



Study Tree Location Plan

Tree Report 2002 - 2013

Purpose:

The purpose of this report is to identify a range of trees of different species which grow on Fairwood Island and monitor the effects of various diseases or insect attack on their growth over a period of time.

The trees chosen are all close to the main house on OK Point, so that they may be readily monitored, allowing visitors to familiarize themselves both with the tree species and their various types afflictions.

The trees have been numbered with painted wooden identifying tags.

Remedial Measures policy:

Some of the trees in this survey (such as those affected by gypsy moth or caterpillar attack) have been treated in various experimental ways to repel the attacks. The survey is intended to monitor the effectiveness of these treatments.

Other trees are not treated in order to observe the natural stages of the pests attack and judge them in the context of adjacent trees to discover whether the disease is contagious or the result of the particular circumstances of individual trees.



Fairwood Island

O.K. Point

Principal Study Tree Location Map

Tree 1	White Pine	Gypsy Moth
Tree 2	Red Pine	Pine Sawfly
Tree 3	White Spruce	Beetle
Tree 4	European Larch	Poor Soil
Tree 5	White Pine	GypsyMoth, Tip Beetle, Ants
Tree 6	White Pine	Pine Rust
Tree 7	Tamarack	Senescence
Tree 8	White Pine	Pine Rust
Tree 9	Maple	Tip beetle
Tree 10	Jack Pine	general monitoring
Tree 11	White Pine	Rust, flooding
Tree 12	White Pine	Lightning Strike
Trees 13	White Pine	shelter transplants 2007-9
Trees 14	Jack Pine	3 ages monitoring
Tree 15	White Pine	1970's transplants
Tree 16	White Pine	Lightning Strike
Trees 17	White Pines	Senescence
Tree 18	White Spruce	Seedling 2005-6



Cocoon and Carapace of Caterpillar



Gypsy Moths laying eggs

Tree Number: 1 - 2002

Location: behind main cottage near back door

Species: White Pine

Height: 9 M

Trunk Circumference: 85cm

Approximate Age: 50 yrs

Other Characteristics:

this tree has been topped at approx. 25 yrs and has subsequently developed two crowns

Nature of Attack: gypsy moth, ants, pine tip beetle

Observations:

1) All phases of gypsy moth activity can be observed in a large festoon under the bifurcating branch. Cocoons are present, the moths have returned to lay their eggs. The infestation seems to be additive with a large accumulation of moth under the branch.

The gypsy moth seems to have irritated the tree so that it has grown shagging peels of bark in the area of attack. This only serves to protect future nest building.

2) There are many ants of two different species (large and miniature ants) The small ants are transporting flecks of white pulp down to the base.

3) The tree also shows evidence attack of the of tip beetle on one or two of the lower branches.

4) Ladybugs are also present on the bark

5) There is no apparent perforation of the bark.

Remedial Measures Taken: gypsy moth cocoons and egg nests have been removed from underside of bifurcation and from individual suppurating knots.



2002- condition



2003 - considerably reduced infestation



Moths laying eggs in autumn



Eggs in captivity hatch into tiny caterpillars in spring



Hatchlings under microscope



Hatchlings create pupa and abandon caterpillar husk



Tree Number: 1 - 2003

Location: behind main cottage near back door

Species: White Pine

Nature of Attack: gypsy moth

Observations:

1) Reduced evidence of gypsy moth on this tree and on OK point in general

Is this reduction due to the extended and very hard winter? There is little evidence of gyps moth elsewhere. The gyps moth eggs are often laid in quite exposed locations suggesting that harshness of winter is not usually a problem.

2) Ant infestation continues.

3) Approximately 40% of the pine is now suffering tip die back which results from the burrowing of the larva stage of the pine shoot beetle, with the succulent pith of all of the new growth cored out hollow. The tips are gathered into nests in which a small spider mite has sewn together with silk late in the summer.

This spider mite seems to be a development of the shoot beetle that has reamed out the pith of the new growth.



2004 - no further evidence of gypsy moth



Weeping knot



2004-dragonfly



Weeping knots caused by insect within bark

Tree Number: 1 - 2004

Location: behind main cottage near back door

Species: White Pine

Nature of Attack: gypsy moth
pine shoot beetle

Observations:

1) No further evidence of gypsy moth on this tree and OK Point in general is free from infestation.

However this tree, like many other white pines nearby, has been weakened by this attack and has thinning foliage.

2) The pine shoot beetle in its larval stage is attacking the pith of the new growth. It is evident on many trees with the browned new growth tips hanging lifeless.

3) A number of weeping knots have also been observed - induced by insect yet to be identified.



No evidence of gypsy moth cocoons, no ant activity noticed previous year



Bleeding knots

Tree Number: 1 - 2005

Location: behind main cottage near back door

Species: White Pine

*Nature of Attack: gypsy moth has now disappeared
pine shoot beetle*

Observations:

1) No further evidence of gypsy moth on this tree and OK Pointe in general is free from infestation.

2) A number of weeping knots are still evident - induced by insect yet to be identified.

3) Apparent reduction in extent of infestation of the pine shoot beetle - only some of the branches are affected. In general there seems to be less pine shoot beetle evident on the island.

Is this due to late spring and generally moist summer?



Needle tip mites nest



Gum bleeding caused by insects under bark - not extensive



No evidence of gypsy moth cocoons, none of ant activity noticed previous year

Tree Number: **1 - 2006**

Location: *behind main cottage near back door*

Species: *White Pine*

Nature of Attack: *gypsy moth has now disappeared completely here and in all sites on island.
pine shoot beetle has disappeared here and from many trees on the island - only rare instances are visible*

Observations:

- 1) *pine tip beetle has disappeared on this tree and on most adjacent trees-probably the result of a hard winter reducing its survival rate. Perhaps its incidence in 'drifts' across the island is due to protected micro-climate as well as colonisation.*
- 2) *no evidence of Gypsy moth either - after severe infestations of 4-5 years back*
- 3) *a number of weeping knots evident, some gum suppurating form crack in lateral branch under stress*
- 4) *Generally healthy with thick new growth - an excellent growing year for all island coniferous trees.*



Crux under transverse bough - favoured nesting area for Gypsy moth



Splitting and bleeding under stressed lateral bough



Gypsy Moth egg cluster - August 23



Gypsy Moth egg under microscope



Bleeding sap from stress joint



Egg cluster - under protective eave

Tree Number: *1 - 2007*

Location: *behind main cottage near back door*

Species: *White Pine*

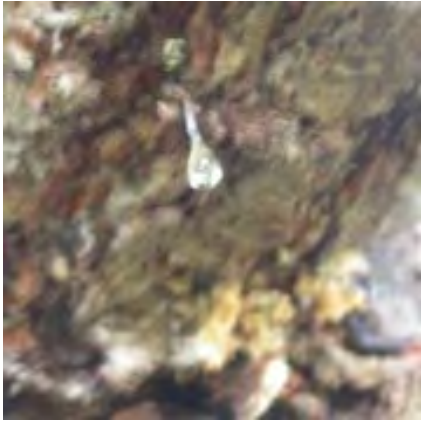
Nature of Attack: *gypsy moth has returned to this tree with many cocoons tucked under branches
pine shoot beetle disappeared last year and are not afflicting this tree this year*

Observations:

- 1) pine tip beetle has disappeared from this tree, there were a few beetles collected on June 8 from adjacent trees and photographed.*
- 2) gypsy moth cycle has begun again with many nests evident in the 3rd week of August.*
- 3) a number of weeping knots are evident with gum suppurating from them..*
- 4) Generally healthy tree with thick new growth - this has been another excellent growing year for all island coniferous trees with adequate water and no winter wind damage..*



Splitting and bleeding under stressed lateral bough



Sap dripping - under bark beetles



Tree Number: 1 - 2008

Location: behind main cottage near back door

Species: White Pine

Nature of Attack: little evidence of gypsy moth infestation, few cocoons, no new egg clusters have been laid by moths
pine shoot beetle has now disappeared entirely

Observations:

- 1) pine tip beetle has disappeared from this tree and from most trees on the island. Earlier in the summer a few spume nests were observed on nearby trees, but these have been rare across the island. The beetle seems to have been eliminated in the cold weather of the hibernation stage
- 2) the gypsy moth that appeared to be on an up cycle in the late summer / autumn of 2007 seems to have been eliminated by an exceptionally severe winter.
- 3) continuing number of knots and bark areas bleeding sap - seems to be due to small local beetle attack resulting from general weakening through previous gypsy moth attacks.
- 4) Tree is generally in good health with healthy new growth. Again 2008 has been almost ideal weather for island trees with plentiful and frequent rain. A severe winter seems to have set back tree afflicting insects like the gypsy moth and shoot beetle.



Sap bleeding under stressed lateral bough



Gypsy moth cocoon and remnants of beetle stage- no egg clusters laid by moths this year.



Secondary lateral branching now more prominent than original crown



Insect nesting and gum bleeding at crux



Tree Number: 1 - 2009

Location: *behind main cottage, partially sheltered opposite back door*
Species: *White Pine with double crown - secondary crown is now more prominent and more fully needled than the primary one.*

Nature of Attack: *Typically this tree hosts gypsy moth that seem to appreciate the sheltering of the adjacent building. There is also evidence of random bleedings of knots and from patches of split bark. During the peak of the pine shoot beetle infestations in drifts of pines across the island this pine was heavily affected .*

- Observations:**
- 1) the pine tip beetles seems to have been eliminated by the very hard winter and late wet spring. No spume nests noted on any white pine trees this summer.*
 - 2)the gypsy moth that appeared in the autumn of 2007 has also been eliminated by the exceptionally severe winter. One or two cocoons noted at crux*
 - 3) the continuing bleeding knots and bark areas - seem to be due to small local beetle attack resulting from general weakening through previous gypsy moth attacks.*
 - 4) Tree is generally in good health with healthy new growth at the top. The lower brances are noticeably thinner in needling.*
 - 5) The cool wet summer of 2009 has again been ideal weather for island trees. A severe winter seems to have set back tree afflicting insects like the gypsy moth and shoot beetle.*
 - 6) A tornado or updraft swept through the adjacent woods during the past winter and uprooted or snapped at high level at leas 4 adjacent trees including a very large boll (550mm dia) white pine overhanging the wooddpile.*
 - 7) There are no cones forming on any of the white pines this year - only light pollination in June.*





Secondary lateral branching now more prominent than original crown and is unbalancing the tree



Insect nesting and gum bleeding at crux



Tree Number: 1 - 2010

Location: *behind main cottage, partially sheltered opposite back door*
Species: *White Pine with double crown - secondary crown is now more prominent and more heavily needled than the primary one and beginning to threaten the balance of the tree.*
Nature of Attack: *Typically this tree hosts gypsy moth that seem to appreciate the wind sheltering of the adjacent building. There is also evidence of random bleedings of knots and from patches of split bark. During the peak of the pine shoot beetle infestations in drifts of pines across the island this pine was heavily affected .*

Observations:

- 1) The pine tip beetles, so prevalent 3 years ago, have not returned to this or any of the pines on Fairwood. There were a few spume nests noted in June, but these have all disappeared. The winter was long but unusually mild and it is surprising that all types of insect life seem to be substantially reduced this year.*
- 2)The gypsy moth is also in abeyance. There are some new egg clusters and a couple of cocoons from this year noted on the tree. The egg clusters were removed as they were last year. There is little evidence of gypsy moth laying eggs elsewhere. All the usual places, the backs of shutters, the wood pile, under eaves are free of the orange fuzzy egg clusters this year.*
- 3) there is continuing bleeding of knots and splits in the bark areas - culprit beetle is not identified.*
- 4) In previous years there has been extensive ant activity on this tree - not observed this year*
- 5) Tree is continuing in excellent health after a good summer with adequate rain.*
- 6) The dual crown is becoming unbalanced with the primary crown now a fraction of the size of the bifurcating branch. This will need to be cut back soon because it is threatening the roof below.*
- 7) For the second year in a row there are no cones forming on any of the white pines - despite very heavy pollination in the week of June 3-8.*



Secondary lateral branching is unbalancing the tree and showing stress bleeding along underside



Pine gum splattered on berry foliage below



Insect nesting and gum bleeding at crux



Tree Number: 1 - 2011

Location: *behind main cottage, partially sheltered opposite back door*
Species: *White Pine with double crown - secondary crown is threatening the balance of the tree and leaning over the house. Proposed to reduce its mass by topping this offshoot next summer.*

Nature of Attack: *Though there is no further evidence of gypsy moth egg clusters after a long, hard winter, there is increased bleeding through the bark along the stressed underside of the offshoot crown. along the offshoot branch.*

Observations:

- 1) The pine tip beetles, so prevalent on this tree 4 years ago, have not returned to this pine although there are a few scattered instances recurring again on O.K. point, generally near the channel. The 2010-2011 winter was long and unusually extended.*
- 2)The gypsy moth remains in abeyance here and in other locations where the orange egg clusters are often found, under sheltered branches like this one, in the wood pile or on the backs of shutters*
- 3) There is increasing bleeding of knots and along bark splits, particularly under the strained lateral bifurcation - culprit beetle is not evident or identified.*
- 4) No ant activity this year, though this has been evident on the bifurcation in previous years.*
- 5) Tree is continuing in reasonable health, but after a long hot summer there is a thinning of the needling.*
- 6) It remains curious that the natural crown of this tree remains stunted. The secondary crown is unbalanced and of greater diameter than the primary crown. This suggests that a previous infection like pine rust thwarted the primary crown and diverted growth into the secondary.*
- 7) There were no cones formed this year on this white pine this year. It has rarely, if ever produced cones and the reason for this is unclear. I usually produces plenty of pollen. However this year there have been plentiful cones formed on adjacent pines. The red squirrels have harvested most of these.*



Beetle making a foam nest in Early June



Microscope image of larva which burrows through pith of new growth



Sketch of emergent segmental beetle

Notes on the Pine Shoot Beetle 2003-2007 (study in progress)

Locations: the tip beetle is found in drifts or copses of trees around the island it is particularly evident on OK Point, in Champlain Park, in clumps on the West End. It is less likely to occur on very exposed situations

Species afflicted: White Pine - not observed on any other tree

Progress of Attack:

A tiny beetle is found on individual pine needles in late spring, early June. This seems to develop into a beetle with a red abdomen which creates a spittal nest on the new pine tips about 75mm from the tip in early June. A boring larva enters the pith of the pine tip by a single round hole and burrows its way iup to through the pith.

The tip of the new growth turns brown and eventually falls off.

In 2005 this was occurring on many trees and afflicting many branches with the result that all new growth was destroyed and the trees became very sparse in appearance.

In 2007 the incidence of this beetle infestation was greatly reduced, possibly after a long and hard winter.

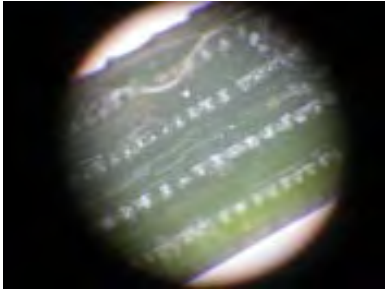
The effects of the hard and long winter of 2007-2008 on the proliferation of this insect will be observed in 2008.



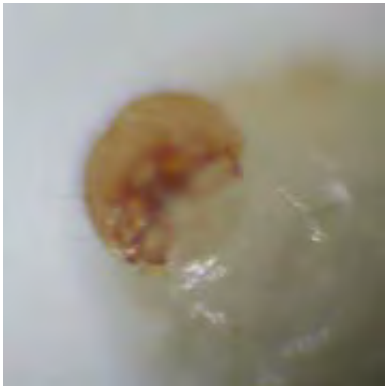
Sketch of head and 'beak' of pine shoot beetle larva



Burrowing Larva



Pine Tip Beetle - June 8, building foam nests in needles



Larva which burrows through pith of new growth



Tips turn brown and die off



Needling of tree becomes very sparse



Secondary lateral branching is unbalancing the tree and showing stress bleeding along underside



*Gypsy Moth nesting and gum bleeding at crux
Pine gum splattered on berry foliage below*



Tree Number: 1 - 2012

Location: behind main cottage, partially sheltered opposite back door

Species: White Pine with double crown - secondary crown is threatening the balance of the tree and leaning over the house.

Nature of Attack: Renewed evidence of gypsy moth egg clusters after a short, warm winter, there is increasing bleeding through the bark along the stressed underside of the offshoot crown.
No further pine tip beetle infestation noted in previous years.
Tree is generally healthy, full needled with limited new growth in 2012 due to the long summer drought.
No cone formation on this or any of the white pines in 2012

Observations:

- 1) Pine tip beetles: many spume nests were noted in all white pines in early June 2012 after a very warm winter, however the summer drought seems to have dried these out before the beetles could become established and there was very little resultant damage. No brown tips noted on this tree later in the summer.
- 2) Gypsy moth was not very evident this summer, however a number of egg sites were discovered in folded birch bark nearby. There were about 10 egg clusters removed from under the crux in October. It is predicted that there may be an upswing of gypsy moth in 2013.
- 3) Significant bleeding now from the horizontal branching, dripping on berry bushes below. This is thought to be resulting from the strain the weight exerted by the split double crown.
- 4) No ant activity this year, though this has been evident under the bifurcation in previous years.
- 5) There were no cones formed in 2012 on this white pine or on any other adjacent pines. The pollination of white pines was light in late May, early June after a medium dry spring and the summer drought seems to have discouraged cone formation. Squirrels are desperately short of food.
- 6) The shaping of this pine appears to be affected by wind streaming around the volume of the house. (see photo opposite) The tree is branching out laterally and not growing in overall height.





Secondary lateral branching is unbalancing the tree and showing stress bleeding along underside



Gypsy Moth nesting and gum bleeding at crux



Tree Number: 1 - 2013

Location: behind main cottage, partially sheltered opposite back door

Species: White Pine with double crown - secondary crown is threatening the balance of the tree and leaning over the house. Tornado winds on August 27th caught this tree and increased the cracking within the lateral limbs.

Nature of Attack: Extensive nesting of gypsy moth detected on southern exposure under bifurcation of crown branch and embedded in the bark (removed). New cracking has occurred and added bleeding of pine gum through bark. No further pine tip beetle infestation noted in 2013. Tree is generally healthy, full needled with limited new growth in 2013. For second year running there has been no cone formation on this or any of the white pines in 2013

Observations:

- 1) Gypsy moth has been detected nesting on many of the white pine in late August. after many years of low activity. There were about 10 egg clusters removed from under the crux in October. 2012. Nevertheless there are many more nests this year. The predicted upswing of gypsy moth is occurring despite a long, a hard winter and very delayed spring.
- 3) Significant bleeding now from the horizontal branching.
- 4) No further ant activity this year
- 5) There were no cones formed in 2012 or 2013 on this white pine or on any other adjacent pines. The pollination of white pines seems to have been light in late May, early June after a very delayed spring start. The subsequent dry summer seems to have discouraged cone formation. Squirrels are again desperately short of food.
- 6) The shaping of this pine appears to be affected by wind streaming around the volume of the house. (see photo opposite) The tree is branching out laterally and not growing in overall height.



Topping has resulted in growth of new crown



Branches denuded of needles

Tree Number: 2 - 2002

Location: path between cabin and bell tower

Species: red pine

Height: 5 M

Trunk Circumference: 30cm

Approximate Age: 50 yrs

Other Characteristics:

This tree has been blighted by saw fly caterpillars on a number of occasions in the past. One drastic remedial measure has been to remove the crown (circa 1965) A new crown has subsequently grown from an adjacent branch resulting in a peculiar gnarl to the trunk.

Nature of Attack: red headed pine sawfly caterpillar.

Observations:

This caterpillar attacks red pines on the island periodically. In recent years it has been less common. The larvae have reddish brown heads and yellow bodies with six rows of black spots along the back and sides. They feed in dense colonies completely defoliating and killing the tree. This tree has been treated for repeated caterpillar attack over the years.

In this year the caterpillars have created a small nest by drawing together the branch tips into a carefully disguised brown cocoon. The only evidence of their presence is the browning tip of the branch. The caterpillars within the nest were approximately 25mm long, and approximately 20 in number. It is suspected that this nest is retarded and should have matured earlier. Or is this a second brood? Or is this a strategy for overwintering?

Remedial Measures Taken:

Nests removed and destroyed

Observations on effectiveness of Remedial Measures or Progress of Attack:

Notes: there are many red pines on the island. They have been repeatedly attacked by caterpillars over many years. The caterpillars infestation is cyclical. In some years trees have been covered with them. It appears that birds feed off the caterpillars on more remote trees. But a number of red pines near the house have succumbed.



Pine sawfly caterpillar - One small caterpillar nest removed

Tree Number: 2 - 2003

Location: path between cabin and bell tower

Species: red pine

Nature of attack: pine swfly caterpillars

Tree in healthier condition.

One nest discovered sewn into bunched branch tip and full of tiny caterpillars.

However this seems too late in the season to cause harm as the tiny caterpillars are live this year and not apparently intended for next spring.

Some of the branch tips have been eaten, but considerable less than in 2002.

One or two yellow with black spot saw fly caterpillars discovered.

In general the red pines on the island have enjoyed a period free of significant infestations such as those that killed off so many red pine trees in the 1960's.



Tree Number: 2 - 2004

Location: path between cabin and bell tower

Species: Red Pine

Tree in healthier condition

Needles on lower branches are sparse or browning. This die back on the lower branches seems to be a natural development.

Extensive pine flowering this year

Bark healthy, no perforations, no lichens setting in.



Heavy flowering



Die back / browning on lower branches



Healthy developing crown branches



Shaggy bark but no new insect infestation



Tree Number: 2 - 2005

Location: path between cabin and bell tower

Species: Red Pine

Tree generally healthy - no evidence of any new caterpillar damage

Extensive late autumn budding, large orange buds dusty with caked sap - monitor result next spring

Bark shaggy but healthy, no perforations, no insect infestation or bore holes evident. No woodpecker damage.



End of season healthy new budding



Tree was originally cut to approx 3 feet high after infestation of caterpillar. The new crown is visible only as a sway in the trunk



Healthy well-needled crown



End of season hard new budding



Shaggy bark but no new insect infestation

Tree Number: 2 - 2006

Location: path between cabin and bell tower

Species: Red Pine

Excellent growing year - sufficient rain and reduced insect populations after hard winter. Tree is generally healthy - the severe damage by sawfly caterpillar has been largely overcome with the growing of a second crown from a lateral branch (evident now only in the slight sway to the tree bole)

Needling on the lower boughs is growing sparse - heavier needling on crown.

The extensive new budding in needle clusters visible last year is not evident this year. Instead there are fewer, tight, woody buds.

No cones forming here or on any of the red pines.

Some mould spots on needles - particularly lower branches.

Bark shaggy but healthy, no perforations, no insect infestation or bore holes evident. No woodpecker damage.

Note: Red pines on the island are generally healthy - the principal problems are due to wind damage in increasingly erratic wind conditions



Dusty mould appears on many needles - end of season



Healthy well- needled crown



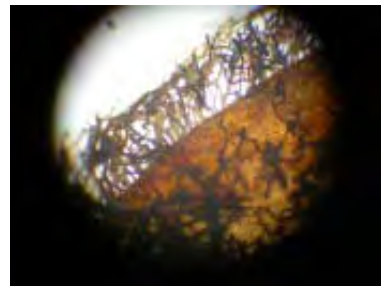
Budding flowers - late October



Browning needles - lower branches



Mould on needles - late October



Needle mould through microscope

Tree Number: 2 - 2007

Location: path between cabin and bell tower

Species: Red Pine

Another excellent growing year - no further evidence of sawfly caterpillar - the severe damage by sawfly caterpillar and the second crown is flourishing (evident now only in the slight sway to the tree bole)

Needling on the lower boughs is increasingly sparse and browning off - heavier needling on crown.

