geographical range.

*C. Tanner (1981)
"Report on the Free-floating Aquatic Plants Water Hyacinth (*Eichhornia crassipes* [Mart] Solms.), Water Lettuce (*Pistia stratiotes* L.) and Salvinia (*Salvinia molesta* Mitchell) in New Zealand."

In the region above Auckland, the potential habitat for the plant is extensive. In the Northland area, there are countless small dune lakes, some of which have been noted by the Wildlife Service as being areas of outstanding wildlife habitat (Map series (NZMS 290)).

The few large lakes in Northland are intensively used for recreational purposes, irrigation and public water supplies. There are also a large number of small man-made dams. Climatic and geographic conditions in Northland are such that many areas rely heavily on these dams for stock and domestic water supply.

There is a large area of potential habitat for salvinia in either modified drainage systems or unmodified wetlands. The accompanying effects on both natural and developed uses can be expected to be extensive.

4. ECONOMIC AND ENVIRONMENTAL SIGNIFICANCE

The problems caused by salvinia are primarily expressed through the physical blockage of a waterbody and secondarily by the effect of salvinia on water quality. These effects detract from the value of a waterbody for:

- wildlife
- stock water
- irrigation supply
- domestic supply
- drainage
- recreational uses

The effects also force increased maintenance measures in an attempt to retain these uses.

Salvinia can completely cover the surface of a waterbody with a tight-packed floating mass of vegetation up to 50 cm thick. Large quantities of deposited organic matter from the mat infill the waterbody. Grass and rush seeds germinate on the mat and form "islands". The mat prevents stock access for drinking water. A number of stock deaths have been caused by stock sinking or breaking through the deceptive floating mat and islands, and consequently drowning in the deep water.

The value of the wetland habitat is severely reduced. The thick cover decreases the diversity of vegetation in the waterbody, which decreases the food supply and shelter for food-chain organisms and wildlife. The cover physically prevents use by birds and wildlife and the associated recreational pursuits of shooting, fishing and bird watching. Swimming and boating are not possible where there is a thick salvinia cover.

Maintenance costs for the waterbody are dramatically increased by the mechanical or chemical clearing required to open up the water body. This provides only a temporary respite from the problem. Dam replacement time is accelerated, drain maintenance costs are increased, drainage can be impeded and natural waterbodies lose their open water character.

A deterioration in water quality is another consequence of a thick surface cover of salvinia. Oxygen levels in the water may be severely decreased and cause the water to become stained and anoxic (lacking oxygen). The diversity of insect and fish life is severely restricted. Anaerobic decomposition or putrefication occurs which results in odours, flocculent organic sediment and tainted water which is unsuitable for stock, irrigation, recreational or domestic uses. Detrital matter from the decomposition process is suspended in the water and clogs pumps and filters in irrigation and water supply systems in the same manner as suspended plankton or algal blooms.

The economic effects of salvinia on the management of water supplies is particularly relevant in Northland. An economic survey of Northland stated that the major constraint on potential horticultural development in Northland was the availability of adequate and reliable irrigation supplies. The Northland area has an uneven seasonal distribution of rainfall and short catchment lengths, resulting in variable river flows and little retention of water for the dry summer months. Alternative water sources such as ground water or large lakes are not available, hence any irrigation schemes will depend on large storage dams to ensure a reliable water supply.

These schemes are expensive. The spread of salvinia to these dams would create extra maintenance costs (especially pump maintenance), and a

decrease in water quality which would jeopardise the success of such irrigation schemes. In many Northland areas smaller dams are a necessity for stock water, rather than an additional water source as in most other parts of New Zealand and they must be maintained.

Drainage schemes have also extended the area of productive land in Northland and further drainage development is predicted. Maintenance costs for drainage schemes will be substantially increased should salvinia invade these areas.

5. CONTROL MEASURES

The control of salvinia requires control of the vegetative structures only as salvinia produces no viable spores. An intensive and coordinated work effort is required however to combat the vegetative vigour and hardiness of the plant.

Control methods used can be chemical, mechanical or involve habitat manipulation such as surface flushing to remove the plants or drainage of an area to change the growing conditions.

The following comments are intended as a guide only, as most sites require a combination of methods. The action on each is outlined in the site specific recommendations.

