Weed Management Plan for The Nut State Reserve (2027-2031)

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Prepared for:
Tasmania Parks & Wildlife Service

Prepared by:
Matt Rose

Natural State
PO Box 139, Ulverstone, TAS, 7315
www.naturalstate.com.au

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Cover photo: *UTV with spray unit setup for weed management on The Nut. Facing SW, M.Rose, 13/06/22.*

To the extent permitted by law, Natural State excludes all liability to any person for any consequences, including but not limited to all losses, damages, costs, expenses and any other compensation, arising directly or indirectly from using information or material (in part or in whole) contained in this plan.

1. Introduction

Natural State was engaged by Tasmania Parks and Wildlife Service (PWS) to prepare another 5 year weed management plan for The Nut State Reserve; located in Stanley, Tasmania.

This plan builds on the previous Weed Management Plans for The Nut State Reserve 2015-2020 & 2021-2026 periods (Natural State, 2015 & 2026).

This plan documents the following information:

- An evaluation of the progress achieved during the previous plan period 2021-2026.

- Lessons learnt over the past 5 years.

- Recommendations and mapping of weed management areas for 2027-2031.

- An estimation of the resources (labour and money) required to achieve realistic outcomes over a 5 year period.

It is hoped that this plan will assist the Parks and Wildlife Service with compliance to protect and restore the natural values whilst also enhancing the onsite experience for visitors and tourists, and to encourage support for the project within the local community.

The works recommended in this plan requires a greater commitment than has previously been allowed to effectively manage the expanding Hemlock infestation and protect the threatened Straw Daisy population.

Due to the degraded nature of the site, a long term commitment of resources will be required for follow up weed management work to consolidate on previous hard work & investment.

It would be greatly appreciated if the PWS can publicly acknowledge and recognise the hard work achieved onsite by Gavin O'Callaghan from West Star Services & Matt Rose of Natural State to restore the site to the current condition. We have worked on this site for over 135 days each since 2013.



***Photo 1**: Using the UTV to spray the dense Gorse (red marker dye) on the summit. M.Rose, 20/01/23.*

2. Summary of weed management activities 2021-2026

2.1 Evaluation of progress

The *Poa* spp. grasslands now visible throughout the Summit and lower slopes highlight where the weed management has occurred. These areas were previously covered in dense Gorse. There has been a significant reduction in Gorse surrounding the tourism infrastructure onsite since 2015 due to the hard work of Gavin & Matt.

An adaptive management approach is necessary to increase resourcing when needed. One of the main barriers preventing greater results is the allocation of resources, both PWS staff time towards weed management and an adequate ongoing budget. Put simply, if PWS staff can not allocate time to manage the weeds at The Nut when necessary, even with the UTV spray unit now readily available onsite, additional extra funds are required to engage contractor labour to carry out this activity. The current allocation of 16-20 person days towards weed management work per year is nowhere near enough time for a site of this size with the complex weed issues. Ideally a minimum of 60 person days is required per year to get on top of the weeds at The Nut.

One example of the need to be more adaptive is the Hemlock infestation which has noticeably spread on the Summit during the past 5 years. It requires greater resourcing to prevent the Summit being smothered in Hemlock and beyond effective control. Improved public safety needs to be seriously addressed to prevent the risk of visitors being poisoned due to Hemlock crowding out the walking tracks. An allocation of the recent funding commitment of $2.3 million should be used between now and 2028 to "improve safety for visitors and locals" (Nut State Reserve Infrastructure Projects, 2024).

Another example is the lack of intervention to protect the endangered Straw Daisy. Natural State has been actively monitoring this species over the past 13 years. We have observed this population significantly decline from >5,000 plants to <50. Action rather than interpretive signage alone is needed to protect and enhance the Straw Daisy population on The Nut.

The annual budgets allocated during the 2021-2026 period limited the treatment areas to the following:

1. **Chairlift, tracks, lookouts,** revegetation areas & remnant native vegetation on the summit.
   This work has been implemented by using 15L knapsacks, a 50L spray tank with a 20m hose attached to the power carrier and the UTV with 200L tank and 50m hose.

2. **The lower slope** between the Stanley wharf and the penguin viewing area.
   This work has been implemented annually using a vehicle mounted spray unit with 300L tank and 100m hose and the UTV with 200L tank and 50m hose.

3. **The large patch of Gorse** in the middle of the summit.
   This work has been implemented twice through mulching conducted by PWS staff and external contractors using both a tractor mounted mulcher and a Positrak with mulcher attachment.

Table 1: Summary of weed management work on the summit of The Nut State Reserve 2021-2026

Financial year	Person days worked	Hectares treated	Litres applied
2021/2022	16	18	3065
2022/2023	15	16	1880
2023/2024	12	19	1660
2024/2025	14	21	2785
2025/2026	16	20	2525
TOTAL	**73 days**	**Average 18.8 ha/Yr**	**11,915L**



Figure 1: *Summary of Weed Management Activities 2021-2026.*

2.2 Observations and lessons learnt 2021-2026

- The Straw Daisy populations are rapidly declining. One larger population of <50 plants has persisted over the past 13 years, restricted to the inaccessible cliff edge near the Stanley wharf lookout. Other isolated plants are restricted to inaccessible cliff edges where the new cantilever lookout was proposed.

