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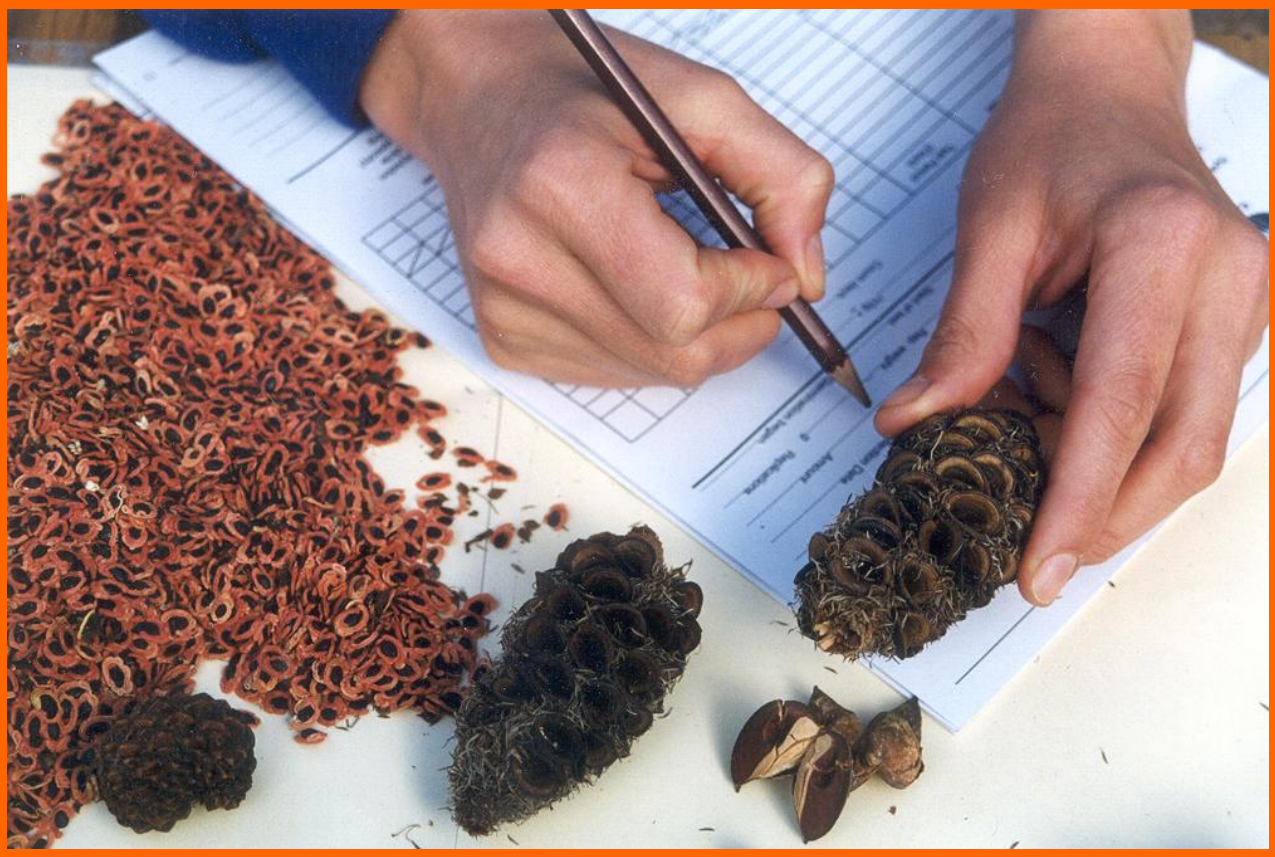
CORANGAMITE CATCHMENT MANAGEMENT AUTHORITY

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Regional Capacity Building

A FRAMEWORK FOR EFFECTIVE SEED SUPPLY

Scaling Up for Revegetation in the Corangamite Region



REGIONAL CAPACITY BUILDING

SCALING UP FOR REVEGETATION IN THE CORANGAMITE REGION

A FRAMEWORK FOR EFFECTIVE SEED SUPPLY

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Corangamite Catchment Management Authority

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Local Government – Golden Plains, Colac-Otway and Surf Coast
Landcare Network Coordinators and Groups
Indigenous Nurseries
Seed Collectors and Seed Suppliers

1.0 EXECUTIVE SUMMARY

This ***Framework for Effective Seed Supply*** provides an assessment of the current seed supply structure within the Corangamite region and identifies key recommendations to establish a strategic and operational framework to service the future native seed supply demands of the Corangamite region.

The key recommendations of this report can be summarised as two priority actions:

1. The formalisation of a Native Seed Supply Network for the Corangamite region, comprising of two, complementary components – a ***Revegetation Network*** and a ***Supply Network***,

2. The facilitated sharing of supply & demand information relating to native seed throughout this network.

   Key information sharing throughout the Network should embrace:

   a) The dissemination of technical guidelines and standards in native seed supply (eg. FloraBank Guidelines and national standards for collecting and storing native seed), and
   b) Sharing of project information required to supply native seed to major revegetation projects in the region, between all Network stakeholders.

Other actions critical to the funding and operation of the of the proposed Native Seed Supply Network include the recognition of the 'true value' of appropriately provenanced, native seed for revegetation projects. The true cost of the supply of local native plant seed should embrace the cost of both collection (market cost for the seed species) PLUS the coordination of its collection (cost of the identification of seed collection zones for different species required for a project and the co-ordination of seed collectors to fulfill seed orders). True cost of sourcing local native seed must be adequately budgeted within project funding and appropriate seed costing recommendations established by the Native Seed Supply Network and communicated/ monitored by funding bodies such as the Catchment Management Authority (CMA), though funding application guidelines etc. (Refer to section **4.43** ***Purchase of Seed***).

It is expected, as has been experienced in other regions of Victoria, that future revegetation within the Corangamite region will utilise a greater portion of direct seeding techniques in order to address the increased scale of revegetation planned across the landscape. A greater use of direct seeding will correspondingly bring about a much greater volume demand for locally-sourced native seed. This increase demand has a two-pronged impact for native vegetation management that will be key issues for the Native Seed Supply Network to address:

- much greater collection pressures upon remnant vegetation of the region, and
- a heightened need to instate and manage, seed quality assurance measures within the native seed collection & supply networks.

The recommended Framework will enable the Corangamite CMA to address issues effecting the supply of native seed in the region and provide a strategic and pro-active planning tool to support large-scale revegetation works, that maximise biodiversity outcomes and ensure the efficient use of capital and environmental resources. It is envisaged that revegetation programs occurring within the region that are operating to achieve objectives as identified within the Corangamite Regional Catchment Strategy, are to be serviced for their native seed demands through this regional Native Seed Supply Network. This includes Corangamite's land, biodiversity and water programs.