New budding in needle clusters which was not evident last year has returned moderately this year.

No cones forming here or on any of the red pines.

Some mould spots on needles - particularly lower branches. These are photographed under microscope.

Bark - no insect infestation or bore holes evident. No woodpecker damage.

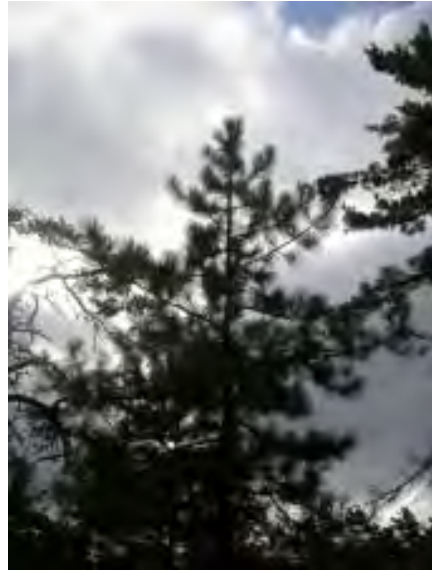
Note: Red pines on the island are generally healthy .



Denuded lower branches



Tight bud at centre of needle cluster



Flourishing, well-needled crown



Healthy, unperforated shag bark



Autumn - browning needles

Tree Number: 2 - 2008

Location: path between cabin and bell tower

Species: Red Pine

2008 has been another excellent growing year - the severe winter has discouraged sawfly caterpillar on all red pines - the second crown resulting from previous infestations is flourishing (note the slight sway to the tree bole and nails pictured below)

Lower branches continue to brown off, sparse needling - heavier needling moving up to crown. Unlike the 2007 autumn's pink budding at this time, there are very tight new buds at the tips of the needle clusters, as if anticipating a hard winter.

6 small cones from last year have now opened and shed seeds.

Mould spots are again visible on needles - particularly lower branches.

Bark is healthy and shaggy - no insect infestation or bore holes evident. No woodpecker damage.

General Note: Red pines on the island are generally in good health but there are few young ones developing by seeding.



Sway in tree bole



Old crown removed after saw fly devastation



Healthy, flourishing crown

Tree Number: 2 - 2009

Location: path between cabin and bell tower

Species: Red Pine

Nature of Attack: this tree has been ravaged regularly by yellow pine sawfly caterpillars. In the 1960's the sawfly killed off many of the Red Pines planted by TUFairlie

Observations:

2009 has been another excellent growing year -the severe winter has eliminated sawfly caterpillar on all red pines. The second crown resulting from previous infestations continues to flourish while the lower branches are dying off.

The whole area has been denuded of protective foliage by the beaver in 2008-2009 and this seems to have hastened the lower branch die back.

No mould spots on needles despite damp weather

Bark is noticeably healthy and shaggy - no insect infestation or bore holes evident. No woodpecker damage.

No cones have formed on this or on any of the other red or white pines this year.



Lower branches are dying back





Healthy, unperforated bark



Healthy, flourishing crown



Lower branches are dying back



Tree Number: 2 - 2010

Location: path between cabin and bell tower
Species: Red Pine
Nature of Attack: this tree has been ravaged regularly by yellow pine sawfly caterpillars. In the 1960's the sawfly killed off many of the Red Pines introduced by TUFairlie

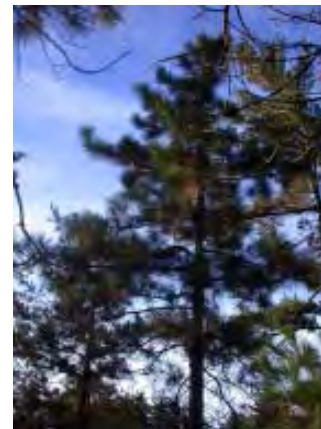
Observations: All trees on the island seem to be enjoying a remission of insect activity in the summer of 2010. The winter was long and mild. Previously it was thought that the long hard winter of 2008-2009 was responsible for abatement of insect activity last year, but this year it may have been a quirk of the freeze thaw cycle which has resulted in abatement.

No sawfly on the island at any stage of development..

No cones on this or any other red pines this year.

No needle mould noted - such as has occurred in previous years.

The extensive beaver damage to the whole area around this red pine is now regrowing, typically with copping succours from the roots. Maples are returning. Adjacent cedars are blighted - see notes following about 2010- Cedar Blight.





Healthy, unperforated bark



Crown still healthy but needling thinner than last year possibly after a slightly drier summer



Lower branches are now needleless



Old crown cut back due to saw fly



Tight budding for next season

Tree Number: 2 - 2011

Location: path between cabin and bell tower
Species: Red Pine 570mm circ. at 1200 a.g.l.
Nature of Attack: this tree has been ravaged regularly by yellow pine sawfly caterpillars. In the 1960's the sawfly killed off many of the Red Pines introduced by TUFairlie

Observations:
The lower branches of this tree have all died back now in the bottom third of the tree.
The crown of the tree is not as densely needled as in photographs of last summer but this may be due to a generally drier summer.
There is no evidence of any insect activity or saw fly on this tree during this season.
The bark is very healthy, without insect holing and is currently shagging.
The winter was extended and harsh, and the spring up to 3 weeks delayed for flowering berries and for pollens. The similarly long hard winter of 2008-2009 also resulted in a sudden abatement of insect activity in the following year

No sawfly noted anywhere on the island at any stage of development..
No cones on this or any other red pines this year.
No needle mould noted - such as has occurred in previous years.



No cones and little new growth

Healthy, unperforated bark



Crown still healthy but little new growth noted through exceptionally dry summer



Some minor bleeding at 2M above ground and gypsy moth nest (orange patch)

Lower branches are now needleless



Tree Number: 2 - 2012

Location: path between cabin and bell tower

Species: Red Pine 570mm circ. at 1200 a.g.l.

Nature of Attack this tree has been ravaged regularly by yellow pine sawfly caterpillars. In the 1960's the sawfly killed off many of the Red Pines introduced by TUFairlie

Observations:

- 1) Sawfly: No evidence of recurrence of sawfly on this or any of the red pines in 2012.
- 2) Bark generally healthy, evidence of some minor bleeding from insect infestation at about 2 metres above ground.
- 3) Die back of lower branches to approximately 3 M above ground. Crown sparse after drought throughout summer.
- 4) Gypsy moth egg cluster discovered and removed.
- 5) Little pollination, no formation of flowers or cones formed in 2012.

Pine Rust bleeding noted on adjacent white pine





Above: Little new growth noted through dry summer
 Below: Historic 'sway' in trunk from previous infestation



Above: truncated crown and nail cluster

Below: Gypsy moth cocoons within needle clusters. Dessicated pine flowers, no cones.



Tree Number: 2 - 2013

Location: path between cabin and bell tower

Species: Red Pine 570mm circ.

Nature of Attack this tree has been ravaged regularly in the past by yellow pine saw fly caterpillars. In the 1960's the sawfly killed off many of the Red Pines

Note: sway in trunk where crown was once cut off after being killed by sawfly. The tree has almost fully recovered, only cluster of nails in the flank indicate position and size of original crown.

Observations:

- 1) Sawfly: No recurrence of sawfly on this or any of the red pines in 2013. Some gypsy moth cocoons were noted within needle clusters.
- 2) Bark generally healthy, evidence of some minor bleeding from insect infestation
- 3) Die back of lower branches to approximately 3 M above ground. Crown sparse after drought throughout summer.
- 4) No Cones: they rarely form on these Red Pines



Above: Pine Rust bleeding noted on adjacent young white pine approximately 2 M to south
 This tree, though favourably situated, is being swiftly affected, branches browning, bark is spongy and loose. Sawdust caught up in cruxes of branches. Sound of munching woodworm within trunk.



Tree Number: 3 - 2002

Location: on bell tower path

Species: white spruce

Height: 4 M

Trunk Circumference: 60cm

Approximate Age: 55 yrs

Other Characteristics:

This spruce is one of the last of the many original spruces planted around the cottage in the 1945-55. These trees generally reached early maturity at 40-50 years and died. They have been popular with woodpeckers. There are still many spruce trees on the island, particularly on OK Point. These are generally offspring of the original trees.

The top of this tree died off approximately 25 years ago. This tree was cut back to 1 metre above the ground since the lower branches were still flourishing.

This tree has developed two new crowns from its lower branches.

Tree frogs to be found in this tree.

Nature of Attack: wood boring beetle

Observations:

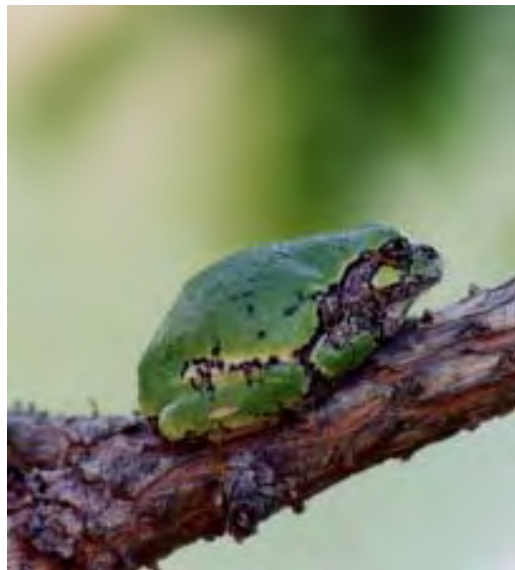
the beetle has attacked the heartwood in the cut area. Sap is oozing from the holes in this area. There are strips of sawdust visible festooned from the bark.

Remedial Measures Taken:

none – let nature take its course - assumed that birds will seek out the pest. The tree seems otherwise healthy.



Topped tree has developed two new crowns



Tree frog concealed on branches

Tree Number: **3 - 2003**

Location: *on bell tower path*

Species: *white spruce*

Tree is in good health and has produced a number of large healthy cones.

This is slightly out of sync with the other coniferous trees on the island which have not produced many cones this year, possibly following the hard winter.

Note: Cones harvested for seeding next spring.



Substantial cone growth from last year



Many strong, well shaped new cones



No new growth, branches denuded of needles



Only 3 new growth cones

Tree Number: 3 - 2004

Location: on bell tower path

Species: white spruce

Tree is in less good health with quite extensive needle fall and denuded tips.

Little evidence of new growth, unlike growth in previous year.

A few new cones on crown, but not the previous abundance.

No further bleeding on trunk - no evidence of insect infestation.

Note: Harvested seeds from previous year were sown, partially germinated but suffered from over watering. Next seedlings proposed to be planted in better drained sandy soil - for seedling stage.



Dropping needles and denuded branches



Tree Number: 3 - 2005

Location: on bell tower path

Species: white spruce

Tree continues to lose needles, thinning branches. Resurgent crown is now thinning.

No evidence of new growth after some years of regrowing new crown. Has this tree reached equilibrium with its soil potential?.

No new cones formed - after the abundance of 2 years ago.

No further bleeding on trunk - no evidence of insect infestation.

Note: the first white spruces were introduced in 1926-1928. They reached a maturity in 1970's and began to die off. Second and third seeded generations are now evident around the island. This tree is assumed to be about 60 years old.



Needle denuded twigging



Dropping needles and sparsely needled branches



Well needed second crown above amputation



Abundant new cones forming

Tree Number: 3 - 2006

Location: on bell tower path

Species: white spruce

Tree condition has improved remarkably in the good growing conditions of this last year with healthy thick needling on the second crown.

Many cones have formed after last years scarcity. These are being eagerly collected by red squirrels.

There is increased evidence of insect boring and rot setting into the trunk amputation point where the second crown off shoots. This activity will ultimately kill the tree and may be encouraging the heavy coning. Other second generation white spruce are not as prolific in coning this year. Cones harvested for spring seeding.



Increased insect activity at amputation point - some spongy rot





Prolific cones

Tree Number: 3 - 2007

Location: on bell tower path

Species: white spruce

Tree condition has improved remarkably with continued ideal growing seasonal weather, needling is more abundant on the second crown.

Many more cones have formed after scarcity in 2005.

Evidence of boring pests in the truncated bole with minor bleeding from holes. Some spongy rot patches on bole.

Other second generation white spruce are not as prolific in coning this year.

Some cones harvested for spring seeding.



Insect damage of trunk, some spongy rot



Large cones - late October



Well needed crown



Generally healthy needling



Tree Number: 3 - 2008

Location: on bell tower path

Species: white spruce

Tree condition is still generally good but there has been some die back of a dense cluster of lower branches. This tree, which had been substantially cut back following a drought some 30 years ago will eventually establish a new equilibrium with the meagre soil around. One reason for its current flourishing double crown is that the roots have invaded the adjacent lily beds.

The many cones observed last year in 2007 have opened up and are shedding their seeds. Many have been harvested by red squirrels.

Most of the remaining cones are harvested and seed shaken out to be planted in a 2 line seed bed in the sandy soil behind the pump house (this operation closely watched by an incredulous squirrel)

Boring pests in the truncated bole and some spongy rot seem to have resulted in the dieback of two branches at low level.

A gypsy moth egg cluster detected and removed - gypsy moth is not common on these spruce.



2006 Cones- now shedding seeds



New die back of lower branches



Patches of dead twigs in lower branches



Tree Number: 3 - 2009

Location: on bell tower path

Species: white spruce

Generally healthy, but a second lower branch has died back and dropped all needles.

No cones at all this year after the particularly heavy crop 2 years ago in 2007

There is a dearth of cones on all conifers except the Jack Pines (long term maturing)

Of the cones planted in the sand seed bed only one has flourished and is a small tree of 450mm height. Other cones probably dug up by squirrels.

Damp Moss is forming in the wound in the boll and increasing the rot penetration.



450mm high seedling in seed bed
(Tree 18)





Patches of dead twigs in lower branches



*Chinese Rain Tree Seedling nearby
Healthy, well needled crown*



Rose of Sharon Seedling



Tree Number: 3 - 2010

Location: on bell tower path

Species: white spruce

Needling very healthy and dense after a good growing summer.

No cones again this year, and no residual cones from previous years.

Offspring in sand seed bed behind cabin is flourishing, approx 700mm high.

No animals, tree frogs or insect activity noted on the branches.





Healthy, well needled crown



Tree Number: 3 - 2011

Location: on bell tower path

Species: White Spruce

After the cutting away of the diseased and dead primary crown, secondary and tertiary crowns have formed hugging the rock face. These have thrived.

Needling remains very healthy and dense after a good growing summer.

Some patchy die back in lower branches.

No cones again this year, and no residual cones from previous years. In some years this tree has been heavy with cones.

Offspring in sand seed bed behind cabin continues to flourish, 680mm high.

No animals, tree frogs or insect activity noted on the branches.

Some rot and moss growth around wound of original cut but not as yet threatening the lateral growth.

Patches of dead twigs in lower branches



Chinese Rain Tree survives to year 3 and still not thriving





Healthy, well needled crown



Sparse and undersized cones



Tree Number: 3 - 2012

Location: on bell tower path

Species: White Spruce

After the cutting away of the diseased and dead primary crown, secondary and tertiary crowns have formed hugging the rock face. These have thrived.

1) Needling remains dense and healthy despite the summer drought.

2) Patchy die back in lower branches towards channel.

3) 11 small cones have formed. This is one of the few trees on the island bearing any new cones at all.

4) Offspring in sand seed bed behind cabin continues to flourish, 750mm high despite drought.

5) No tree frogs or insect activity noted on the branches. (Tree frogs found in house)

6) Some rot and moss growth around wound of original cut but not as yet threatening the vitality of the lateral growth.

Moss Growth and decomposition on old stump



FAIRWOOD ISLAND FOREST MANAGEMENT PLAN

Few new cones (11) - generally quite undersized

*Chinese Rain Tree has died
Rose of Sharon below (3 years)
clinging to life in unsuitable soil*



TREE STUDY REPORTS - SECTION 09



Healthy, well needled crown

Extensive woodpecker damage to new crown, and gum bleeding



New cones have formed

New cones join year old cones which have not yet opened.



Tree Number: 3 - 2013

Location: on bell tower path

Species: White Spruce

Nature of Attack : This tree has recently been attacked by the downy woodpecker, there is extensive holing in the replacment crown and some bleeding.

Tree is otherwise thriving in the lower branches.

1) Needling remains dense and healthy.

2) Moderate coning from both this year and last. Last years cones were not harvested by squirrels despite the general dearth of cones on all the island trees.

4) Offspring in sand seed bed behind cabin has died back extensively (60% apparently due to drought)

5) No tree frogs or insect activity noted on the branches.

6) Some rot and moss growth around wound of original crown.

Moss Growth and decomposition on old stump

Lily of Valley at foot is thriving and producing many red berries this year.





Sparse needling of upper branches

Tree Number: ***4 - 2002***

Location: *on the bell tower path*
Species: *European Larch*
Height: *7 M*
Trunk Circumference: *50 cm*
Approximate Age: *55 yrs planted circa 1950 by TUF*

Other Characteristics:
This is a deciduous tree distinguished by branches covered with small cones.
This is the last of the larches planted on the south side of the cottage. They have been prolific with cones but none of the offspring have survived. A number of upper branches on this tree are now dying back.
There are a number of new cones in formation.

Nature of Attack: *woodpecker*

Observations: *inadequate soil to support much future growth. Very vulnerable to drought. Position very exposed to winds.*

Remedial Measures Taken: *seeds gathered and sown in pots to re-establish species*



Second year cones ready to release seed



Woodpecker attack

Tree Number: 4 - 2003

Location: on the bell tower path

Species: European Larch

This tree has been ravaged by the hard winter and now has very little foliage remaining. There is evidence of recent woodpecker attack.

A few new cones have formed and these have been harvested for spring seeding. Replanting will be attempted in this position and in more sheltered positions. These larches are related to the native tamarack but are less tolerant of boggy conditions.

Of the original stand of Larch planted in the 1940's, there are now only 2 trees remaining.

Both of these trees are now dying.



Mid section needling - but little new growth generally

Tree Number: 4 - 2004

Location: on the bell tower path

Species: European Larch

This tree is dying and has been ravaged by woodpeckers. Nevertheless there is an area of feathery new growth in the mid section of the tree, while the top has died off.

There are only 2 evident new cones, the rest have opened up in the previous year. No offspring have taken root.



Area of new growth sprouting



Mid section needling - no new growth, no new cones

Tree Number: 4 - 2005

Location: on the bell tower path

Species: European Larch

This tree is dying. It is the last of a stand of european larches planted originally in 1940's. This stand has suffered from lack of soil and very little retained water on the rock surface. The position is very drought prone.

These larches are planted in a relatively dry location, possibly unsuitable for trees that tend to thrive in more moist sites.

Old cones are decomposing. No new cones have been produced. Is this due to lack of cross pollination opportunities now that the neighbouring tree is dead?



Ruffed grouse at foot



Confused confusing fall warbler



Tree Number: **4 - 2006**

Location: *on the bell tower path*

Species: *European Larch*

Slow and protracted demise of last larch on island.

Harvested seed has not been successful - pots overturned and plundered by squirrels.

As a result of the good growing conditions the needling has come back patchily on all levels - even on some of the lower branches.

Very few cones have formed- these are dense and will not be ready until next year.

Insect boring holes through bark is quite extensive - but there is no further woodpecker interest in this site.

Desired strategy to reintroduce seedlings but in wetter and deeper soil conditions, yet well drained - possibly around end of Archer's Bay inlet.



New cone - ready next year



2-3 year old - spent cones



Mid section needling -patchy re-greening



Tree Number: 4 - 2007

Location: on the bell tower path

Species: European Larch

Protracted death of this tree.

Some new clusters of needles in patches up the tree near trunk

Some tiny new cones have developed from last year.

Gypsy moth cocoon on lower branch.

Previous years cones on denuded branches



Gypsy Moth infestation - late August



New growth and new cones



New cones developed from last year



Patches of renewed needling



Cones from previous years clinging to branches



Tree Number: 4 - 2008

Location: on the bell tower path

Species: European Larch

Continuing and protracted death of this tree which is the last of a stand of approximately 10 planted as a shelterbelt.

Cause of decline is poor soil and periodic years of drought.

However the condition of the tree has improved slightly in the last growing seasons. New clusters of needs are reappearing throughout its height - including areas thought permanently dead.

Last Year's cones are collected for seed stock.

No apparent recent woodpecker damage.



Overview with patches of renewed green



Previous Woodpecker damage to bark



New offshoot crown



Sparse foliage

Tree Number: 4 - 2009

Location: on the bell tower path

Species: European Larch - 60 years old - planted by TUF

Larches are deciduous and this larch has regrown needles in patches at all levels as a result of the current cycle of favourable weather conditions.

The original crown of the tree however is not greening and a secondary crown has shot off northwards and this is needed.

The bark of this tree continues to be healthy and there is no sign of insect infestation or of woodpecker damage. The woodpecker damage of some 5 years back has now been covered by new shag bark overlayer.

There are no new cones on this tree. The opened old cones remain attached and do not shed.

Attempts to grow seedlings from this last of the European larches have not been successful.

It is expected that this tree will die during the next cycle of adverse weather.



Patches of greening occur at all levels - no new cones





Tree has sprouted new greenery at all levels



Woodpecker damage

Tree Number: 4 - 2010

Location: on the bell tower path

Species: European Larch - 60 years old - planted by TUF

This larch has continued to re-sprout green branches at all levels. The past mild winter and adequate rain have turned around a tree that was dying, the last of a group of about 6 larches and their offspring..

There appears to be an area of recent woodpecker damage about 2M above ground..

There are no new cones on this tree. The old cones have all opened. The seeds planted out have not germinated. It is likely that this tree will die during the next cycle of adverse weather.

The closest indigenous relation to the European larch is the Tamarack - but this site is not wet enough - tamaracks prefer semi-marshy conditions.

Note: a Rose of Sharon seedling which may thrive in the acidic soil has been planted nearby as an experiment. - to be monitored.

No new cones





Tree has sprouted new greenery at all levels



Tree Number: 4 - 2011

Location: on the bell tower path

Species: European Larch - 60 years old - planted by TUF

Continues to re-sprout sparse green branches at all levels.

No new cones on this tree. Many old cones are still clinging to branches and all have opened.

Previous evidence of woodpecker damage has now shagged off and bark is clear of perforations noted last year.

Small woody fungal clusters noted on some branches and viewed under the microscope below.

Heavy lichen growth on lower branches.



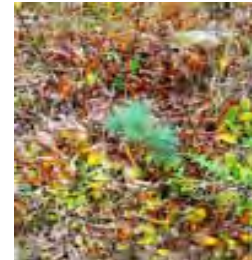
Stump of deceased larch nearby.



No new cones



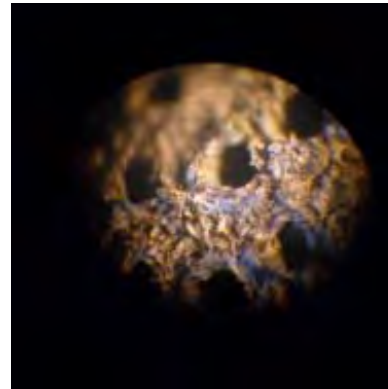
White pine planted 2009



Heavy lichen growth on lower branches



Woody fungal growth on branch and viewed under microscope





Needling of tree reduced due to drought especially at crown



Tree Number: 4 - 2012

Location: on the bell tower path

Species: European Larch - 60 years old - planted by TUF

This is a deciduous tree which loses all its needles in the wintertime.

1) Less renewed growth than witnessed last year, due to drought. Greening occurs at 2M, 3M 4M and 5M above ground but no longer on crown

2) No new cones on this tree. Old cones are still clinging to branches and all have opened and shed their seeds.