- The Shearwater / mutton bird rookeries are expanding in area resulting in more disturbed ground and potential for further Hemlock and Horehound spread.

- To keep the tracks and public access areas safe and tidy the Thistles and Hemlock require control between August – December before the peak tourism season and active rookeries.

- Cape Ivy is continuing to spread further up the slope near the chairlift station and around the car park.

- The introduced Elderberry control amongst the forest has encouraged birds to spread native berry producing species instead, in particular the *Rhagodia candolleana* – Sea-berry Saltbush.

- The *Poa* ssp. seeding trials conducted in June 2020 were very effective at revegetating bare ground after Hemlock control. Ongoing Hemlock control is necessary to allow the *Poa* tussocks to fill in the bare areas.

- The herbicide Metsulfuron-methyl (Associate) provides a longer term residual control of Hemlock and has been very effective when mixed with Clopyralid (Lontrel).

- Natural regeneration is now occurring adjacent to remnant vegetation due to ongoing follow-up weed control. Species observed include: *Astroloma humifusum* – Native Cranberry, *Acacia verticillata* – Prickly Moses, *Banksia marginata* – Silver Banksia, *Carpobrotus rossii* – Pigface, *Correa alba* – White Correa, *Goodenia ovata* – Hop Goodenia, *Lomandra longifolia* – Sagg, *Melaleuca ericifolia* – Swamp Paperbark, *Poa labillardierei* – Silver Tussock Grass, *Poa poiformis* – Coastal Tussock Grass, *Rhagodia candolleana* – Sea-berry Saltbush, *Tetragonig implexicoma* – Native Spinach.

- Regular community consultation is very important to inform the local community of the project objectives, site challenges, and to familiarise them with the progress achieved to date e.g. Stanley Chamber of Commerce, local politicians, West by NorthWest and external funders.

  Community consultation is urgently required as it is obvious from recent media releases and social media posts that these stakeholders are not aware of the restoration strategies and conservation work that is being implemented.

  A field day is recommended to invite these local stakeholders, including PWS project managers (fire crew, engineer, regional manager), to inform them on what we have been doing for the past 13 years.

3. The proposed strategy for the next 5 years

3.1 More follow up control

All previous weed control areas will need to be continually monitored and treated annually. The weed seed burden is significant and requires ongoing control especially once the ground is disturbed to create new tracks.

3.2 Continue to improve the site aesthetics

The infrastructure at The Nut State Reserve has received significant upgrades in recent years with a new toilet block, major track work on the summit, new penguin viewing area, and the PWS depot improvements.

All the new tracks will need follow up weed control after the ground disturbance and should require erosion control measures such as provision of stormwater drainage, jute mesh matting and mass plantings of indigenous grasses, groundcovers and small shrubs.

We need to keep building on the previous hard work and investments. It is important that the weed management activities continue to be effective and do not slow down. Otherwise it would seem that millions of dollars have been invested to promote a weed infested site with no conservation outcomes linked to this funding. This would be a missed opportunity for the local flora & fauna species, many of which are listed as endangered at State and National level.

The Nut is a highly visited tourism asset and widely promoted. It currently looks nice due to our commitment to diligent hard work and expertise in natural area restoration. If this work is reduced and no more money is allocated to do the work recommended in this plan the weed infestation will quickly return and spread. It will cost more in funding and effort the longer that the work is delayed. It will be difficult to find contractors that are interested in taking on this challenging site.



Photo 2: *Drone aerial view of the carpark, new access track and lower slope. Facing North. M.Rose, 24/02/26.*



Photo 3: *Drone aerial view of the summit near the chairlift station. Note the Poa grasslands where weed control has occurred. Facing East, M.Rose, 20/01/23.*

3.3 Hemlock containment

Improved public safety needs to be urgently addressed to prevent the risk of visitors being poisoned due to Hemlock crowding out the walking tracks. The rookeries are undermining the walking track in sections creating another public safety liability & increased maintenance costs.

The area covered in Hemlock has effectively doubled in size in the past 10 years with no dedicated resources committed over the past 5 years. If the issue is not addressed in the coming years, a tipping point will be reached and it will be too late. The summit will eventually be covered in Hemlock. In future, fuel reduction burns on The Nut may not be permitted due to the public safety risk associated with toxic Hemlock smoke.

The timeframe for effective Hemlock control on The Nut is critical. There is a small window of availability to balance the windy seasonal conditions, allowing enough plant biomass to uptake the herbicide, ideally before flowering and when the Shearwaters are absent, which is generally April - October.

To cover more ground the most efficient and safest method will be to aerial spray the Hemlock with a helicopter and controlled droplet applicator. This method has been utilised to spray Gorse onsite several times in the past 20 years. Hemlock is much easier to kill than Gorse. Smaller targeted areas may be able to be sprayed with a drone. The limiting factor of drone use is the payload per tank compared with a helicopter. For this reason the drone control areas will need to target smaller or isolated infestations and buffer areas closer to native vegetation where there will be more control of off-target damage compared to a helicopter. Further trials are required to determine if a drone can at least maintain containment lines either side of the walking tracks. If effective, the containment lines should be pushed further away from the walking track edge into the rookeries.