2.0 SECTION A - PROJECT BACKGROUND

This section provides an introduction and background information relevant to the development of a Seed Supply Framework for the Corangamite catchment region.

2.1 THE CORANGAMITE CATCHMENT

The Corangamite Catchment Management region is located 240Km south-west of Melbourne covering an area of more than 13,340 square kilometres of south western Victoria, including 17,500Ha of the State's coastal fringe (Figure 2.1a). The physical attributes of the region change markedly over its length, offering a diverse landscape ranging from volcanic plains, grasslands and internationally recognised wetlands in the north to heathlands, temperate rainforests and coastal areas in the south. The region is typified by a temperate Mediterranean climate of warm dry summers and cool wet winters. The soils of the region reflect a diverse geological history and range from recently deposited windblown sands to heavy clays derived from highly weathered material (CCLPB, 1997).

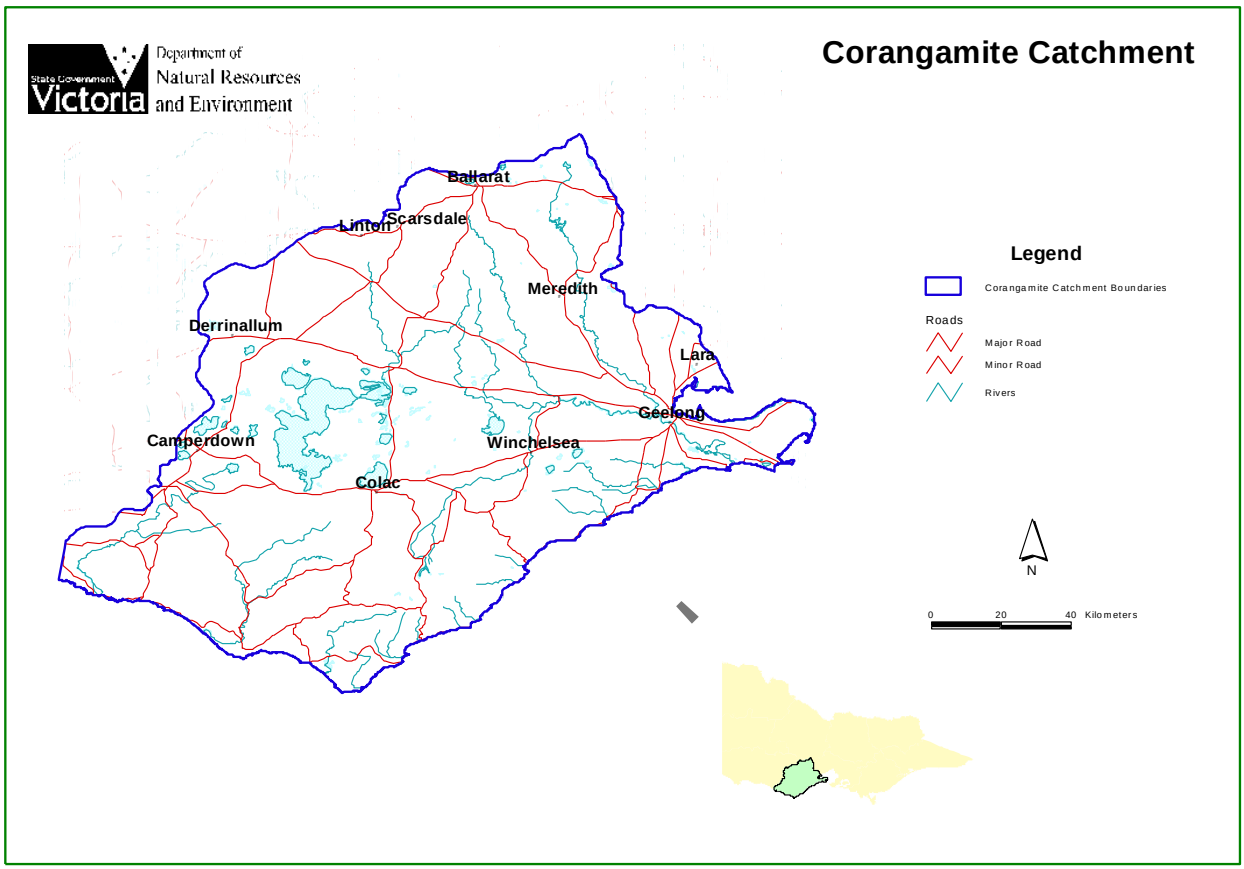


Figure 2.1a. Corangamite Catchment Management Region

Stabilising the status of Victoria's native vegetation is a clear directive of *Victoria's Native Vegetation Framework (August 2002)* and for each *Draft Native Vegetation Plan* developed for Victoria's catchment management regions. Conserving biodiversity and restoring the landscape to the point of long term sustainability (NRE, 1999) is an appropriate aim, however the overall picture for existing vegetation in the Corangamite region is not encouraging. Only 21% of the original native vegetation remains and approximately half of this remaining vegetation is considered threatened (CCMA, 2000).

In order to protect and enhance Victoria's native vegetation, targets for revegetation and regeneration have been established on a catchment basis. In the Corangamite region, the target is to increase the overall cover of native vegetation to 30% of the catchment. As part of this total, the cover of the majority of threatened Ecological Vegetation Classes (EVC's) is aimed to be at least 10% of the pre-European cover by 2030 (CCMA, 2000). *Note: Where the current level of the EVC is under 2% the goal is to increase its cover to 5% by 2030.*

This equates to a target of revegetating and regenerating approximately 3,400 hectares of native vegetation per annum, over 30years (CCMA *Draft Native Vegetation Plan*, 2000). These targets set a clear agenda for the Corangamite CMA to manage a process to dramatically 'scale-up' revegetation activities occurring within the region in the years ahead. The ability to achieve these regional targets, the impact it may have on the environmental and human resources of the region and planning and infrastructure required to ensure quality outcomes, are some of the motivations behind the development of this Framework Report.

Specific to seed supply, the impact upon seed demand influenced through direct seeding as a preferred method for large-scale revegetation, should not be overlooked. Direct seeding is a very cost effective revegetation technique to establish plants on large areas quickly and with low labour inputs. As experienced in neighbouring catchments, the use of direct seeding in the Corangamite catchment is likely to dramatically increase if the revegetation targets of the region are to be achieved. Unfortunately, direct seeding is not as efficient in its use of seed as other revegetation techniques. Field germination of seed (although arguably producing much more resilient plants adapted to local conditions) uses much higher seed volumes to produce the same amount of plants as compared to nursery propagation. The favouring of direct seeding as a technique for large-scale revegetation could easily produce a 20 to 25 fold increase in current seed demands to produce the same amount of plants in the landscape.