5.1 Initial Control

The first stage of control involves a major control action such as mechanical or manual removal, chemical application or draining.

It has a 2-fold aim:

- To improve access to plant material by removing sheltering vegetation (i.e. by mechanically clearing, cutting or spraying). This improves spray contact with the salvinia, exposure of the plant to winter conditions and aids the effectiveness of surveillance operations.
- To substantially reduce the amount of plant material present by clearing or spraying in the late autumn. This reduces the amount of plant material available for new growth at a time when the plant is becoming stressed due to winter conditions.

(a) Mechanical removal

Mechanical removal of the mat using drain cleaners, earth moving machinery or nets may be recommended as a first stage in heavy infestations.

(b) Manual removal

Manual removal of plants with simple hand tools such as nets and rakes is appropriate for small infestations and the mop-up stage of large operations.

(c) Chemical application

The chemical recommended for salvinia is paraquat at the rate of 2 kg active ingredient per hectare.

The Noxious Plants Act (section 47) provides for the use of herbicides for class A noxious aquatic plants without the need for water rights, provided that the herbicides used have the prior approval of the Pesticides Board. This concession refers to emergency control measures only. Where it is necessary to continue measures, water rights are to be applied for as required by the Water and Soil Conservation Act 1967.

Paraquat is applied as a fine spray to penetrate the water repellent hairs on salvinia. Repeated application may be necessary to decrease mat thickness or as part of a mop-up operation.

Paraquat spraying on heavy infestations has been found to be most effective late autumn (March-May). On a few sites, spraying earlier in the season may be appropriate, especially where the area is accessible to the public. This decision is made when the site specific eradication programme is drawn up by MAF.

(d) Drainage

Drainage is only an option when the waterbody can be completely drained. The site must be kept dry for a considerable period of time or plants will be able to survive in damp areas.

5.2 Second Stage

Once the bulk of plant material has been removed, regular year round surveillance is essential to assess the need for further control operations to remove plant regrowth.

Such surveillance should include the following actions:

- (a) Respray overhanging vegetation as often as necessary to keep the edges clear for spotting salvinia and to enable easy movement around the site.
- (b) Remove any plants present with a net or by hand regularly. Respray salvinia if necessary.
- (c) Encourage the land owner or occupier to be interested in the site and check it every 2 weeks or monthly.
- (d) Follow the surveillance programme exactly, it is essential that it is followed as every pair of leaves can become a new plant, and pairs of leaves are produced every few days in Northland summer temperatures. If the site is not monitored often enough the site can revert to its original state of infestation very rapidly.

GUIDELINES AND GENERAL COMMENTS

- (a) Always try to treat the top of the infestation first and work downstream or down a series of dams. A thorough survey should be carried out upstream of a new site to eliminate any future sources of reinfestation.

- (b) It will usually be necessary to use more than one of the methods described in this management plan for control on any site.
- (c) A series of booms made from battons held together by string to separate out areas with different salvinia covers or with different ease of control can be useful to keep uncleared areas from invading clear areas.
- (d) Keep stock out of the area if possible as stock can pug small pieces of salvinia into the mud around dam areas.
- (e) When working on larger areas and removing salvinia by hand, truck or car inner tubes with a plywood bottom can make excellent "weed barges" for towing behind a person, dinghy or using on a pulley system to the shore.
- (f) A good spray cover in late autumn when salvinia is at 100% cover has sometimes eradicated the entire infestation. This appears to be a combination of the spray sitting on top of the salvinia mat for a longer contact time, the vitality of the plant decreasing in winter and stopping regrowth, and possibly the buildup of bacteria and fungi in a thick plant mat and the smothering effect of dead vegetation on top of the mat.
- (g) When salvinia is at low cover values it is often difficult to get good long spray contact with the growing points of the plant. Netting is often more effective control in this situation.
- (h) If there is the chance of infestation further down a stream protect downstream areas by stopping salvinia from leaving the site with nets, chicken mesh etc.

- (i) If the site is in danger of flooding and infesting other sites instant action to control the salvinia may be required instead of leaving till March to May.
- (j) Plants should be placed away from the waterbody on removal, to prevent recontamination. They can be composted in free draining pits, dried out or burnt. Plants will remain viable for extended periods if left in unturned heaps.