If scheduled and planned early enough the UTV could be used to spray the edges of the walking tracks and isolated patches of Hemlock prior to the aerial spraying, or used to tidy up any missed areas post aerial spraying, where safe under foot for operators to do so.

The future management of the dense Hemlock cover in the Shearwater rookeries needs an integrated pest management approach. Broadleaf selective spraying alone will not exhaust the weed seed bank which has accumulated for many years now. After spraying there will be large areas of bare ground, especially throughout summer when the birds are most active. Groundcover needs to be established ASAP to prevent the risk of soil erosion at the windy site. The best option is to encourage *Poa labillardieri* - Common Tussock Grass & *Poa poiformis* - Coastal Tussock Grass to recolonise the bare ground after spraying the Hemlock. Based on the success of using this technique elsewhere on the summit in combination with follow-up weed control it may take at least 3-5 years to establish.

The most cost effective method of *Poa* grassland establishment in this context is through direct seeding. We can speed up the *Poa* grassland natural regeneration process through collecting *Poa* seed in January and February, and then hand seeding or broadcasting seed into the barer ground throughout May – July. Use a seeding rate of 10 grams / m^2 for smaller areas (a handful of seed). Opportunistic seed collection should be incorporated into the weed monitoring activities during Summer to maximise the efficiency of contractor and staff time.



Photo 4: *Hemlock growing out of control near the walking tracks 1.5m tall. Due to the public safety poisoning risks it should not be allowed to get to this stage at any time. Facing NW, M.Rose, 20/01/23.*



Photo 5: *The last aerial spray treatment targeting Gorse using a helicopter in 2019. Note the spray edge where the bare ground indicates where Hemlock has died compared to the mature Hemlock with Poa grass ready to set seed into the bare ground. Facing NW, M.Rose, 17/01/20.*