3) No new evidence of woodpecker damage or other infestations.

4) Heavy lichen growth on lower branches.



No further woodpecker damage to bark

Modest patches of greening





*Tree almost completely bare of needles
Trumpet vine is growing up trunk.*



No further woodpecker or insect damage to bark



Tree Number: 4 - 2013

Location: on the bell tower path

Species: European Larch - 65 years old - planted by TUF

This is a deciduous tree which loses all its short needles in the wintertime.

- 1) Tree has almost succumbed to the harsh winter, only one branch at about 1500 above ground had developed needles this year.*
- 2) Old cones are still clinging to branches but all have opened and shed their seeds. No offspring.*
- 3) No new evidence of woodpecker damage or other infestations. Wood is of no interest to insects now.*
- 4) Heavy lichen growth on lower branches.*
- 5) Policy to leave tree and observe process of final die off.*



Note: Rose of Sharon planted nearby has not grown at all above 2" - yet continues to survive

Only one branch has produced any needles this year. The harsh conditions of 2012-13 winter have set this tree back severely. It appears unlikely to recover.



Brown tips and sparse foliage throughout tree



Brown tips due to insect boring through pith of tips small spider nesting in dead tips



Tree Number: 5 -2002

Location: on the old flag pole point

Species: White pine

Height: 4 M

Trunk Circumference: 30 cm

Approximate Age: 20 yrs

Other Characteristics:

This tree is young and well rooted. Like many of the trees on OK Point it has been weakened by the drought of 2001. It has been chosen to monitor the new tip die back phenomenon which is apparent in many of its neighbours on the point.

Have these trees been irreparably weakened by drought – or will they survive?

Nature of Attack: pine shoot beetle and pine aphids

1) A brown snouted beetle with irregular patches of white scales. The beetle seems to burrow down through the pith of the leading shoots and the shoots turn brown and hang down. Results in the development of crooked or forked stems.

Almost all of these tips then are gathered together into a discreet cocoon by a small spider. It is not as yet clear whether the spider is an opportunist making use of the brown tips, or whether she is related to the boring beetle.

2) Being in weakened state the tree has been attacked also by gypsy moth.

Observations:

Remedial Measures Taken: gypsy moth cocoons removed, tip beetle to be monitored to observe spread to other adjacent trees.



Black ants farming aphids for pine gum secretion

Tree Number: 5 -2003

Location: on the old flag pole point

Species: White pine

This tree has died back considerably in the last year and its foliage is becoming very sparse.

Most of the trees on OK point exhibit the same sparsening and dieback. This seemed to be a follow on from the droughts of recent years, but elsewhere on the island the pines are better restored.

Brown tipping seems to occur in drifts, some on the west end and north shore path.

Nature of Attack: pine shoot beetle and pine aphids 'farmed' by ants

Pine aphids being farmed by ants are noted on some of the upper branches. The ants prod the aphids and seem to be keeping them in a state of worry and they seem to be secreting a sugary substance that they have processed from the pine gum.

Two days later the ant farm was gone. This is surprising, in other locations they have lasted for substantial periods of time.



*Brown tips due to insect boring through pith of tips
small spider nesting in dead tips*



Pine tip insect nest forming



Black ants farming aphids for pine gum secretion



Ravaged and sparse tips



Mites nests at branch ends, needles drawn together with silk web and inhabited by small spider



Tree Number: 5 -2004

Location: on the old flag pole point

Species: White Pine

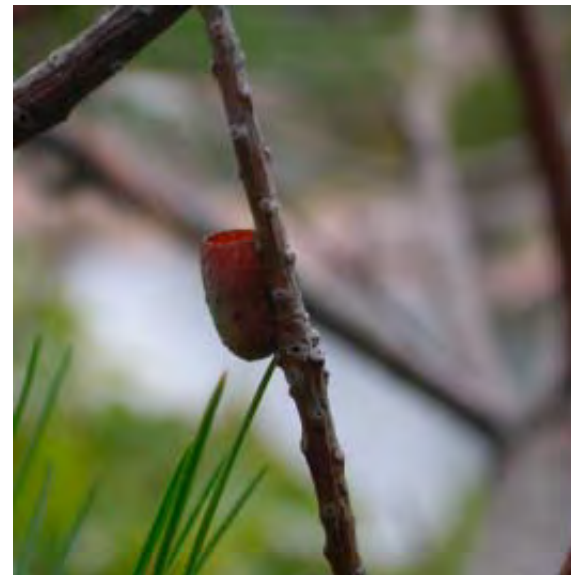
No further evidence of gypsy moth on this or adjacent trees.

Tree foliage is still very sparse and any new growth is afflicted with shoot beetle. This is one of many trees on OK Point that seem to be endangered by the beetle infestation.

These infestations occur in clumps across the island, for no apparent reason of wind exposure, poor irrigation or poor soil. It can occur in quite sheltered locations but usually in clumps of 10-15 trees.

Experiment undertaken to determine the effect of removing all of the tip mites nests bound up in the branch tips.

Noted also a number of conical insect casings for unidentified insect.



Cocoon casings on branches - unidentified insect



Tree Number: 5 -2005

Location: on the old flag pole point

Species: White Pine

No further evidence of gypsy moth visible on this or anywhere on OK Point.

Tree foliage has not recovered from drought, gypsy moth infestation and then the subsequent shoot beetle.

Like many trees on OK Point, this tree is severely weakened and is not likely to recover.

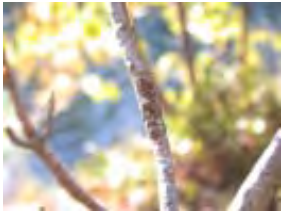
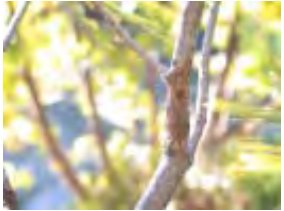
The result of last year's experiment to remove all of the mites bound up in the branch tips has resulted in a clear reduction of the infestation of the pine shoot beetle.

Conclusion is that the cocooned nests with spider insect are part of the shoot beetle cycle.

Noted also were a number of conical insect casings of unidentified insect.



Ravaged and sparse needling - less pine tip beetle



Evidence of pine rust fungus girdling twigs



Pine shoot beetle



Prolific cones on adjacent pines



Sparsely needled crown

Tree Number: 5 -2006

Location: on the old flag pole point

Species: White Pine

The reasons for the decline of this tree and its neighbour are uncertain. The lower branches have lost most needles, the crown is thin.

Seems to have adequate rooting, vulnerable to drought in bad years. The immediate microclimate may be adverse and exposed.

Various branches show rust fungus symptoms. They are swollen, girdling the branch and there is evidence of orange spores under the broken bark. The girdled branch has died. There is no evidence of rust closer to the bole, where it would destroy the tree. (continuing monitoring)

Only one tip beetle nest remains on tree.



Ravaged and sparse needling -no pine tip beetle



Tree Number: 5 -2007

Location: on the old flag pole point

Species: White Pine

Needling continues to sparsen. No apparent reason except thin soil and low water levels.

No evidence of tip beetle on new growth tips, but little new growth..

No infestation of gypsy moth.

Several tiny cocoons (vacant) found attached to underside of branches. (wasp like insect?)

Adjacent trees are also sparsely needled and tend to be competing for limited space and soil.

Propose to thin out these trees selectively in 2008



Clumped neighbouring trees - competitive require thinning



Sparsely needled crown



Tree 5 and neighbour are increasingly sparsely needed



Comparing crowns of paired trees



Heavy crop of cones on adjacent tree



Squirrel harvest



Pine aphid damage from 2006



Sparse mid height needling



Tree Number: 5 -2008

Location: on the old flag pole point

Species: White Pine (adjacent pair)

Needling continues to sparsen in middle branches but crown appears well needled and the general condition of both trees has improved after 3 good growing seasons.

No evidence of tip beetle which previously afflicted many trees in this area. Trees are looking much healthier.

No significant infestation of gypsy moth. However there are some cocoons entangled in the needles. No moth overwintering nest patches detected.

Tree #5 has produced 6 cones which are in the process of opening and dropping their seed.

Some adjacent and dying trees have been removed to reduce overcrowding. The intended removal of the paired white pine tree is postponed because of an exceptionally heavy crop of cones. This appears to be the weaker and moribund tree.



Gypsy moth cocoon caught in needling





Adjacent trees are becoming sparser in needling compared with last year.



Bleeding gum through smooth bark is occurring in various locations - suggesting under bark insect activity.

Tree Number: 5 -2009

Location: on the old flag pole point
Species: White Pine (adjacent pair)

Mid range branches are now almost all brown. Despite the good growing cycle this tree is not thriving probably due to a lack of good soil being located on a rock crown.

Crown of tree appears less fully needled than in previous years.

*No gypsy moth noted. this year.
No pine tip beetle noted. this year.
No pine aphids noted. this year.*

Nevertheless there are patches of bleeding gum in the smooth bark of the trunk suggesting some insect activity under the bark.

No cones have formed on this tree or on its adjacent mate (which was heavily coned last year.)

*The adjacent tree of same age is competing for soil resources and seems to be less favoured.
The cutting down of the adjacent competing tree to study the liberating effect on the growth of Tree 5 has been postponed.*





Needles - much denser than last year - tree almost fully recovered from insect infestations of previous years. Middle branches have died back.



Tree Number: 5 -2010

Location: on the old flag pole point
Species: White Pine (adjacent pair)

Crown of tree and base have better denser needling in contrast to last year.

The bark is clean and unperforated by recent beetle activity.

No gypsy moth noted.this year.

No pine tip beetle noted.this year.

No pine aphids noted.this year - fully recovered fro aphid activity in 2008. Aphid infested branches in mid range have died..

The patches of bleeding gum noted last year have disappeared, however there was some evidence of rust on some of the branches- This has not settled into the branching cruxes.

No cones have formed on this tree or on its adjacent mate (which was heavily coned in 2008)

The adjacent tree of same age is failing and outstripped by its peer.

Minor rust infections on branches under bark have not gravitated to trunk





Tree 5 and its mate are exactly same age but Tree 5 is now outstripping mate in growth



Return of pine tip beetle noted on adjacent white pines - as in previous years



Tree 5 has lost many mid branches in aphid and tip beetle attacks. Base branches and crown now flourishing



Tree Number: 5 -2011

Location: on the old flag pole point
Species: White Pine (adjacent pair)

Healthy needling on crown and base, but mid branches dead.
Little evidence of insect infestation, only one instance of tip beetle nest, though there are more instances of this recurring on an adjacent mature pine.

No more rusting, bleeding through bark or pine aphids. A few lower branches, are swollen as a result of previous pine aphid attack.

Trunk diameter at 110mm has far outstripped its mate tree of identical age (80mm)
No gypsy moth noted.this year.
No pine tip beetle noted.this year.
No pine aphids noted.this year.

No cones have formed on this tree or on its adjacent mate (which was heavily coned in 2008)

Trumpet vine growing on adjacent pine



One instance of tip beetle on Tree 5





Tree 5 and its mate are exactly same age but Tree 5 is now far outstripping its mate in growth



Crown is well needled, die back on mid branches, which endured aphid, gypsy moth, and tip beetle attacks

Tree Number: 5 -2012

Location: on the old flag pole point
Species: White Pine (adjacent pair)

- 1) Healthy needling on crown and base, but mid branches are now dead.*
- 2) No evidence of insect infestation.*
- 3) No more rust, bleeding through bark or pine aphids. Aphid attack brance is completely dead and riddled with holes.*
- 4) No gypsy moth noted this year.*
- 5) No pine tip beetle noted this year.*
- 6) No pine aphids noted this year.*
- 7) No cones have formed on this tree or on its adjacent mate (last heavily coned in 2008)*



Dogged Pine - thriving in North Shore rock seam in spite of drought

Tree 5 has lost many mid branches in aphid and tip beetle attacks. Base branches and crown now flourishing





Minor instances of tip beetle and browning tips with interior pith cored out by larva.



Tree 5 and its mate are exactly same age but Tree 5 is now far outstripping its mate in growth



Crown is well needled, die back on mid branches, which endured aphid, gypsy moth, and tip beetle attacks



Lower branch riddled by aphid attack of a few years ago.

Tree Number: 5 -2013

Location: on old flag pole point

Species: White Pine (one of identical twins of same age)

tree is in exposed position and roots are remote from low water level

1) Healthy needling on crown and base, but mid branches are now dead and bark is riddled with aphid holes from previous attack.

2) No further evidence of any insect infestation. No pine aphids noted this year. Two instances of pine tip beetle noted. Generally there has been very little incidence across the island this year.

3) No gypsy moth noted this year, however it is on the more sheltered pines in front of house (below)

6) All shoreline pines have rooting systems that are dependent on the water level nearby. Many of these trees have been stressed by drought and the continuing low water levels

7) No cones have formed on this tree or on its adjacent mate (last heavily coned in 2008)

Below : cleared area in dell in front of house with 4 reforested pines planted circa 1970.



Pine Rust Notes:

Locations: tends to attack in moist, cool and sheltered areas
Afflicted Species: White pine only
Age: Rust is lethal to young trees where the fungal infestation has less distance to travel to reach and girdle the bole.



Two trees in this study are afflicted by Rust.
Tree # 6 is young and has succumbed quickly.
Tree # 8 is a mature tree of approximately 50 years age.
Both are near woods where the Ribes, wild currant, flourishes. swollen girdle on stem

Pine Rust is a fungal infection which was introduced to North America in a shipment of pine seedlings from Europe in 1898. These were being imported from established European nurseries to help remedy the ravages of the logging industry in North America.

The rust fungus does not spread from pine to pine but requires a very complex intermediary set of stages for spore development in conjunction with the Ribes family, wild currant or gooseberry. There are 5 specific spore stages, two on the pine and 3 on the Ribes to develop the specific spore that can enter a stomata (breathing hole) in a white pine needle and infect the tree. The spore establishes a mycelium root system which swells the bark of the branch and works its way towards the tree bole. This swelling is often orange coloured and breaks open to release spores which infect the currant. The infection of the currant goes through 3 different waves of spore development before the specific spores that are able to re-infect the pine are released from orange fungal patches on the underside of the currant leaves in late summer.

Once the canker girdles the pine branch it kills the branch resulting in the brown 'flags' or dead branches, with needles intact, which are distinctive of the disease.

Pine resin begins to drip out from the splitting canker and drops to the ground.

Bark beetles and other armillaria (wood rot fungi) then take advantage of the weakened state of the tree and the under bark sapwood becomes slimy and riddled with beetle tracks. These beetles and fungi are not part of the rust disease. They are just ensuing afflictions.

[FAIRWOOD ISLAND FOREST MANAGEMENT PLAN](#)

Rust infections tend to occur in 'wave' years when the cool moist weather conditions are right to promote the complex stages of fungal growth on the currant, and encourage the resulting spores to enter the pine needle stomata.

*Young trees are particularly vulnerable.
The fungus cannot overwinter on the ribes, only on the pine.*

Possible Remedies - control strategies

- 1) tear up ribes - currants. This has been tried unsuccessfully in various locations around infected trees on the island - notably near the Stepping Stone crossing.*
- 2) remove afflicted branches, sufficiently distant from the bole that the mycelium tentacles have not penetrated to it. Note 95% of rust infection occurs within 3 metres of the ground.*
- 3) resistant tree selection*



Bleeding cankers on bole of rust infected Tree # 10



Ribes - wild currant at foot of tree

[TREE STUDY REPORTS - SECTION 09](#)



Tree Number: 6 - 2002

Location: in the clearing beyond the old incinerator
Species: White pine
Height: 3.5 M
Trunk Circumference: 30 cm
Approximate Age: 20 yrs

Other Characteristics:

This tree is young and well rooted. It has good irrigation through a natural draining seam across the rocks. There is plentiful green moss around it as a result and some blackberries and bilberries.

Nature of Attack: white pine blister rust which thrives in these moist, protected areas

Observations:

Brown needles, swellings on branches and large resinous wounds on trunks near branchings. White blisters contain a powdery orange spores in May. Individual branches affecte and then mycelium spreads to bole and whole tree turns brown and dies.

The needles on the upper branches have turned brown and fallen. There are festoons of sawdust hanging from under the branches. There is a pile of sawdust circling the trunk of the tree. There is profuse bleeding sap around the tree at higher level which though it supports no needles the sap is still being delivered into the bare branches.

Unlike other trees dying of Rust disease near the stepping stones of Otter Lake, there is no wild currant vine present to act as host to a different phase of the affliction. Are the nearby blackberries fulfilling this role? There is wild currant 20 metres away near the disused incinerator.

Remedial Measures Taken: monitor situation. No adjacent trees seem to be afflicted except for a large white pine near the incinerator. Rust cannot jump from pine to pine - only via the Ribes succession of fungi.

Sawdust and bleeding gum under branches - orange powdery fungus spores under bark.



Ring of sawdust around base of tree - bark beetles ravage the bark around the rust cankers



Sawdust and bleeding gum under branches orange powdery fungus spores under bark.

Tree Number: 6 - 2003

Location: in the clearing beyond the old incinerator

Species: White pine

This tree is dying. Its decline may have been hastened by the hard winter.

A previous year's ring of sawdust around its base has disappeared suggesting that the beetles have abandoned it or have died off from lack of nourishment.

The tree overhanging the old incinerator is similarly infested and will be added to study as Tree # 8



Sudden appearance of lichen on branches



Tree is now nearly dead.



Overview of trunk



Bark decomposing in upper 2/3 of trunk

Tree Number: 6 - 2004

Location: in the clearing beyond the old incinerator

Species: White Pine

Upper 2/3 of tree is now completely dead.

Lower branches harbour pine shoot beetle.

No evidence of new sawdust at base.

Minor fresh bleeding in one location half way up stump.

Moist sphagnum moss at base.

Perhaps this tree has succumbed because there is little soil available under the sphagnum moss and the moss may harbour the wrong type of bacteria for white pine roots to flourish.



Gum weeping through bark



Overview of trunk with localised rot around insect infestation

Tree Number: 6 - 2005

Location: in the clearing beyond the old incinerator

Species: White Pine

Upper 2/3 of tree is completely dead.

Lower branches are no longer afflicted with pine shoot beetle. Is the tree too sickly to provide the nourishing new growth for the shoot beetle?

Evidence of renewed sawdust around base of trunk..

Minor fresh bleeding in one location half way up stump.



Bark beetles take advantage of the weakened state of tree



Upper 2/3 rds of tree now dead



Overview of tree, lower branches only are green



Bark damage and decay



Tree Number: 6 - 2006

Location: in the clearing beyond the old incinerator

Species: White Pine

Top of tree completely dead and rotting.

Sphagnum growing on upper branches.

Wet patches of insect perforated bark visible half way up trunk. Bark spongy and detached on rotted bed.

Two lower most branches remain well needed.

No fresh evidence of sawdust around trunk - insects seem to have abandoned this tree.



Sphagnum growth on upper branches



Orange fungal growth



Bark damage and decay



Insect activity visible under falling bark

Tree Number: 6 - 2007

Location: *in the clearing beyond the old incinerator*

Species: *White Pine*

Final dying off after prolonged rust and insect attack

One lower branch only is partially alive.

Bark is rotten on upper half of tree and sliding off on a slippery rotting underlay.

No further evidence of insect infestation, including around the one remaining live branch.

Luxuriant new green lichens are growing on twigs.

Tree is of no interest to woodpeckers.



Bark insect penetrations



Pine aphid infestation on adjacent pine



Tree Number: 6 - 2008

Location: *in the clearing beyond the old incinerator*

Species: *White Pine*

This tree is now completely dead. No further sign of insect activity on trunk or branches. Bark is detaching and falling away.

Elaborate new green lichens are growing on twigs.

The currant vine which symbiotically sustained the rust infection cycle has now also disappeared. The ground around the trunk is saturated and mossy.

Generally the death of this tree is ascribed to its poor location resulting in weakening and susceptibility to pine rust. The tree is rooted in a seam which picks up a lot of water off the adjacent rocks. During the last 3 rainy summers this may have frequently drowned the roots. The tree was located to thrive during the preceding dry years.

An adjacent tree of roughly the same age (80mm bole) has similar rooting. Its needles are yellowing and there is an extensive aphid infestation on the lower branches which is still being farmed by the ants, in slow motion, despite the cold weather (5 degrees Celsius at night)



Twigs encased in fast growth lichens



Spectacular new lichen growth



Tree bark falling away



Tree Number: 6 B - 2009

(Tree 6 Dead)

- study focus shifted to adjacent tree of similar age and size - now designated 6B

Location: in the clearing beyond the old incinerator

Species: White Pine 3.6M high 75mm boll

Original Tree 6 has now been dead for a year. There are however still brown needles clinging to one branch. The bark is falling away to reveal the mushy underlayer of the rust affliction. Lichens are growing on the branches. No insects are noted in the decomposition..

The focus is now shifting to an adjacent tree of the same age which is located in the same rooting conditions, little soil, boggy and in a transverse drainage seam. There is a similar moss surround at the base of the trunk..

The new study tree has no current evidence of rust affliction.(as continuing in mature Tree 8 following)

The extensive pine aphid infestation noted late season last year on tree 6B is no longer evident.

The currant vine which symbiotically sustained the rust infection cycle has now disappeared.

Tree 6 dead - study replaced by adjacent partner which shares the same rooting conditions - will the rust infestation migrate to the new tree?



Decomposing bark of original and now dead Tree 6



Smooth healthy bark of replacement study Tree 6B





Tree Number: 6 B - 2010

(Tree 6 Dead)

- study focus shifted to adjacent tree of similar age and size - now designated 6B

Location: in the clearing beyond the old incinerator

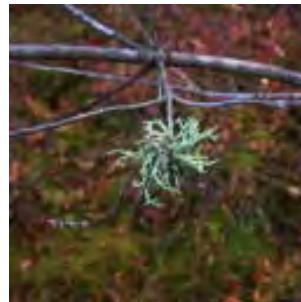
Species: White Pine 3.6M high 75mm boll

Original Tree 6 has now been dead for 2 years. Bark is falling off. No further insect activity, beetles or borers. Lichens are growing on the branches.

The new study tree, 6B, has no ongoing evidence of rust affliction.. The currant vine which symbiotically sustained the rust infection cycle has now disappeared from immediate vicinity but it is in the area.

Crown and base branches are green, mid branches have died off after the aphid infestation. .The extensive pine aphid infestation noted in 2008 is no longer evident.

Tree 6B is very healthy and well needed. There has been adequate but not excessive rain over this season and its roots which sit in a drainage swale in the rock have not been flooded as in previous years.





Tree 6A dead and 6B both occupy a drainage seam with excessive moss and moisture



Healthy bark and no evidence of rust infection though ribes has been noted in the area.

Tree Number: 6 B - 2011

(Tree 6 Dead)

- study focus shifted to adjacent tree of similar age and size - now designated 6B

Location: in the clearing beyond the old incinerator

Species: White Pine 3.6M high 75mm boll with bifurcation

Original Tree 6 has now been dead for 2 years. Bark is falling off. No further insect activity, beetles or borers, trunk is becoming spongy with rot. Lichens are growing on branches.

The new study tree, 6B, has no ongoing evidence of rust affliction.

Trees 6A & B are located in a less than ideal mossy and swampy drainage seam. Their roots become overwhelmed with run off in wet years, but the location has allowed trees to thrive briefly in drier years.

The currant vine (ribes) which symbiotically sustained the rust infection cycle has now disappeared from immediate vicinity.

No further evidence of aphid infestation of 2008.



Tree 6A is decomposing rapidly, no evidence of continuing insect interest. Slimy moulds, lichens thriving



The original crown of tree 6B has died off entirely and bark is peeling, probably due to an old rust infection and the secondary crown has developed instead.