SPECIFIC EXAMPLES

The following is a number of different situations and the general action suggested. Other factors may alter these recommendations for any one site. Consult the A0 - Aquatic plants for further information.

Is the waterway needed?

(A) NO.

- (i) Consider drainage especially if there is a lot of smothering vegetation present, but consideration should be given as to where the drained salvinia will go to.

Drainage is followed by

- Leaving the vegetation around to spread over the salvinia and smother it out, or
- Spraying to decrease the mass of salvinia present, or
- Contouring to stop pockets of water forming if drainage is not complete.

(B) YES - the waterway is needed.

- (i) If 100% cover of salvinia and clean edges and there are no floating islands of vegetation.

- Clean up spray with glyphosate on edge vegetation.
 - Spray salvinia with paraquat in March to early May.
- (ii) If 100% cover and poor access of overhanging vegetation or floating islands.
- Mechanically clean edges with drain clearing equipment, or
 - Cut vegetation and cut edges, or
 - Clean up spray edges and other vegetation with glyphosate.
 - Spray salvinia with paraquat in March to early May.
- (iii) If much less than 100% cover at the beginning of summer.
- Spray immediately to keep the salvinia down.
 - Clean up edges and overhanging vegetation.
 - Monthly surveillance and respray or net as required.
- (iv) If less than 5% cover netting is more effective than spraying if manpower and access allows.
- Net as required over the surveillance period.

6. RESPONSIBILITY FOR ERADICATION

6.1 General

The Ministry of Agriculture & Fisheries has the responsibility for action on class A noxious plants under the Noxious Plants Act 1978. Within MAF the task has been given to Advisory Services Division.

Each Regional Advisory Officer is responsible for ensuring the operation and success of the eradication programme in their area. (RAOs may delegate regional oversight to a regional coordinator.)

The programme must provide procedures for detection of new sites, identification of the plant, arrangement of eradication measures, maintenance of records, publicity inputs and progress reports.

The RAO/regional coordinator will nominate an officer (warranted under section 44 of the Noxious Plants Act 1978) in each subregion/district in which the plant is present to be responsible for the ongoing eradication work on each of the sites in that subregion/district.

6.2 Responsibilities of Nominated Officers

- (i) Formulate the details of eradication work to be carried out on each site using the information provided in this management plan as a guide. Additional technical information can be obtained from Helen Neale, Advisory Officer, Aquatic Plants Section, Ruakura Soil & Plant Research Station, Private Bag, Hamilton.

The eradication programme should be in writing with a copy forwarded to the occupier and the Advisory Officer, Aquatic Plants. A copy should also be sent to the local NPO to keep him/her informed. The eradication programme must be evaluated annually and if satisfactory results have not been achieved in the preceding year, a new eradication strategy should be drawn up.

(ii) The designated MAF officer may personally carry out the eradication work, employ a contractor or request the NPO employed by the local district noxious plants authority (DNPA) to do the work. The NPO is under no obligation to do this work and has the right to decline. Irrespective of who physically does the work required, the MAF officer is responsible and accountable for the work being completed to a satisfactory standard.

If the MAF officer requests another party to do the work he/she must keep in close contact with the contractor, DNPA, or other personnel involved so as to be aware of any delays or lack of action.

(iii) Follow up surveillance of a site once the eradication programme has been completed is essential, and should be carried out by the designated MAF officer. If the local NPO has agreed to carry out the surveillance programme, the MAF officer is still accountable for the surveillance being carried out as specified in this management plan and should ensure that any action required is taken.

(iv) A filing system with the site information sheet and action/surveillance record must be kept up to date for each site.

(v) New sites must be reported as detailed in section 7.1.2.

(vi) A composite record of the action and surveillance undertaken at each field site throughout the year should be forwarded to the RAO by 30 April each year.

This should be in the form of a year long action/surveillance sheet for each site (see page 32).