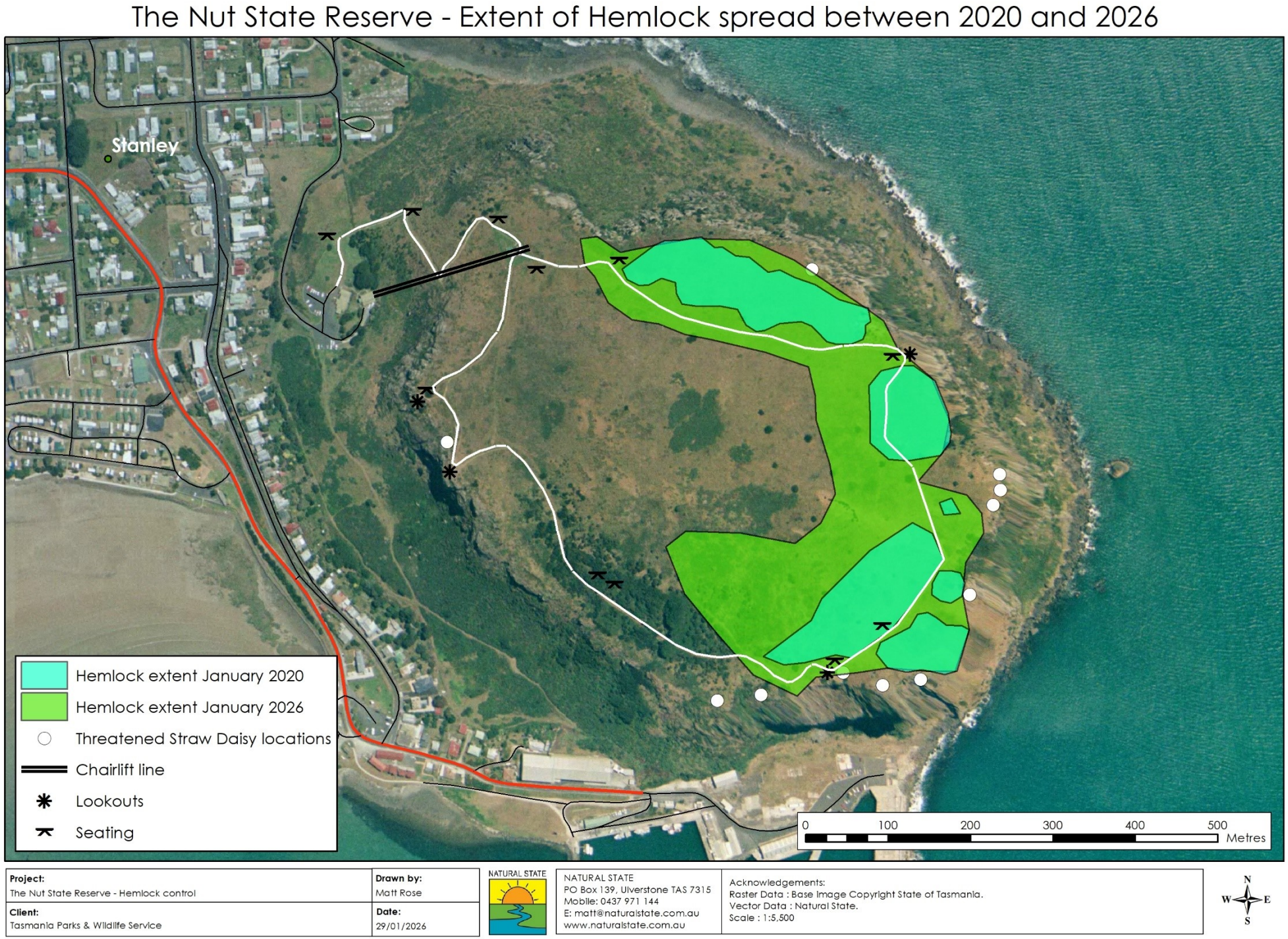


Figure 2: *Extent of Hemlock spread 2020-2026.*

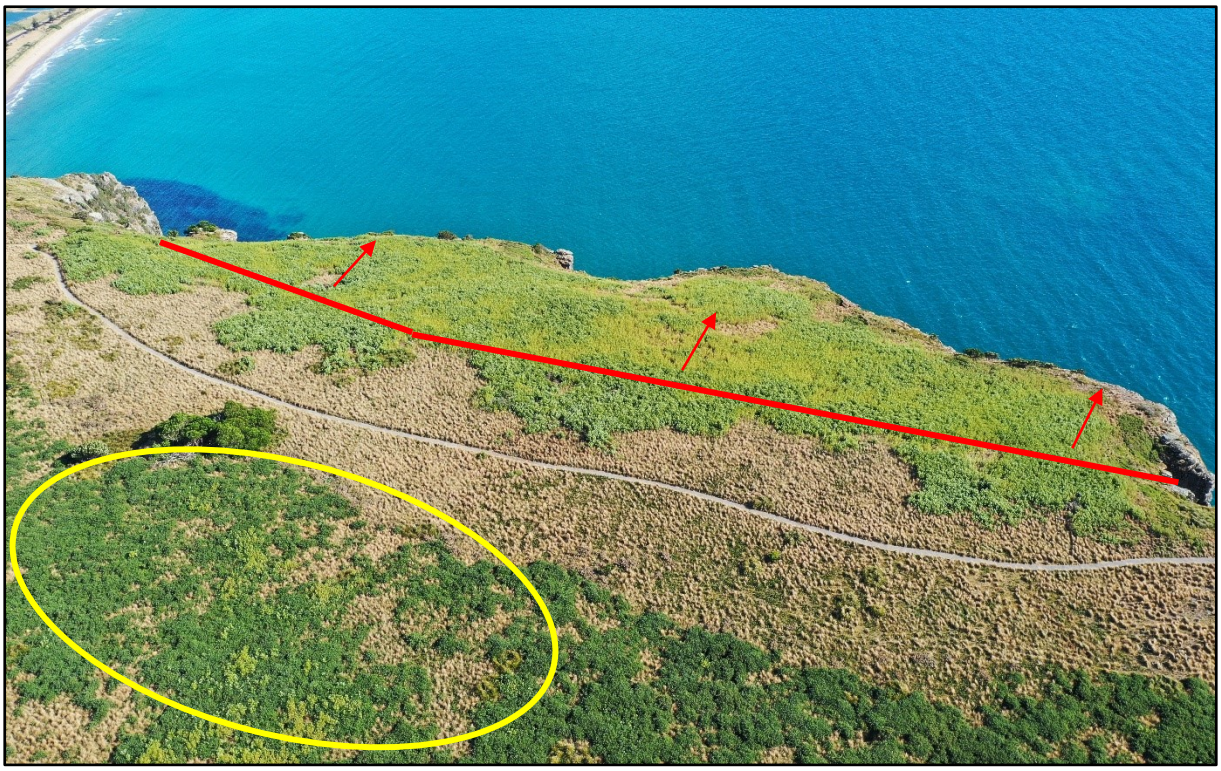


Photo 6: *Unmanaged Hemlock growing in the Northern rookery with recommended containment line in red and isolated patches urgently needing to be controlled in yellow. Facing NW, M.Rose, 20/01/23.*



Photo 7: *Hemlock growing near the walking track and forest edge with recommended containment lines. M.Rose, 20/01/23.*



Photo 8: *Hemlock germinating after Autumn rain.*



Photo 9: *Poa labillardierei seed broadcast onto bare ground in Winter.*



Photo 10: *Hand broadcasting the Poa seed in Winter after spraying Hemlock.*



Photo 11: *Bright green Poa tussocks established less than 12 months after seeding.*

3.4 Protect and enhance the Straw Daisies

Over the past 13 years whilst implementing the weed management work, we have monitored the condition of the Straw Daisy populations. We have observed a significant decline in seedling numbers. Extra care has been taken to avoid any impacts to this species whilst managing the nearby weeds. The most likely current threats to the *Environment Protection & Biodiversity Conservation Act 1999* (EPBC Act) listed endangered species are drier seasons, browsing pressure from wallabies and rabbits and soil erosion associated with Shearwater nesting.

Some practical solutions to test the browsing pressure theory would be to provide protection from browsing through brush matting, or constructing basic wire netting cages near known populations during winter before the growing season. Rabbit baiting options are required.

All known populations have been recorded, monitored and mapped by Natural State. Any weed management and restoration activity proposed to protect the Straw Daisy should be undertaken by experienced operators only.

Funding for seed collection, propagation and fencing is recommended in the proposed budget.