2.2 PROJECT BRIEF

The identification of increased revegetation targets for the Corangamite region that represent significant increases on current levels of activity, has encouraged growing concern of the availability of native seed to facilitate such outcomes. This project was developed to assess the current situation in the region in regard to revegetation seed supply & demand and to recommend future directions for the region to ensure an efficiently managed supply of native seed for revegetation projects in the future.

Framework recommendations identified (Section C) are presented at two levels:

1. **A Strategic Plan** – describing the recommended infrastructure and resources to be instated/ supported within the region,

2. **An Operational Plan** – describing the recommended process of operation, interaction of seed supply stakeholders and processes of quality assurance.

Greening Australia Victoria (GAV) was contracted by the Corangamite Catchment Management Authority to develop this Framework for Effective Native Seed Supply.

2.3 PROJECT AIMS

In accordance with the project brief, the Framework Report aims to achieve the following:

- assess current situation with respect to revegetation industry operating in the region
- provide a clear direction for the development of a native seed supply network for the Corangamite region.
- recommend appropriate infrastructure to deliver the vegetation objectives and targets identified within the *Corangamite Regional Catchment Strategy* and the *Draft Corangamite Native Vegetation Plan*,
- recommend a framework that combines seed quality assurance aspects, to enable the realisation of the Region's biodiversity conservation objectives.

2.4 LEGISLATION AND POLICY

Victorian legislation that is relevant to seed supply include:

Flora and Fauna Guarantee Act 1988,
National Parks Act 1975,
Forest Act 1958,
Timber Harvesting Regulations 2000,
Forests (Licences and Permits) Regulations 2000,

There are a number of other plans, strategies and polices that influence and direct the management of native seed supply in the Corangamite region. The more relevant of these documents include:

Victoria's Native Vegetation Management Framework 2002,
Corangamite Regional Catchment Strategy 1997,
Draft Corangamite Vegetation Plan 2000,
Victoria's Biodiversity Strategy 1997.

2.5 METHODOLOGY

A survey of key seed supply stakeholders was undertaken to determine the current status of revegetation and seed supply in the Corangamite region (***Appendix 2 - Seed Supply Survey - INTERVIEW QUESTIONNAIRE***). The questions in the survey covered an investigation of various issues relating to seed supply including:

- current vegetation practices,
- current methods of seed supply and information exchange,
- identification of the current systems involved with supplying seed to projects,
- evaluation of quality of seed collection & management,
- effectiveness of seed sourcing and supply to indigenous nurseries, etc.

A total of 88 key stakeholders were contacted, with 43 respondents. These persons were selected on the basis of their known involvement with the revegetation industry within the region and their experience in native seed supply. Stakeholders included representatives of the *Department of Natural Resources and Environment*, local government, *Corangamite Catchment Management Authority*, indigenous plant nurseries, contractor & volunteer seed collectors and native seed suppliers, revegetation project officers and Landcare Network Coordinators/ groups representatives (***Appendix 1 – Key Stakeholders in the Corangamite Region***).

Three methods of contact were utilised:

- direct phone surveys,
- postal surveys,
- facilitated, interactive workshops.

Individuals were categorised into appropriate stakeholder groupings for the purpose of analysis and to encourage open discussions during workshops. To maximise outputs in the given timeframes workshops were held for each the two largest stakeholder groups – *Landcare Project Officers* and *Nursery Proprietors*. Surveys were completed on an individual basis during the course of these workshop days. Those who were unable to attend the workshop were further offered the opportunity to participate through postal survey. All other participants were contacted by phone and surveyed at that time or posted a survey to complete and return.

All data obtained from surveys and workshops were collated using MS Excel spreadsheets and analysed to determined trends and differences between stakeholder groups and different areas of the catchment. Results of this analysis are presented in **Section B**.

2.6 CONTEXT OF REPORT FINDINGS

Conclusions and recommendations made in this report have been determined from a combination of stakeholder survey results from the Corangamite region and from collective experience of over a decade of operating within the native seed supply industry in Victoria and nationally.

It should be appreciated however, that the group surveyed was a **targeted group** within the region chosen for their direct involvement and/or experience in native seed supply and whose thoughts and opinions may not represent those of the broader Corangamite community. This target group is judged as those who would provide the best feedback on current issues involved with seed supply in the region and have a high level of knowledge of the impact of seed selection and quality on revegetation and biodiversity outcomes.

Similarly, of the stakeholders approached, approximately 50% responded. This represents an excellent return for surveys of this nature but must be appreciated that the views of every individual within the stakeholder groups are not necessarily represented.

3.0 SECTION B - CURRENT STATUS

Eighty-eight stakeholders from the Corangamite Catchment Region were invited to take part in the seed supply survey for the region of which 43 were available and willing to participate (***Appendix 1 – Key Stakeholders in the Corangamite Region***). Stakeholders were consulted via interview, participating in a workshop or completing a questionnaire (***Appendix 2 - Seed Supply Survey - INTERVIEW QUESTIONNAIRE***).

3.1 CURRENT STATUS OF SEED SUPPLY, SEED STORAGE & DEMAND

There are currently 13 professional seed collectors, 28 nurseries, 1 commercial seedbank and 15 project officers (government and non-government) collecting seed from indigenous vegetation to be used in revegetation projects within the Corangamite catchment.

On average, individual projects use less than 30 different indigenous species, 41% of these comprised of species that form an overstorey. Thirteen of the participants in the survey chose to complete a detailed survey which identified the indigenous species from all stratums that are currently used to revegetate Corangamite, and those species that would be used if readily available. In total there were 49 species identified as being currently used, with an additional 103 being identified as being desirable in the future.

Most projects use tube stock to revegetate, however as the weight of seed collected across the region (including seed harvested for forest logging coupe revegetation) totalled 1,400Kg for 2001, there may be more opportunities for direct seeding in the future. Although less efficient in its use of seed to instate the same number of plants in the field as compared to nursery tube stock propagation, the speed and cost effectiveness of direct seeding for large-scale revegetation is likely to encourage its wider use throughout the Corangamite region in the near future.

Provenance material was difficult to source for 61% of participants. The ramifications being that 58% of participants would choose to delay a project to obtain seed of an appropriate (local) provenance, whilst of the remaining participants would either choose to use a substitute provenance or omit the species from their project entirely. The reduction in quality of biodiversity outcomes under these circumstances is significant to the region.

The participants were equally reliant on the Ballarat Region Seedbank, professional collectors and their own seed collection efforts to provide seed for their projects.

Almost all private seed stores are not refrigerated, instead stored in a cool dry place in a sealed container. On average seed is stored for one to two years, with 71% of participants reporting the maximum storage time exceeds two years.

Record keeping of collected seed varied amongst the participants. Over 90% of participants always record the species, date seed was picked, location where seed was picked from, whilst the supplier was only recorded by 60% of participants, and the weight and viability of seed only regularly recorded by 40% of participants. Records were most commonly stored in paper files (60%), followed by spreadsheet, then database.