- (vii) Estimates of expenditure for the forthcoming financial year should be forwarded to the RAO by 20 January each year. As it is not possible to draw up individual site programmes and predict new noxious plant sites by this date, it is accepted that estimates will be an adjustment to historical expenditure.
- (viii) Liaise with local organisations such as DNPAs, government departments, catchment authorities, environmental groups etc. It is particularly important that field personnel in these organisations can identify the plant and are encouraged to keep an eye out for new infestations.
Even if DNPAs are not asked to assist with the physical eradication activity they should be kept informed, asked to publicise the problem and report new sites.
- (ix) Arrange local publicity to inform the general public of the plant and encourage infestations to be reported particularly private fish pond collections.

6.3 Responsibilities of RAO/Regional Coordinator

- (i) Nominate officers to assume responsibility for the above in each subregion/district in which class A noxious aquatic plants are found. Ensure these officers are warranted under section 44 of the Noxious Plants Act 1978.
- (ii) Ensure eradication programmes are designed and operational for each site in the region.
- (iii) Establish and maintain a regional file of all sites.
- (iv) Forward copies of the action/surveillance records for each field site for the preceding year to the Advisory Officer, Aquatic Plants, ASD, Hamilton by 31 May each year.

The Advisory Officer (Aquatic Plants) is responsible for national coordination of the eradication strategy and for providing an annual progress report to the Director of ASD.

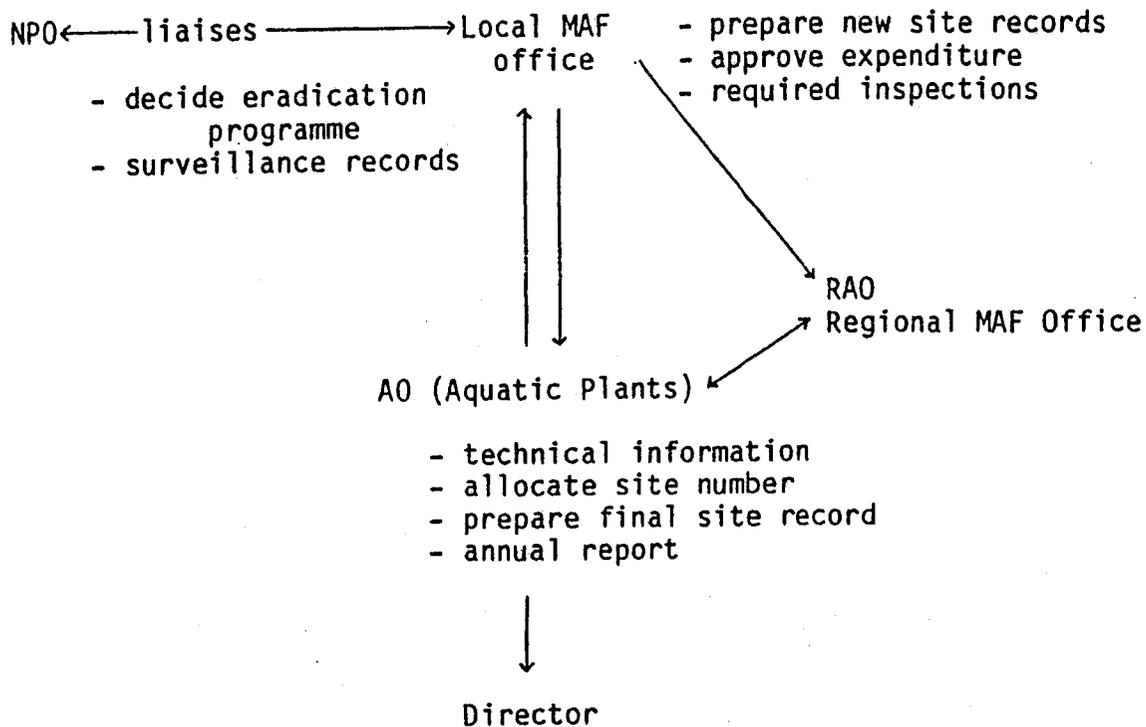


Fig. 1 Responsibility for class A aquatic plants.

Regions with field infestations must also implement the site specific control recommendations in Sect 7.2.

7. ERADICATION PROGRAMME

7.1 General

Two important aspects of the eradication programme are

- (a) increasing public awareness of the plant and its status
- (b) clearing field sites

The first aspect has already been implemented by the training of field staff and a public awareness drive. These will receive further input throughout the programme.

