

JOAN BRADLEY

BUSH REGENERATION

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Cover: Kangaroo Grass (Themeda australis)

Drawn by Betty Maloney

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BUSH REGENERATION

The Practical Way to Eliminate Exotic Plants from Natural Reserves

The method described is the product of seven years' observation and experience. It consists of weeding only, without re-planting. Its essence is that areas to be weeded are selected, and their sizes graduated, in such a way that each is promptly re-colonised, and quickly stabilised, by the spontaneous regeneration of native plants.

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In natural areas, success in weed control means the regeneration of weed-free stable bush, which needs brief attention only once or twice a year, mainly in vulnerable spots such as creek banks and the edges of roads and clearings. By this standard, all the crash weed-control programmes which my sister and I have seen are dismal failures.

Since 1964, over and over again in the bush reserves round Sydney, we have seen heavy but quite stable blocks of mature perennial weeds cleared, and either carted away or burnt on the Sometimes the clearings were planted out with native spot. trees and shrubs, sometimes they were not. The result of all this labour was either regrowth of the same weeds, or more usually the appearance of a bewildering variety of quick-growing, quick-seeding weeds which have proved infinitely harder to control than those which were removed. Only continuous cultivation has kept alive such of the plantations as have survived, and most of the enthusiastic amateurs who started the clearing have lost heart and given up. Cultivation is needed in all but a few miserably small areas, and indeed in many places weeds have spread into what was previously quite good bush. Meanwhile, other bush which in 1964 contained only scattered weeds has been neglected, and parts of it have seriously deteriorated.

These well-meaning efforts were failures, but there was a lesson to be learned from them. In areas alongside good bush, where weeds had not been impossibly thick, the natives responded magnificently. Weed control in natural areas was shown to be a much easier task than it seemed. Bush regeneration fails if you treat the task like gardening. Gardeners expect to keep cultivating, and don't expect roses and pansies to spring up of their own accord. If you use the naturalist's approach, and help the bush to help itself, you can expect the native plants to do just this.

In Weeds and Their Control (1967), we made general recommendations based on a fairly detailed analysis of the weed problem in Ashton Park, a small bush reserve in a Sydney suburb. We think that since then we have more than proved the practical value of our suggestions. We are regenerating bush with conspicuous success over a total area of about 40 acres, and our results are plain to see, both in Ashton Park and on nearby Chowder Head. We have also taken care of the weeds induced by a 6-acre "silvicultural" winter burn, and about 4 or 5 acres of other fires. We have not over-worked at it. We are both over fifty, able bodied but by no means Amazonian. My sister takes the dog for a walk on most mornings, and I do the same in the afternoons. On these walks we might average, between the two of us, about three-quarters of an hour spent actually pulling up weeds.

Done in our way, the regeneration of weed-infested bushland is an easy and fascinating part-time occupation. We are still forging ahead, my sister mainly on a dry ridge, myself mainly in a damp gully, faster than we should have thought possible when we wrote <u>Weeds and Their Control</u>. We hope that this outline of our methods will encourage and help you to do the same.

PRELIMINARIES

First of all, you will need official permission to carry out the work, and also, unless you are very knowledgeable, a permit to take plant specimens for identification. Some weeds look very natural in the bush, and some natives look oddly out of place. We collect a small piece of every plant species we find in our working areas, and have it identified at the National Herbarium, Royal Botanic Gardens, Sydney. We dry all specimens, and keep them for reference.

It is essential to make sure that you don't pull up any natives, or preserve any weeds, but for practical purposes it is not necessary to learn the names of hundreds of different natives. All you need is to be sure of the weeds. Most of them don't invade the bush, but are found in badly disturbed and neglected places on the outer margins, where people dump garden rubbish. Away from such areas, you will mostly be pulling up only a dozen or so different species, and we can assure you that in time you'll recognize them when they have no more than two leaves.

We are working to preserve natural bush, which to our minds needs no "improvement". We regard all local natives as good, and all exotics - whether from overseas or from other parts of Australia - as weeds in the natural areas. In spite of flower-pickers, plant thieves, and invading exotics, Ashton Park's sixty-odd acres of bush still contain over 250 local natives species of vascular plants. They have been getting along together since the last ice age, and time and natural selection have kept them in balance. So we make no attempt to control native parasites, or prevent rampant native creepers from bringing down shrubs or old trees. They are all part of the ecology, and will give way to other plants when their time comes.