In relation to the management of and access to seed stores, the survey identified that primarily the seedbank manager was the person whom had direct access to seed. Others wanting to use seed typically gained access through the seedbank manager. The seedbank manager also usually embraced the role of processing, documenting seed information and appropriately batching and distributing seedlots for use in projects.

A current seed collection projection as calculated from the survey, is in order of 70Kg of seed to be collected over the next three years. However, this is figure represents an extremely conservative estimate, as most participants were unable to forecast any projections for seed demands.

3.2 IMPEDIMENTS

3.21 Timeframes

85% percent of the participants stated current time frames between project initiation and expected delivery are too short. Most seed suppliers agreed that there should be a minimum of 12-24 months between the placement of an order for seed and the expected delivery of seed. Most nursery operators stated they require a minimum of 12-18 months between the placement of an order for tube stock and the delivery of the plants.

3.22 Species availability

60% of the participants were dissatisfied with the range of species available for regeneration as seed or tube stock. This highlights serious doubts as to whether biodiversity outcomes of projects are actually being achieved in the field. Pricing seed to take into account the difficulty of picking some species may alleviate this problem, as seed collectors would then have a greater incentive to obtain species that are more difficult (or time consuming) to locate, pick and/or extract from fruit.

3.23 Market uncertainty

55% of participants were unable to forecast any projections for future seed demand. This results in part from the review of the Corangamite Native Vegetation Plan, and the uncertainty as to the nature and scale of future revegetation projects. However, most participants were in agreement that the amount of revegetation occurring in the region was on the increase, and therefore identified a need to build up their seed stocks now if they were to service future demand. Similarly, there was a demand for more knowledge of seed extraction techniques and germination methods, both for nursery grown tube stock and direct seeding in the field.

3.3 OPERATIONAL

3.31 Coordination of Supply

58% of participants expressed dissatisfaction with the current avenues of seed supply in Corangamite ie. obtaining seed through a non-coordinated supply market of seedbanks, private collectors or through self-sourcing. Participants were equally supportive towards seed supply being coordinated by a government or non-government organisation (40% each), whilst only 20% thought seed supply would be best coordinated by community groups.

3.32 The Role of Seedbanks

All of the participants agreed that a coordinated network for seed supply with at least one regional seedbank (but with preferably more than one seedbank storage facility - to minimise transport of seed) would improve current seed supply mechanisms. Over 90% of the participants also suggested that a "one-stop-shop" for seed purchases would better communication between consumers and collectors. A similar percentage also identified the need for better management of collection zones, a needs for more than one seedbank and endorsed the purchase of seed from licensed/ appropriately trained collectors. Time allocated to sourcing seed and testing the quality of seed were other important considerations for 80% of participants.

Over 70% of participants agreed that seedbanks would perform important services and functions in any regional seed supply network including:

- seed storage,
- seed viability testing,
- seed preparation and distribution,
- coordination of regional seed supply and demand,
- management of seed supply contracts,
- maintenance of a site register of seed collection areas,
- maintenance of a database of seed stored in the seedbank and distributed to projects,
- training and accreditation of collectors,
- provision of technical information, and
- employment of a dedicated seedbank coordinator.

50 % of participants thought that a seedbank should also perform tasks including:

- overseeing of Seed Production Areas (seed orchards),
- actual collection of seed, and
- pre-treatment of seed prior to distribution.

3.4 STRATEGIC

Coordination of seed supply throughout Corangamite was perceived to be poor by the participants. Whilst 50% were unable to comment on how well seed supply is coordinated at catchment level, the remaining agreed it was not coordinated at all. Even at the project and site level, only 47 and 33% (respectively) thought seed supply was well coordinated.

4.0 SECTION C – SEED SUPPLY FRAMEWORK

4.1 SCALING UP FOR SEED SUPPLY

The need to fulfil revegetation demands for future projects requires the development of structures not presently in place in the region. The strategic plan provides the framework for the Corangamite Region to scale up for large-scale revegetation projects. The two-part framework proposes a strategic plan, which identifies the structure needed, and an operational plan that provides a basis for delivery of the strategic plan. These will provide the mechanism for calculating and providing the future seed requirements for the region.

The Corangamite CMA has a key responsibility to manage the impacts of increased seed demand created by the vegetation targets identified within the *Corangamite Regional Catchment Strategy* (1997) and *Draft Corangamite Vegetation Plan* (2000). This responsibility extends to supporting the development of infrastructure and the coordination of seed supply and revegetation networks to provide for sustainable management of the Corangamite region's vegetation resources.

4.2 STRATEGIC PLAN

The strategic plan will provide a framework for Corangamite catchment management region to scale up for large-scale revegetation with a focus on species and diversity of appropriate provenance. Through the federally funded FloraBank program comprehensive principals and guidelines for seed supply have been developed and it is recommended that the CCMA ensure these principals are utilised throughout the region.

The proposed framework is based on the findings of the consultative process undertaken by stakeholders in the region. The key issues identified for the future of native seed supply in Corangamite included:

- The need to correctly identify Ecological Vegetation Classes (EVC's) occurring within the project region and from this the identification of species, provenances and quantities of seed required for each project;
- The need for a well managed network of seed storage facilities that keep detailed records of native seed and contribute this information to a centralised system;
- The need for a process to assist collectors with quality assurance;
- The need to communicate the quality and quantity of seed required by projects to all seed collectors able to work within the specified area;
- The requirement to increase the planning time for projects allowing a minimum of two years of lead time to adequately source and supply local plant material;
- The necessity to facilitate information sharing at all stakeholder levels and the subsequent increase in knowledge of stakeholders;
- The provision of training opportunities to support seed supply stakeholders;
- The importance of utilisation of existing facilities, structures, procedures and networks;
- The need to establish Seed Production Areas to alleviate the seed collection pressures upon remnant vegetation collection areas.

Note: Revegetation sites can be registered as future Seed Production Areas provided that the original selection of seed sources are appropriate for this purpose and that all seed source information is collected and recorded for the site. The Greening Australia Victoria, Seed Supply System Database is an effective tool for this purpose. A network of 'certified' Seed Production Areas can then be registered for the Region.

The strategic plan recommends the development of a seed supply network comprising two complementary components. The first component addresses revegetation demands at a project level and the second component addresses the implementation of supplying the demand.