Tree 6A dead and 6B both occupy a drainage seam with excessive moss and moisture



Healthy bark and no evidence of rust infection though ribes has been noted in the area.

Tree Number: 6 B - 2012

(Tree 6 Dead)

- study focus shifted to adjacent tree of similar age and size - now designated 6B

Location: in the clearing beyond the old incinerator

Species: White Pine 3.6M high 75mm boll with bifurcation

Original Tree 6 has now been dead for 3 years. Bark is falling off. No further insect activity, beetles or borers, trunk is becoming spongy with rot. Lichens are growing on branches.

1) The new study tree, 6B, has no ongoing evidence of rust affliction.

2) Trees 6A & B are located in a less than ideal mossy and swampy drainage seam. During the 2012 drought however, the location has allowed this tree to thrive on limited rainfall.

3) The currant vine (ribes) has now returned to the vicinity and there is evidence of the orange fungus on the underside of the leaves in autumn.

Tree 6A is decomposing rapidly, Slimy moulds, lichens thriving under bark



Ribes, wild currant, noted in vicinity





Tree 6A dead and 6B both occupy a drainage seam with nutrient depletion in wet years and moss growth at base.



Tree 6A is decomposing rapidly, Slimy moulds, lichens thriving under bark

Tree Number: 6 B - 2013

(Tree 6 Dead)

- study focus shifted to adjacent tree of similar age and size - now designated 6B

Location: protected inner island location, in the clearing beyond the old incinerator. This protected location sustains certain types of lichen and ribes (wild currant) growth

Species: White Pine 3.6M high 75mm boll with bifurcation

Original Tree 6 has now been dead for 4 years. Decomposing but no further insect activity, beetles or borers, trunk is becoming spongy with rot. Lichens are growing on branches.

- 1) The new study tree, 6B, has no ongoing evidence of rust affliction.*
- 2) The siting of both these trees in a natural drainage channel allows them to thrive in dry years but the water washes away soil and nutrients in wet years and tends to favour spongy moss growth around the roots.*
- 3) The currant vine (ribes) has now returned to the vicinity. There was evidence of the orange fungus on the underside of the leaves in autumn of 2012, but none noted this year.*



Ribes, wild currant, noted in vicinity



Lichen growth on old bark in this protected, damp, overshadowed, inner island location



extensive woodpecker damage to main trunk



lichen encrusted boughs



Tree Number: 7 - 2002

Location: near the 'Stop/Go' sign
Species: Scotch pine- relatively rare on Fairwood
Height: 4 M
Trunk Circumference: 30 cm
Approximate Age: 50 yrs

Other Characteristics:
This tree is stunted and gnarled. The boughs are encrusted in green lichen. There is an offspring tree of approximately 20 years alongside.

Nature of Attack:
1) *Woodpecker attack, small holes in lines up and down main trunk suggest that there is insect life hidden under the bark. However tree seems tough and withstanding attacks.*
2) *Like many of the trees in this protected valley it is heavily encrusted in green lichens. This lichen grows on many pines and hardwoods in a zone around this bog at the end of Archers bay.*

Observations:
This tree seems to be too marginal to be of interest to new predatory insects but the woodpecker activity attest to some insect activity under the dry bark. Are the lichens a protective shield?

Remedial Measures Taken: none – to monitor in relation to the few other scotch pines on island
Cones harvested to experiment with heat releasing seeds for reforestation.



Delicate fresh lichen growth (following the hard winter and wet spring)

Tree Number: 7 - 2003

Location: near the 'Stop/Go' sign

Species: Scotch pine- relatively rare on Fairwood

This tree is so marginal that it seems to be of little interest to new insect predators.

This results in a long term more or less stable condition.

New lichen growths are appearing on denuded branches.

Attempts to plant seedlings in the spring of 2003 have failed. The environment within the coldframes appeared to be too moist and rotted the seedlings at base of stem.

Propose to attempt again in spring 2004 with a sandy, peaty mix of soil (less rich compost)



Sparse, lichen encased branches

Tree Number: 7 - 2004

Location: near the 'Stop/go' sign

Species: Scotch pine- relatively rare on Fairwood

This tree is so afflicted that it seems to be of little interest to new insect predators.

Largely stable condition

Approximately 30% of old needles are browning and being replaced with new tips.

No new cones - though some have appeared on the adjacent Scotch Pine

Some tiny cones seem to be appearing on the tips - as if to be ready in 2 years time.



Future cones - in 2 years?



Browning needles



New growth





Extensive growth of lichens

Tree Number: 7 - 2005

Location: near the 'Stop/Go' sign

Species: Scotch pine- relatively rare on Fairwood

This tree is so emaciated that it seems to be of little interest to new insect predators.

Largly stable condition - gently declining.

Approximately 30% of old needles are browning and being replaced with new tips.

1 new reddish cone only, this has developed from miniature cones noted in 2004. Other cones have disappeared. Cone probably ready to seed next year.



Single new growth cone



New growth lichens



Previous years opened cone



Extensive growth of lichens



Heavy encrustation of lichens

Tree Number: 7 - 2006

Location: near the 'Stop/Go' sign

Species: Scotch pine- relatively rare on Fairwood

Successful growth year

Largly stable condition - gently declining.

No evidence of insect attack - no woodpecker damage.

Microclimate is protected and slightly boggy nearby. Nevertheless a number of adjacent trees including a red pine have succumbed to a turbulent wind updraught and been overturned.

One single new cone forming but evidence of a number of tiny forming cones to develop next year.



Tiny new cones forming



Extensive growth of lichens



Heavy encrustation of lichens

Tree Number: 7 - 2007

Location: near the 'Stop/Go' sign

Species: Scotch pine- relatively rare on Fairwood

Largely stable condition

New cones noted last year are growing and greening

Propose to analyse and monitor wide range of different lichens fixed to branches.



New cones noted last year



Tree Number: 7 - 2008

Location: near the 'Stop/Go' sign

Species: Scotch pine - relatively rare on Fairwood

Continuing stable condition

No new cones

Tight, woody buds formed at ends of branch clusters

The lichens on this tree are spreading to neighbouring trees including the adjacent red and white pines.



Range of lichen growth



Tight new buds





Extensive varieties of lichen growth

Tree Number: 7 - 2009

*Location: near the 'Stop/Go' sign
Species: Scotch pine - relatively rare on Fairwood
(compare Tree 10 and new Tree 14)*

*Continuing stable condition
No significant change noted
No new cone formation
Tight, woody buds formed at ends of branch clusters*

The lichens on this tree continue to spread to neighbouring trees including the adjacent red and white pines.





7 new tight green cones have formed on one south facing branch



Tree Number: 7 - 2010

*Location: near the 'Stop/Go' sign
Species: Scotch pine - relatively rare on Fairwood
(compare Tree 10 and new Trees 14)*

Tree is in continuing stable condition

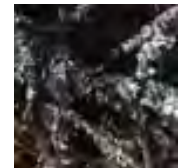
Adjacent swampy area has been cleared of a tangle of recently fallen trees (ice storm)

Tree is in stable condition, together with its mate, existing in very difficult growing conditions, little soil, near swamp.

*7 new tight green cones have formed on one southern branch, none elsewhere or on mate.
Non new woody buds forming at ends of branch clusters noted as in previous years.*

*2 old woody cones, very tightly closed, were harvested for seed extraction
The mate tree has some woody old cones at the top, squirrels are not interested*

The lichens on this tree continue to spread to neighbouring trees including the adjacent red and white pines.





Tree Number: 7 - 2011

Location: near the 'Stop/Go' sign
Species: Scotch Pine - relatively rare on Fairwood
(compare Tree 10 and new Trees 14)

Tree is in continuing stable condition though the needling is slightly sparser and browner than last year due to the drier summer.

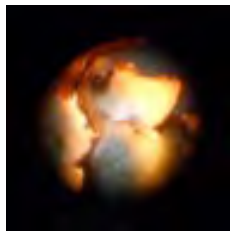
(For an example of a very healthy Scotch Pine specimen see tree 14)

Tree is in stable condition, together with its mate, subsisting in very difficult growing conditions, little soil, near swamp.

Of the new cones noted last year all but one have disappeared, probably taken by squirrels, (though generally they seem to leave the dense woody scotch pines alone)

There are no new cones coming this season, whereas tree 14 is covered with new cones.

The lichens on this tree continue to spread to neighbouring trees including the adjacent red and white pines.



Extensive lichen growth on lower branches and microscope view of lichen



Tight budding for next spring - only one cone from last year remains





Tree Number: 7 - 2012

Location: near the 'Stop/Go' sign
Species: Scotch Pine - relatively rare on Fairwood
 (compare Tree 10 and new Trees 14)

Tree is in continuing stable condition though the needling is slightly sparser and browner than last year due to the drier summer.

(For an example of a very healthy Scotch Pine specimen see tree 14)

Tree is in stable condition, together with its mate, subsisting in very difficult growing conditions, little soil, near swamp.

1) Large sections of the needling have browned as the result of drought, needling sparser than previous years

2) only 7 small cones have formed from last year

3) a number of tiny cones (see photo below) forming for next year.

The lichens on this tree continue to spread to neighbouring trees including the adjacent red and white pines. The damp protected micro climate that allows lichens to form also seems to favour tree's survival

Extensive browning and lichen growth on branches



Tiny cones forming for next season





Above: Extensive browning and lichen growth on lower branches

Below: Tiny new cones forming



Tree Number: 7 - 2013

Location: near the 'Stop/Go' sign
Species: Scotch Pine - relatively rare on Fairwood
 (compare Tree 10 and Trees 14 in other exposures)

Needling is growing considerably sparser and browner particularly on the lower branches many of which have died back and become encrusted in lichens. (For an example of a very healthy Scotch Pine specimen see tree 14)

Crowns of both this tree and its mate are spreading laterally.

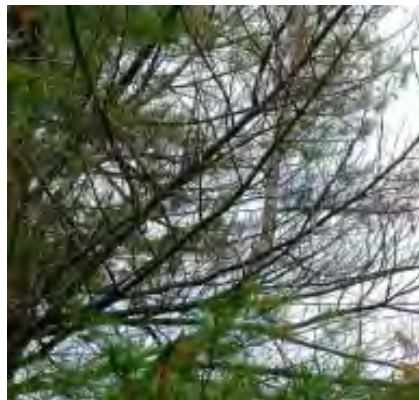
Tree is in reasonably stable condition, together with its mate, subsisting in very difficult growing conditions, little soil, with roots extending into nearby swampy dell.

- 1) Large sections of the needling have browned as the result of drought, needling sparser than previous years*
- 2) last years cones are still tight. There are many tiny cones forming which should come to maturity in 3 years time.*
- 3) The lichens on this tree continue to spread to neighbouring trees including the adjacent red and white pines. This damp micro climate and protected location allows lichens to form but also seems to favour tree's survival*





Extensive bleeding



Sparse foliage at tips

Tree Number: 8 - 2004 New Tree

Location: Overhanging Old Incinerator

Species: White Pine

Nature of Affliction: Pine Rust

This tree is indicative of the state of many white pines in the area, not healthy following years of drought, heavily afflicted with various insect infestations, dying back.

The tree is quite densely twigged but the needling is sparse following drought. The sparse needling may be the result of rust fungal infection of a number of mid branches which has over time now worked its way back to the trunk.

Rust thrives in cool wet weather and tends to remission in periods of drought.

Apparently reasonably good soil conditions at base. Tree is situated in a cool sheltered glade, a location conducive to rust fungus and the Wild Currant which sustains half the cycle leading to rust infection.

No evidence of gypsy moth or spittlebug.

This tree has been added to study whether it is in a recovery phase, fighting off pine rust, and see whether it is going to find some new equilibrium as a 'character' tree, or whether it will continue to grow as part of a denser forest.





Heavily twigged but thinning needles

Tree Number: 8 - 2005

Location: Overhanging Old Incinerator

Species: White Pine

Nature of Affliction: Pine Rust

This tree is indicative of the state of many white pines in the area, not healthy following drought , and now dying back and with a localised rust infestation. Opportunistic insects seem to be attracted by its weakened state.

It is expected that when the rust fungus girdles the trunk, this tree will die. (See Tree 6)

Reasonably good soil conditions at base.

No evidence of gypsy moth or spittlebug on this tree..

Bleeding of trunk has now become more extensive - apparently a rust infection which has resulted in cankers on the trunk.

This tree does not seem to be in recovery as suggested in 2004 - the rust infection is becoming extensive in a number of locations on the trunk and the needling is continuing to thin. The cool moist summers are conducive to the rust infection cycles.



Bleeding from bark - opportunistic bark beetles following rust fungal weakening



Extensive bleeding from rust cankers



Crown of tree very sparse

Tree Number: 8 - 2006

Location: Overhanging Old Incinerator

Species: White Pine

Nature of Affliction: Pine Rust

This tree continues to worsen with rust infection.. The fungal infection has worked its way in from the afflicted branches to the trunk. Many cankers are bleeding on the main bole and attract opportunistic insects as seen on tree # 6..

At present there is no evidence of 'Ribes' wild currant or gooseberry necessary to sustain the rust cycle at base of trunk

Reasonably good soil conditions at base but the tree may be too well drained and drought prone. Rust however thrives in moist cool and sheltered locations like this situation.

No evidence of gypsy moth or spittlebug on this tree.

This large tree seems to be declining rapidly despite the good growing season which has improved the health of adjacent pines.



Bleeding from cankers on main trunk

General Note on White Pines on OK Point - 2007

There continue to be a large number of trees on OK point which are thin and dying back.

The reasons for this appear to be:

- i Many trees have been planted on OK Point where there is relatively scanty soil and where there is considerable exposure to strong weather from the south east. These trees are competing for scarce resources.*
- ii Many pines, planted at roughly the same time in 1930's, 1950's and 1970's are reaching a climax at the same time. Many trees are stunted and appear to be younger than they actually are, some having changed little in size in 50 years.*
- iii The low water levels are beyond the reach of root systems and the trees have been very stressed over the drought summer years of 2000-2001*
- iv The trees were afflicted with gypsy moth which seemed to reach a climax around 2002. The moth disappeared by 2004. There is evidence of a return of gypsy moth in 2007 which suggests that it will be in an upcycle in 2008. This did not occur - perhaps due to the severe winter.*
- v The pine tip beetle reached a peak in 2005. There was less evidence of it in 2006 and virtually none in 2007, although a number of nests were photographed in early June.*

Proposed remedial work on OK Point:

- i Many trees are being transplanted from the productive mudflats in FairIsle bay - particularly in 2005-7*
- ii In 2008 we propose concerted effort to thin out competing trees across the point, working to avoid creating situations which encourage top heavy trees - balance is important.*
- iii Begin again to diversify the tree stock, replanting spruce and larch started from indigenous seed.*

Tree Number: 8 - 2007

Location: Overhanging Old Incinerator

Species: White Pine

This tree appeared to be infected by rust infection, however in the last year seems to be coming back with new growth and a fuller needled crown. There is less bleeding evident at mid height. Is the rust infection dormant?

No evidence of gypsy moth or spittlebug.

Monitor closely in 2008



Rust Fungus has killed a group of branches at mid height



Bleeding from cankers on main trunk



Tree Number: 8 - 2008

Location: Overhanging Old Incinerator

Species: White Pine

Nature of Affliction: Pine Rust

This tree continues to succumb to a rust fungal infection.

The last 3 cool wet summers have supported a continuing fungal infection of this tree.

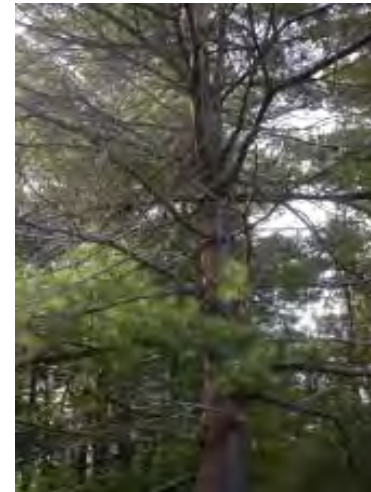
Extensive new bleeding is showering onto berries around trunk. Some of this may be due to opportunistic bark beetles mining under the bark - as noted on Tree 6.

Middle branches are thinning and dying back in area of bleeding. Over dense branching and disorder of middle branchings.

'Ribes' wild currant carrier of 3 of the 5 spore stages is noted at foot of tree. No fungal infection noted on underside of these leaves.



'Ribes' Wild Currant which sustains 3 of the 5 spore stages leading to Rust infection



Bleeding from cankers on main trunk



Uneven needling



Bleeding from cankers on main trunk



Chaotic overbranching in areas of main trunk

Tree Number: 8 - 2009

Location: Overhanging Old Incinerator

Species: White Pine

Nature of affliction - pine Rust

This tree continues to succumb to a rust fungal infection.

The roots of this tree have slightly lifted from the rock below and an animal den opens into extensive cavities at foot of trunk.

Ground cover at base juniper and moss.

Lichens forming on north side of tree.

The last 4 cool wet summers have supported a continuing fungal infection of this tree.

Middle branches are thinning and dying back in area of bleeding. Over dense branching and disorder of middle branchings.

None of the 'Ribes' (wild currant) carrier of 3 of the 5 spore stages is noted now at the base of the tree.



Animal den at foot of tree





Bleeding from cankers on main trunk



Areas of red brown discoloured bark



Chaotic overbranching in areas of main trunk



Gum bleeding from trunk

Tree Number: 8 - 2010

Location: Overhanging Old Incinerator

Species: White Pine

Nature of affliction - pine Rust

This tree is generally much healthier and more densely needled than in previous years. There is still evidence of a rust fungal infection and some bleeding under the branches.

The roots of this tree have slightly lifted from the rock below and an animal den opens into extensive cavities at foot of the trunk.

Wild currant 'Ribes' (wild currant) carrier of 3 of the 5 spore stages is noted now at the base of the tree. No evidence of infection on back of leaves.

Lichens forming on north side of tree.

The last 5 wet summers have supported a continuing fungal infection of this tree.

Middle branches are thinning and dying back in area of bleeding. Over dense branching and disorder of middle branchings.



Wild Currant - host of rust fungus





Sway in trunk near foot of tree indicates earlier attack and recovery through a second crown.



Distinctive chaos of branchings noted on many trees afflicted with pine rust fungus



FAIRWOOD ISLAND FOREST MANAGEMENT PLAN



Tree Number: 8 - 2011

Location: Overhanging Old Incinerator

Species: White Pine

Nature of affliction - Pine Rust

This tree is less densely needled than last year.

There is more evidence of bark discoloration indicating increasing presense of rust fungus.

Wild currant 'Ribes' (wild currant) carrier of 3 of the 5 spore stages has previously been noted at the base of the tree.

Pine gum bleeding through bark at various locations and dripping around base.

The last 6 non-drought summers have supported a continuing fungal infection of this tree.

The curious snaggle of branchings mid way up the tree and the sway in the trunk at the base suggesting an original thwarted crown (like younger tree 5) and the s bifurcation at high level which has now died died off all suggest that this tree has undergone many iteraions of the rust fungus and tried to counter them by growing out sideways.

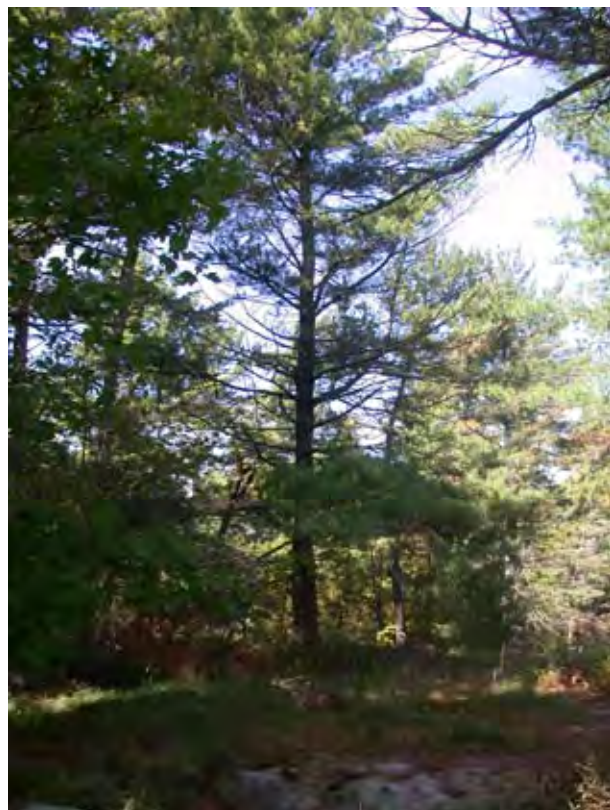
Distinctive reddening of bark of Pine Rust



Wild Currant - host of rust fungus



TREE STUDY REPORTS - SECTION 09



More gum drips noted on lower trunk than previous year. Die back of mid range branches.



Bleeding through bark especially at knots

Reddish staining on trunk, chaotic branchings, die back of mid range branches indicative of rust



Tree Number: 8 - 2012

Location: Overhanging Old Incinerator
Species: White Pine

Nature of affliction - Pine Rust

This tree is less densely needled than last year. There is more evidence of bark discoloration indicating increasing presence of rust fungus.

1) Wild currant 'Ribes' (wild currant) carrier of 3 of the 5 spore stages is infected by fungus on underside of leaf in many locations on the island. The Ribes cycle does not seem to have been affected by the drought.

2) Increased pine gum dripping noted on lower trunk as well.

3) Many mid branches have died back leaving those at base and crown. In general the foliage is more sparse than in previous years, probably due to the summer drought.

Wild Currant - host of rust fungus underside leaves



Orange Pine Rust located on the underside of currant vines as viewed through 15x49 microscope



Tree Number: 8 - 2013

Location: Overhanging Old Incinerator

Species: White Pine

Nature of affliction - Pine Rust

Mid branches of this tree around areas of previous rust infection have died off. Crown is healthy if lighter needled than previously.

Continuing evidence of bark discoloration around 5 M above ground indicating increasing presence of rust fungus.

1) Wild currant 'Ribes' (wild currant) carrier of 3 of the 5 spore stages) shows no further sign of the yellow fungus on underside of leaves - possibly due to the late spring and generally dry summer.

2) Minimal gum dripping from bark, appears reduced from last year.

3) In general the foliage is sparser than in previous years, probably due to last summers drought and the dry summer of 2013.

4) No cones have formed on this or any other white pine this year.



Die back of mid range branches. Sparser needling of the crown.



Bleeding through bark especially at knots

Reddish staining on trunk, chaotic branchings, die back of mid range branches indicative of rust



Orange Pine Rust located on the underside of currant vines which was evident last autumn 2013

Wild Currant - host of rust fungus underside leaves





Tree Number: 9 - 2008 New Tree

Location: Typical on OK Point

Species: Maple

Tree 9 has been added to monitor the infestation of maples, which are supposedly soon to experience serious attack from a shoot beetle.





Healthy unblemished leaves, are very late to form cork and turn colour due to superb, warm September weather.



Many maples around boathouse have been harvested by beaver - These have regrown as coppiced clumps

Tree Number: 9 - 2009

Location: Typical on OK Point- adjacent to Tree8 and overshadowing old compost pile.

Tree 9 is 9 M high with a 250mm boll.

Species: Maple

Tree 9 has been added to monitor the predicted infestation of maples by an attack from a shoot beetle.

The beaver has removed all small maples around the boathouse and these are reappearing as succouring clumps of low growth.

A large maple has been chosen as the basis of further study and designated Tree 9 (adjacent to tree 8 and overhanging the compost pile.)

Ground elder is invading the area around its roots. This is a non-indigenous and very invasive groundcover which has inadvertently been brought in with the garden. Attempts to suppress the ground elder have been unsuccessful.