The vegetative vigour of the plant is such that its successful eradication from field sites requires an intensive work effort. Plant material must be controlled at a rate faster than its growth rate. Initial control work aims to improve accessibility to the plant material and substantially reduce the inoculum (amount of plant material available for new growth). This initial action must be followed up by regular surveillance of the site and control of any subsequent plant growth. Failure to do so will result in plant material and cover rapidly reaching precontrol conditions again.

The following sections contain detailed instructions and recommendations for the eradication programme in the form of regional action packages. All RAO's are provided with the specific information they require to implement the programme in their region. These packages are coordinated on a national level by the AO - Aquatic Plants.

For regions with no reported salvinia sites the regional action package requires Sections 7.1.1 to 7.1.3 to be implemented. This should ensure new infestations are identified, reported, controlled and integrated in a continuing surveillance programme.

7.1.1 Publicity and staff training

Publicity and staff training are important measures to ensure the success of the salvinia programme. All known field sites will be controlled but there still may be an unknown number of small contained "backyard" infestations. It appears that an increased public awareness of the eradication programme, leading to voluntary control of these collections is the most effective method of control. Publicity material in the form of a poster and AgLinks is available. Newspaper articles and talks to appropriate groups will remind both the aquarium trade and the public that it is illegal to possess this plant. A video on salvinia is available from the Advisory Officer, Aquatic Plants Section, Ruakura Soil & Plant Research Station, Hamilton.

Field staff should know the legal status of the plant, be able to identify it and be aware of the contingency plans in the event of a new infestation.

7.1.2 New infestations

It is the responsibility of any person who finds a new class A aquatic plant site to inform the local authority noxious plants officer (NPO) or MAF officer immediately. If the NPO is initially advised he/she must advise MAF. If MAF is initially advised they should inform the relevant NPO.

The plant must be identified either by a MAF or noxious plants officer. This identification can be confirmed by sending a sample wrapped in damp newspaper or tissue and labelled "Plants for Identification" to the Advisory Officer, Aquatic Plants Section, Ruakura Soil & Plant Research Station, Private Bag, Hamilton.

New infestations should be recorded on the site description sheets included in the management plan and copies forwarded to the Advisory Officer, Aquatic Plants. The method of eradication is to be decided on by MAF after discussion with the NPO. This will be along the lines detailed in the management plan, with additional technical information available from the Advisory Officer, Aquatic Plants, if required. A written estimate of clearance costs should be provided (see Page 25) by personnel who have been so nominated by ASD for each area. The nominated MAF officer in the subregional or district office is responsible for approving these estimates. The eradication programme should be discussed with the owner and/or occupier and should be confirmed with him/her in writing by the MAF officer.

The following page is to be filled in for all new sites and sent to the Advisory Officer (Aquatic Plants), Ruakura Soil & Plant Research Station, Private Bag, Hamilton. It will be returned with a site number typed on the top. A copy will be forwarded to the district MAF office and the RAO.

This site record sheet is a very important source of information and some of the points that should be considered when filling it in include:

- (a) Where is the furthest upstream area of the infestation?
- (b) How close is the site to other waterways?
- (c) Where will flushed salvinia go to?
(Check downstream for further sites.)
- (d) What is the depth of water at the site?
- (e) What is the use of the waterway?
- (f) What is the percentage cover of salvinia, the thickness of the mat and the area?

- (g) What other plants are present? Salvinia often spreads with waterlily donations to other dams.
- (h) What other vegetation is overhanging or creeping into the dam or field site?

Loose copies of the site record sheet and the claims form for photocopying are provided at the back of this management plan.

SITE REFERENCE NUMBER:

(To be assigned by Advisory Officer-Aquatic Plants)

DISTRIBUTION DATA FOR CLASS A NOXIOUS PLANT

SITE INFORMATION

Map Reference (NZMSI):

Valuation Number:

Region:

County:

Access:

Catchment:

Potential for spread in catchment:

WATER BODY

Description:

Area:

Water use requirements:

INFESTATION DETAILS

Date of inspection:

Source:

Noxious plants found:

Extent of infestation:

Other species found:

Suggested control measures:

Signed: _____

Date: _____

MAF designation: _____

Assistance from: _____

Organisation: _____

(This sheet to be filled in for all new sites and sent to the Advisory Officer, Aquatic Plants Section, Ruakura Soil & Plant Research Station, Private Bag, Hamilton). Estimates of costs involved with eradication should be sent separately to the district MAF office on a claims form (see Page 25).