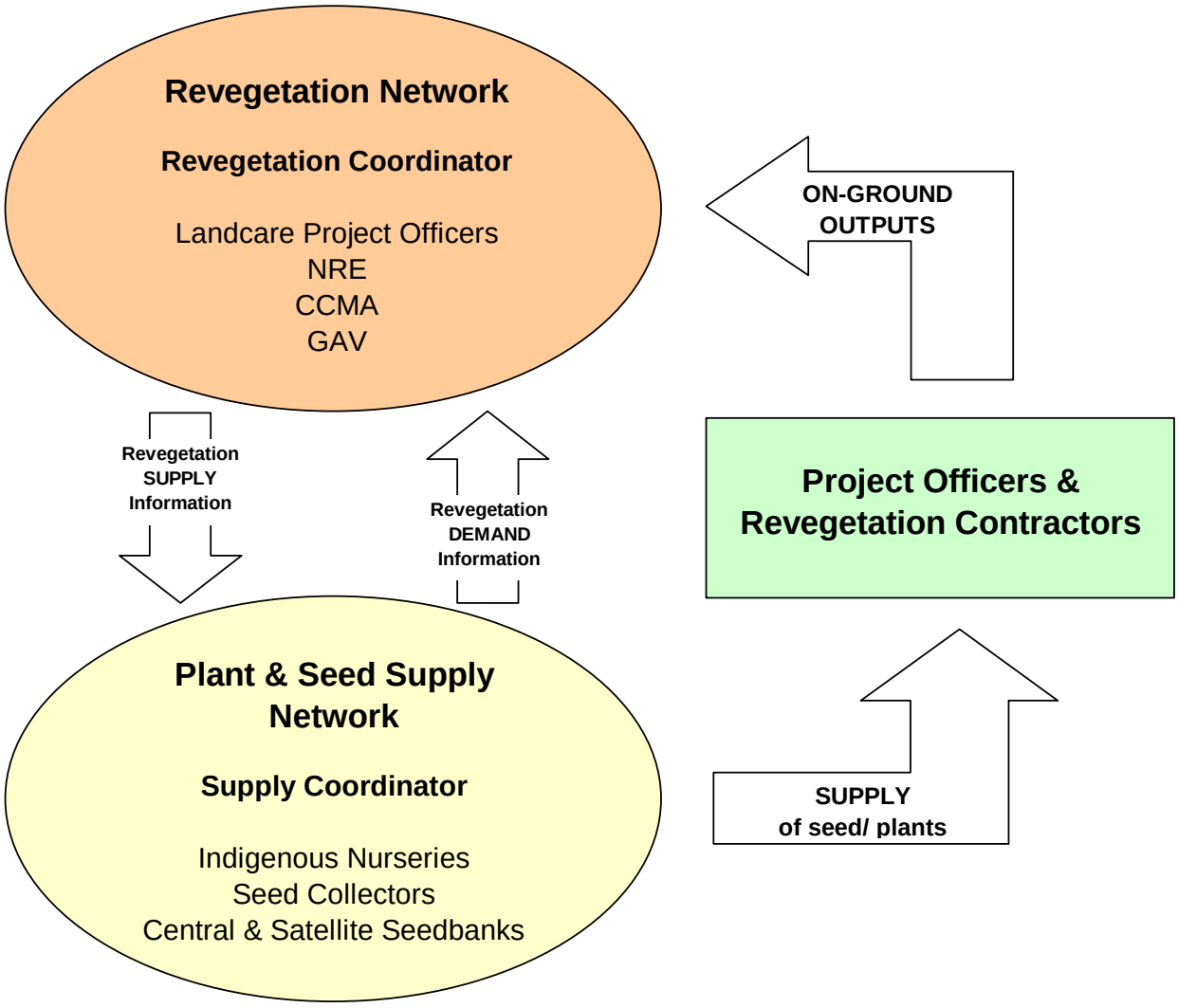
4.21 Revegetation Network

*KEY TASKS: * Regional Revegetation Planning*

Planning

Planning for seed demand is the first step in the process of seed supply. The proposed *"Revegetation Network"* will be responsible for the collation of all the revegetation demands in the region. It is important to increase the time frame necessary for the planning to implementation of projects, to ensure that the desired biodiversity outcomes can be achieved by acquiring the appropriate seed. Projects must be planned two years ahead of the expected on ground implementation dates. This will require major change in the existing funding regimes.

Communication & supply flows of the proposed Regional Native Seed Supply Network



Effective planning for seed supply should be considered a long-term process. The steps involved in planning are:

- Initial project conception two years ahead of expected on-ground implementation;
- Planning of requirements for successful project outcomes such as seed and plant requirements;
- Across the region, sharing and collation of information identified by project coordinators;
- Placement of orders 18 months in advance with seed collectors and nurseries;
- Regular checks on progress of supply of seed and plants until on ground implementation.

To ensure that this planning takes place and is implemented efficiently it is proposed that the CCMA set up and maintain the operation of a *"Revegetation Network"* that will be responsible for collating the project information requirements for seed and plant material. This network will consist of the appropriate stakeholders – all Landcare Project Officers and Coordinators, GAV, NRE, CMA, local government representatives and others as necessary.

The *Revegetation Network* will:

- Develop a register of all Landcare and strategic vegetation projects;
- Document on the register all the revegetation demand information for projects two (2) years prior to on ground implementation;
- Document on the register the quantities of species and provenances needed to fulfil projects;
- Define the minimum standards for revegetation projects to maximise biodiversity outcomes;
- Develop and implement procedures for enhanced communication between stakeholders;
- Record the implementation details of each project across the region ie. exactly what has been planted when and where, site treatments undertaken and timing;
- At appropriate intervals, record the evaluation of the projects for future reference and modify the process when necessary.

4.22 Supply Network

KEY TASKS: ** Coordination of Seed Collection*
** Seed Storage*
** Seed Dissemination*
** Quality Assurance*

It is proposed that the "*Supply Network*" will be complementary to the *Revegetation Network*. To ensure that the supply of seed takes place and is implemented efficiently it is recommended that the CCMA establish and maintain the operations/communications of a *"Supply Network"* consisting of nurseries, seed collectors, seedbank managers and a Supply Network Coordinator.

This network will be instrumental in delivering the coordinated supply of the seed as defined by the *Revegetation Network*. The *Supply Network* will be involved in organising the collection, storage and dissemination of seed. Although all seed supply stakeholders will be active participants in the network function, the Supply Network Coordinator will have the key responsibility to maintain Supply Network communication and seed supply functions. The Supply Network Coordinator will work closely with the Revegetation Network Coordinator.

It is recommended that the dedicated Supply Network Coordinator role, be a full-time position funded through the CCMA (refer to section ***4.4 FUNDING)***.

The *Supply Network* will:

Collection

- Ensure that the collection of seed is a coordinated process;
- Coordinate the quality assurance of collectors and arrange contracts to collect identified amounts of seed of species from specific project zones;
- Coordinate (where appropriate) orders to nurseries.

Note: It is not intended for the Supply Coordinator nor other seedbank coordinators to perform a policing role on the licensing of and appropriate ethics of seed collection techniques practised by collectors. However, the key communication/coordination role of the Supply Coordinator should include a process of review and improvement of seed collection. The position would have a key function to provide feedback and information to collectors on seed supply issues including: collection ethics; seed quality assurance; seed collection training; improvements to the efficiencies of collection techniques etc.

