



Environmental Defenders' Office  
AUSTRALIAN CAPITAL TERRITORY



The Committee Secretary  
Standing Committee on Environment and Transport and City Services  
Legislative Assembly for the ACT  
GPO Box 1020  
Canberra ACT 2601

3 June 2019

By email: [LACommitteesETCS@parliament.act.gov.au](mailto:LACommitteesETCS@parliament.act.gov.au)

Dear Committee Secretary,

**Nature in our City: Environmental Defenders Office ACT Additional Comments**

Dear Committee,

Further to EDO ACT's oral submissions to the Standing Committee on Environment and Transport and City Services on Wednesday, 22 May 2019, the EDO ACT wish to make the following three points.

Firstly, with respect to tree protection in the ACT, we reiterate that the legislation (the *Tree Protection Act 2005*) can be improved to more effectively protect trees in the ACT, by more extensive consideration of conservation issues (such as tree habitat values) when assessing whether or not to remove a protected tree in the ACT. In addition, importance of trees as a carbon sinks should be added as a consideration, particularly given the ACT is the first jurisdiction in Australia to declare a climate energy.

We acknowledge that significant work was completed through the Office of the Commissioner for Sustainability and the Environment in 2011, in her "Report on the Investigation into the Government's tree management practices and the renewal of Canberra's urban forest". Several of the recommendations in that report are as relevant now as they were in 2011, including:

- As a high priority, the establishment of an ACT tree curator (Recommendation 4A) (agreed in principle by the ACT Government in 2012);
- As a high priority, develop a National capital—Canberra tree protection and management strategy; an ACT Government tree protection and management policies and procedures guide; and an across-agency Tree Network Committee to provide advice and coordination between agencies on tree management and community communication (Recommendation 5) (agreed in principle by the ACT Government in 2012);

1

Tel (02) 6243 3460  
Fax (02) 6243 3461

Email [edoact@edo.org.au](mailto:edoact@edo.org.au)  
Web [edoact.org.au](http://edoact.org.au)

GPO Box 574  
Canberra ACT 2601

ABN 32 636 009 247





**Environmental Defenders' Office**  
AUSTRALIAN CAPITAL TERRITORY

- As a high priority, strengthening communication and community engagement in relation to the treed landscape (Recommendation 9) (agreed in principle by the ACT Government in 2012).

Secondly, as discussed, please find attached Toronto Green Roof Bylaws discussed in our submissions (written and oral). The by-law applies to new commercial, institutional and residential development or additions greater than 2000m<sup>2</sup> in gross floor area. This is not a particularly large area, and not only would apply to high rises (for a comparison, the Community Legal Centre hub in the Templar building on 21 Barry Drive, Turner, is double storey building and has an estimated GFA in excess of 2000m<sup>2</sup>).

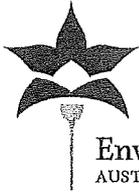
Lastly, the Standing Committee asked whether there were any existing laws that sought to not only protect the environment, but to improve its condition. We commented that current ACT environmental laws generally facilitate a "managed decline" rather than entirely protect or proactively seek to restore environmental features.

The Australian Panel of Experts on Environmental Law (APEEL) defines 'environmental restoration' to mean 'actions to initiate or facilitate the recovery of an ecosystem, in whole or in part, with respect to its integrity, health and sustainability' (Australian Panel of Experts on Environmental Law, *The Foundations of Environmental Law: Goals, Objects, Principles and Norms* (Technical Paper 1, 2017).

There are limited laws and regulations in the ACT that seek to improve the quality of our environment. Often "enhancement" or "restoration" of the environment is a broad, overarching objective, and is not supported or complemented by the legislation. One of the main objects of the *Nature Conservation Act 2014* is to "protect, conserve and enhance the biodiversity of the ACT" (section 6(1)), through "protecting, conserving, enhancing, restoring and improving nature conservation" (section 6(1)) (emphasis added). Provision is made in the *Nature Conservation Act* for the development of action plans for relevant species, ecological communities or key threatening processes. Action plans are to set out proposals to ensure, *as far as practicable*, the identification, protection and survival of a species/community, including identification of critical habitat, and management strategies "to ensure the persistence of the species". Here, the ACT law only affords protection "as far as practicable". Restoration is regularly included as part of action plans specific to species or ecological communities, however action plans are often unclear as to how to achieve restoration, and implementation is limited. For a general discussion of environmental restoration in Australian environmental law, including recommendations, please find attached the following article by Benjamin J Richardson, 'Reclaiming Nature: Eco-restoration of Liminal Spaces'.<sup>1</sup>

---

<sup>1</sup> (2015) 2 *Australian Journal of Environmental Law*.



**Environmental Defenders' Office**  
AUSTRALIAN CAPITAL TERRITORY

Should you have any questions or would like further information on the above, please do not hesitate to contact Stephanie Booker on 6243 3460 or [stephanie.booker@edoact.org.au](mailto:stephanie.booker@edoact.org.au).

Yours faithfully

Stephanie Booker  
**Principal Legal Officer**

TORONTO MUNICIPAL CODE  
CHAPTER 492, GREEN ROOFS

**Chapter 492**

**GREEN ROOFS**

ARTICLE I

**General**

§ 492-1. Definitions.

ARTICLE II

**Requirement for Green Roofs**

§ 492-2. Green roofs required.

§ 492-3. Maintenance of green roofs and health of vegetation.

§ 492-4. Permit required.

§ 492-5. Exemption.

ARTICLE III

**Application and Fees**

§ 492-6. Application for approval.

§ 492-7. Fees and charges.