CLASS A NOXIOUS PLANT ERADICATION CLAIM

Organisation: _____

Address: _____

Site Code: _____

Valuation No: _____

Treatment

	Estimated cost (\$)	Actual cost (\$)
Mechanical/		
Chemical cost	_____	_____
Application cost	_____	_____
Labour	_____	_____
Transport	_____	_____
TOTAL	_____	_____
	_____	_____

Control programme approved as per above estimates

Name and designation (printed)

Signature

- Note:
- i) A separate form is required for each site.
 - ii) Estimates must be approved by the local MAF officer prior to treatment being undertaken.
 - iii) Treatment must be within the guidelines established in this management plan.

Every attempt should be made to find the source of the plants and to check for other infestations in the catchment area. A screen (small mesh chicken netting) on dam outlets or nets around an infestation will prevent downstream spread before and during control operations.

"Backyard" infestations

Reports of small contained collections of salvinia that pose no threat to nearby waterways are expected from all regions. These should be checked and any plants found should be destroyed by burning or composting. The source of the plants should be traced, if possible. A record of all small infestations should be kept at the local level and at least one followup visit is required on such sites.

7.1.3 Site code

Individual salvinia sites are numbered in an open-ended system for each county. The site number has the form:

X/YR/S#

X is a number code for the counties, numbered north to south as follows:

- 0 = Mangonui County
- 1 = Whangaroa County
- 2 = Bay of Islands County
- 3 = Hokianga County
- 4 = Hobson County
- 5 = Whangarei County
- 6 = Otamatea County
- 7 = Rodney County
- 8 = Waitemata County
- 8A = Auckland City
- 9 = Waiheke County
- 10 = Manukau City
- 11 = Franklin County
- 12 = Waikato County
- 13 = Hauraki Plains County

- 14 = Thames/Coromandel District
- 15 = Ohinemuri County
- 16 = Piako County
- 17 = Waipa County
- 18 = Matamata County
- 19 = Tauranga County

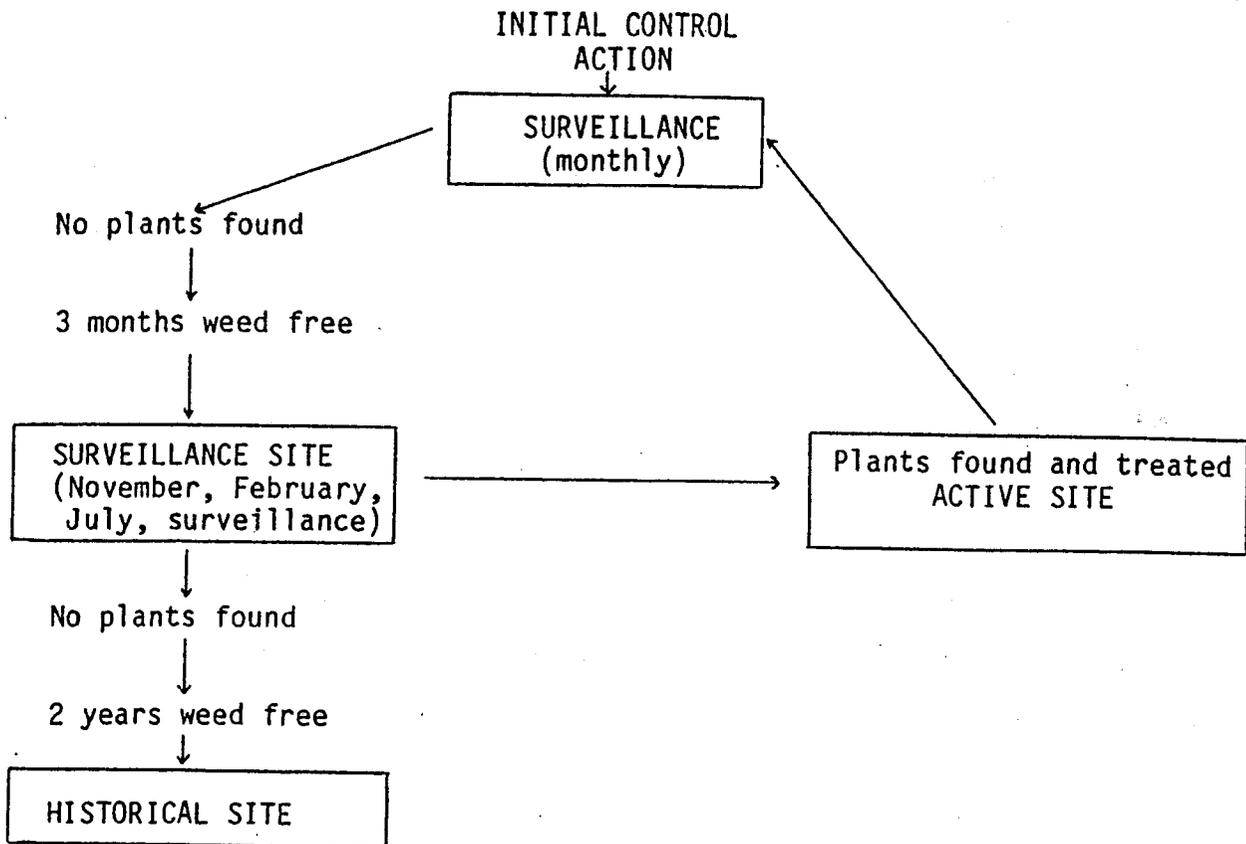
YR is the year (eg. 83) that the infestation was first recorded.

