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## **A PROTOCOL FOR THE REHABILITATION OF NATURAL ALPINE ENVIRONMENTS FOLLOWING SKI AREA DEVELOPMENT**

**Between**

**DEPARTMENT OF CONSERVATION and NZSKI LTD.**

### **1. Introduction**

The protocol sets out practical means of achieving a high standard of environmental rehabilitation during and following development works at either Coronet Peak or The Remarkables Ski Areas. NZSki will require its staff and contractors to act in accordance with the protocol.

The scope includes any work that results in any environmental disturbance including (not limited to) the indigenous vegetation, native fauna, soil, wetlands, streams, lakes and natural landforms of the ski area. Works may only be exempted from the protocol with prior agreement from DOC.

DOC staff will conduct regular monitoring to observe progress and assess effectiveness of the measures. This will include providing advice, troubleshooting unexpected problems, adjusting management approaches and, if necessary, require corrective action to ensure the objectives of the protocol are met.

### **2. Objectives of the protocol**

To ensure that during the course of ski area developments there is a minimum of interference with the natural environment, and avoidance of disturbance to areas outside approved work areas;

To ensure that any indigenous vegetation disturbed by development is restored as near as possible to its original density and diversity, within the shortest practical timeframe;

To minimise the erosion and sedimentation of exposed soils (and soil among transplanted vegetation), optimising the longer term regeneration of indigenous vegetation through natural dispersal;

To otherwise replicate a high standard of natural appearance to any ground not occupied by permanent structures or required to regularly bear mechanised traffic; and

To establish a clear understanding between the staff and contractors of both the Department of Conservation (DOC) and NZSki on the required standards for:

- Work site control measures;
- Removal and replacement of vegetation and top soil;
- Management of soil erosion and sediment control;
- Ongoing monitoring and maintenance of rehabilitated areas;
- Contracted monitoring; and
- DOC's ability to suspend works.

### **3. Work Site control measures:**

- a. Only machinery operators with a demonstrated ability in low impact earthworks and vegetation rehabilitation in an alpine setting are to undertake construction;
- b. Prior to works NZSki shall ensure that a briefing occurs between its staff, contractors and DOC to ensure a common understanding of how works will be conducted;
- c. NZSki must minimise disturbing non target areas when accessing and working within development sites. If machinery is required to move off existing tracks the least damaging route must be used and any disturbed vegetation must be rehabilitated when works are completed;
- d. The risk of soil erosion over denuded areas must be carefully managed until rehabilitation works are undertaken and soil is no longer exposed;
- e. Works must be conducted to ensure no contaminants are discharged onto the land or into watercourses (directly or indirectly). All vehicles, machinery, equipment and aggregate material must be cleaned of weeds, seeds and soils before entering the works area. Refuelling must be undertaken on hard surfaces away from watercourses and vegetation.
- f. Sensitive natural features including streams, wetlands, tarns, lakes and rare habitats are not to be disturbed, either for development works or access to development sites. Where disturbance is unavoidable prior approval must be sought and additional environmental protection measures may be required;
- g. All development and rehabilitation works impacting the natural environment must be completed by the 1<sup>st</sup> May. Any unfinished work must be stabilised to prevent soil erosion until works can recommence.

### **4. Removal and replacement of vegetation and top soil:**

- a. Vegetation must be carefully removed in a manner to minimise damage to both the above ground plant and to protect as much soil material around the roots as possible;
- b. The remaining topsoil must also be removed before excavation of rock material may commence. If not used quickly with the replanting of vegetation this topsoil may be stockpiled for later use;
- c. All vegetation removed should be quickly replanted into areas where works have already been completed. This will usually occur through progressive reinstatement on completed formations behind the main work "face";
- d. Priority for replanting shall be given to areas prone to erosion;
- e. Individual plants or clumps of vegetated material ("sod") shall be reinstated by careful use of a digger bucket. Spacing should be no greater than 1 metre, unless directed otherwise by DOC.
- f. Final positioning of transplanted vegetation and sods should be conducted by hand tools, with top soil packed around each plant or sod to maximise survivorship and to achieve a result that closely resembles the surrounding natural areas;
- g. When transplanted plants and sods are insufficient to cover the disturbed area additional vegetation may be sourced through splitting indigenous vegetation from adjacent areas. This should only be done where there is sufficient plant and humic material to allow survival of both 'parent' and 'split' plants.
- h. Nursery reared plants (usually tussocks) may also be used to supplement transplanted vegetation and sods. Only locally sourced seeds may be used to grow plants for the ski area. Nursery reared plants are susceptible to rapid die off and browsing and must be handled carefully as follows:

