BRACKENRIDGE ESTATE

REHABILITATION PROPOSAL FOR BLOCK 5

Report: # 1

Period: 1 September 2024 to 31 August 2026

Date: 31 August 2024

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The aim of this report is to document the deliverables agreed upon between the Homeowners Association (HOA), the Environmental Management Committee (EMC) and the newly appointed Environmental Control Officer (ECO) to ensure the proper management of Brackenridge.

The area in question is vegetation block 5 which underwent a prescribed burn on the 15th July 2024. The purpose of this particular report regards the rehabilitation measures that will now be taken to rehabilitate the Garden Route Shale Fynbos in this area.

The following report will highlight the results of the prescribed burn, the current situation regarding the pipeline that has been laid for the new reservoir, how this has since altered the burn site, and the new measures that will be implemented to rehabilitate the area.

Rehabilitation of this area will be a long-term project . If you have any questions, please feel free to contact either the ECO Kellyn or Brackenridge management.

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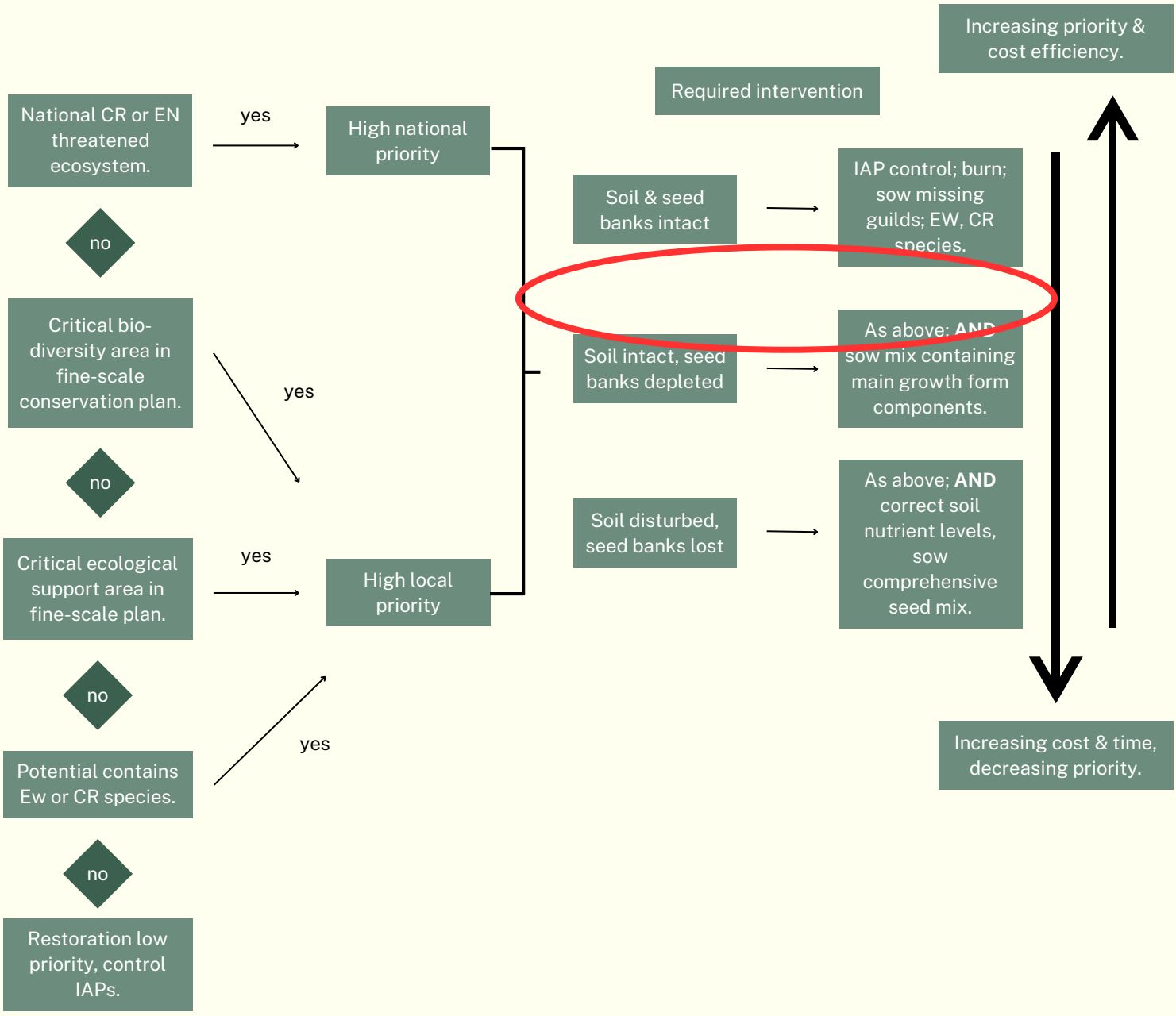
Below a decision support tool taken from the Guidelines for Restoring Lowland Sand Fynbos Ecosystems by P.M. Holmes et al, 2022. The area circles is where the estate stood before the prescribed burn.