Storage

- Ensure that short-term storage facilities are set up at local project level;
- Oversee quality assurance for short-term storage facilities;
- Ensure maintenance of a central seedbank that has large storage facilities capable of storing many seedlots (both large and small) over ten years or more;
- Maintain databases of stored seed that are consistent across all storage areas;
- Ensure that the central seedbank maintains a database of seed stored throughout the entire region;
- Ensure that germination tests are performed upon seedlots of questionable viability (eg. seedlots kept in storage for many years) before being dispatched for use;
- Encourage project officers to budget for seed viability tests for their project seed scheduled to be kept for longer periods.

Dissemination

- Supply projects with correctly sourced, processed and stored seed with appropriate records kept of all transactions;
- Ensure that project-based, satellite seed storage facilities disseminate seed locally and keep records that will be forwarded onto the central seedbank;
- Oversee that any excess seed from satellite seed storage facilities not used in the year of collection, is sent to the central seedbank for longer term storage;
- Promotion of the seed that is stored at the central seedbank is available for individual purchase (ie. outside project requirements).

4.3 OPERATIONAL PLAN

The Operational Plan will implement the Strategic Plan through a coordinated mechanism that is able to supply current and future seed requirements. It is important that existing infrastructure and resources are utilised as this coordinating structure is developed.

It is proposed that the first network – termed the *Revegetation Network* will be operating from the CCMA and will include all the project coordinators encompassing landcare, NRE, CCMA, GAV, local government and other associated individuals. The main function of this network will be to calculate and provide information to the second network (the Supply Network) of the specific seed requirements for revegetation projects planned within the Corangamite region.

4.31 Revegetation Network

KEY COMPONENTS: ** Revegetation Network Coordinator*
** Revegetation Network*

It is proposed that the Revegetation Network will be coordinated by a Regional Revegetation Coordinator whose job is to:

- Develop and coordinate the Revegetation Network with the appropriate stakeholders;
- Work with the Network members to define the seed and plant material demands for Corangamite's major revegetation works/projects, a minimum of 18 months prior to scheduled project implementation dates;
- Develop a register of all Landcare and strategic vegetation projects using the above information;
- Document on this register, all revegetation seed demand information. Seed requirements are to be calculated using all available tools as appropriate (including FloraBank Guidelines, revegetation technique seed calculators, available EVC guides, revegetation lists) in conjunction with establishing anticipated locations and sizes of revegetation sites and the species and provenances of seed required;
- Define and maintain, minimum seed supply standards for revegetation works, designed to maximise biodiversity outcomes for the region;
- Define project information in a consistent format identifying species, harvested weights, locality, EVC's, etc;
- Communicate this information to Supply Coordinator;
- Monitor the ordering of seed and plants by project officers and the Supply Coordinator. Landcare project officers coordinating a project will be able to order approved species and seed directly from nurseries and collectors or will be able to place orders through the Revegetation Network Coordinator to the Supply Coordinator;
- Collate information of project delivery outcomes for the region;
- Coordinate the monitoring and evaluation of revegetation project sites throughout the region;
- Use information from the monitoring and evaluation of sites to modify and improve the seed information process in future years;
- Ensure that seed and plant utilisation in the field are maintained in a database for future reference;
- Identify from the information available the possibility of establishing Seed Production Areas for future seed collection.
- Disseminate technical information on maximising success of revegetation activities and encourage experienced practitioners to the share site-specific technique information with other project officers.

It is recommended that the dedicated Revegetation Network Coordinator role, be a full-time position funded through regional investment programs (refer to section ***4.4 FUNDING***).

The supply of seed & plants to all projects supporting the Regional Catchment Strategy (ie. typically all projects funded through the CMA) can be serviced through either local indigenous nurseries or satellite or central seedbanks. The coordination of this flow of materials to projects must be processed through the Revegetation Network to ensure coordinated supply. Issues of quality assurance regarding the sourcing of seed for revegetation projects will be an overseeing responsibility for the Revegetation Coordinator. Their job will involve ensuring that the suppliers of seed and plants have systems that appropriately process and catalogue information on native seed supply and that they are provided with technical support to fulfill FloraBank standards of seed supply.

4.32 Supply Network (Seed & Plant Supply)

KEY COMPONENTS: ** Supply Network Coordinator*
** Central Seedbank*
** Satellite Seedbanks*

The function of the second network – the *Seed and Plant Supply Network (Supply Network)* will be to coordinate the collection, storage and dissemination of seed, ensure the coordinated pre-ordering of both seed and plant stock from seed collectors and nurseries.

It is proposed that this network will be coordinated by a CCMA employed, Supply Coordinator whose job will be to:

- Coordinate collection of seed for projects as defined by project delivery orders identified through the Revegetation Network;
- Maintain a database of the regional seed supply system detailing the storage and dissemination of seed from the central and accredited satellite seedbanks of the region;
- Supply technical advice and assistance to satellite seedbanks;
- Coordinate management of short-term, satellite seedbank facilities;
- Coordinate the central seedbank;
- Develop project location information – soil type, position in landscape, species required, acceptable provenances (ie. distance from site where seed is acceptable) for project planners to prepare seed requirements;
- Provide a map of project site locations throughout the region;
- Keep a register of revegetation sites having known seedlot inputs, to allow for their future use as seed collection areas;
- Oversee the establishment of Seed Production Areas of selected species appropriate for the region eg. rare or species difficult to collect from existing remnant patches.

Central Seedbank

It is proposed that a central seedbank will function to provide not only the seed storage facilities and amenities (batching, cataloguing, quality control, stock monitoring, etc.) but also will provide a coordination role for the provision of seed at a regional level.

It is considered important to utilise existing structures, experience and knowledge already existing in the region. The Ballarat Region Seedbank has existing infrastructure, expertise, operational databases and supply processes, for the region coordination of seed supply. It also has experience in coordinating and processing large seed collection orders and processing over one tonne of provenanced seedlots per annum. It is a registered business entity, has an ABN, is GST registered, has separate financial accounts and is efficient in prompt payment of collectors.

Although providing seed supply services to the western region of the Corangamite catchment, the Portland Seedbank is less experienced with large-scale, regional seed supply coordination than has been achieved by the Ballarat Region Seedbank over the past few years through servicing both the Corangamite and North-central CMA regions. The Portland Seedbank would however play an important support role as a key satellite seedbank to Ballarat under the proposed framework structure, with an increasing level of coordination responsibility as seed supply volume and experience increases.

The Ballarat Region Seedbank operates a database system that is part of the Greening Australia Victoria's Seed Supply System. This system contains a provenanced seed information database as well as standardised, field data collection sheets based on FloraBank Guidelines and other technical information relating to seed. Feedback sheets for the users of seedlots are also included to capture the information on where seedlots material is established in the field. Also included with the software are FloraBank Guidelines (widely accepted as a national standard for seed supply) and a seed collection and storage training package.