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- Fertiliser is to be placed in the root well prior to planting;
  - Plants must be well bedded to lessen risk of uprooting by feral animals; and
  - Plants may be treated with suitable chemicals to deter browsing by feral animals.
- i. Locally sourced seed of appropriate species may be broadcast to promote vegetation growth between transplanted vegetation and sods. Exotic seeds may be spread only with prior approval;
- j. Special care must be taken when replanting on steep slopes between 30 and 45 degrees:
- Plants should be transplanted quickly, steep slopes require plants to be in the healthiest possible condition;
  - Indented troughs or depressions should be formed to create “bedding” for the tussocks or sods to be transplanted. Replanting should not occur on sheer surfaces;
  - Replanting should be as close together as practical, leaving little exposed ground;
  - Large heavy plants and sods should be staked for support where possible;
  - Steep slopes should be closely monitored and any plants or sods released from the slope quickly retrieved, split into smaller, lighter clumps and replanted back into the slope as described above;
  - Consideration should be provided to planting small nursery reared plants where possible;
  - Attempts at replanting vegetation on slopes steeper than 45 degrees should only proceed with prior approval;
- k. The vegetation removed at one site may be used at another development site within the ski area only with prior approval;
- l. If no areas are available for a quick reinstatement, vegetation may be temporarily stored in designated areas with prior agreement:
- All handling of vegetation for longer term storage must be done with great care to minimise cumulative damage to plants;
  - Vegetation may only be stockpiled up to one metre high to avoid die off resulting from smothering and crushing; and
  - All vegetation temporarily stored must be watered when protracted dry conditions may impact on survivorship.
- m. If NZSki expects to have a surplus of vegetation and/or topsoil at the end of works, this must be replanted /spread over other areas of rehabilitation, under direction from DOC.
- n. Any surplus rock material must not be stockpiled and/or spread over nearby terrain without prior approval.
- o. NZSki will actively eradicate any noxious weeds from all development and rehabilitation areas; and
- p. No rock landscaping may be used as a substitute for vegetation unless by prior agreement.

## **5. Management of soil erosion and sediment control**

- a. The surface of vehicle tracks, formed ski trails and any other disturbed ground without a cover of indigenous vegetation will be managed to improve water infiltration, minimise rilling and sheet erosion, reduce suspension of sediment and provide micro sites for wind borne seed to settle. Control measures include;

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- shaping / crowning the surface;
  - applying an appropriate gravel surface in problem areas;
  - forming of earth, rock or vegetation bunds;
  - Ripping or roughening soils perpendicular to the slope angle; and
  - Constructing water tables/swale drains to intercept and divert surface flows.
- b. Where the slope angle exceeds 30 degrees natural features such as rocks could be incorporated into the slope where this lends to the stability of the site; this would require prior approval from DOC and potentially the support of geotechnical experts. This solution would be considered on a site by site basis.
- c. Water tables/swales must have a catchment area no greater than 2,000m<sup>2</sup>. Ski trails must have functioning swales no less than 60m apart. All water tables/swales must be clear of sediment and able to convey water.
- d. Water tables and swales must lead to an appropriately designed and armoured settlement pond to capture sediment so only clear water disperses into the surrounding landscape.
- These ponds must be large enough to ‘settle’ the flow and allow sediment to be deposited, particularly from heavy rainfall events. Precise dimensions will depend on the area and erosion potential of catchment above, however, these may be graduated areas 1m wide x 2m long x 1m deep. They should be armoured with rocks or surrounded by soil mounds and tussocks or geotextile materials.
  - Sediment captured by settlement ponds are to be redistributed to assist re-vegetation of disturbed areas, whether previous or planned earthworks e.g. used to fill gaps between transplanted tussocks or to improve the mineral soil content when planting nursery tussocks.
  - Settlement ponds must be maintained such that they provide a means of monitoring the effectiveness of control measures thereby assist adjusting management approaches to reduce the potential for recurrent erosion.
- e. To protect wetlands and wetland vegetation from sediment no surface water carrying sediment must be allowed to run into wetland areas. Settlement ponds must not exit onto wetland areas. Water tables and swales must be designed to maintain the hydrological integrity of adjacent seepages and wetlands.
- f. Areas requiring erosion control measures are to be prioritised based on the following criteria:
- Vulnerability to erosion (e.g. slopes > 20 degrees, unconsolidated soils, disturbed ground adjacent to compacted soils)
  - Saturated soils on cut faces where seepages have been intercepted,
  - Remediation of slips or slumped land and stabilisation of land to prevent further or repeated slope failures.
  - Settlement areas that require armouring or treatment in order to filter water,
  - Stabilisation works required to facilitate revegetation.
- g. Areas identified for erosion control and soil conservation work may vary from year to year as revegetation occurs and slope and soil stability is achieved. Areas prioritised for erosion control in the 2015 – 2016 works programme are outlined in **Attachment A** below.