CR = critically endangered
EN = endangered
EW = extinct in the wild
IAP = invasive alien plant

The prescribed burn for block 5 was conducted on the 15th July at approximately 15:00 and completed at 18:30 after which a mop-up crew oversaw the area for 24 hours to prevent any flare ups.

Block 5 was inspected the following day and the fire had burnt the majority of the block with only a few areas that did not take to the fire. The block was cleaned up and stacks burns were done in the areas that needed a second burn. There was evidence of a successful burn, ecologically, with protea seeds scattered around the area from burst open cones.

All-in-all the prescribed burn was a success and the next steps to be taking for block 5 was to till the hard soil to loosen it, remove the large amount of sour fig and potentially sow some seed balls. The tilling of the soil and sowing of seed balls was postponed until after the gravity feed pipeline for the reservoir had been laid and the area was clear of heavy machinery and construction personnel.

Brackenridge Estate's management team are mid-way through a water project which is currently laying new pipeline to link the newly built reservoir in block 5 to the connection points for the water pump stations. One of the new pipelines needing to be installed runs through the middle of block 5.

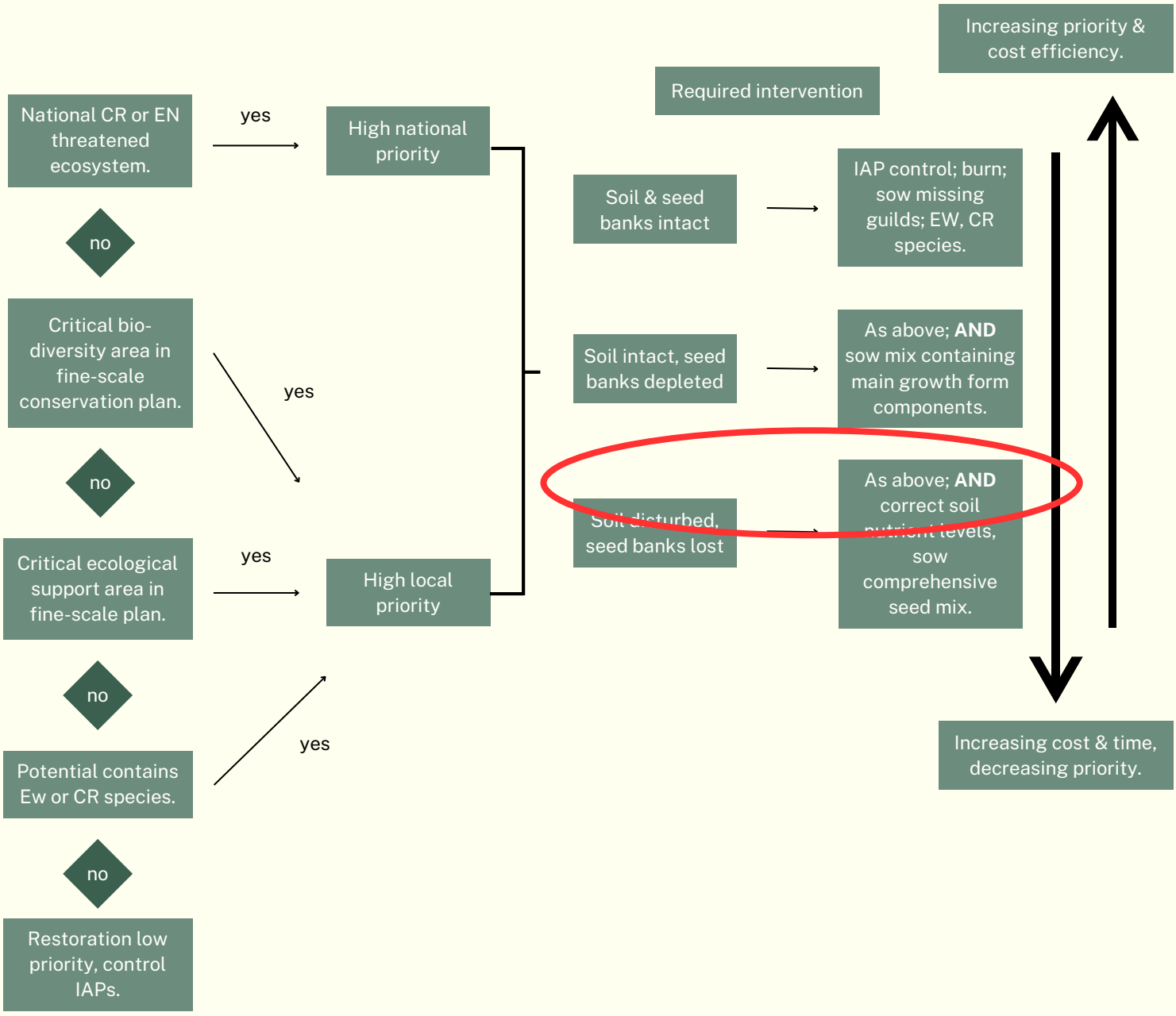
The General Manager and Chairman of the Environmental Management Committee walked block 5 with the company installing the pipeline to mark out the path where the pipeline should be placed. The company informed the management team that they would adhere to this path and minimise their impact to the surrounding recently burnt Fynbos.