New Tree 9 is a healthy specimen with rooting into the old compost pile. It is a maturing tree which has avoided beaver ravages.



Healthy unblemished leaves with only occasional instances of fungal infection.

Tree Number: 9 - 2010

Location: Typical on OK Point- adjacent to Tree 8 and overshadowing old compost pile.

Tree 9 is 9 M high with a 250mm boll.

Species: Maple

Tree 9 has been added to monitor the predicted infestation of maples by an attack from a shoot beetle. There is no evidence of this on the island at this time.

The tree is tapping into the benefit of an old compost pile and is very healthy.

The extensive damage to all the maples nearby caused by the beaver in the autumn of 2008 is now growing back as multiple shoots from the roots. In many cases these have been thinned and pruned to produce a more tree like growth shape. This is ongoing.

This maple is particularly healthy and green with only minor fungal damage to leaves



Typical resprouting clump of maple following beaver damage





Tree thriving in old compost aea



Dense healthy bark healed over old branching



Protected spider nest



Healthy unblemished leaves



Tree Number: 9 - 2011

Location: Typical example of maple on OK Point- adjacent to Tree 8 and overshadowing old compost pile.
Tree 9 is growing upwards and outwards with remarkable speed, - now approx 12M high with a 250mm boll, circ. at 1200 is 740mm
Species: Maple

Tree 9 has been added to monitor the predicted infestation of maples by an attack from a shoot beetle. There is no evidence of this on the island at this time.

The tree is tapping into the benefit of an old compost pile and is growing exceptionally fast. A extremely long horizontal branch of approximately 8 M length was removed this summer because of oversailing path. The tree has a tendency to overgrow itself and become distended.

Ongoing activity pruning out many adjacent dense copsings of maples throughout the area which have resulted from the beaver harvesting in 2008.

Leaves very healthy and largely unblemished. This is a very healthy tree.





Tree thriving after last years surgery



Healthy unblemished leaves



Tree Number: 9 - 2012

Location: Typical example of maple on OK Point- adjacent to Tree 8 and overshadowing old compost pile.
Tree 9 is growing upwards and outwards with remarkable speed, - now approx 12M high with a 250mm boll, circ. at 1200 is 740mm

Species: Maple

Tree 9 has been added to monitor the predicted infestation of maples by an attack from a shoot beetle. There is no evidence of this on the island at this time.

- 1) The tree is tapping into the benefit of an old compost pile and is growing exceptionally fast.
- 2) Leaves very healthy and largely unblemished. This is a very healthy tree.
- 3) Cauterised knot of branch removed in 2011 below.

Dense healthy bark healed over old branching





Tree thriving after surgery in 2011 to remove lateral branch.



Healthy unblemished leaves



Tree Number: 9 - 2013

*Location: Typical example of maple on OK Point- adjacent to Tree 8 and overshadowing old compost pile.
Tree 9 is growing upwards and outwards with remarkable speed, now approx 12M high with a 250mm boll, circ. at 1200 is 740mm*

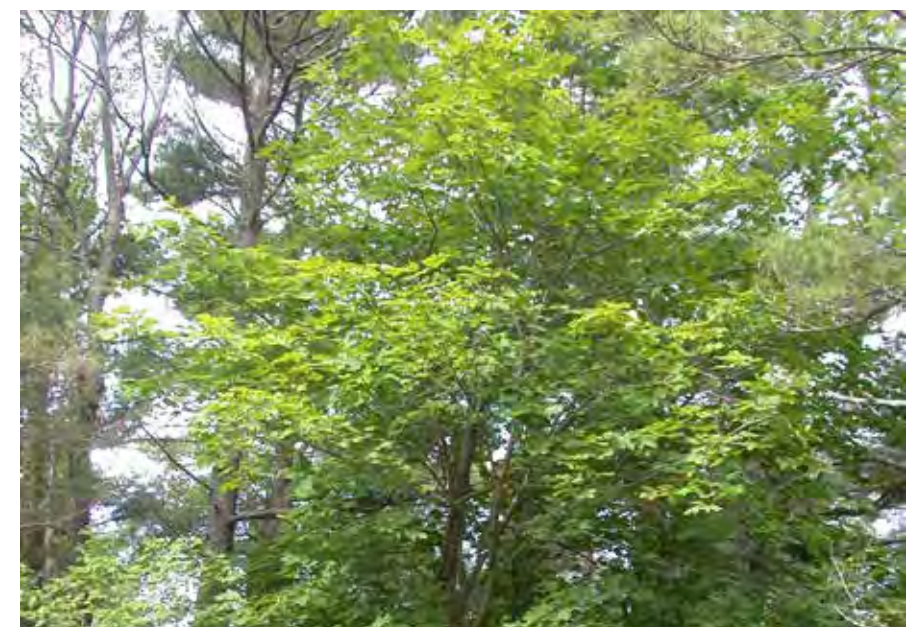
Species: Maple

Tree 9 has been added to monitor a predicted future infestation of maples by attack from a shoot beetle. There is no evidence of this anywhere on the island at this time.

This tree is a healthy specimen and very favourably located, with a slight tendency to grow diagonally towards the clearing and open sunlight.

- 1) The tree is tapping into the benefit of an old compost pile and is growing exceptionally fast.*
- 2) There is some holing of the leaves by leaf miners, but generally foliage is very healthy.*

Tendency of tree to grow towards sunlight of open glade.





Memorial Jack Pine - 1966 - 40 years growth



Tree Number: 10 - 2006 New Tree

Location: West End

*Species: Jack Pine memorial tree transplanted from Nares in 1967
planted in memory of John Fairlie who died Nov. 25th, 1966*

This tree is now about 7-8 metres high. It is 40 years old, and very slow growing.

Very exposed location and quite bent in the prevailing west wind.

Lower branches are dying off but the crown of the tree is lightly needed.

No evidence of insect attack.

Some new cones forming. No cones remaining from previous years.

Tree Number: 10 - 2007

Crown relatively healthy but increasingly wind bent

Lower branches around base are dying off

No evidence of new cones this year.



New cones forming in 2006 for next year seeding



Tree Number: 10 - 2008

Location: West End

Species: Jack Pine

This tree is now about 7-8 metres high. It is 44 years old, and very slow growing. Very exposed location and increasingly bent in the prevailing wind.

Lower branches are dying off but the crown of the tree is lightly needed. No evidence of insect attack.

Many cones have now formed, sealed tight with gum. These may be 2 years away from shedding seed (?)

New mini-cones are forming at branch tips near rosy buds.



New mini-cones forming



Last Years cones sealed tight



Tight and heavily gummed cones are of no interest to squirrels. They remain on the tree a number of years (this one is 2years) before opening.

Tree Number: 10 - 2009

Location: West End

Species: Jack Pine

This tree is now about 7-8 metres high. It is 45 years old, and very slow growing.

Lower branches are dead to approximately 1.8 M above ground.

There are now approximately 30 cones which remain tightly sealed with gum and of little interest to the squirrels.. These may be 2 years away from shedding seed (?)

The crown of the tree, beant in the west wind, remains healthy.



West End Notes: - Tree Plantings

The white pine re-introduced into the West End gulches and in the grassy areas over the past 10 years are now thriving after 5 years of drought free growing conditions.



Unchanged for decades



A tornado like 'updraught' has wreaked havoc on a group of cedars and pines at the edge of Archers Bay en route to the West End. This damage is quite localised and therefore distinct from the ice damage that quite often affects groups of cedars.



Reforested white pines in Blackberry Gulch



The Lookout Pine on Archers Island - favoured by merlins in 2010 - osprey platform.



Tree Number: 10 - 2010

Location: West End

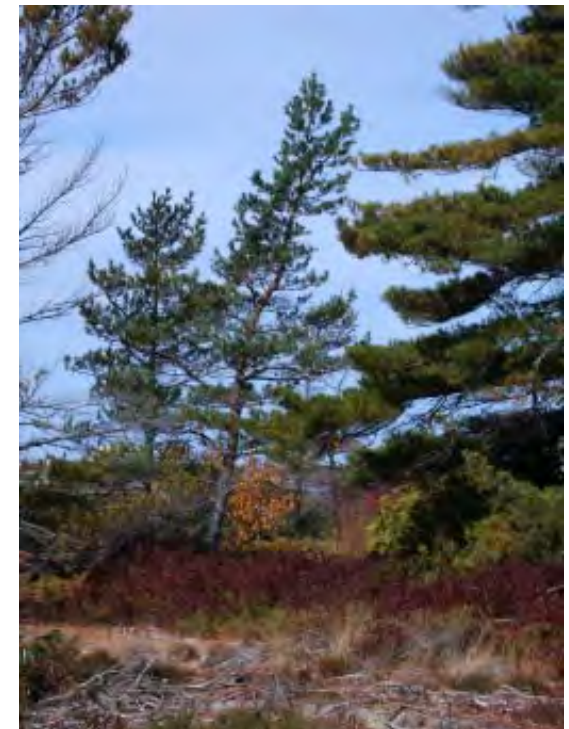
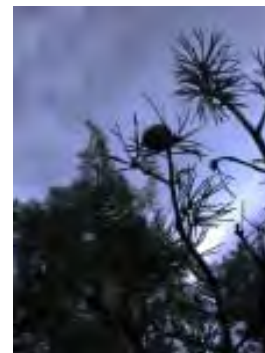
Species: Jack Pine

This tree is now about 9 metres high. It is 46 years old, and very slow growing.

Healthy crown with typical sparse needling for Jack Pine. The lower branches have now died off to a height of 1500mm.

Of the 30 cones noted last year all but two have disappeared. These are opened. Possibly the squirrels harvested the rest. There are no offspring seedlings in the area..

There are only 2 new green and tight cones this year.



West End Notes: - Tree Plantings



The 'Fairwood Tree' painted by many artists including Gooderich Roberts has had its top blown off in the winds in winter of 2010 and looks much less regal!

New trees transplanted to the West End have now reached 2100mm - 2400mm high and generally thriving in the relatively drought free last 5 years



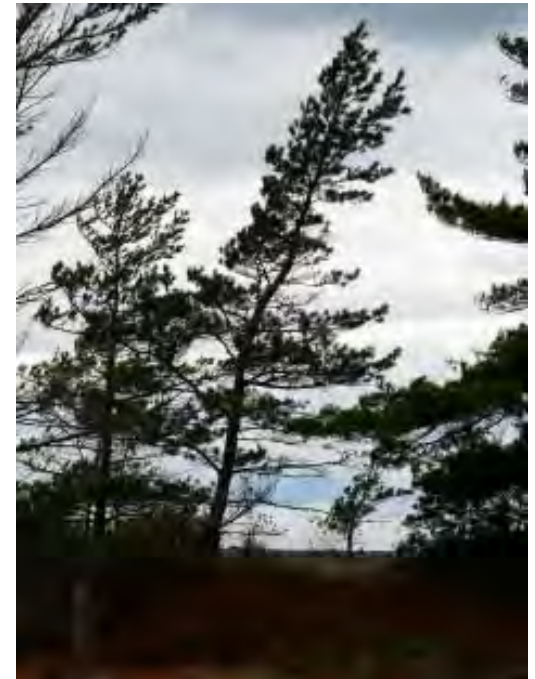
Tree Number: 10 - 2011

Location: West End
Species: Jack Pine - planted 1967 (memorial JFF)

This 'JFF Memorial' tree is now about 9 metres high, with a trunk 450mm circ. It is 47 years old, and very slow growing.

Healthy crown with typical sparse needling for Jack Pine. The lower branches have now died off to a height of 1500mm.

There are now many tiny cones (5mm) forming on the branches
 The few mature cones from last year have disappeared - probably harvested prematurely.



West End Notes: - Tree Plantings



The 'Fairwood Tree' has lost its distinctive shape. New trees planted in the vicinity have survived the drought of 2012

New trees transplanted to the West End blueberry gulch have now reached 2700mm high and generally thriving.



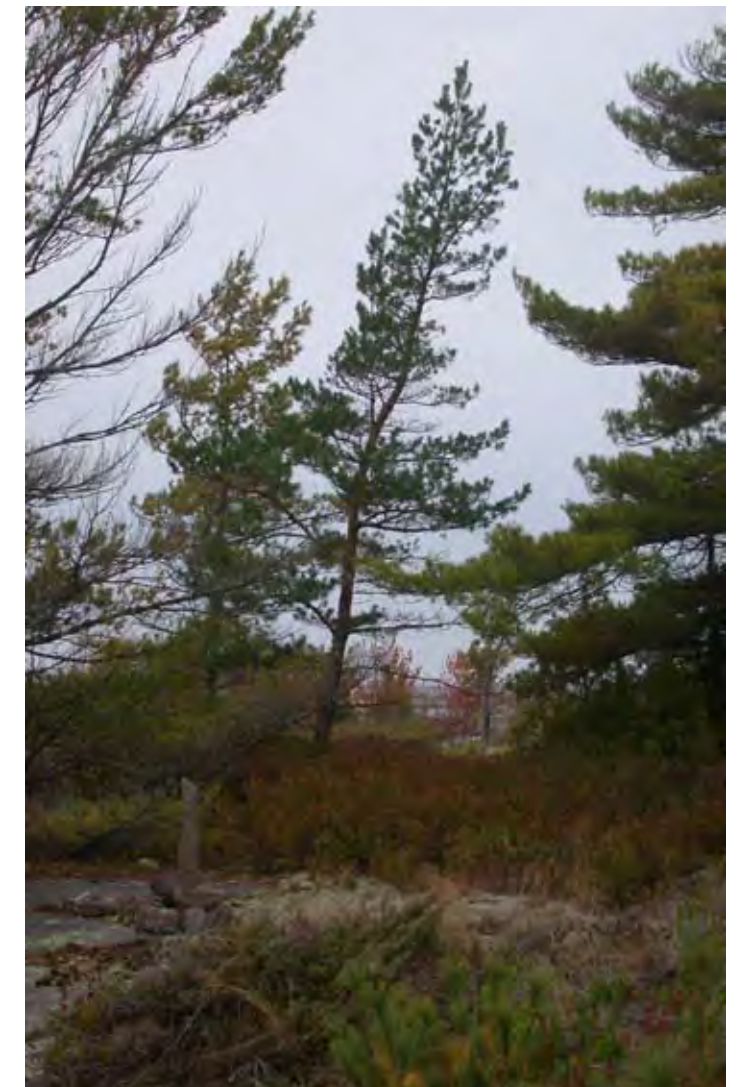
Tree Number: 10 - 2012

Location: West End

Species: Jack Pine - planted 1967 (memorial JFF)

This 'JFF Memorial' tree is now about 10 metres high. with a trunk 450mm circ. It is 48 years old, and very slow growing.

- 1) Healthy crown with typical sparse needling for Jack Pine.*
- 2) The lower branches have now died off to a height of 2400mm. Some new woodpecker damage.*
- 3) Only 1 fresh cone on whole tree, some wizened cones from last year fall off to touch.*



West End Notes: - Tree Plantings



The 'Fairwood Tree' has lost its distinctive shape. Compare 2012 to 2013. New trees planted in the vicinity have survived the drought of 2012 and are growing quickly - see below

New group of white pine transplanted to the West End blueberry gulch have now reached 3000mm high and generally thriving.. The largest of these are already bearing tiny cones - the only white pines bearing cones noted this year on the island



New triple cone clusters at top branches



Tree Number: 10 - 2013

Location:

West End

Species:

Jack Pine - planted 1967 (memorial JFF)

This 'JFF Memorial' tree is now about 10 metres high. with a trunk 450mm circ. It is 48 years old, and very slow growing.

- 1) Healthy crown with typical sparse needling and mid branch die back typical of Jack Pine.*
- 2) The lower branches have now died off to a height of 2400mm. Extensive new woodpecker damage and bleeding on south side. Orange waxy bark being shed on mid branches.*
- 3) Many mini cones forming for 3 years hence, 2 cones unopened from last year*





Report on West End Transplantings 2002-2007

*Location: West End
Species: White Pine*

In the past 5 years an estimated 125 trees (at approx 2-3 yrs - 30 cm) have been transplanted to west end to replace several large trees which have died over past 40 years. Of these transplants approximately 1/4 have survived the exposed location.

Soil on the west end is particularly scarce and often quite waterlogged in rock depressions. The successful introductions have all occurred in better drained soil.

In the Blueberry Gulch a large and established pine died around 1970. A new pine transplanted into its decaying trunk is now thriving. The middle of the Gulch is too waterlogged in the off season to sustain pine, but the pines planted along the edges have at last taken hold.

One pine planted in 1964 has become particularly well-established and bushy creating a sheltered microclimate for other plantings.

Excellent growing conditions in 2006 have meant a higher survival rate from last year. Continued excellent growth year in 2007 - prime transplants are now 900mm high.

Tree 10 noted opposite is the John Fairlie memorial jack pine transplanted planted in 1967.

New transplants at a critical stage

Report on West End Transplantings 2008

*Locations: OK Point
Species: White Pine*

Many white pine seedlings have been transplanted from FairIsle bay and the back boathouse bay to locations around the new Caravanserai and all along the point where the existing pines have not recovered from the stress of the drought years.

Due to the relatively constant and low water levels over the past 5 years these rocky bays have produced a large number of small pines which thrive in the moist sandy soils. Transplantings from 2007 have had a high success rate.

Cones from the white spruce have also been harvested and the seeds set out in an open nursery in the sandy behind the pumphouse, to be transplanted to replace the larch shelterbelt when they are established.



Also thriving are the island's many natural bonsai pines tucked into crevices in the rock

Report on West End Transplantings 2008

*Locations: West End
Species: White Pine*

Ideal cool wet summer conditions continue to ensure that west end transplanting thrive.





Adjacent trees have been killed by the rust cycle, which is most evident in the cankers formed around branchings. These cankers seem to overstimulate branchings in the area of the affliction.



Tree 11 located in flat flood prone area adjacent to stepping stones.



Historic scenic pine near stepping stones, killed by rust in 1968

Tree Number: 11 - 2008 -2009

Location: Near Stepping Stones at Otter Lake
Species: White Pine

These trees are in the shade of a famously picturesque white pine which succumbed to pine Rust circa 1968. There is extensive Wild Currant, 'Ribes', in the adjacent boggy area that acts as host for the formation of spores underside its leaves in the 5 year rust cycle.

This tree is 9 M high with a 300mm diameter trunk.

These trees are irrigated by the beaver lake and have become very sensitive to any change in water levels effected by the beavers. Their roots can become fatally waterlogged. with 6" rise of water levels.

An adjacent tree is fighting off a rust attack - but there is no current evidence of Ribes, currant, in the area. It has been apparently a dormant year.



A large pine (550mm trunk) was overturned in the winds of winter 2008. This has opened up a clearing which will stimulate new growth on all sides,



Tree Number: 12 - 2008

Location: South shore near Catherine Boundary

Species: White Pine 20M high

This tree was struck in August 2008

This tree has had a 50mm strip of bark ripped off its north side from top to ground in an almost straight line during a storm in August 2008.

Extensive bleeding of pine gum has occurred onto bushes below.

Noted that lightning tends to follow the north side of a tree to the ground. Though the driving rain may be from the south east or the south west it is possible that the north side of the trees is denser and wetter wood. Most insect infestations are noted on the southern exposures of trees as well.

See tree fall information in table following which notes the positions of lightning strikes and general effects



FAIRWOOD ISLAND FOREST MANAGEMENT PLAN

Tree Number: 12 - 2009

Location: South shore near Catherine Boundary

Species: White Pine 20M high

This tree was struck in summer 2008

This tree has had a 50mm strip of bark torn off its north side from top to ground in an almost straight line in a storm in August 2008.

The pine gum bleeding from this wound has abated somewhat but there is still evidence of it showering upon the leaves of the deciduous bushes below.

The Pilated woodpecker has recognised the trees distress and had excavated a large hole about 10 M above ground.



The needling of the crown of this tree is appreciably thinner within one year.

Pilated woodpecker has excavated near the lightning strip.



TREE STUDY REPORTS - SECTION 09

Tree Number: 11 - 2010

Location: Near Stepping Stones at Otter Lake

Species: White Pine

Adjacent to white pine which succumbed to pine Rust circa 1968.
There are extensive Wild Currant, 'Ribes' in the adjacent boggy area
This acts as host for the formation of spores underside its leaves in the 5 year rust cycle.

This tree is 9 M high with a 300mm diameter trunk.

This tree has a healthy green crown and very sparse mid range an base. There is some bleeding at 2.4 M above ground level.

The adjacent tree that was suffering from rust blight is now dead and its bark is lifting to expose an orange slimy underlay..

There is no current evidence of Ribes, currant, in the area. It has been apparently a dormant year.



Discoloured patches of bark on main trunk of Tree 11 indicate rust infection cycle.



A rust canker on the adjacent dead white pine, bark lifting to expose orange undergrowth



Tree Number: 12 - 2010

Location: South shore between Catherine's and Ryans Houses

Species: White Pine 20M high

This tree was struck in summer 2008

This tree has had a 50mm strip of bark torn off its north side fro top to ground in an almost straight line in a storm in August 2008.

The bleeding of pine gum has now largely abated.

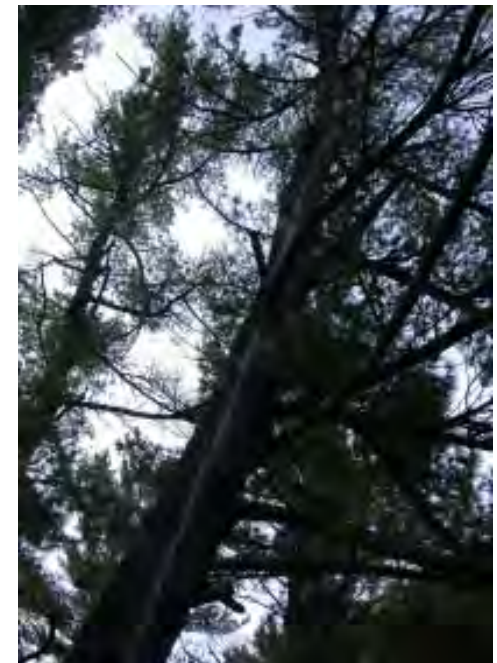
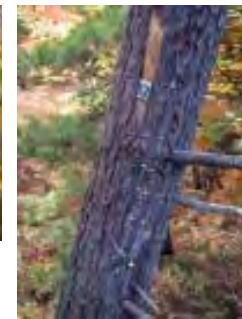
The lightning strike crack has become more weathered and there are insects infestations tucked under the bark flaps along the rip line.

Funguses have begun to sprout on the north side - where it is shady and damp.

No further damage from Pilated woodpecker (last summer's pair have not been seen on the island this summer)



Fungal growths near strike damage



Tree Number: 11 - 2011

Location: Near Stepping Stones at Otter Lake

Species: White Pine

Adjacent to the 'Scenic' white pine which succumbed to pine Rust circa 1968. There are extensive Wild Currant, 'Ribes' in the adjacent boggy area

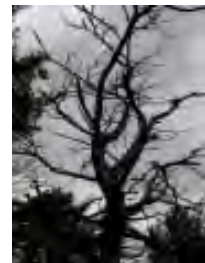
This tree is 9 M high with a 300mm diameter trunk.

This tree has a healthy green crown and very sparse mid range and base. There is now considerable bleeding evident with oozeings through the bark.

Chaotic bunching of branches at 2/3rds height is typical of Pine Rust infected trees.

An adjacent tree now dead from rust blight has its bark lifting to expose an orange slimy fungal underlay.

There is no current evidence of Ribes, currant, in the area. It has been apparently a dormant year.