Photo 12: *Flowering Straw Daisies on the cliff edge overlooking the wharf. M.Rose, 02/12/22.*

4. Recommended weed management areas 2027-2031

The following recommendations are for weed control works within the management areas. The recommended approach is to manage the weed infestations using a combination of chemical, mechanical & biological control, integrated with natural regeneration techniques. Figure 3, p.15, highlights the proposed management areas for the 2027-31 period.

Annual costs associated with the works have been estimated for each management area over a 5 year period. The actual budgets required will depend on the density of weed regrowth and seasonal conditions which vary from year to year.

The contractor labour and herbicide costs are estimated at the current market rates as of May 2026. Contractor rates have been calculated at:

- $100 per hour x 1 person for an 8 hour day using a spray unit, chainsaw or knapsack.*
- $4,000 per hour for helicopter aerial spraying
- $220 per hour for mulching with a Positrack.*

* These rates do not factor in contractor travel or living away from home expenses. Prices are highly variable due to the current conflict in the Middle East and economic uncertainty.

Costs shown exclude Goods and Services Tax (GST). The costs in this plan provide a guide only to assist with allocating budgets for engaging contractor labour, or for the herbicide expenses required. Quotes for works should be sought by several service providers before confirming annual works budgets.

For comparison, in the case where a PWS budget is not available, the PWS staff time required to do the same activity has also been estimated in consultation with local PWS staff.

Please note: The registered herbicides available to control specific weeds in Tasmania is referenced from the Department of Natural Resources & Environment Tasmania (DNRET), Invasive Species, Weeds website. The mention of a specific product brand name is not, and should not be construed as an endorsement of that particular product, rather as an example for product names with specific active ingredients. Generic herbicide brands are now much cheaper.



Photo 13: *Drone aerial view around the chairlift station and summit tracks. M.Rose, 20/01/23.*

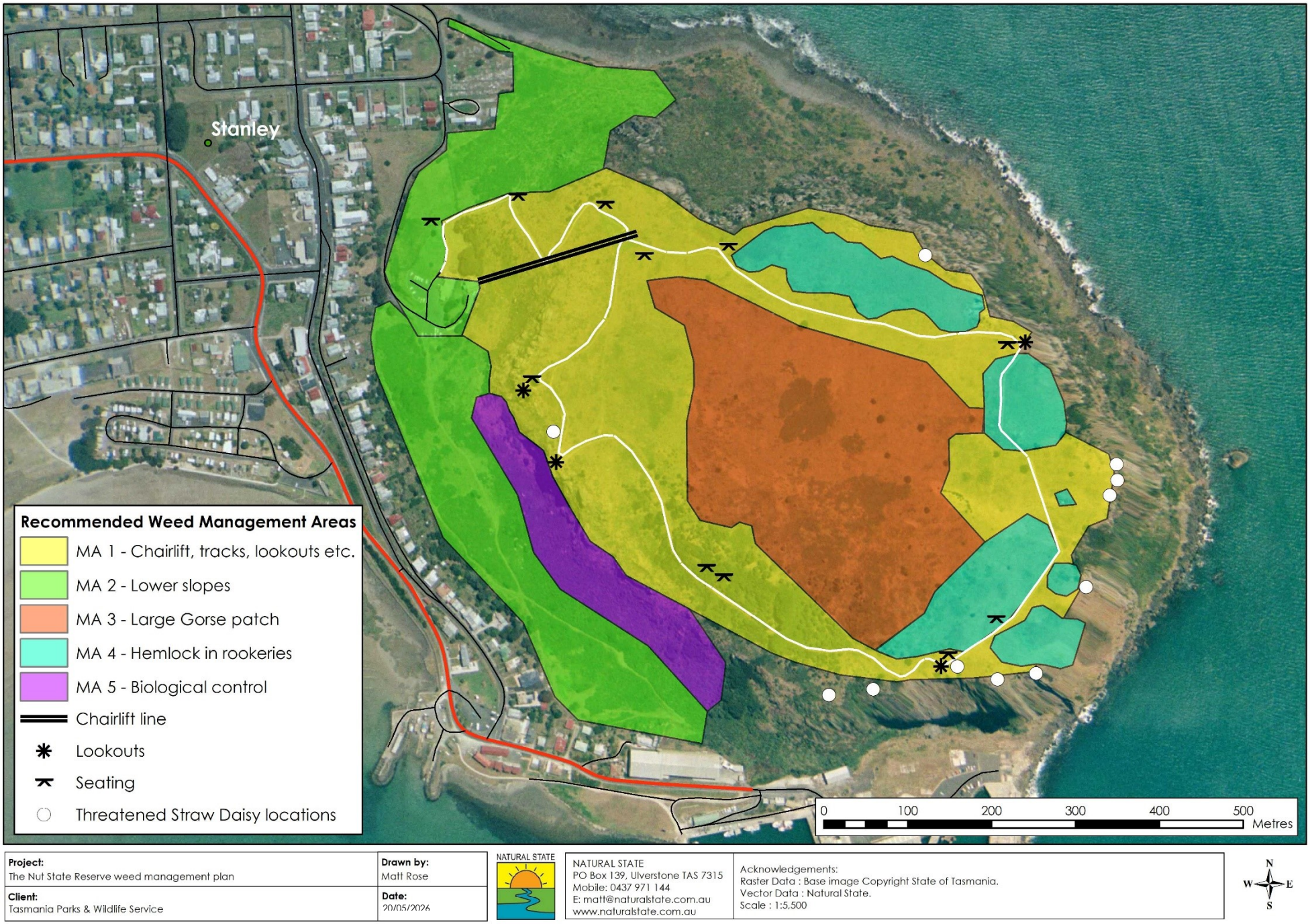


Figure 3: *Recommended weed management areas 2027-2031.*

4.1 Management Area 1 – Chairlift, tracks, lookouts, revegetation areas and straw daisy buffers

Total area : Approximately 20 hectares. **Weed density / cover:** Sparse 6-25% cover. Individual plants are well separated. Other plant species dominate and typically occur between the target species. Small clumps may occur.