The trench to be dug for the pipeline was to be three meters deep with one section requiring a depth of seven meters. The trench would be five meters wide to accommodate the digger, an extra three meters on either side of the trench would be used to place the topsoil and clay. When filling in the trench the company would first fill with the clay and then the topsoil to allow for planting.

Unfortunately, due to unforeseen circumstances, the overall amount of clay that needed to be removed while digging the trench exceeded the amount initially believed. This resulted in larger areas of block 5 needing to be accessed by heavy machinery which has caused unforeseen disturbance to the soil, likely removing much needed nutrients for the soil and potentially caused damage and loss of important seed banks.

Based on the new developments for block 5, more extensive, hands-on rehabilitation will be required to rehabilitate the area back to pristine Garden Route Shale Fynbos.

The area circled is where the estate now stands <u>after</u> the prescribed burn.



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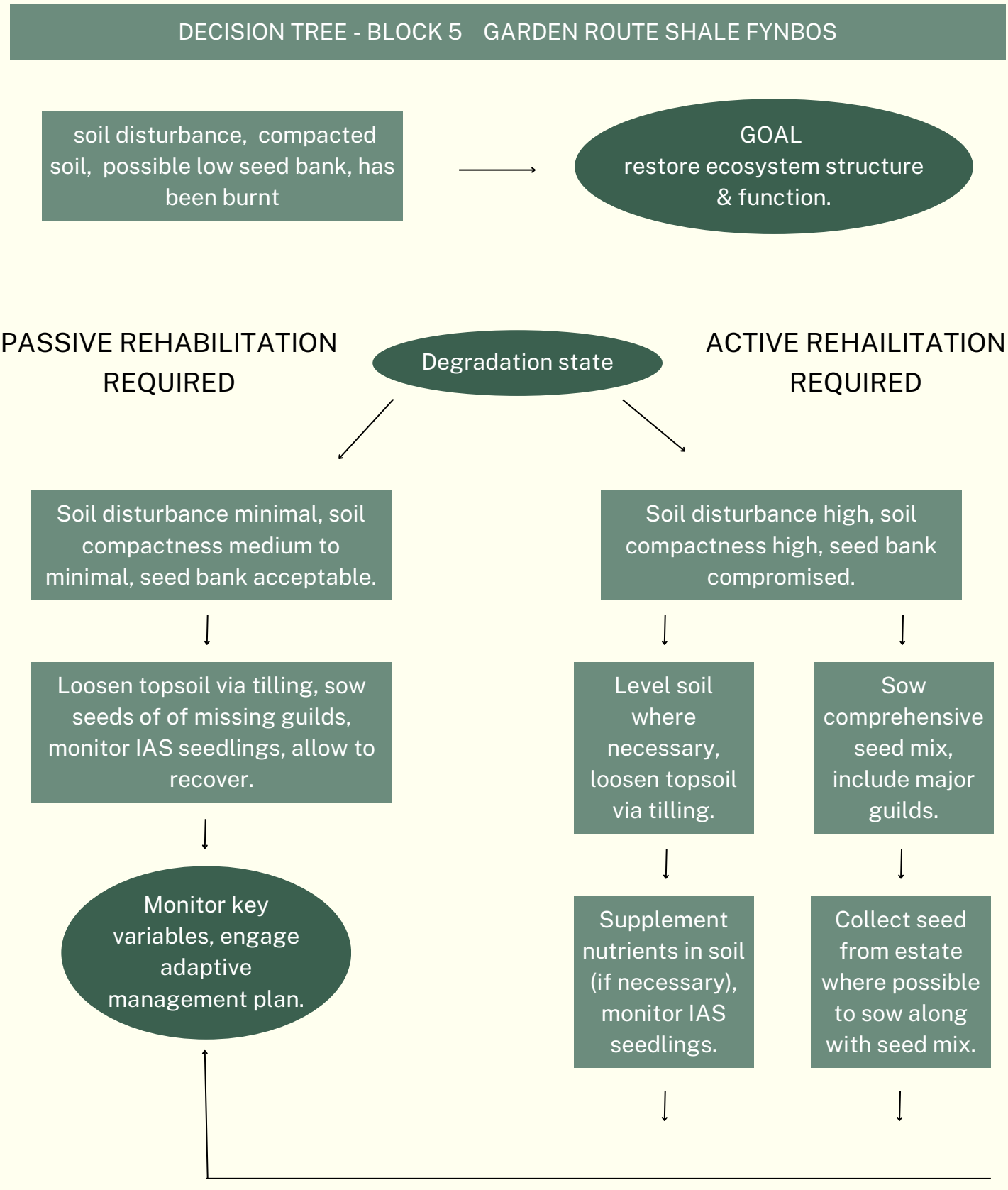
The following proposed outline for the rehabilitation of block 5 takes advising on Fynbos rehabilitation from Guidelines for Restoring Lowland Sand Fynbos Ecosystems by P.M. Holmes et al, 2022.



Once the pipeline laying has been completed and all construction personnel have finished work in bock 5, it will be thoroughly assessed and based on the findings the decision will be made whether passive or active rehabilitation is required. In both situations, the ECO will work with the Home from Home gardening team, Ricky's team, the EMC and management to accomplish the set goals.

Passive rehabilitation

Tilling of topsoil layer - depending on the depth of the compacted soil, a rotavator will be hired to till the soil and loosen it in preparation for sowing of seeds.

Seed sowing - ideally, the seeds to be sowed must come from the area and can be purchased if the source of the seeds is known. It must be noted that certain species require sowing at different times of the year and thus, not all seeds will be sown at once. The process will have to be done over a period of time.

Featherbed Co. in Knysna has been involved in seed ball planting and the ECO will visit them on site to discuss acquiring seed balls from them.

Given that the seed bank has been deemed to be efficient, only seeds of missing major guilds, that were not documented during the pre-burn plant survey, will be sown i.e. Proteaceae, and Restionaceae. One species of Ericaceae was documented however it will be beneficial to sow seeds of other species that occur in the area. Some geophytes were also documented, more may germinate now that the block has been burnt. It may be best to see what sprouts before sowing bulbs.

IAS monitoring - continued monitoring of block 5 will be needed to keep on top of invasive alien species. There were IAS found on site during the pre-burn plant survey so there will be a seed bank that developed over the 40+ years since the latest burn.