The 'Scenic' Stepping Stones Tree - died 1968



Adjacent Pine Rust victim



Tree Number: 12 - 2011

Location: South shore midway between Catherine's and the Ryan's Houses

Species: White Pine 20M high

This tree was struck in summer 2008

This tree has had a 50mm strip of bark torn off its north side from top to ground in an almost straight line in a lightning strike in August 2008.

This once very healthy tree in an ideal growing situation is now dying back considerably. The foliage in the upper branches has become sparse and patchy.

There is still light bleeding along the edges of the wound strip which drips onto the berries below.

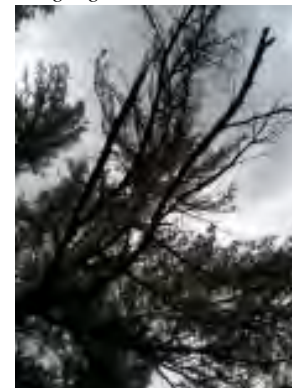
Insects infestations are tucked under the bark flaps along the rip line.

Small fungi continue to sprout on the north side - where it is shady and damp.

No further damage from Pilated woodpecker.



Fungal growths



Lightning Strikes 2008

With increasing incidence of thunder storms over the past few years, a number of trees on the island have been struck by lightning.

One example has been a tall pine beside the causway between the beaver lakes, which has subsequently died and collapsed (2005).

Another interesting example occurred in 2008 on the south shore near the Ryan's Island back bay. A white pine roughly 20 metres (60 feet) high was struck in an August 2008 storm.



A strip of bark has been torn from the top of the tree to roughly 3 metres above ground in a straight line approximately 50mm across. The tree is subsequently bleeding profusely onto the bushes at its foot.

No scorch marks or burn lines are evident and no trenching of the ground at the foot of the tree as witnessed in other lightning strikes.

Monitor damaging effects and resulting insect activity around bark trench.



Tree Number: 11 - 2012

Location: Near Stepping Stones at Otter Lake

Species: White Pine

Adjacent to the 'Scenic' white pine which succumbed to pine Rust circa 1968.

1) Wild Currant, 'Ribes' present with distinctive orange fungus on underside of leaves. (see photo)

2) Minor bleeding is occurring at approx 2400mm above ground.

3) Healthy green crown and very sparse mid-range and base. Chaotic bunching of branches at 2/3rds height is typical of Pine Rust infected trees.

4) Adjacent dead rust victim (original study tree) is ready to fall. Rust also noted on adjacent younger tree with bulbous crux. (see photo)



Adjacent Pine Rust victim



Tree Number: 12 - 2012

Location: South shore midway between Catherine's and the Ryan's Houses

Species: White Pine 20M high

This tree was struck in summer 2008

This tree has had a 50mm strip of bark torn off its north side from top to ground in an almost straight line in a lightning strike in August 2008.

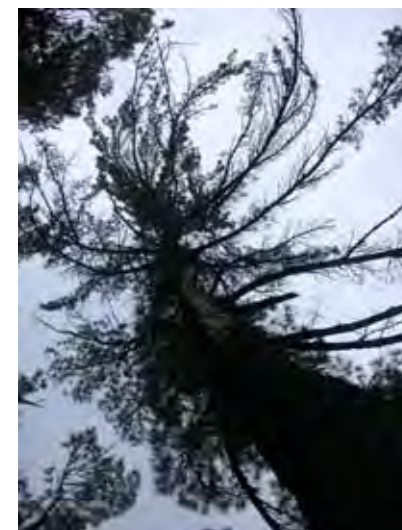
1) Extensive damage by woodpeckers has resulted in 40% of bark being shed over a large section. It seems unlikely that the tree will survive such exposure. Large slabs of bark at base.

2) Needling has become noticeably more sparse and the tree has developed a pronounced list to the north.

2) No new bleeding or drips on berries below. New mosses are growing on bark, north exposure.



Fungal growths



Tree Number: 11 - 2013

Location: Near Stepping Stones at Otter Lake
Species: White Pine
Adjacent to the 'Scenic' white pine which succumbed to pine Rust circa 1968.

- 1) Wild Currant, 'Ribes' present in area but not currently stained by orange fungus on underside leaves.
- 2) Minor bleeding and swollen cruxes at approx 2400mm above ground.
- 3) Healthy green crown and very sparse mid-range and base. Chaotic bunching of branches at 2/3rds height is typical of Pine Rust infected trees.
- 4) Adjacent dead rust victim (original study tree) has collapsed and is rotting.



Adjacent Pine Rust victim



Tree Number: 12 - 2013

Location: South shore midway between Catherine's and the Ryan's Houses
Species: White Pine 20M high
This tree was struck in summer 2008

This tree has had a 50mm strip of bark torn off its north side from top to ground in an almost straight line in a lightning strike in August 2008.

- 1) Further damage by woodpeckers in soft spot from base of strip to ground. 50% of bark has been shed on upper reaches.
- 2) Needling has become noticeably more sparse and the tree has developed a pronounced list to the north.
- 3) No new bleeding or drips on berries below. Various branches have fallen around its base.



Tree increasingly listing to north and branches falling



Tree Number: 13 - 2009

Location: Transplanted 2007 & 2008 around Caravanserai project
Species: White Pine seedlings (1-2 year) from Fairisle bay

Due to the good growing conditions there has been a high success rate with these transplantings

Nevertheless a number of these transplantings are expected to be stunted due to a lack of soil depth.

Tree Group A toward Ryans has flourished with two prime specimens at approximately 900mm high replacing a dead pine.

Tree Group B towards Honsbergers. This group has poor soil depth and will rely on finding an earth pockets for rooting. A few of these transplants have already died (replaced spring 2009)

Tree group C in front of Caravansertai. These have minimal soil and will need to rely on puddle rooting and roots under spalded rock surface. They will be naturally very stunted.



FAIRWOOD ISLAND FOREST MANAGEMENT PLAN

Tree Number: 14- 2009

Location: adjacent flag pole
Species: 3 Jack Pines of various age

Tree A is a natural bonsai in a very restrictive crack

Tree B was topped in some accident or die back about 20 years ago and has spread out laterally subsequently.

Tree C is an offspring and is approximately 5 years old.

These jack pines are deeprooted in poor soil cracks and have remained healthy and stable for a number of years.

Like other jack pines on the island this is forming tiny red cones in a year when there are no cones on other trees. Intention to use these cones for seed stock since the genetic profiles of these trees is clearly robust.



TREE STUDY REPORTS - SECTION 09

Tree Number: 13 - 2010

Location: Transplanted 2007 & 2008 around Caravanserai Centennial project
Species: White Pine seedlings (1-2 year) from Fairisle Bay

Good growing conditions and continuing high success rate for these transplantings.

Tree Group A toward Ryans has flourished with prime specimens at approximately 1100mm high replacing a dead pine.

Tree Group B towards Honsbergers. Poor soil and less advanced - approximately 400mm high.

Tree Group C in front of Caravanserai. - approx. 400mm high. These have minimal soil and 2 of them are dying due to alternating drought-flooding conditions of their locations - not enough soil to cushion these cycles.

Tree Number: 14- 2010

Location: adjacent flag pole
Species: 3 Jack Pines of various ages

Tree A is in good stable health.

Tree B is covered with many small green cones. This is most unusual because cone formation on all coniferous trees on the island this year has been rare or non existant despite heavy pollination.

Tree C is an offspring and is in good health.



Tree Number: 13 - 2011- Caravanserai Point Plantings

Location: Transplanted 2007 & 2008 around Caravanserai Centennial project
Species: White Pine seedlings (1-2 year) from Fairisle Bay

Good growing conditions and continuing high success rate for these transplantings.

There is no evidence of tip beetle, gypsy moth or other blight in this area. The growing conditions over the 2011 summer have been reasonable with sufficient rain.

Tree Group A toward Ryans has flourished with prime specimens at approximately 1200mm high clustered around two long dead and decayed pines.

Tree Group B has limited and poor soil and is less advanced - approximately 400mm high.

Transplantings around the old Fairwood sign are thriving and beginning to close in the view.

Tree Group C in front of Caravanserai. - approx. 400mm high. These have minimal soil and one has now died of excess boggy condition and lack of true soil.

Group A - growing fast, filling dead gap



Group B & C - less favoured growing conditions



Tree Number: 14- 2011

Location: adjacent flag pole
Species: 3 Jack Pines of various ages

All 3 trees are in good stable health. The middle tree is a bonsai due to lack of soil in crack.

The many small green cones on Tree B have grown into their second year to cover the tree. This is the only Jack Pine on the island that is so fecund with cones.

The foliage of this pine is exceptionally healthy.

Tree C is an offspring and is in moderate health.



Healthy Natural Bonsai



Tree Number: 13 - 2012- Caravanserai Point Plantings

Location: Transplanted 2007 & 2008 around Caravanserai Centennial project

Species: White Pine seedlings (3 years) from Fairisle Bay

- 1) Drought summer of 2012 has tested the growing conditions of these trees.
- 2) Some of the more vulnerable exposures (3) have died and browned off
- 3) Transplantings around the old Fairwood sign are withstanding drought and beginning to close in the view. Decided to let them do this.
- 4) Tree Group C in front of Caravanserai. - approx. 400mm high. These have minimal soil and two have now died of drought conditions.

Group B & C - some trees succumb to drought



Group A - growing fast, filling dead gap



Tree Number: 14- 2012

Location: adjacent flag pole

Species: 3 Jack Pines of various ages

- 1) All 3 trees are in reasonable health and withstanding drought. They have roots that extend into deep cracks.
- 2) Very few new cones produced. Old cones are cracking open but have not yet shed seeds.



Old cones - few new cones forming in 2012



Tree Number: 13 - 2013- Caravanserai Point Plantings

Location: Transplanted 2007 & 2008 around Caravanserai Centennial project

Species: White Pine seedlings (3 years) from Fairisle Bay

- 1) Drought summer of 2012 has tested the growing conditions of these trees.
- 2) Some of the more vulnerable exposures (3) have died and browned off
- 3) Transplantings around the old Fairwood sign are withstanding drought and beginning to close in the view. Decided to let them do this.
- 4) Tree Group C in front of Caravanserai. - approx. 600mm high. These have minimal soil but two have now died of drought conditions.

Group B & C - some trees have succumbed to drought



Tree Number: 14- 2013

Location: adjacent to flag pole

Species: 3 Jack Pines of various ages in a relatively exposed shoreline position

- 1) All 3 trees are in good health and withstanding drought. They may have roots that extend into the deep cracks.
- 2) Many new cones are in formation. The tree is visited by many types of insects including a peculiar hornet with large flattened black abdomen. Also present grasshoppers and ants.

In general much more insect life than on other specimens # 8 and # 10. Insect presence may account for pollenation and prolific coning.



Many new cones forming in 2013, 2012 cones are still present and unopened



Tree Number: 15- 2009

Location: in front of main house
Species: 2 white pines transplanted at approximately 4 years in 1970 after death of othe trees in front area.
250mm diameter trunks, 9 M high

These trees have been added to the study because there exact date of planting is known. They helped to fill an opening created by the senescence and death of a line of spruce trees.

Observations: These trees are in a favoured position being irrigated regularly from the puddle system in front of house.

Nevertheless the foliage is light and not as abundant as expected. Is there too much competition for resources at the roots? Are there poisons forming in the soil run off from the house?

No cones have formed this year.



These two trees are less densely needled than expected considering their favoured position. What is inhibiting their growth?



Tree Number: 16 - 2009

Location: in front of Pagoda
Species: white pine - one of a group of mature trees approximately 20 M high
600mm diameter trunks coarse bark.

The largest of these trees is beginning to die back at the top. It has sustained a lightning strike within the last 5 years. There are a number of recent 2-4 year offspring seedlings now flourishing at its base.

Moth-like eggs (not gypsy) are noted in the lightning strip area.



Moth eggs and rotting underbark noted in area of lightning strip. Note also that lightning tens to follow north side of the tree (denser wood) to find its grounding.



Tree Number: 15- 2010

Location: in front of main house
Species: 2 white pines transplanted at approximately 4 years old in 1970 after death of other trees in front area.
250mm diameter trunks, 9 M high

These trees have been added to the study because their exact date of planting is known. They helped to fill an opening created by the senescence and death of a line of spruce trees.

Observations: These trees are in a favoured position being irrigated regularly from the puddle system in front of house.

Nevertheless the foliage is light and not as abundant as expected. Is there too much competition for resources at the roots? Are there poisons forming in the soil run off from the house?

No cones have formed this year.



These two trees are less densely needled than might be expected considering their favoured position. What is inhibiting their growth?



Tree Number: 16 - 2010

Location: in front of pagoda
Species: white pine - one of a group of mature trees approximately 20 M high
600mm diameter trunks coarse bark.

The largest of these trees is beginning to die back at the top. It has sustained a lightning strike within the last 5 years. There are a number of recent 2-4 year offspring seedlings now flourishing at its base.

Moth-like eggs (not gypsy) are noted in the lightning strip area.

Adjacent cedar trees have been overturned in a wind updraught.



Moth eggs and rotting underbark noted in area of lightning strip. Note also that lightning tends to follow north side of the tree (denser wood) to find its grounding.



Tree Number: 15- 2011

Location: in front of main house
Species: 2 White Pines transplanted at approximately 4 years old in 1970 after death of othe trees in front area.
60mm circ. trunks, 9 M high

Observations: These trees are in a favoured position being irrigated regularly from the puddle system in front of house.

The foliage continues to be lighter than expected in such an apparently advantageous position. No cones have formed this year though there have been many cones on adjacent pines. Some light bleeding of gum noted on the smooth bark.

The bark quality is beginning to change from smooth skinned to a rough bark and vertical seams are forming that look like hatchet strikes.



FAIRWOOD ISLAND FOREST MANAGEMENT PLAN

Tree Number: 16 - 2011

Location: in front of the Pagoda
Species: white pine - one of a group of mature trees approximately 20 M high
600mm diameter trunks coarse bark.

This tree continues to die back due to a severe lightning strike. Pine gum is still dripping along the length of the wound. Observation that these lightning strikes tend to follow the north sides of trees which being damp and sunless are perhaps better conductors.

Moth-like eggs (not gypsy) are again noted in the lightning strip area.

Adjacent 'mate' tree is bleeding profusely. It has fought off pine rust many times in the past as evident in chaotic branchings.



Adjacent 'mate' pine is bleeding profusely. Its snagged branches suggest that it has repelled many pine rust infections over its life

TREE STUDY REPORTS - SECTION 09

Cedar Blight - prevalent on island - 2010

Location: prevalent across island on all Eastern White Cedar - *Thuja Occidentalis*
Name of affliction: *Keithia Thujina*

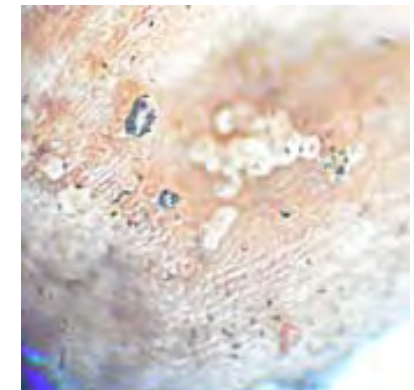
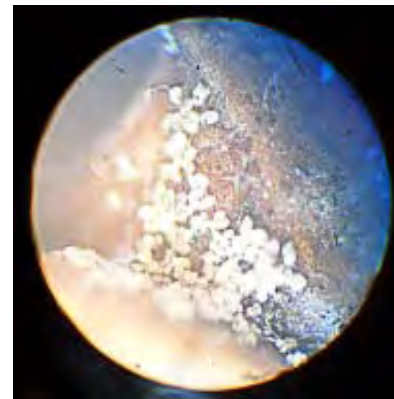
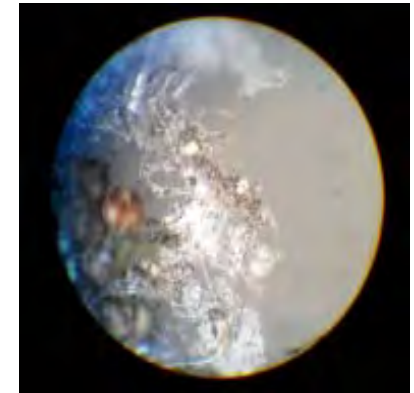
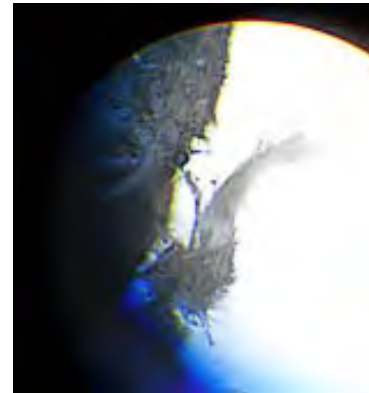
Symptoms: Small white spots on upper leaf surface in spring begin to turn brown in June (fungus Apothecia) and then turn black at maturity when the fruting body releases its spores. The airborne 'ascospores' are released from June to October and can travel up to 5 kilometers to infect a wide area.
 The leaves take on a brown scorched appearance, then they turn ash grey.

There are also spruce spider mites attacking the trees simultaneously. These mites spin a fine silk webbing at the browning tips pulling them into clusters which catch dust and debris. These mites, 5-8 generations per season will overwinter as eggs in their nests.

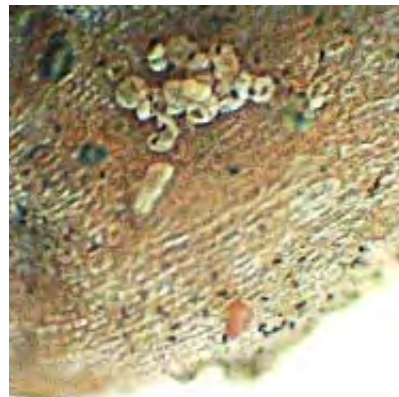
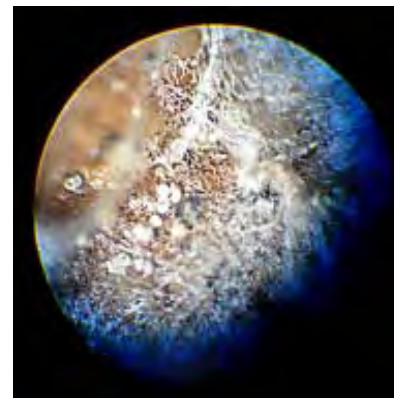
This cedar blight which usually infects only trees situated in damp shady areas is not considered lethal, except to new seedlings and nursery stock.



Fruiting bodies under microscope 600X

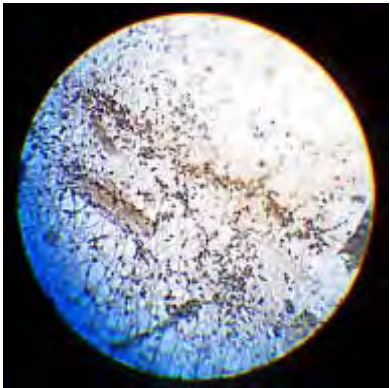


Mycelium strands

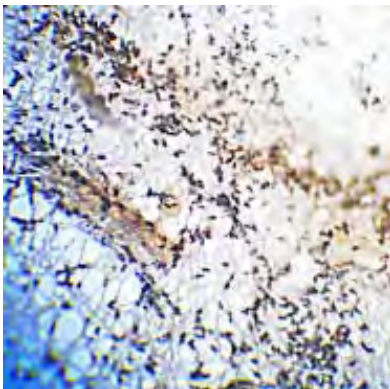




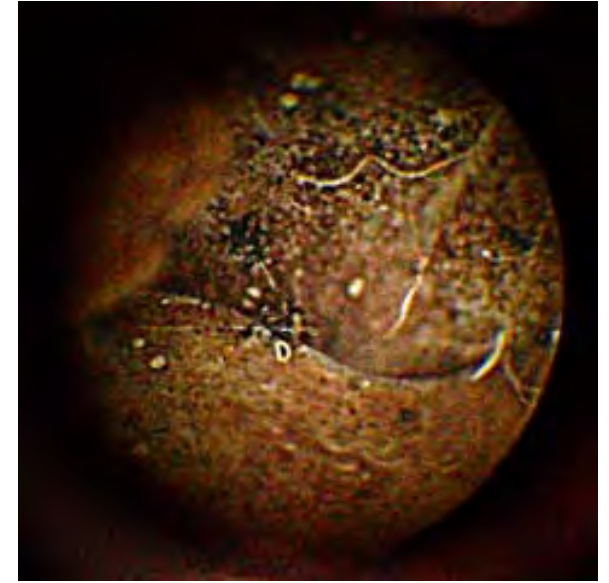
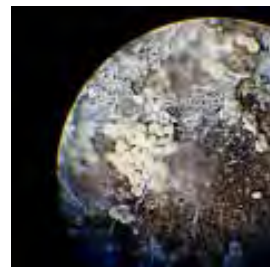
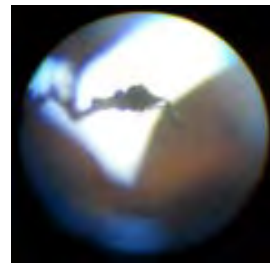
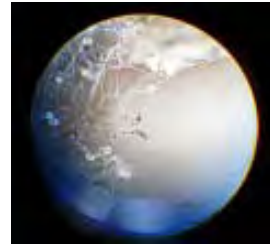
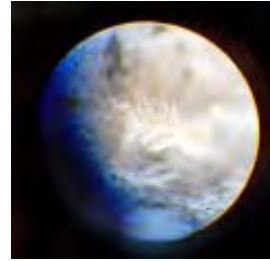
Mycelium tendrils



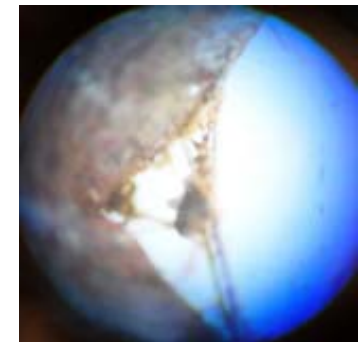
Fungal fruiting bodies 600X magnification



Infected leaf - browning throughout season-June to October



Close up of Leaf overlap showing infecting fungus 'Apothecia' 300 X magnification



Mycelium tendrils

Tree Number: **Report on Cedar Blight**

Location: *in front of main house*

Species: *Keithia Thujina*
cedars across the island but particularly on OK Point have been blighted with brown foliage for 3 years now.

the blight creates a scorched appearance on the leaf fronds, many of which turn ash grey.

This blight is rarely lethal.

Symptoms: small whitish spots on upper leaf surface in spring. Browning of foliage is evident by June. fungus apothecia. The fungal spores turn black at maturity and release spores.

Airborne ascospores are released from June to October and can travel many kilometers infecting large drifts of trees.



Tree Number: **16 - 2012**

Location: *in front of the Pagoda*

Species: *white pine - one of a group of mature trees approximately 20 M high 600mm diameter trunks coarse bark.*

1) This tree now appears stable after a severe lightning strike and has not succumbed to insects and woodpecker as tree 12..

2) Pine gum along edges of the split has successfully cauterised the wound. (unlike Tree 12)

3) No apparent insect infestations visible

4) Adjacent 'mate' tree is no longer bleeding as profusely as in 2011.



Adjacent 'mate' pine



Tree Number: *15 - new addition*

Location: *beyond yew wood, in gully adjacent to fallen white pine*
Species: *This appears to be an Eastern Red Cedar (*Juniperus virginiana*) which is apparently unique on the island and distinctly different with its fine soft more tubular foliage from the typical Northern White Cedar.*

generally white cedars across the island have been blighted with brown foliage caused by leaf miners for 3 years now.

This cedar appears to be unaffected.