If the area to be weeded is large, you will also need labour. Keep the accent on quality rather than quanitity. One lone person working intelligently will achieve far more than half-a-dozen thundering about "scrub-bashing". If you are employing paid labour, choose people without preconceived ideas, and give them full supervision until they are trained. It is very hard indeed to convince a dyed-in-the-wool municipal gardener that <u>leaving</u> weeds will grow bush faster. Volunteers already interested in the bush take to the work like ducks to water, and need only to be told which plants are weeds and where to stop.

Work from Good Areas Towards Bad Ones

The essence of our method is that native plants have an unexpected power to re-colonise ground which exotic plants have taken from them. Given a proper chance, they will take back the space which weeding makes available to them. They can't do this if you work from bad areas towards good ones.

Where exotics meet natives, there are opposing pressures, and the natives give way to the stronger plants from alien environments. The balance is in favour of the weeds, but only slightly. Starting by clearing the worst areas is worse than inefficient, it is actively harmful. Weeds are given ideal conditions when bare, disturbed soil is suddenly exposed to full daylight. The balance is tipped to favour the weeds, and such areas are far harder to regenerate than those which are left undisturbed.

Working a little at a time from the bush towards the weeds takes off the pressure under favourable conditions. Native seeds and spores are ready in the ground, and the natural environment favours the plants which evolved in it. The balance is tipped towards regeneration. Keep it tipped that way, by always working where the strongest bush meets the weakest weeds.

Keep the Soil Deeply Mulched

In undisturbed bush, the soil is covered with a litter of petals, leaves, twigs, branches and fallen logs in all stages of decay. This natural mulch is full of organisms, some of which are essential to the growth of native plants. It holds moisture, prevents erosion, and keeps the soil from sudden changes in temperature. As it decays, it returns plant foods to the soil. The natives love it, and very few weed seedlings come up through it.

Disturbed soil favours weeds against natives. Weeding, however carefully done, leaves gaps and disturbs some soil. Replace all the natural ground litter that you can, and where possible mulch also with the weeds themselves.

Allow Regeneration to Dictate the Rate of Clearing

The better the bush, the greater the area which can profitably be weeded at any one time and place. Regeneration slows down as the weeds get thicker, and the weeding rate must be reduced to match.

Never over-clear. Under-clearing can do no harm, but over-clearing makes regeneration much slower and more difficult. At best it involves a great deal of tiresome and unnecessary follow-up work, and at worst it can make regeneration almost impossible without expensive and time consuming replanting. If you have a lot of helpers, spread them out to weed small amounts in many places. The total area they weed will be just as great as if. you had concentrated them in one place, and the regeneration rate will be very much greater.

In the plan of work we have put down sizes of areas to be cleared as you reach the thicker weeds, but these are suggestions only. Experience in your own environment is the only guide we know to keep clearing geared to regeneration. There is a great temptation to go just a little further when you know you really should not. If you do, you will pay for it next season, pulling up hundreds of weed seedlings which would never have had a chance to grow if you had kept them smothered, first by their parent plants and then by regenerating natives.

The end results of the plan of work will be most impressive, but at the beginning its effects will be essentially unspectacular. Few people notice a scattering of weeds among the bush plants, and even fewer will notice their absence when you have pulled them up. On the other hand a large clump of a well-known weed like lantana is an eyesore in a prominent position, and you will be under pressure to get rid of it. Resist all temptation to abandon the plan of work for the sake of doing window-dressing. Remove those weeds systemically from the bush outwards, as described on Page 9. Explain what you are doing, and why you are doing it. You will find, as we do, that people will readily understand.

> Feel your way from bush towards weeds, and be guided by whether weeds or natives grow to fill the space which you create by weeding. If you are at all uncertain, STOP. There is bound to be another place where you can take more weeds out, profitably.

> > J. Bradley, 46 Iluka Road, Mosman, 2088

June, 1971

5.

This is the sequence which one person should follow, working from the best bush to the worst weeds. Keeping the sequence always the same, it can be followed by any number of people in any number of places.

1. PREVENT DETERIORATION OF GOOD AREAS

Vegetation: Native bush with scattered weeds.

Overclearing Risk: Nil.

Start by getting rid of the weeds which are scattered singly or in groups of four or five through otherwise clean bush. Practically no-follow up work will be needed: Check once or twice a year, at least once in the flowering season, when colour will show up weeds which you may miss at other times of the year.