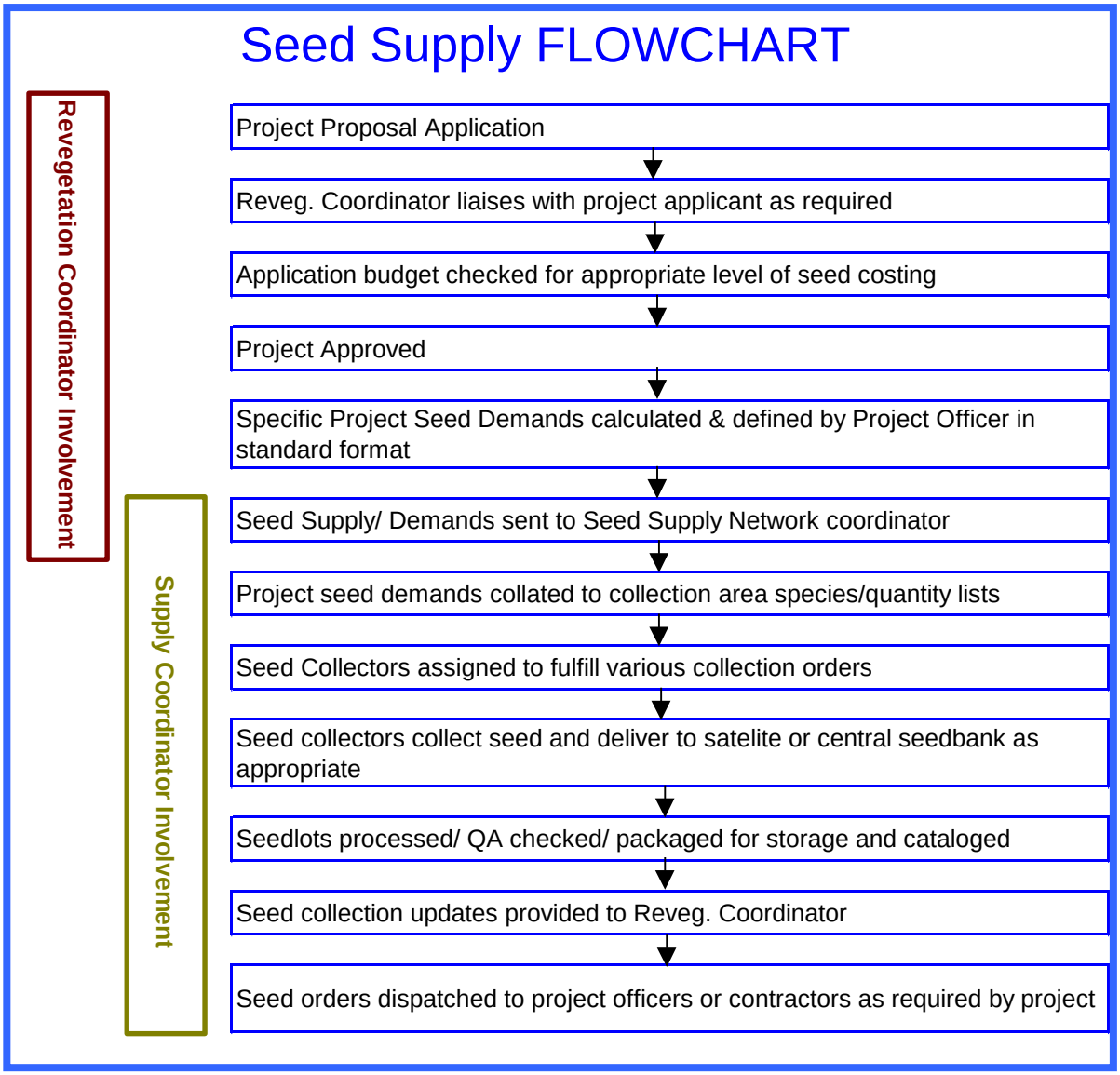
It is strongly recommended that a standardised data management system such as the Greening Australia Victoria, Seed Supply System, be used by the central and satellite seedbank of the Corangamite region.

Satellite Seedbanks

It is an important aspect of this infrastructure that Satellite Seedbanks maintain local ownership and contact with the project area from which the seed has been collected. Preferably these facilities should be managed by an appropriate Landcare group member or project officer, operating locally eg. employee of GAV, Local Government, Private Operator, CMA, NRE, etc. Where appropriate the satellite seedbank could be set up and operated out of an existing private business (indigenous nursery or seed collector). In this circumstance, the private operator would manage the function of the seedbank with input from the Landcare network. However, all satellite seedbanks must conform to a minimum standard of seed storage conditions appropriate for the shorter-term storage of seed and clearly identified through the Supply Network.

These satellite seedbanks will be used for **short-term seed storage only** and if any seedlot is not used within 12 months of collection, then it is to be sent to the central seedbank and kept for that project under appropriate long-term storage conditions. This will assist in prolonging the viability of collected seedlots and maintaining high levels of field performance.

The development and use of Satellite Seedbanks however, is not in any way intended to deny private collectors, nurseries or others of their current practice of collecting and storing their own seed. Collaborative arrangements with established collectors and nurseries to act as satellite seedbanks to store the seed of local projects should be embraced. Seed storage areas are presently in use at Apollo Bay, Geelong, and the Heytesbury.



4.4 FUNDING.

To institute this proposal, investment funding will be needed to support the following activities:

4.41 Revegetation Network Coordinator

This is anticipated to be a full-time position working out of the CCMA with the job description as outlined above, for which regional investment funding will be required. Regional investment for this position is likely to form part of funding bids to support regional infrastructure submitted at a state and/or federal levels eg. funding through National Action Plan or Natural Heritage Trust Mk.2. Sponsorship opportunities also exist for this position at both a regional and state levels eg. Greening Australia Victoria is currently pursuing corporate sponsorship in this area.

4.42 Supply Network Coordinator

This is anticipated to be a full time position financed by the CCMA but managed by either the CCMA or other appropriate organisation eg. Greening Australia Victoria. The location of this role would be best placed at the central seedbank. Funding for services provided by this position should be partly generated through individual project budgets reflecting the 'true cost' of supplying local native seed ie. the difference between the cost of seed charged to projects, less the price paid to seed collectors, equals the costs of the services provided by this position. However, many of the coordination duties of this position, as outlined in section 4.32, will require an additional funding allocation directly from the CCMA.

4.43 Purchase of Seed

Funding for purchase of seed from local collectors should come from projects, reflecting the true cost of providing of the necessary provenanced seedlot, collected in a sustainable and environmental sensitive manner. Realistic costing for quality seed should be built into budgets as projects are developed. Guidelines on costing for seed should be provided to groups and networks developing projects. (This information will be a product of the proposed revegetation network.)