S# represents salvinia and the specific site number as assigned by the

A0 - Aquatic Plants.

A site will be considered to be active until 2 years have elapsed since the last plants were found. Records of historical sites are not included in this management plan. If required, they are available from the A0 - Aquatic Plants.

7.1.4 Site classification



ACTIVE SITE = A site where plants are present or have been present within the last 3 months.

SURVEILLANCE SITE = A site where plants have not been found for 3 months or more.

HISTORICAL = A site where plants have not been found for 2 years.

NB: On very large or difficult sites it may be necessary to extend this 2 year period to 5 years where the nature of the site makes thorough surveillance difficult. This decision will be made when the site is first reported if it appears it will be difficult to manage or if a site becomes problematic. This decision will be made by the AO-Aquatic Plants after discussion with MAF and field personnel.

The land owner or occupier should be encouraged to accompany field personnel on visits and assist in the surveillance programme.

NB: Any sightings of plants require surveillance to revert to a monthly inspection. The reporting system for the programme is outlined in section 7.2.

An infestation will be considered to be eradicated after 2 years have elapsed since the last salvinia plants were found. Provided that surveillance is regular and thorough, eradication on most sites should be achieved in 2-3 years.

7.2 Record System

Personnel who are responsible for surveillance are expected to maintain and provide records of inspections. Any discontinuity in surveillance which allows plant regrowth to remain uncontrolled will set the programme back markedly.

Field sheets have been designed to help maintenance of records and should be completed at each inspection. An example of the field sheet is given on the next page.

These field sheets, or a copy, should be sent by the designated MAF officer to the RAO of the region, as required. An additional copy is included in the back of this management plan for photocopying.

7.3 Site records and recommendations

The following sections contain distribution records and specific control recommendations for each salvinia site. These records are attached to this management plan to complete the regional action package for regions with active field sites.

SALVINIA SURVEILLANCE FIELD SHEET

Site No.: _____ Valuation No.: _____

DATE OF INSPECTION _____ STATE OF INFESTATION _____ TREATMENT Tick which applies

_____	Plants found	YES/NO	Plants removed	
	Est. number	_____	sprayed (paraquat)	
	or area	_____	(AF101)	

Accompanied by: _____

Notes: _____

SIGNED: _____	PHOTOCOPY AND SEND TO:
MAF DESIGNATION: _____	Regional Advisory Officer
ASSISTANCE FROM: _____	Ministry of Agriculture & Fisheries
ORGANISATION: _____	_____

(This field sheet should be filled in for each visit to a site.)