Even in a large park where you cannot hope to cover all the ground immediately, it is amazing what a difference you can make if you pull up one or two weeds any time you go for a walk. With minimum effort, this stage will make many acres of good bush vigorous and safe from degeneration for years to come; and bring it up to press against the thicker weeds which are its next challenge.

2. IMPROVE THE NEXT BEST

Vegetation: Heavy weeds, some native undergrowth.

Overclearing Risk: Moderate to high.

Once you are confident that you have prevented deterioration of your better bush, you can safely start work on some of the thicker weeds. Choose a place which you can visit easily and often, where thick native growth is pushing up against a mixture of weeds and natives, preferably not worse than one weed to two natives.

We suggest you start with a strip about 12 feet wide, and no longer than you can cover about once a month during the growing season. It is unlikely to need as much follow-up work as this, but you cannot tell till you try, and anyway it is quite a thrill to go and see how fast the natives grow when you give them room. If the clean bush/heavy weed boundary runs up and down a steep slope which may erode, clear a number of patches instead, still not breaking ground more than about 12 feet distant from vigorously growing natives. This may look a little odd, but regeneration varies from place to place, and however you begin, your strip is not going to stay neat and even. Let a few months go by before you lengthen the strip. You must expect weed seedlings as well as natives, and the first weeding after clearing is the worst. It is better not to force yourself into the position of having to do it all at once. If freshly cleared areas are kept small, no great harm is done if something happens to stop you from tending them.

Extend the strip along the boundary, making it longer or shorter, wider or narrower, as experience shows you it is best.

3. HOLD THE ADVANTAGE GAINED

Vegetation: Heavy weeds cleared, new growth a mixture of weeds and natives.

Overclearing Risk: High

Resist the temptation to push deeper into the weeds before regenerating natives have stabilised each cleared area in turn. The natives need not be very tall, but they usually need to form an almost complete ground cover. Weeds will nearly always keep germinating until this is achieved - the only exceptions we have found were under very dense tree cover.

It is the newly disturbed and shaky areas that need attention. It is these that will revert to weeds if you neglect them, and these that will be badly affected if you let in too much light by clearing more ground beside them. (We think that this light question is very important; it cannot be just coincidence that weed seedlings appear so consistently at the edges of tracks and clearings, even when these are not recently disturbed, and are surrounded by acres of clean bush).

4. CAUTIOUSLY MOVE INTO THE REALLY BAD AREAS

Vegetation: Thicker and thicker weeds, finally reaching complete replacement of native undergrowth.

Overclearing Risk: High to extreme.

When the new growth coming up consists almost entirely of native plants, with only a few weeds among them, it is safe to move deeper into the weeds Do not feel compelled to do this if it happens to be inconvenient. The beauty of the system is that nothing disastrous is likely to happen if you leave a really vigorous, well-established area to look after itself for months at a time.

Keep working along the regeneration boundary, making your new clearings smaller as the weeds get thicker, until regeneration reaches the edge of the very worst weeds. These can be such an alarming sight that you may feel a renewed temptation to over-clear.

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However bad it looks, <u>don't start to clear a block of solid</u> weeds until you have brought good bush right up to it. This does not mean that you cannot start work on a bad area until you have got rid of all the weeds right round it. We start nibbling away at it whenever and wherever we stabilise an area beside it. We poke in round its edges, taking the line of least resistance, making clearings all as little as six feet in diameter, or we do "spot weeding". (See page 9). We form peninsulas of weeds even islands - to avoid creating weed-productive spaces open to the sky. Be particularly careful with the strips of bad weeds so often found on the edges of roads and clearings. (See page 14).

At first, germination is often more exotic than native, and we have to pull up a lot of weed seedlings. In the very worst places where there is not even reasonable tree cover, it may take a whole season for the natives to become dominant, but once they do, the effect is amazing. Just as we are beginning to wonder if the weeds are inexhaustible, the natives take over. They need not be very tall, just very thick on the ground. We have so often seen the disastrous effects of over-clearing in similar areas, that even now that we have so often seen our own results, we can hardly believe our eyes when we look at our little patches of fresh young natives, sitting pretty, hard up against a solid wall of weeds.

THE FUTURE

As far as we have gone, the natives are still merrily planting themselves, and we can't see any reason for them to stop. However, we have still not reached the hearts of our worst treeless wastes of weeds, where planting trees and shrubs may quite likely speed the process. There are other places too, where sowing mixed seed should be a help. But we must admit that we shall never get as big a kick out of something sown or planted as we get out of the plants which we have simply allowed to grow themselves; true natural regeneration, in all its beautiful variety.