Objective : Follow up control to manage ongoing weed regrowth and improve the aesthetics for visitors to the Nut, improve the native vegetation condition, and create a weed buffer zone around each of the endangered Straw Daisy populations.

Method : Spot spraying with UTV, knapsacks & chainsaws. Collect seed and propagate Straw Daisies. **Timing :** The best results have been achieved when actively growing between Spring-Autumn.

Herbicides : Broadleaf selective for woody weeds (Grazon Extra) active ingredient *Triclopyr* and *Picloram*, or (Garlon) active ingredient *Triclopyr* or (Brushoff) active ingredient *Metsulfuron methyl*, with a surfactant and marker dye. For Thistes and Hemlock (MCPA 500) active ingredient *MCPA*, or (Lontrel Advance) active ingredient *Clopyralid*, with a surfactant and marker dye.

Table 2: Recommendations for Management Area 1 over the next 5 years

Year	Description of activities	Contractor costs			PWS staff labour required
		UTV, knapsack, chainsaw	Herbicide	Protect Straw Daisy	
1	**Target Species:** African Boxthorn, Broom, Cape Ivy, Elderberry, Hemlock, Horehound, Gorse, Three Cornered Garlic, and Thistles.	500 Hrs. x $100/hr. = $50,000	$7,500	$5,000	50 days x 1 person
2	**Target Species:** African Boxthorn, Broom, Cape Ivy, Elderberry, Hemlock, Horehound, Gorse, Three Cornered Garlic, and Thistles.	500 Hrs. x $100/hr. = $50,000	$7,500	$5,000	50 days x 1 person
3	**Target Species:** African Boxthorn, Broom, Cape Ivy, Elderberry, Hemlock, Horehound, Gorse, Three Cornered Garlic, and Thistles.	200 Hrs. x $100/hr. = $20,000	$4,000	$0	20 days x 1 person
4	**Target Species:** African Boxthorn, Broom, Cape Ivy, Elderberry, Hemlock, Horehound, Gorse, Three Cornered Garlic, and Thistles.	200 Hrs. x $100/hr. = $20,000	$4,000	$0	20 days x 1 person
5	**Target Species:** African Boxthorn, Broom, Cape Ivy, Elderberry, Hemlock, Horehound, Gorse, Three Cornered Garlic, and Thistles.	150 Hrs. x $100/hr. = $15,000	$3,000	$0	15 days x 1 person
TOTAL		**$155,000**	**$26,000**	**$10,000**	**155 days**

4.2 Management Area 2 – Lower slopes

Total area : Approximately 10 hectares. **Weed density / cover:** Sparse 26-50% cover. Individual plants are clearly separated or rarely touching. Individuals may be moderately clumped. Other plants present or bare ground.

Objective : Follow up control to manage ongoing weed regrowth and improve the aesthetics for visitors to the Nut and the adjoining properties, improve the native vegetation condition, gradually working further up the slope.

Method : Broadacre spraying with a spray unit / UTV & where necessary chainsawing & knapsack spot spraying. **Timing :** Spring-Autumn.

Herbicides : Broadleaf selective for woody weeds (Grazon Extra) active ingredient *Triclopyr* and *Picloram*, or (Garlon) active ingredient *Triclopyr* or (Brushoff) active ingredient *Metsulfuron methyl*, with a surfactant and marker dye. For Thistes and Hemlock (MCPA 500) active ingredient *MCPA*, or (Lontrel Advance) active ingredient *Clopyralid*, with a surfactant and marker dye.

Table 3: Recommendations for Management Area 2 over the next 5 years:

Year	Description of activities	Contractor costs		PWS staff labour required
		Spray unit / UTV, knapsack, chainsaw	Herbicide	
1	**Target Species:** African Boxthorn, Broom, Cape Ivy, Elderberry, Hemlock, Holly, Horehound, Gorse, Periwinkle and Thistles	100 Hrs. x $100/hr. = $10,000	$3,000	10 days x 1 person
2	**Target Species:** African Boxthorn, Broom, Cape Ivy, Elderberry, Hemlock, Holly, Horehound, Gorse, Periwinkle and Thistles	100 Hrs. x $100/hr. = $10,000	$3,000	10 days x 1 person
3	**Target Species:** African Boxthorn, Broom, Cape Ivy, Elderberry, Hemlock, Holly, Horehound, Gorse, Periwinkle and Thistles	70 Hrs. x $100/hr. = $7,000	$3,000	7 days x 1 person
4	**Target Species:** African Boxthorn, Broom, Cape Ivy, Elderberry, Hemlock, Holly, Horehound, Gorse, Periwinkle and Thistles	70 Hrs. x $100/hr. = $7,000	$2,500	7 days x 1 person
5	**Target Species:** African Boxthorn, Broom, Cape Ivy, Elderberry, Hemlock, Holly, Horehound, Gorse, Periwinkle and Thistles	70 Hrs. x $100/hr. = $7,000	$2,500	7 days x 1 person
TOTAL		**$41,000**	**$14,000**	**41 days**

4.3 Management Area 3 – Large Gorse patch

Total area : Approximately 10 hectares. **Weed density / cover:** Very dense >75% cover. Individual plants are touching or overlapping – forming a monoculture with few other species present. Individuals may be very densely clumped.