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- h. Significant developments will have a soil conservation and erosion control plan in place prior to the commencement of works. This plan will demonstrate how the objectives of this protocol will be achieved.

**6. Ongoing monitoring and maintenance of the rehabilitated area**

- a. The purpose of the monitoring is to assess the progress of rehabilitation and advise NZSki how to prevent or minimise risks to re-growth becoming self sustaining;
- b. All development and rehabilitation works will be monitored at least once prior to the commencement of work and again at completion of works. Interim monitoring may be required, depending on the nature of work. Following completion, regular monitoring will continue until DOC resolves, at its sole discretion, that the rehabilitation of the natural environment can progress unaided;
- c. Additional monitoring of erosion and sediment control measures will be made during or following significant periods of rainfall.
- d. Where monitoring establishes significant risks to rehabilitation, DOC will require NZSki to take any reasonable steps to rectify the situation and return the area to its desired condition. Any additional work required will be carried out at the cost of NZSki;
- e. In the event that an area is not rehabilitated following works, monitoring will continue until rehabilitation works have begun. Attention will be paid to preventing erosion during any lay period;
- f. DOC should reserve the right to recover the actual and reasonable costs of monitoring work.

**7. Contracted monitoring:**

DOC may contract monitoring to an external person/s. This approach not only provides time savings, but can also source specialist expertise on how to rehabilitate the sensitive alpine vegetation. This expertise is also vital to advise on appropriate remedial actions for any issues, and to provide expert input to planning processes. Contracted monitoring will take place as follows;

- a. The contractor is generally tasked to monitor the implementation of this protocol during any ski area development work that disturbs the natural environment;
- b. The monitor is to resolve any concerns of a routine nature directly with NZSki. Issues should be referred to DOC when problems are recurrent, significant in scale, unconventional or if a mutual agreement cannot be reached;
- c. To advise both DOC and NZSki whenever their action (or inaction) may present a problem for ski area environment, whether related to a specific development or any other activity;
- d. The monitor is to immediately advise DOC and NZSki if unauthorised works may be occurring, of significant risks to the natural environment that warrant suspension of works, and of any concerns with geotechnical hazards and/or public safety;
- e. Monitoring visits are to be scheduled in consultation with NZSki and DOC at a frequency of no more than once a week and no less than three times a summer (depending on nature of works over summer);
- f. If agreement on scheduling cannot be reached, DOC will make a final decision and notify NZSki of when monitoring is to occur;
- g. A brief written report of each monitoring visit is to be forwarded to DoC and NZSki in a timely manner. Reports should take a broad approach to assess overall performance, record agreements reached on site and highlight unresolved issues. Reports should take advantage of photo monitoring where possible;

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- h. The time required for visits (and reports) are to be appropriate to the works in progress. The monitor is to notify and seek agreement from NZSki on where the combined time required for site visits and reporting is likely to exceed 5 hours;
- i. Support tasks supplementary to monitoring and reporting (eg research and meetings) are to be agreed with DOC and NZSki prior work occurring;
- j. The time spent on monitoring visits, reporting and support work will be billed directly to NZSki at a rate equivalent to DOC's current hourly rate for field staff, plus gst. Disbursements are to be billed separately.
- k. All monitoring reports and discussions between the contractor, NZSki and DOC will be kept confidential.

**8. Right to suspend works**

- a. DOC will, at its sole discretion, suspend any development work or activity should contracted monitoring, public feedback or DOCs own observations determine there are unexpected and/or significant impacts on the natural environment that are not being adequately rehabilitated.
- b. Any suspension shall remain in place until a response plan is agreed with NZSki.