PERMANENT CLEARINGS

A permanent open space means an environment permanently favouring weeds. Roads, car-parks, playing fields, private gardens - even small clearings made for park seats - all are potential trouble spots. If a strip of soil is disturbed and left exposed, and particularly if filling has been brought in to level the ground, weeds can quickly replace the natives.

Tracks spread out from clearings, particularly from places where people leave their cars. Many people, who would not dream of walking over a garden bed, will tramp unheeding through the bush, smashing the plants and compacting the soil. Weeds are spread further, let in by the destruction of the native undergrowth. All our worst infestations have spread out from clearings, often with rubbish-dumpers speeding them on their way.

The verges of clearings are difficult places. Even when a strip of weeds is only a yard or two thick, clearing it in one operation seldom brings the bush outwards. In fact, very often it lets the weeds further in.

In such places, continue to work as always from the bush towards the weeds, but not in a continuous strip. Weed, instead, a number of separate wedge-shaped areas with the thin ends of the wedges pointing towards the open space. In this way, you will break through the screen of weeds at scattered points, making small openings which will not let in much light. Make the wedges wider as the bush regenerates, and they will join up to form clean bush.

It is important, particularly when working where the weeds are fairly thick, to remember not to open up spaces in such a way that people will walk through the gaps which you have formed. It is frustrating to have to leave a screen of weeds until the natives grow thick and tall enough, but if the way looks clear, sparse or small natives will be destroyed by the tread of feet. Remember, too, that if you yourself leave even a faint track, others may follow it.

Large weeds, put down with their roots in the air, are most useful in preventing the public from trampling the ground. We have closed a number of trample tracks by blocking both ends with uprooted lantana.

SPOT WEEDING

My sister is working on a dry headland which has a lookout with park seats near its top, is handy to a car park, overlooks a popular fishing spot, and is bounded on one side by a busy walking track. Some of its worst weeds are cut off from clean bush by tracks and rock outcrops. It slopes very steeply to the water. Trampling is a major difficulty. People have scrambled up and down it to such effect that they have even caused a small landslide. It is also infested with rabbits. A real problem area, yet still it is regenerating.

In a place like this, clearing any sort of strip, however irregular, would invite disaster, so my sister has evolved the special technique of spot weeding.

When she finds a native plant surviving among otherwise almost unbroken weeds, she gives it room to grow, often at first by pulling up just one large weed plant. Released from competition, the native grows much faster, and later other native seedlings appear as well. This makes it profitable to remove a few more weeds, and thus extend regeneration a little further.

In this way she dots patches of native growth throughout the weeds, never laying bare a patch of soil big enough to erode, and never clearing an open space big enough to invite trampling. The rabbits devour young grasses and legumes, so native growth is slower and less varied than we might wish, but heavy weed growth gradually becomes lighter, and all of a sudden a season or two later, the natives coalesce to form clean bush. We follow four general rules: disturb the soil as little as possible; sweep back the surface mulch over any soil you do expose; mulch with the weeds themselves; and watch where you put your feet.

DISTURB THE SOIL AS LITTLE AS POSSIBLE

We never use a heavy tool when we can use a light one, and prefer hand-pulling to using any tool at all. Our most weeds, such as lantana and boneseed, are widespread surface-rooted, and can be pulled up with surprising ease. If they are too big for simple hand-pulling, we get them out by cutting the roots a couple of inches below the soil surface, using the smallest tool that will do the job. A sharp sheath-knife or a pair of seccateurs will account for all but the very largest specimens, for which we use a hatchet or a pair of pruning shears. If the cut ends of the roots are left well buried, they don't grow again.

Cutting roots one at a time can be a tedious process, but don't get impatient and fetch a mattock. Heavy tools cut the roots of nearby natives, kill small native seedlings, break up the essential surface mulch, and bring weed seeds to the surface where they germinate. Time taken to keep down soil disturbance is more than repaid in time saved doing follow-up work.

SWEEP BACK THE SURFACE MULCH

However carefully you weed, you cannot avoid disturbing some ground litter, and exposing some soil. Repair the damage as you go. When you hand-pull a big weed, and some soil comes up with it, you can usually scuff back the mulch quite easily with your foot, but get your hands to it if necessary. If a weed is so big that you have to cut roots, sweep the mulch aside and put it back afterwards. If you forget this brief piece of work, you will very likely find a weed seedling coming up later on in the bare patch.