4.44 Central Seedbank

The central seedbank is vital to the success of this proposed structure. Adequate resourcing of projects should enable substantial recovery of the costs of seedbank operation. It is proposed that the funded Supply Coordinator position be based at Corangamite's central seedbank, with duties split between coordinating the supply network and managing central seedbank operations. The funding of capital improvements and maintenance of facilities may need to be sourced externally.

4.45 Seed Storage Facilities

The proposed 'satellite' storage facilities will be linked to projects. The management of these facilities should be the responsibility of the relevant project officer/ Landcare coordinator and would therefore be funded as part of local project funding. Supporting capital funding for these locally-based facilities will also need to be provided, to ensure that seed will not suffer a loss in quality during storage.

If existing facilities are utilised for satellite seedbanks, regional funding assistance may be required to upgrade them where necessary, to achieve acceptable standards for seed storage as identified by Florabank Guidelines. The Revegetation or Supply Coordinator will provide technical advice and support to assist operators of the Satellite Seedbanks in the upgrading facilities. Both Coordinators will have a role to play in ensuring quality standards are maintained across all regional seedbank facilities, including issues of moisture, light & temperate management, insect control, and information management.

4.46 Operational Issues

Various Operational Issues were highlighted during the planning of this Framework. The following list of issues has been included to identify a number of key factors that need to be embraced within the implementation of the proposed Seed Supply Framework for Corangamite:

Regional Technical Information Register

Various databases are already in existence that provide valuable information on aspects of seed supply. Notably, FloraData is an Australia-wide, MS Access database that contains useful germination and propagation tips for the establishment of native plant material.

However, cultural preferences of native species tend to vary at a regional or landsystem level. Some local populations of species of the Corangamite region eg. *Phebalium squameum, Pimelia axiliflora, Correa laurenciana* et al, are difficult to propagate. Others such as *Pittosporum bicolor, Coprosma quadrifida* and *Notolea ligustrina* have long germination times. Still others, such as *Pomaderris aspera* and *Nothofagus cunninghamina* produce seed that is difficult to assess when ready for collection. These difficulties have to be taken into account in calculating the timing of seed supply to projects and information one how to better manage these plants, shared widely throughout the Seed Supply Network.

Similarly, more work is required to develop efficient and effective seed cleaning techniques and recommendations of best practice widely distributed. Innovative ideas to clean bulk seedlots should be encouraged and a regional database of seed collecting times, cleaning methods, storage and germination techniques, established.

Regional Access to Equipment

Access to seed harvesting and seed cleaning equipment needs to be considered at a regional level to allow for efficient use of available resources. An equipment inventory for the Corangamite region should be compiled and then access to the use of equipment coordinated through the Seed Supply Network.

Equipment can be either:

- centrally located in each sub-catchment on a pick-up and return hire basis by collectors/ groups, or
- established as portable tool kits/ trailers, owned by local shires or CCMA, to be booked for hire throughout the region (modelled on the Greening Australia Victoria, Community Tool Trailer hire system).

Collection timing database

Collection timings for species vary seasonally and in different landsystems across the region. A useful tool for the planning and coordination of seed collection in Corangamite is the creation of a seed collection timing database. This database would be compiled progressively by the Seed Supply Coordinator based on actual collection information gathered through the processing of seedlots through the central seedbank database.

Greening Australia's Seed Supply System software allows for the capture of seedlot collection information (including collection timing) and could be used to build this important information resource for the region.

Seed Production Areas

Seed Production Areas are required for the sustainable supply of provenanced seed to satisfy the Region's revegetation demands. Degradation of remnant vegetation, especially those patches containing rare and threatened plants, can easily occur though over-collection and/ or extended harvesting of seed from the same plants year after year.

It is recommended that revegetation projects be required to allocate a portion of their total seed budget, to invest in the development of Seed Production Areas for the region. In this way, the users of seed can contribute to the sustainable supply of provenanced material for future revegetation projects.

Seed Production Areas (SPA) must be planned and well designed in both species and populations represented. Single species, easily harvestable 'block plantings' are preferred rather than mixed species 'revegetation style' plantings as are typically established. Species targeted in the first instance should be those that are less common or difficult to collect. Understorey, grassland, herbs, ferns, etc. are obvious choices for SPA development because of their poor representation in current revegetation (due to lack of availability) and being typically smaller plants, would require less land space to develop a critical mass to use as a SPA.

The development of Seed Production Areas for Corangamite should be coordinated through the Seed Supply Network.

Opportunistic Collection

As the delivery of revegetation projects requires seed of appropriate species and provenance to be available within project delivery timelines, seed collection should be occur using two complementary approaches:

- **Coordinated collection** – planned seed collection specific to fulfilling the demands of projects (although often limited by project timelines and seasonal variations in seed crops loads), and

- **Opportunistic collection** – to take advantage of a readily available sources of seed that are not specifically collected for a current project.

Seed crop development varies significantly from year to year. The bounty of seed produced in years when species seed prolifically is an opportunity that should not be missed. Speculative seed collection should occur in 'the good years' and stored within seedbank facilities for the inevitable years when seed production is low.

In a similar vain, if vegetation is damaged, destroyed by storms or planned for removal for road construction etc. all seed held on fallen branches or otherwise discarded vegetation should be harvested for use. Communication with contractors performing vegetation clearance for powerlines, fire management or road construction etc. can reveal many seed collection opportunities for the region.

It is recommended that the Seed Supply Coordinator be a point of liaison to communicate with contractors on vegetation removal.

Symbiotic plant associations

Often the less obvious lifeforms in the environment are overlooked during environmental restoration activities. Fungi, bacteria and bryophytes etc. frequently form symbiotic relationships with higher plant life that can contribute significantly to plant germination, establishment success rates, growth of plant material, etc. Work is continuing with organisations such as CSIRO and Greening Australia into the practical field use of beneficial fungi and bacterial inoculants.

Although not appropriate to be a key focus for the Corangamite region, it is recommended that the Supply Network Coordinator maintains contact with organisations performing such research and distributes appropriate information on advances in this area as it becomes available.

5.0 REFERENCES

CCLPB (1997). *Corangamite Regional Catchment Strategy.* Corangamite Catchment and Land Protection Board, Colac.

CCMA (2000). *Draft Corangamite Native Vegetation Plan.* Corangamite Catchment Management Authority, Colac.

NRE (1999). *Restoring our Catchments, Victoria's Draft Native Vegetation Management Framework.* Department of Natural Resources and Environment, Melbourne.

6.0 APPENDICES

6.1 Appendix 1 – Key Stakeholders in the Corangamite Region

6.2 Appendix 2 – Seed Supply Survey - INTERVIEW QUESTIONNAIRE

6.3 Appendix 3 – GLOSSARY