Tree Number: *16 - 2013*

Location: *in front of the Pagoda*
Species: *white pine - one of a group of mature trees approximately 20 M high 600mm diameter trunks coarse bark.*

Nature of affliction: *lightning strike in 2008*

1) This tree appears stable after a severe lightning strike and unlike tree # 12 has not succumbed to insects and woodpecker. The edges of the ripped bark strip have sealed with gum and no continuing bleeding is occurring.

2) No apparent insect infestations visible. Adjacent 'mate' tree is no longer bleeding as profusely but it is hosting numerous gypsy moth nest locations.



FAIRWOOD ISLAND FOREST MANAGEMENT PLAN



Adjacent 'mate' pine

TREE STUDY REPORTS - SECTION 09

Tree Number: 17 - 2009

Location: adjacent to pumphouse
Species: a group of very vertical mature white pine - 15 m high
200-400mm diameter trunks

These are being monitored because of the curious wind conditions occurring in this area behind the main house over the past 10 years.

In the winter of 2008-9 a wind event snapped two adjacent pines at 3.6 M and 4.8 M above ground. Two other trees, pine and spruce were overturned. A large pine in the woodpile was overturned.

Tree A - double trunk pine 400mm and 300mm trunk diameters looming over pumptank. This tree protected the tank form a fallen tree in 2004.

Three othe pines with 200mm, 250mm and 350mm trunkks have long branchless trunks and light feathery crowns.

All 5 trees are nearing the end of their lives.



Tree Number: 18 - 2009

Location: adjacent to pumphouse
Species: white spruce seedling from Tree 3 in well drained septic bed sand.

This tree is now approximately 400mm high and quite healthy.



Tree Number: 17 - 2010

Location: adjacent to pumphouse
Species: a group of very vertical mature white pine - 15 m high
200-400mm diameter trunks

These are being monitored because of the curious wind conditions occurring in this area behind the main house over the past 10 years. Many trees have been snapped or uprooted.

There has been no further wind damage as had occurred in the winter of 2008-9.

Trees above pumphouse 'twins' are flourishing, but the other pines have reached a climax where they are green crowned but all lower branches have died off. They are therefore very susceptible to wind snapping.



FAIRWOOD ISLAND FOREST MANAGEMENT PLAN

Tree Number: 18 - 2010

Location: adjacent to pumphouse
Species: white spruce seedling from Tree 3 in well drained septic bed sand.

This tree is now approximately 600mm high and quite healthy.

Note: a seed bed of horse chestnuts has been set out about 5 feet away

Seeded larch and other seeded white spruce in the area have not germinated, nor have the pot seeded spruce which were dug up by squirrels.



TREE STUDY REPORTS - SECTION 09

Tree Number: 17 - 2011

Location: adjacent to pumphouse
Species: a group of very vertical mature White Pine - 15 m high
200-400mm diameter trunks

These are being monitored because of the curious wind conditions occurring in this area particularly over the past 10 years. Many trees have been snapped or uprooted.

These pines were observed under extreme wind conditions in a storm in late October 2011. With their very long trunks they move around violently in the wind which catches the foliage at the top.

The twin trees behind the pumphouse are still generally healthy, well rooted and unaffected by insects, but have nevertheless peaked and clearly begun to decline, with less foliage density. The wind conditions in this area have been unbalanced by some major tree falls in the last decade and this may be a long delayed result of the installation of the open space septic bed 35 years ago.



FAIRWOOD ISLAND FOREST MANAGEMENT PLAN

Tree Number: 18 - 2011

Location: adjacent to pumphouse
Species: White Spruce seedling from Tree 3 in well drained septic bed sand.

This tree is now 680mm high and reasonably healthy.

Note: the adjacent seed bed of horse chestnuts has produced a line of healthy seedling. What to do with them now?

A line of acorns from oaks on Childs Way has been planted alongside the chestnuts to experiment with different genetic strains of oak



Adjacent seed bed of horse chestnuts



TREE STUDY REPORTS - SECTION 09

Tree Number: 17 - 2012

Location: adjacent to pumphouse

Species: a group of very vertical mature White Pine - 15 m high
200-400mm diameter trunks

1) This group of trees is thinning in foliage density and presents less of a wind drag and threat to the water tower.

2) The conjoined twin trees behind the pumphouse are still generally healthy but have begun to decline, with less foliage density. These trees are being monitored to determine whether they should be removed from presenting a threat to the tower and cabin.



FAIRWOOD ISLAND FOREST MANAGEMENT PLAN

Tree Number: 18 - 2012

Location: adjacent to pumphouse

Species: White Spruce seedling from Tree 3 in well drained septic bed sand.

1) Tree is sparser in needling but withstanding drought.

2) Adjacent seed bed of horse chestnuts has succumbed to the drought

3) Line of acorns planted in 2011 has not germinated.



Adjacent seed bed of horse chestnuts has succumbed to drought



TREE STUDY REPORTS - SECTION 09

Tree Number: 17 - 2013

Location: adjacent to pumphouse
Species: a group of very vertical mature White Pine - 15 m high
200-400mm diameter trunks

- 1) This group of trees is thinning in foliage density and presents less wind drag and threat to the water tower.*
- 2) The conjoined twin trees behind the pumphouse continue to decline, with less foliage density. These trees are being monitored to determine whether they should be removed from presenting a threat to the tower and cabin.*
- 3) Hurricane on August 27, 2013 blew these trees around violently - and pressure difference blew out window on back of cabin.*



FAIRWOOD ISLAND FOREST MANAGEMENT PLAN

Tree Number: 18 - 2013

Location: adjacent to pumphouse
Species: White Spruce seedling from Tree 3 in well drained septic bed sand.
Other fullgrown specimens in this area have now all succumbed

- The seedbed area has well drained sandy soil, ideal for many seedlings but few nutrients*
- 1) This spruce has been severely affected by dry conditions and long winter. It has lost 60% of its needles following the 2012 drought.*
 - 2) Adjacent seed bed of horse chestnuts is not thriving The soil conditions suited to germination are not suited to continued sustenance.*



Adjacent seed bed of horse chestnuts is not flourishing after 3 years. The acidic soil conditions are thwarting these saplings



White spruce has lost most of its needling due to dry conditions in drought period of 2012.



TREE STUDY REPORTS - SECTION 09

Tree Number: 19 - 2012 - (added tree)

Location: exposed in open area on OK point opposite Ugo Island main house

Species: Hemlock - only specimen on island

- 1) Remnants of a single much larger tree that has fallen over and developed multiple crowns which are hugging the rock.
- 2) Tree is well needled with flat soft needles and has a few new red cones in 2012
- 3) Appears to have weathered the drought in 2012, there is no evident die back.
- 4) Many smooth red cones have formed - (how were they fertilised?)

Tree Number: 20 - 2012 - (added group with Pine Rust)

Location: beside Doghouse on North side

Species: Group of White Pine quite densely clustered

Nature of Attack: Severely affected by Pine Rust - ribes present in area

- 1) Heavy bleeding on many of the trunks in this grouping, needling is sparse.
- 2) Early stages of severe infection
- 3) monitor to observe sequence of infection, how tree fights back, the effects on branchings etc.



Fallen tree has grown multiple crowns



Smooth clean bark and new cones



Heavy bleeding on trunks of affected group of trees located on south east side of Doghouse



Tree Number: 19 - 2013 - (added tree)

Location: exposed in open area on OK point opposite Ugo Island main house

Species: Hemlock - only known specimen on island

1) Remnants of a single much larger tree that has fallen over and developed multiple crowns which are hugging the rock.

2) Tree is well needled with flat soft needles and has a few new red cones in 2012

3) Appears to have weathered the drought in 2012, there is no evident die back.

4) New smooth red cones have formed



Fallen tree has grown multiple crowns



Smooth clean bark and tender new cones



Hericium Coralloides - Tree Fungus

Location: dead hardwood on forest floor - Armak Point

Scientific name: *Hericium coralloides*

Derivation of name: Corall- means "coral" in reference to resemblance of this species to marine coral.

Synonyms: *Hericium ramosum* (Bull.) Letellier

Common name(s): Comb tooth.

Phylum: Basidiomycota

Order: Russulales

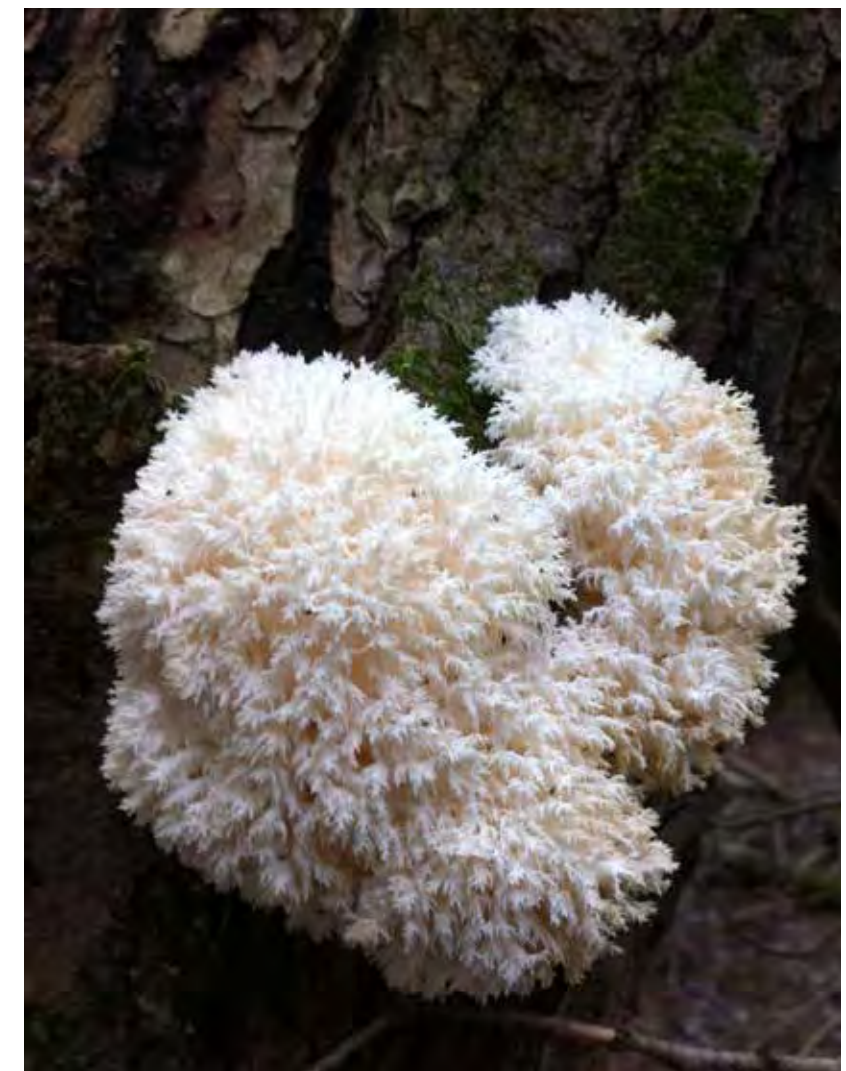
Family: Hericiaceae

Occurrence on wood substrate: Saprobic; solitary or in groups on dead deciduous wood; August through October.

Dimensions: Fruit body up to 35 cm wide; individual spines averaging about 1 cm in length.

Description: This intricately branched species forms an irregularly shaped cluster of spreading, whitish branches bearing spines. The branches originate from a common point. The spines hang more or less evenly in rows (like a comb) along the branches. With age, the branches and spines turn yellowish.

Edibility: Edible when young.

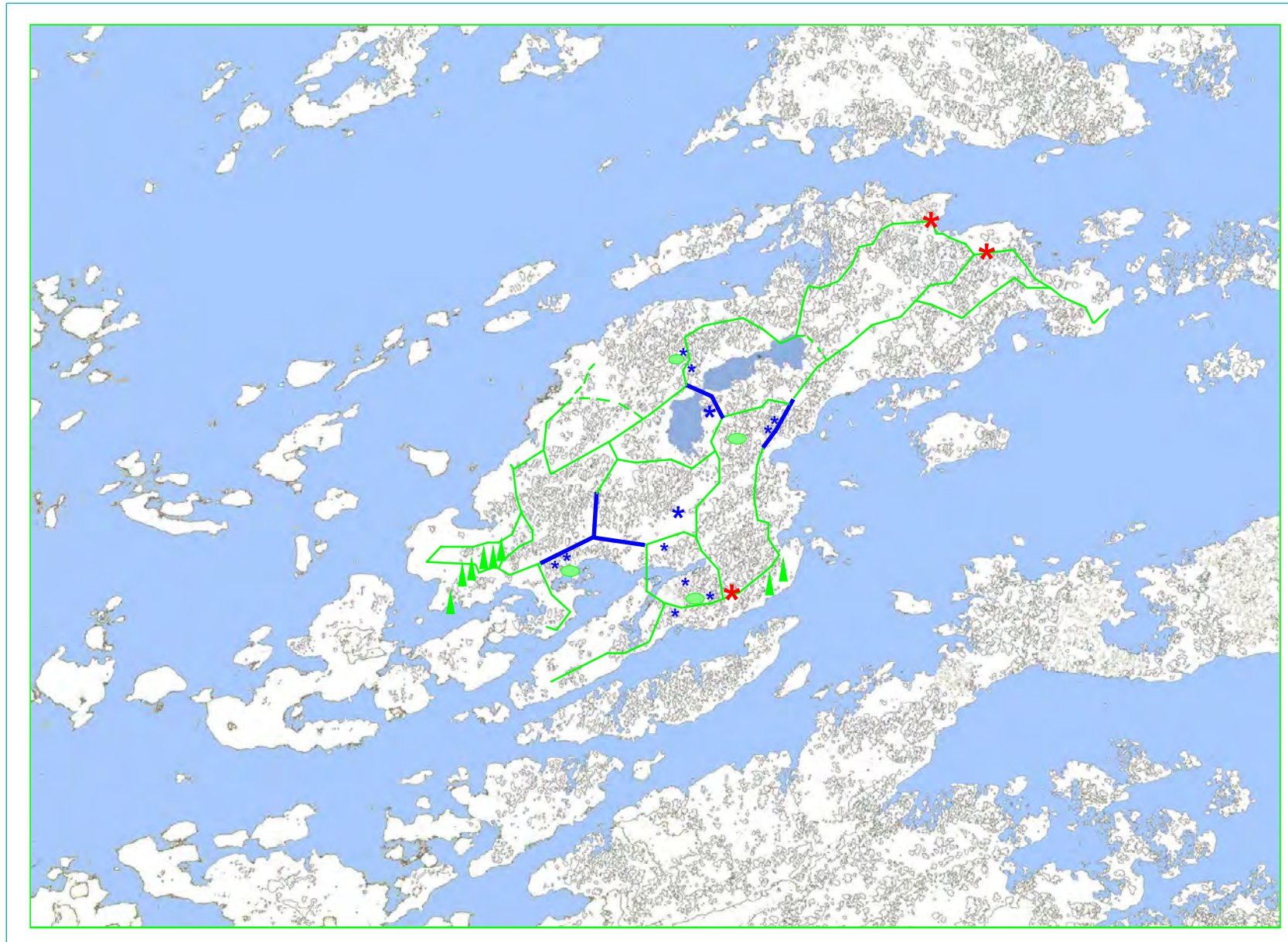


2009 Fairwood Island - Survey of Recent Tree Falls
- to monitor causal wind directions and other contributing factors

Tree Ref. No.	Location	Year of Fall	Diameter of bole (mm)	Uproot	Nature of Affliction	Woodpecker	Lightning	Collateral damage	Direction of Fall
O K Point									
1	near Duff Emma Memorial	2005	350		Carpenter Ants	yes		into clearing in woods	N
2	Woodpile behind house	2008	500		Carpenter Ants			into open gardens	N
3	Path to Caravanserai	2000 est	350		Carpenter Ants			into clearing/no wind	SE
4	Path to Caravanserai	2008	300		Carpenter Ants	yes (pilated)		into clearing	E-SE
Maclean Point									
5	Massive pine on path	1996	700		Carpenter Ants			into woods, much damage	E-SE
6	In first dell	1990 est	300		Carpenter Ants			high level snap into woods	S-SE
7	In first dell	1990 est	250	yes				uproot	S-SE
South Boundary Mid Point									
8	across path	2000	600		Carpenter Ants			twist FI, rot at base	SE
9	across path		500		Carpenter Ants				SE
Spratts Park									
10	West end over path	1986	2x250					snap at 1500mm	S
10b	West end over path	1980	400					fell across path	N
10c	West end over path	1980's	500		Carpenter Ants			snap at 4000	SE
Champlain Park									
11	East end Champlain Park	1970's	350					into clearing path, well rotted	S-SE
12	East end Champlain Park	2008	600	yes				uproot with rocks, still alive	E
13	Path behind monument	2006	300	yes				uproot and split	SE
14	Path behind monument	2008	450						SE
15	Proposed treehouse tree	2007					yes	full height strip removal N-NE side of tree	
16	Near lightning tree	2000	400					snap at 1500	E-SE
17	At Cath Boundary	2008	700	yes				massive uproot, havoc in woods	E-NE
18	At Cath Boundary	2008	300		twinned with oak			snap at 1500	E-NE
19	Near pothole with white stone	1980's	350		Carpenter Ants				E-NE
Marnie's Point									
20	In front of house	2005	400		tornado		yes	uproot with stones	S-SE
21	Clintonia berry Swampwoods	2006	250		ice or wind event				E-NE
22	Cedar Uproot	2006	350		ice or wind event		yes	tangle with other cedars	E-NE
23	Sundry other Pines	2005-2008			ice or wind event				E-SE
Beaver Lodge Lake-north path									
24	North side woods	2008	600		ice or wind event			high level snap at 4800	E-NE
25	North side woods	2005	400		ice or wind event			high level snap at 3600	E-NE
26	North side woods	2000	400		Carpenter Ants			snap at 1200, rot	E
27	North side woods	2008	550		Carpenter Ants			snap at 1000, rot	
Middle Lake - north side path									
28	at causway	2000 est	300		ice or wind event		yes/clump	group of smaller trees uprooted	E
29	west of causway	2000 est	350		ice or wind event		yes	lightning 1996, fell 5 years later	E-NE
30	Otter Lake - Stepping Stones	2008	450		wind event		yes	uproot (lateral root in crack)	N
31	Causway between lakes	2002	500		Carpenter Ants				E-NE
32	Lightning Strike	1995	600		Carpenter Ants			snap at 3600	E-NE
Tennis Court									
33	North side	1995	500					snap at 1200	SE
34	North side	2000	350				yes		SE
Bat Park									
35	Large Pine beside path	2005	450					snap at 3600	SE
West End									
36	Gateway to Stone Man point	1990	300					fell into woods, collateral damage	NNE
37	Gateway to Stone Man point	2006	300				yes	uprooted	NNE
38	East end Jurassic Park		350				yes		E
39	The Great Wall	1964			wind event		yes	5 tree uproot	E
40	Path back to Saegert Park	2008	250		Carpenter Ants			snap	N-NE
Saegert Park									
41	in Stonehenge	2005	500					uproot-part still living	E-SE
42	Mum's Path	1995	500					fell into beaver lake	N-NE

Conclusions:








- trees, snapped or uprooted tend to fall East or South- East direction
- most fallen trees exhibit some insect infestation which has weakened them
- no trees have fallen westward or southwest or northwest
- trees tend to fall into clearings - presumably the wind gusts into this unimpeded path
- 75% of trees fell within the 90 degree quadrant of NE to SE
- 88% of trees fell within the 135 degrees of N-NE to S-SE
- no trees fell towards N-NW to S-SW
- lightning tends to strip down north side of tree - presumably deep penetrating dampest being out of sun