MULCH WITH THE WEEDS THEMSELVES

Burning weeds, or carting them out of the bush, is worse than unnecessary - it is wasteful. We keep everything we possibly can to add to the mulch. In dry places we find it safe to put most weeds back on the ground with their roots in the air. In damp places we hang them up on the nearest native until they dry off. It is marvelous what delicate looking native ferns will support if you spread the load and put it down gently. Curtains of <u>Asparagus sprengeri</u> look a bit odd hanging on trees, but we don't worry. It all dries out in the end, and we either let it break up in its own good time or put it back on the ground. We find woody stems, laid down across the slope, useful for erosion control. 12.

A small quantity of material is unsuitable for mulch, and this we carry away:-

Bulbs, tubers etc.: If is hard to find a place where you can put these, and be sure they will not grow.

<u>Plants that root at every node</u>: Lawn grasses - couch, kikuyu and buffalo - head our list of these. There is also Wandering Jew (Tradescantia, not the native Commelina) which breaks at a touch, and every bit of it grows.

Free-seeders with ripe seed: We take the flowering parts only, putting them into plastic bags to avoid scattering seed. The rest we pull up and leave in the bush.

WATCH WHERE YOU PUT YOUR FEET

Be careful how you move through the bush. A small weeding party moving through thick bush in single file can open up a trample track in one operation. Tread carefully, and follow different routes to places where you are working. Move about no more than is necessary. Look behind you when you step back. Watch your feet when you move round to cut the roots on the other side of that big weed. Any natives you tread on will get a set-back.

Trampling by the unthinking public lets in the weeds. See that your own feet don't undo any of the good you are doing by weeding.

WEEDING TECHNIQUES - LABOUR-SAVERS

Our first big direct labour-saver is using weeds on the spot for mulch: people waste hours, tramping about, carrying weeds to heaps and burning them. You will save more labour still by a little extra attention to detail.

TIMING

Isolated weeds can be pulled up at any season, but good timing pays dividends when you reach thick growth of weeds which seed freely after clearing.

In general, early in the growing season is a good time to start on a bad infestation. Winter clearing is apt to give a false sense of security: little seed germinates immediately, but you may find yourself next summer tied down by too much follow-up work. Such work should not take more than a few minutes at a time.

Mature, long established free-seeding weed plants have been dropping seed for years, but only a few of their seedlings have survived competition. If you clear them when they are ready to shed seed, you spread that seed over newly disturbed ground, and give the weeds an advantage over the natives. With free-seeders, the ideal time to start is just before the first seed ripens, when the parent plants have had nearly a year to choke out the previous seasons's crop of seed.

WEED-KILLERS

We are often asked why we do not use weed-killers. Used close to native plants they generally do more harm than good. The trials which we have seen were not successful. Sprays drifted and killed established natives. Soil applications caused a complete kill of native seedlings, followed by regrowth of weeds. Herbicides do not respect countries of origin and are lethal to weeds and natives alike.

"Experiments are being carried out with various herbicides. The results of these, however, are not expected for some years as previous experiments which promised well initially were found in the longer term merely to have retarded growth temporarily. Needless to say, a safe and effective herbicide for use on large weed trees such as Camphor laurels would be most welcome."

(Mosman Parklands & Ashton Park Association August 1984)

EFFICIENT WEEDING

It is a waste of time to attempt to clean up a tangled mass of weeds and natives in one operation. Take what you can conveniently reach, and leave it to wilt. When you return, the wilted sections show what you have pulled up and what you have missed. Do not waste effort by taking out the whole of a weed if part will do. If you have a large exotic creeper like honeysuckle growing all over a native tree or shrub, don't try to untangle it. Cut the stems near the ground, and get out the rooted sections. The rest keeps some of the light out of the bush, and finally breaks up to form more mulch.

Some plants, like the taprooted ochna and the tuberous-rooted potato vine, must be dug up bodily. We trace them out patiently with a knife or a trowel - it is more efficient than chasing cut taproots and broken strings of tubers when they shoot again after mattocking.