Objective : follow up control to manage the largest area of mature Gorse on the summit. Reduce the cover & density of this patch and encourage the Common Tussock Grass - *Poa labillardieri* & Coastal Tussock Grass - *Poa poiformis* to colonise the disturbed ground.

Method : Gorse mulching using a Positrak with mulcher attachment and spraying the edges with UTV spray unit. **Timing for control :** All year round.

Herbicides : Broadleaf selective for woody weeds (Grazon Extra) active ingredient *Triclopyr* and *Picloram*, or (Garlon) active ingredient *Triclopyr* or (Brushoff) active ingredient *Metsulfuron methyl*, with a surfactant and marker dye. For Thistes and Hemlock (MCPA 500) active ingredient *MCPA*, or (Lontrel Advance) active ingredient *Clopyralid*, with a surfactant and marker dye.

Table 4: Recommendations for Management Area 3 over the next 5 years:

Year	Description of activities	Contractor costs			PWS staff labour required
		Mulching	Spray unit / UTV	Spray unit Herbicide	
1	**Target species :** Gorse Hemlock & Thistles. Utilise the PWS tractor mulcher & spray unit. Outsource contractor assistance for mulching where required.	80 Hrs. x $220/hr. = $17,600			8 days x 1 person
2	**Target species :** Gorse Hemlock & Thistles. Utilise the PWS tractor mulcher & spray unit. Outsource contractor assistance for aerial spraying.		100 Hrs. x $100/hr. = $10,000	$5,000	10 days x 1 person
3	**Target species :** Gorse Hemlock & Thistles. Utilise the PWS tractor mulcher & spray unit. Outsource contractor assistance for spraying outlier Gorse areas.				
4	**Target species :** Gorse Hemlock & Thistles. Utilise the PWS tractor mulcher & spray unit. Outsource contractor assistance for aerial spraying.	80 Hrs. x $220/hr. = $17,600			8 days x 1 person
5	**Target species :** Gorse Hemlock & Thistles. Utilise the PWS tractor mulcher & spray unit. Outsource contractor assistance for spraying outlier Gorse areas.		100 Hrs. x $100/hr. = $10,000	$5,000	10 days x 1 person
TOTAL		**$35,200**	**$20,000**	**$10,000**	**36 days**

4.4 Management Area 4 – Hemlock in rookeries

Total area : Approximately 5 hectares. **Weed density / cover:** Very dense >75% cover. Individual plants are touching or overlapping – forming a monoculture with few other species present. Individuals may be very densely clumped.

Objective : To prevent further Hemlock spread on The Nut summit, improve the integrity of nearby native vegetation. Encourage the Common Tussock Grass - *Poa labillardieri* & Coastal Tussock Grass - *Poa poiformis* to colonise the disturbed ground in rookeries.

Method : A combination of aerial spraying with a helicopter or possibly a drone & UTV spray unit. **Timing for control :** May – December, when Shearwater's are absent. UTV spraying should be limited to near the walking tracks and follow-up where helicopter / drone spraying was ineffective.

Herbicides : (MCPA 500) active ingredient *MCPA*, or (Lontrel Advance) active ingredient *Clopyralid*, (Brushoff) active ingredient Metsulfuron methyl, with a surfactant and marker dye.

Table 5: Recommendations for Management Area 4 over the next 5 years:

Year	Description of activities	Contractor costs					PWS staff labour required
		Helicopter	Helicopter Herbicide	Spray unit / UTV	Spray unit Herbicide	Revegetation (*Poa* seed & seeding)	
1	**Target species :** Hemlock & Thistles. Revegetate small areas closer to the walking track through seeding with *Poa* spp.	5 Hrs. x $4,000/hr. = $20,000	$5,000	30 Hrs. x $100/hr. = $3,000	$1,000	$5,000	5 days x 1 person
2	**Target species :** Hemlock & Thistles. Revegetate small areas closer to the walking track through seeding with Poa spp.	5 Hrs. x $4,000/hr. = $20,000	$5,000	30 Hrs. x $100/hr. = $3,000	$1,000	$5,000	5 days x 1 person
3	**Target species :** Hemlock & Thistles. Revegetate small areas closer to the walking track through seeding with Poa spp.	5 Hrs. x $4,000/hr. = $20,000	$5,000	30 Hrs. x $100/hr. = $3,000	$1,000	$5,000	5 days x 1 person
4	**Target species :** Hemlock & Thistles. Revegetate small areas closer to the walking track through seeding with Poa spp.	5 Hrs. x $4,000/hr. = $20,000	$5,000	30 Hrs. x $100/hr. = $3,000	$1,000	$5,000	5 days x 1 person
5	**Target species :** Hemlock & Thistles. Revegetate small areas closer to the walking track through seeding with Poa spp.	5 Hrs. x $4,000/hr. = $20,000	$5,000	30 Hrs. x $100/hr. = $3,000	$1,000	$5,000	5 days x 1 person
TOTAL		**$100,000**	**$25,000**	**$15,000**	**$5,000**	**$25,000**	**25 days**

Please note : The most cost effective option for aerial spraying is likely to be a helicopter using a Controlled Droplet Applicator. The Hemlock will germinate again in the bare ground until adequate *Poa* spp. grass competition can be established over time.