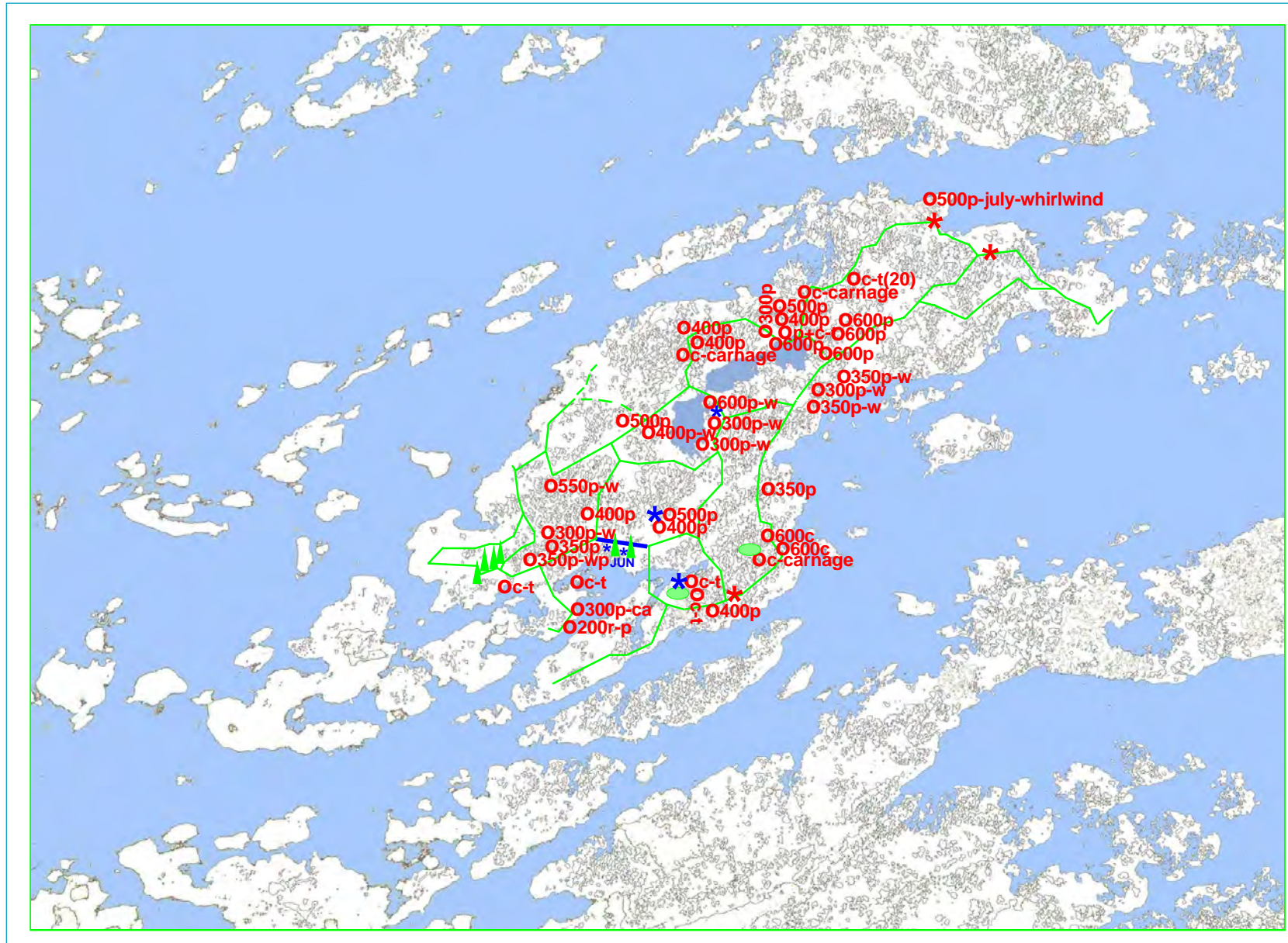


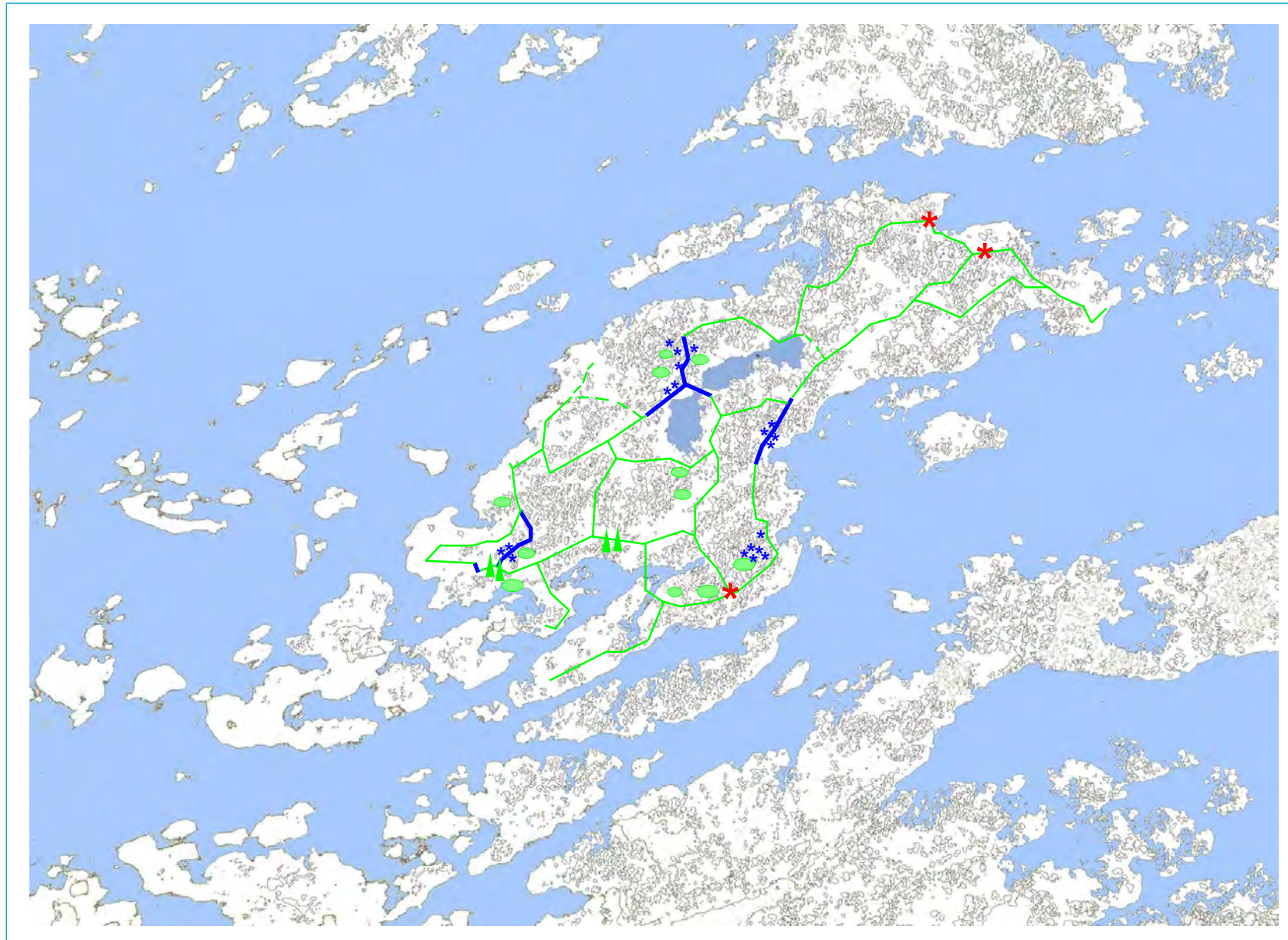
1999 PATH UPGRADING & TREE REMOVALS

- * COTTAGES
- PATH NETWORK
- SECTIONS OF UPGRADING OF PATH SYSTEM
- * TREE REMOVALS
- ▲ TREE PLANTINGS (white pine)
- COMPOSTING SNAG

2000 PATH UPGRADING & TREE REMOVALS

-  COTTAGES
-  PATH NETWORK
-  SECTIONS OF UPGRADING OF PATH SYSTEM
-  TREE REMOVALS
-  TREE DAMAGE - ICE STORM
- MAJOR DAMAGE IN ALL PARTS OF ISLAND
larger tree diameters at breast height noted
KEY:
p white pine
c cedar
w windfall
t tangle carnage
ca carpenter ant
r rust
wp woodpecker
-  TREE PLANTINGS (white pine) - approx 15
-  COMPOSTING SNAG





2001 PATH UPGRADING & TREE REMOVALS

** COTTAGES*

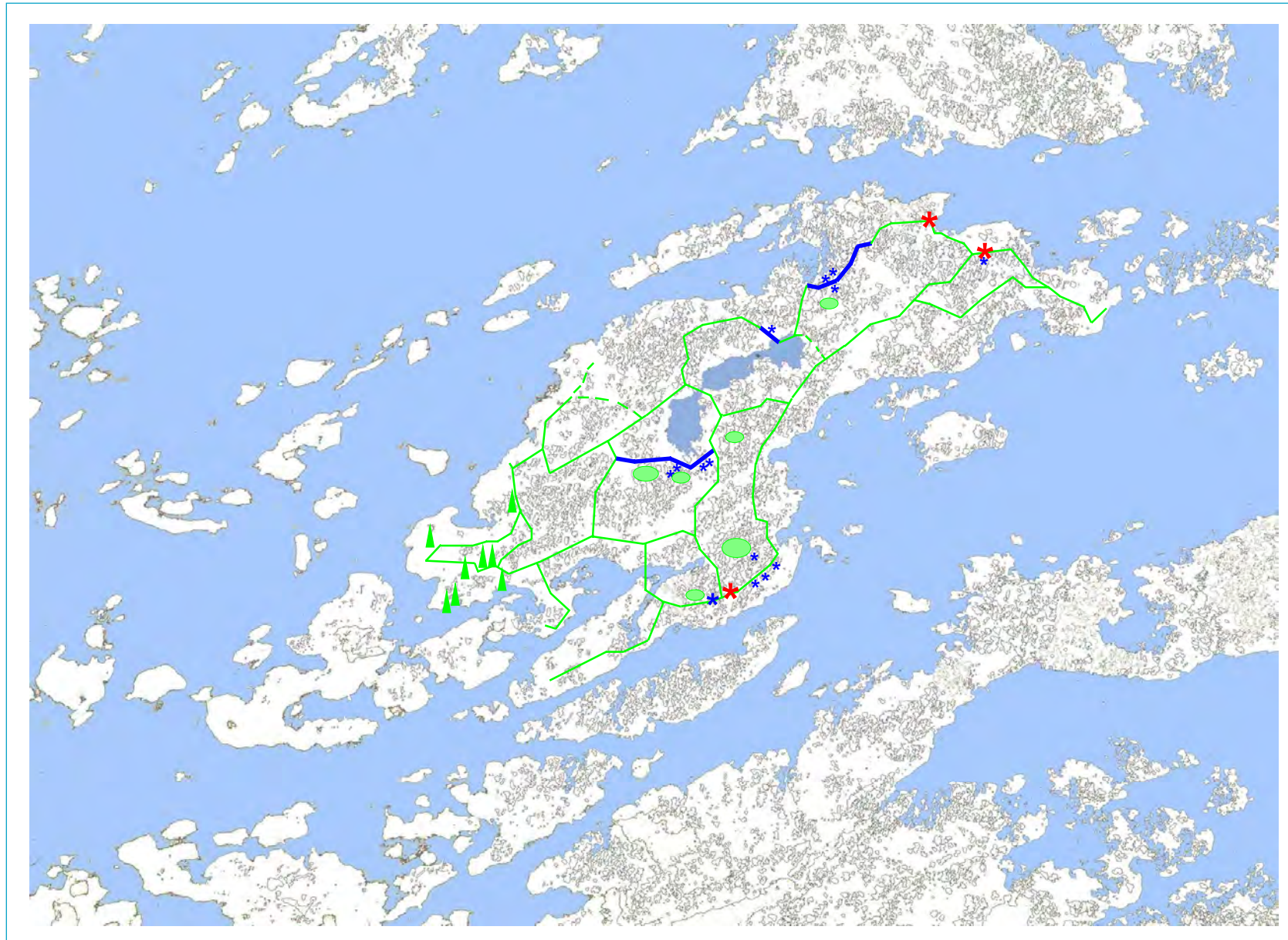
— PATH NETWORK

— SECTIONS OF UPGRADING OF PATH SYSTEM

** TREE REMOVALS*

▲ TREE PLANTINGS

● COMPOSTING SNAG



2002 PATH UPGRADING & TREE REMOVALS

***** COTTAGES

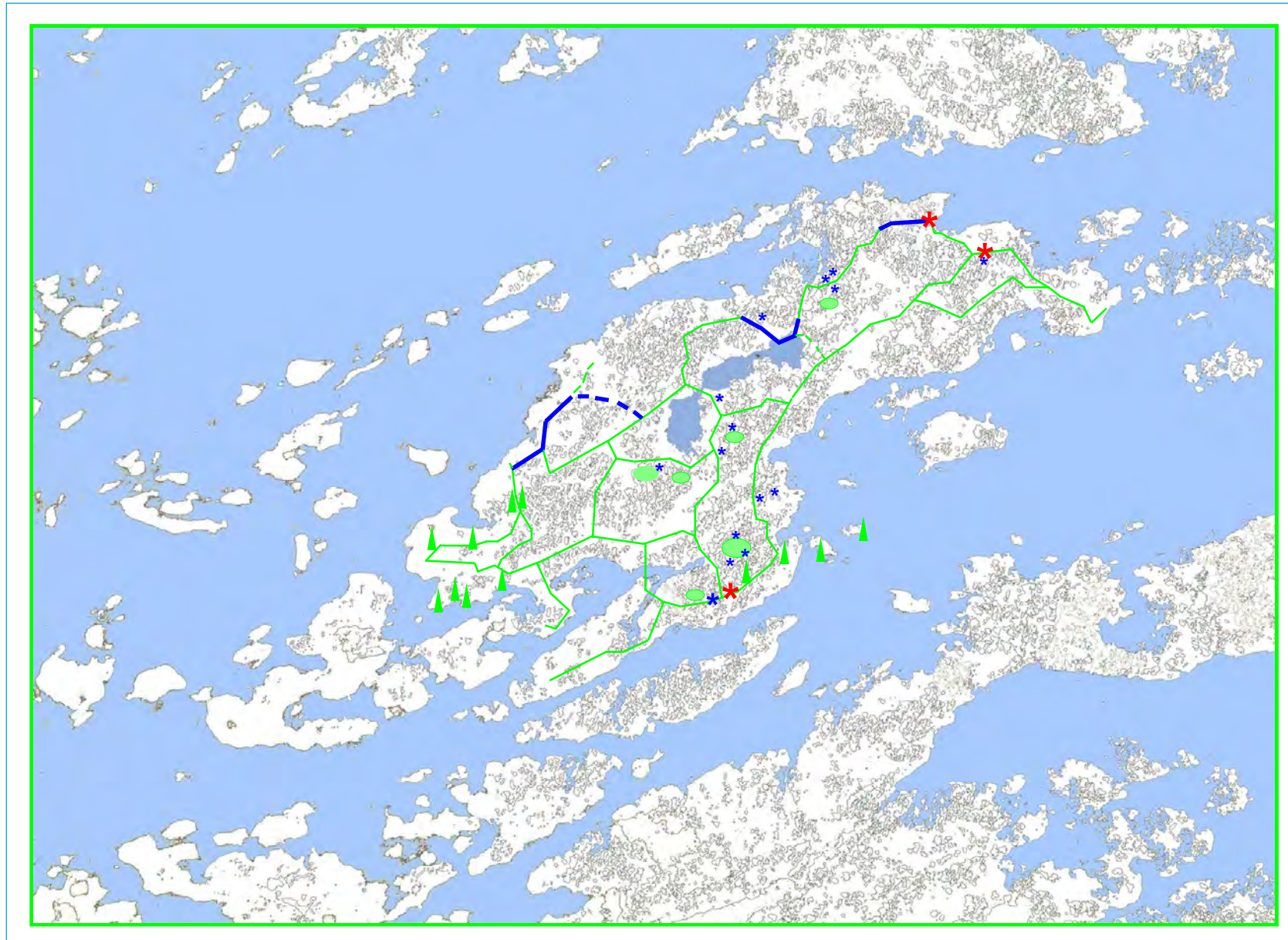
— PATH NETWORK

— SECTIONS OF UPGRADING OF PATH SYSTEM

***** TREE REMOVALS

▲ TREE PLANTINGS

● COMPOSTING SNAG



2003 PATH UPGRADING & TREE REMOVALS

***** COTTAGES

— PATH NETWORK

— SECTIONS OF UPGRADING OF PATH SYSTEM

***** TREE REMOVALS

▲ TREE PLANTINGS

● COMPOSTING SNAG



2004 PATH UPGRADING & TREE REMOVALS

***** COTTAGES

— PATH NETWORK

— SECTIONS OF UPGRADING OF PATH SYSTEM

***** TREE REMOVALS

▲ TREE PLANTINGS

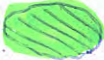
● COMPOSTING SNAG



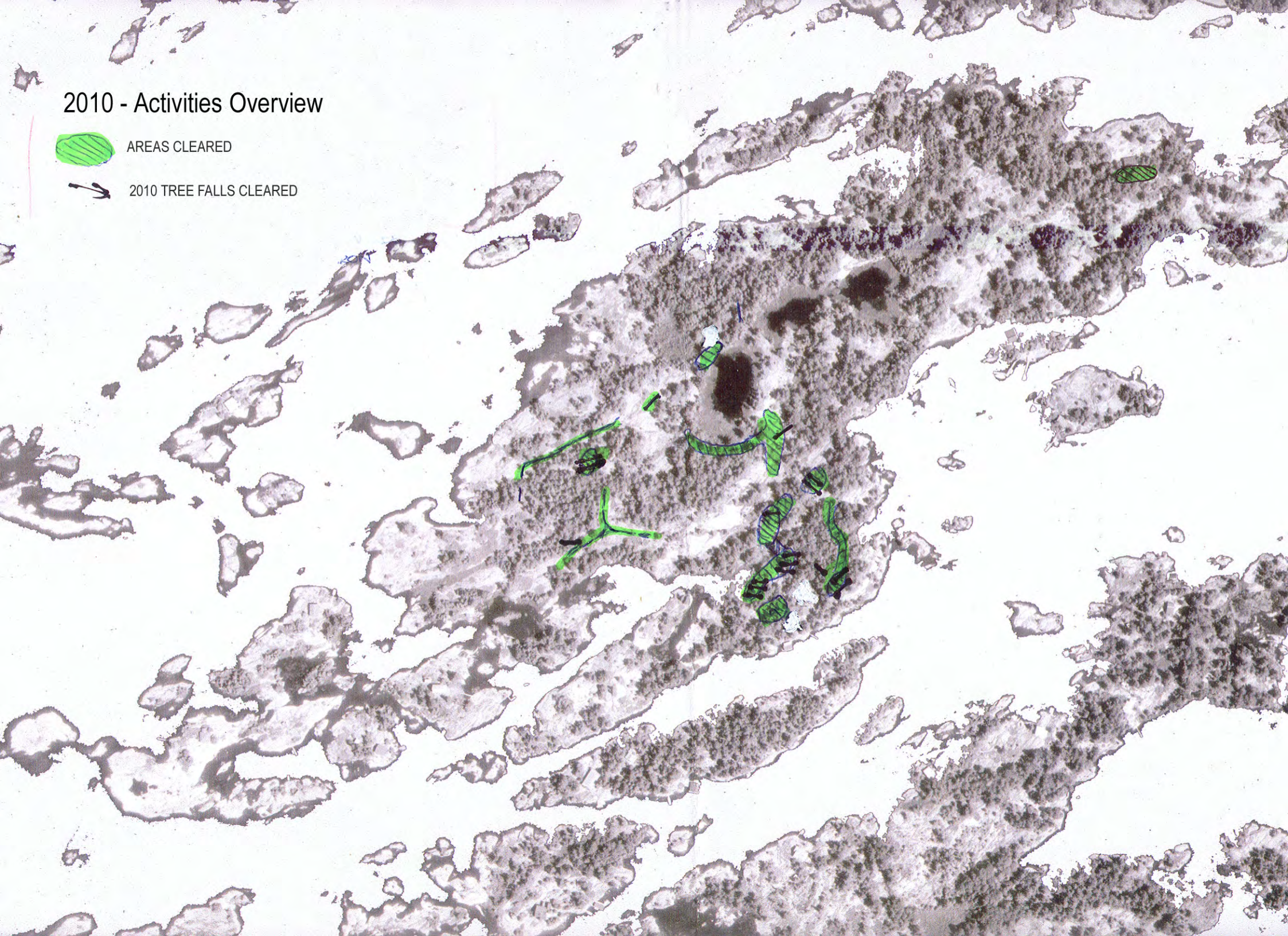
2005 PATH UPGRADING & TREE REMOVALS

- * COTTAGES
- PATH NETWORK
- SECTIONS OF UPGRADING OF PATH SYSTEM
- * TREE REMOVALS
- ▲ TREE PLANTINGS
- COMPOSTING SNAG

2010 - Activities Overview

 AREAS CLEARED

 2010 TREE FALLS CLEARED



General Observations - 2011

The winter of 2010-2011 was extended and cold and the spring was delayed by almost 3 weeks for the flowering berries.

There was little over winter wind damage and few trees down. Most of the 'leaner' damage thought to have been caused by snow and ice. There was no further evidence of wind updrafts as in 2010.

The spring however when it arrived was wet and the berry blossoms were more prolific than in any recent memory.

In the spring there was very little tent caterpillar activity on the cherries.

The summer was generally hot and dry but there was adequate rain, the island did not dry out.

However unlike the summer of 2010, when a general dearth of insect life was noted on the island, the adequate moist conditions seemed ideal in 2011 for a full scale return of all crickets, roaches and other insects.

Not as many dragon flies or butterflies noted as in peak years, but nevertheless quite reasonable numbers.

O.K. point has begun to recover from the extended beaver damage in 2008 caused by harvesting maples, cherries and cedar trees. However the beaver appears to be trying to return to the boat house having been driven out of the Ryan's boathouse. The beavers have not returned to either of their lodges in the Beaver or Otter Lakes.

Bird life was prolific due to the abundance of insects. Merlins, Blue Herons on south shore, Sand Hill Cranes, Pilated woodpeckers, and Grouse. Blue Jays, Flickers and many Warblers as usual.

A fox family with 2 kits ensured that the geese avoided the island generally. The fox did not succeed in hunting the grouse. Male fox ambushed and killed by geese, a very surprising episode.

A small bear, not the large bear of 2010, has returned to the island in the autumn of 2011 and has caused extensive damage of the paths and uprooted soil in a search for insects.

Many snakes this year

FAIRWOOD ISLAND FOREST MANAGEMENT PLAN



Pilated Woodpecker damage to white pines behind Ian's house



Bear up-rooted mosses and bear berry droppings



Bear Damage to paths



Mating rattlesnakes



Male fox ambushed by Canada Geese



TREE STUDY REPORTS - SECTION 09

General Observations - 2012

The winter of 2011-2012 started early but proved to be short and mild with little snow.

A dry warm spring was already underway at time of first opening May 18th weekend.

Due to dryness early lilies and orchids were undersized, though iris were very prolific (small)

There was little over winter wind damage and only a few new leaners. There was no further evidence of tornado wind updrafts as in 2010.

Overall water levels plunged 10" and by October 2012 were at absolute lowest on our records.

Because the spring was dry, the water level was very low in the interior lakes. The water was about 450mm below high water line in Otter Lake and 950mm below high water line in Middle and Beaver Lodge lakes

In the spring there was very little tent caterpillar activity on the cherries.

The summer of 2012 was exceptionally hot and humid. There was a long period of drought in July and August and many of the small seedling trees established in the previous 5 years succumbed to the drought.

Due to the drought there were few blueberries or blackberries.

Deer, a doe and faun as well as two bears were sited on occasions through the summer. The smaller bear, adolescent did much damage rooting up the moss layer for grubs.

The beaver has not returned to the interior lakes. He attempted a dam across the channel where the low waters have exposed many rocks.

Bird life was reasonably good. Sand hill Cranes were in the Middle lake and the Blue Heron daily in Beaver Lodge Lake.. Merlins, a nesting pair of Broadwing hawks, Pilated woodpeckers, and Grouse. Blue Jays, Flickers and as many Warblers as usual. However fewer blackbirds in the Otter Lake colony. Turkey vultures nest on north shore.

The fox family has reappeared on the West End.

Many snakes noted this year but no rattlesnakes. Fox snakes enjoying a comeback.

The vegetable garden has proved prolific in tomatoes, potatoes, cucumbers, beans and lettuce.



Pilated Woodpecker damage to white pines behind Ian's house



Bear Damage to paths



Exceptionally low pond water levels in Middle Lakes



Exceptionally low lake water levels in Archers Bay



General Observations - 2013

The winter of 2012-2013 started early but proved very long and severe with much snow. A very late spring was underway at time of first opening May 12th weekend. Most deciduous trees were in tight bud at this time, the ice having gone out 3only 3 weeks earlier. Lillies were undersized though blueberries were blooming prolifically. There was little over winter wind damage and only a few new leaners.

Overall water levels had plunged 22" and by early May were at absolute lowest on our records. These levels recovered 16" in May June. Such fluctuations seem very abnormal. The water level was very medium to low in the interior lakes.

In the spring there was litle tent caterpillar activivty on the cherries.

The summer of 2013 was generally short on rain, hot and humid. There was a long dry period in July and August though not as severe as the drought in 2012.

The bluberry and black crop has never been better due to the late spring start and generally cool moist weather at critical early periods.

Deer, a bear, and 2 fox families were sighted frequently.

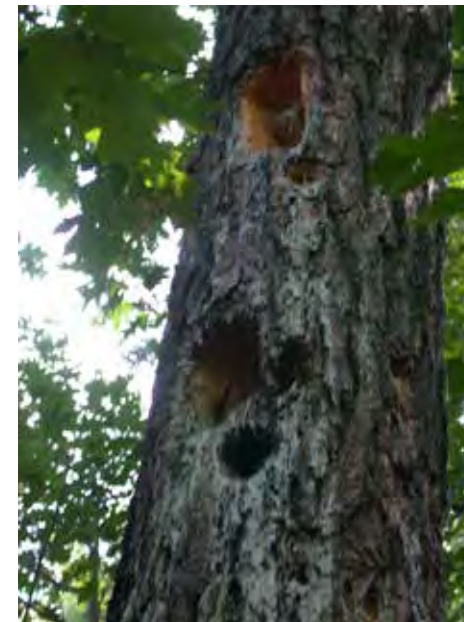
The beaver was sighted early morning and seemed to be retreating to a location near the Ryans.

Bird life was reasonably good. Sand hill Cranes and Blue Heron in Beaver Lake.. Merlins, Pilated woodpeckers, and Grouse, a very unusual flock of approximately 20 Blue Jays. Flickers and many Warblers as usual. However fewer blackbirds in the Otter Lake colony. Turkey vultures nest on north shore.

The fox family set up home at Stonehenge. and one on the south shore.

1 rattlesnake noted by Sarah.. Fox snakes are enjoying a comeback.

A vegetable garden was not attempted this year.



Pilated Woodpecker damage to white pines behind Ian's house



Fox scat with blueberries and dung beetles. With 2 fox families on Fairwood there is much evidence on the paths - and no geese venture onto the island.



Above: Reappearance of gypsy moth in many locations



Below: Hericium Coralloides tree fungus on decomposing hardwood in woods on Armak Point