We have a profound respect for lawn grasses. Couch, kikuyu and buffalo are among our most destructive weeds. They are just as capable of destroying the bush as obviously dangerous shrubs and creepers. People who should know better plant them beside the bush, saying comfortably that they do not grow in shade. Maybe they don't, under the dense shade of broad-leafed garden shrubs. They certainly can, and do, invade our open forest, spreading very fast indeed and overwhelming all the native undergrowth. Get them out - all of them, even though it does take hours of patient hand-weeding. In Ashton Park, where an unsealed road shoulder is covered in buffalo and kikuyu grasses, we have left a "hedge" of lantana and crofton weed. It does not look good to motorists using the road, but it is keeping the grasses out of the bush until we are in a position to control them. Where buffalo did get in, it spread over a quarter of an acre, and we have still not got all of it out. There should always be some sort of barrier between lawn and bush. A path, a kerb - anything that does not get in the way of a mower cutting round the edges.

In contrast, we have lost all respect for lantana, declared noxious and regarded with horror. It may take you some time to cut your way in to the base of a big plant, but if you take it steadily there is no need to get scratched. Once you reach the roots you will find that they are nearly all near the surface, quite soft, and easy to cut a foot or two out from the base. Crofton weed, also declared noxious, must be watched because it seeds freely, but mature plants come up quite easily by simple pulling.

I started by trying to dig out the whole of asparagus "fern", as seems to be necessary in the garden. Some of the plants have root systems over six feet across, all tangled up with the roots of natives. I gave up in despair, having got out all I could, and found to my delight that if I took out the whole centre of the plant, and carefully covered up all the cut root-ends, there was no regrowth of the roots and tubers that I had been forced to leave in the ground. Some have been there for over three years, with good rain in the last two summers, so we think they must be safely dead.

Experiment to find the minimum work necessary to kill each kind of weed, and you will save yourself much labour.

NEW WEEDS

If a plant which you have never seen before puts in an appearance, have it identified as soon as possible. If it turns out to be a bad weed, pursue it relentlessly: prompt action will save you a world of time later on.

RECORDS

We keep general written records, and make periodic vegetation surveys, plotting the weed intensities on maps. The maps show us, and our local authorities, how much we have accomplished and how much we have still to do. Also, we do not have to trust our memories when deciding whether any particular patch of weeds is spreading and needs urgent attention, or is stable and can be left awhile. We wish that we had a photographic record as well. Places showing before and after are getting more and more inaccessible, and the regenerated bush looks so good that people need a map and a guide to tell where we have been.

14.

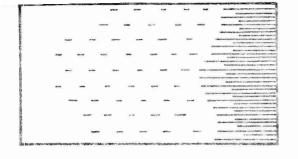
SCIENTIFIC NAMES OF WEEDS MENTIONED IN THE TEXT

Asparagus "fern" Boneseed Buffalo Grass Couch Grass Crofton Weed Honeysuckle Kikuyu Grass Lantana Ochna Potato Vine Privet

Wandering Jew

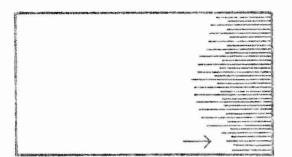
Asparagus sprengeri Chrysanthemoides monilifera Stenotaphrum secundatum Cynodon dactylon Eupatorium adenophorum Lonicera iaponica Pennisetum clandestinum Lantana camara Ochna serrulata Acetosa sagittata Ligustrum sinense Tradescantia albiflora

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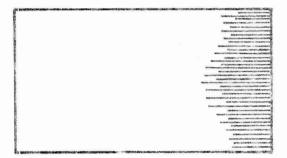
eft to Right:

Clean native bush Native bush with scattered weeds Heavy weeds, some native undergrowth Native undergrowth replaced by weeds

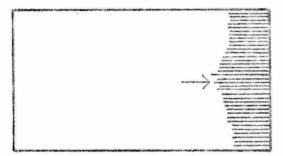


Scattered weeds removed

First pilot strip cleared along the boundary of the heavy weeds (Arrow)

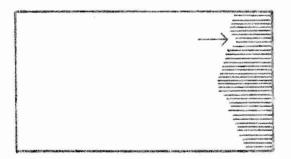


Pilot strip lengthened, in widths varying occording to the rate of regeneration



Heavy weeds all cleared, except in one area which has regenerated slowly (Arrow)

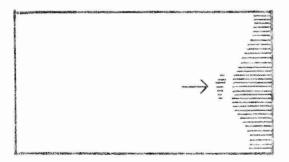
Natives elsewhere growing strongly



The last of the beavy weeds cleared

A narrow strip cleared where weeds had replaced all native undergrowth

Clearing delayed in slow regeneration area. Clearing deeper in fast regeneration area (Arrow)



More of the worst weeds cleared, and an "island" left in the slow regeneration area