Active rehabilitation

Tilling of topsoil layer - due to the use of heavy machinery during the pipeline installation, i.e. excavators and digger loaders, the soil will likely be compacted deeper than a rotavator will be able to manage. A tractor and drill will be required to loosen the soil in preparation for seed sowing.

Soil nutrient supplements - once the soil has been loosened, the quality will be assessed to see if nutrient supplements will be needed before sowing seed. If so, acid compost or well-composted pine bark are best. Avoid fertilizers, compost and bonemeal. The pH of soil in the Fynbos usually ranges from four to seven (acidic to neutral).

Seed collection - ideally it is best to collect seed from Fynbos in the area and the 'Millennium Seed Bank' protocols should be adhered too to avoid over-harvesting (collect <20% of seed/plant). Seed collection will need to be done across all seasons.

The seeds should be collected when ripe , i.e. they are starting to drop, and this is generally one month after flower for annuals and two to three months for perennials. The seeds should then be dried and treated against pests before they are stored in a cool, dry room in paper or canvas bags. Collect from as many individuals as possible for genetic diversity.

Rootstock should ideally be collected after flowering season in Spring and Autumn. Cuttings from resprouting species root better if it is harvested as heel cuttings from young shoots after fires. These are shoots that grow directly from the rootstock and are gently removed along with some of the bark tissue.

Seed sowing - the process will be the same as that mentioned above under 'passive rehabilitation' with the added step of seed treatment prior to sowing for the seeds collected in the field. Depending on the species, some seeds will require either a heat or smoke treatment before they can be planted.

Active rehabilitation

IAS monitoring - the process will be the same as mentioned above under 'passive rehabilitation'.

Management plan - management for the Fynbos will fall into the 'Integrated Fire and Invasive Alien Management Plan' that is currently being complied.

Homeowner participation - the homeowners will be invited by the ECO and EMC to get involved in the rehabilitation of block 5, particularly along the perimeter of block 5. This voluntary homeowner initiative will be restricted to a 15 m wide strip adjoining the fire break along the property boundary.

The ECO will prepare a manual detailing the quantities and selection of permitted plant species as well as adequate planting methods to be followed. Homeowners can then choose the plants they wish to plant in the demarcated area adjoining their property.

Things to consider:

If there is an approved, future development located near Brackenridge Estate, permission could be given by the landowner for the ECO to collect propagation material and possibly collect topsoil containing an intact seed bank. It must first be confirmed that the area contains the same habitat type as Brackenridge. If topsoil is available for collection it should be done in Summer when the soil is dry and the 15 cm of soil collected and placed in the are to be rehabilitated immediately. Do not stockpile the soil as that can lead to seed death.

Table 1: Recommended species list for major Fynbos guilds, i.e. Proteaceae, Ericaceae and Restionaceae.

Species	Family	Comments
Erica copiosa	Ericaceae	Fynbos endemic
Erica densifolia	Ericaceae	Fynbos endemic
Erica discolor var discolor	Ericaceae	Fynbos endemic
Erica discolor var speciosa	Ericaceae	Fynbos endemic
Erica formosa	Ericaceae	Local endemic
Erica seriphifolia	Ericaceae	Fynbos endemic
Erica sessiliflora	Ericaceae	Fynbos endemic
Erica sparsa	Ericaceae	Fynbos endemic
Erica uberifolia	Ericaceae	Fynbos endemic
Leucadendron eucalyptifolia	Proteaceae	Fynbos endemic
Leucadendron salignum	Proteaceae	SA endemic
Leucospermum cordifolium	Proteaceae	Fynbos endemic
Leucospermum cuneiforme	Proteaceae	Fynbos endemic
Protea cynaroides	Proteaceae	Fynbos endemic

Species	Family	Comments
Protea exima	Proteaceae	Fynbos endemic
Protea mundii	Proteaceae	Fynbos endemic
Protea neriifolia	Proteaceae	Fynbos endemic
Elegia capensis	Restionaceae	Fynbos endemic
Elegia tectorum	Restionaceae	SA endemic

Table 2: Estimated budget for rehabilitation project.

Table 3: Estimated timeline for rehabilitation project.