4.5 Management Area 5 – Biological control area, upper slopes

Total area : Approximately 2.5 hectares. **Weed density / cover:** Very dense >75% cover. Individual plants are touching or overlapping – forming a monoculture with few other species present. Individuals may be very densely clumped.

Objective : To build up a local source population of Gorse biological control agents. With further intervention it is hoped that this biological control agent breeding area will expand and reduce the Gorse biomass on the upper slopes of The Nut.

Method : Source and release more infected Gorse material with Gorse Spider Mite – *Tetranychus lintearius*. Research options to source and release samples of Gorse Seed Weevil – *Exapion ulicis*, Gorse Soft-shoot Moth - *Agonopterix umbellana* and Cape Broom Psyllid - *Artinnis hakani* also.

Timing for release : Spring and Summer.

Table 6: Recommendations for Management Area 5 over the next 5 years:

Year	Description of activities	PWS staff labour required
1	**Target species :** Gorse. Release biological control agent infected material amongst the Gorse on the upper slopes annually.	1 day x 1 person
2	**Target species :** Gorse. Release biological control agent infected material amongst the Gorse on the upper slopes annually.	0.5 day x 1 person
3	**Target species :** Gorse. Release biological control agent infected material amongst the Gorse on the upper slopes annually.	0.5 day x 1 person
4	**Target species :** Gorse. Release biological control agent infected material amongst the Gorse on the upper slopes annually.	0.5 day x 1 person
5	**Target species :** Gorse. Release biological control agent infected material amongst the Gorse on the upper slopes annually.	0.5 day x 1 person
TOTAL		**3 days**

Please note : No herbicides are to be used in this area. There are small isolated patches of Gorse Spider Mite infected Gorse bushes already located in this area. Realistically it is unlikely that this area will be able to be treated over the next 5 years using chemical or mechanical means.

4.6 Summary of estimated costs for weed management works 2027-2031

Table 7: Summary of estimated costs for weed management works 2027-2031

Description	Year 1	Year 2	Year 3	Year 4	Year 5	TOTAL
Management Area 1	$62,500	$62,500	$24,000	$24,000	$18,000	**$191,000**
Management Area 2	$13,000	$13,000	$10,000	$9,500	$9,500	**$55,000**
Management Area 3	$17,600	$15,000	$0	$17,600	$15,000	**$65,200**
Management Area 4	$34,000	$34,000	$34,000	$34,000	$34,000	**$170,000**
Management Area 5	$0	$0	$0	$0	$0	**$0**
TOTAL	**$127,100**	**$124,500**	**$68,000**	**$85,100**	**$76,500**	**$481,200**

4.7 Budget explanation

Ideally the more that the PWS staff can implement during the 2027-2031 period, the lower the required budget for engaging contractor labour. The estimated costs assume that no PWS labour will be allocated for weed control. Contractor labour will be required to reach the best possible outcome over the next 5 years.

Some of the contractor labour requires specialised machinery, such as the Positrak with mulcher attachment, and the Drone / Helicopter with controlled droplet applicator. This equipment adds substantial value to the project through efficiency and productivity gains which can not be matched with the existing PWS equipment.

The bush regeneration work on the summit is a specialised field of ecological restoration with limited practitioners available in Tasmania. This project utilises experienced and skilled contractors in their chosen professional disciplines who have, over previous years, given discounted rates to assist PWS to achieve successful results. This commitment and added value, although difficult to quantify, should not be underestimated.



Photo 14: *Clearing mature Gorse bushes by chainsawing. Facing SE, M.Rose, 28/01/16.*

5. Track access for machinery - UTV, tractor & Positrak

The new access track from the carpark to the zig zag track was built without confirming if the UTV can fit through or around the track. We now can not safely access the area between the carpark and the sandstone obelisk with the UTV for weed management purposes. This could have been avoided by consulting us prior and simply moving the track alignment a couple of meters. The rocks near the chairlift sign need to be shifted to allow the UTV to safely fit through the tight gap.

There are currently proposals for the construction of stairs next to the Zig Zag track up to the summit. This is not a feasible option as it will prevent machinery from being able to traverse up and down the Nut. Blocking the machinery access for land management activities would effectively stop all weed and fire management programs up there unless carried out by helicopter. Any earthworks for new tracks should also factor in erosion control measures.





Photo 15: *The tight UTV access near the new track works.* ***Photo 16:*** *The space needed for the UTV to traverse the Zig Zag track. Facing West, M.Rose, 10/12/25.*

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