ARTICLE IV

**Toronto Green Roof Construction Standard**

§ 492-8. Purpose of Toronto Green Roof Construction Standard: relation to Ontario Building Code.

§ 492-9. Toronto Green Roof Construction Standard: mandatory provisions.

ARTICLE V

**Approval of Application**

§ 492-10. Approval by Chief Building Official.

§ 492-11. Exemption or variation of coverage requirement for a green roof by the Chief Planner.

§ 492-12. Cash in lieu of construction of a green roof.

TORONTO MUNICIPAL CODE  
CHAPTER 492, GREEN ROOFS

ARTICLE VI  
**Green Roof Technical Advisory Group**

§ 492-13. **Green Roof Technical Advisory Group.**

§ 492-14. **Qualifications for Chair and members of the Green Roof Technical Advisory Group.**

§ 492-15. **Purpose of the Green Roof Technical Advisory Group.**

§ 492-16. **Recommendations of the Green Roof Technical Advisory Group.**

§ 492-17. **Meetings of the Green Roof Technical Advisory Group.**

ARTICLE VII  
**Changes to the Technical Standards**

§ 492-18. **Changes to technical standards.**

ARTICLE VIII  
**Chief Building Official to Publish Guideline**

§ 492-19. **Chief Building Official to publish guideline.**

ARTICLE IX  
**Miscellaneous**

§ 492-20. **Offences.**

§ 492-21. **Penalty.**

[History: Adopted by the Council of the City of Toronto May 27, 2009 by By-law 583-2009.<sup>1</sup>  
Amendments noted where applicable.]

**General References**

Building construction and demolition - See Ch. 363.  
Development of land - See Ch. 415.  
Building Code Act, 1992 - See S.O. 1992, c. 23.  
City of Toronto Act, 2006 - See S.O. 2006, c. 11, Sched. A.  
Nursing Homes Act - See R.S.O. 1990, c. N.7.  
Planning Act - See R.S.O. 1990, c. P.13.  
Weed Control Act - See R.S.O. 1990, c. W.5.

---

<sup>1</sup> Editor's Note: This by-law was passed under the authority of section 108 of the City of Toronto Act, 2006, S.O. 2006, c. 11.

TORONTO MUNICIPAL CODE  
CHAPTER 492, GREEN ROOFS

ARTICLE I  
**General**

**§ 492-1. Definitions.**

As used in this chapter, the following terms shall have the meanings indicated:

**APPLICABLE LAW** - Shall have the same meaning as defined in sentence 1.4.1.3(1) of Division A of the Building Code.

**APPLICANT** -The owner of a building or property who applies for a permit or any person authorized by the owner to apply for a permit on the owner's behalf.

**AVAILABLE ROOF SPACE** - The total roof area of the building or building addition excluding:

- A. Areas designated for renewable energy devices;
- B. Private terraces no greater in area than the floor of the abutting residential unit at the roof level; and
- C. In the case of a residential building or a building addition to a residential building, the Required Outdoor Amenity Space. [**Amended 2012-11-29 by By-law 1598-2012**]

**AVERAGE GRADE** - The average elevation of the ground surface measured at the street property line.

**BASEMENT** - The portion of a building between the first floor and any floor below the first floor.

**BUILDING CODE, ONTARIO BUILDING CODE or OBC** - Means or refers to Ontario Regulation 350/06 as amended, under the Building Code Act, 1992.

**CHIEF BUILDING OFFICIAL** - The Chief Building Official and Executive Director, Toronto Building.

**CHIEF PLANNER** - The Chief Planner and Executive Director, City Planning.

**COMPLETE BUILDING PERMIT APPLICATION** - An application submitted to the Chief Building Official for an above grade building permit which complies with all technical requirements of the Building Code Act, 1992, and includes the payment of all applicable fees.

**COMPLETE SITE PLAN APPLICATION** - An application submitted to the Chief Planner for site plan approval pursuant to section 114 of the City of Toronto Act, 2006, and section 41 of the Planning Act, and includes the payment of all applicable fees and the submission of all supporting documentation as may be required by the Chief Planner or his delegate.

TORONTO MUNICIPAL CODE  
CHAPTER 492, GREEN ROOFS

**COOL ROOFING MATERIALS** - With reference to an Industrial Building or building addition, means roofing materials with a minimum Solar Reflectance Index ("SRI") of 78. [Added 2011-12-01 by By-law 1381-2011; amended 2013-10-11 by By-law 1244-2013]

**FIRST FLOOR** - The floor of a building closest to average grade.

**FLOOR PLATE AREA** - The total area of a floor of a building, measured from the exterior of the main wall of the floor level, including voids at the level of the floor, such as an atrium, mezzanine, stairwell, escalator, elevator, ventilation duct or utility shaft.

**GRADE** - The finished ground level of the land upon which the building is located.

**GREEN ROOF** - An extension of an above grade roof, built on top of a human-made structure, that allows vegetation to grow in a growing medium and which is designed, constructed and maintained in accordance with the Toronto Green Roof Construction Standard.

**GROSS FLOOR AREA** - The total area of each floor level of a building, above and below average grade, measured from the exterior of the main wall of each floor level, including voids at the level of each floor, such as an atrium, mezzanine, stairwell, escalator, elevator, ventilation duct or utility shaft, but excluding areas used for the purpose of parking or loading

**HEIGHT** - The vertical distance measured between a horizontal line drawn from the average grade to the highest point on the building, but shall not include the following elements located on a roof of the building:

- A. Equipment used for the functional operation of the building, such as electrical, utility, mechanical and ventilation equipment;
- B. Structures or parts of the building that are used for the functional operation of the building, such as enclosed stairwells, roof access, maintenance equipment storage, elevator shafts, chimneys, vents and water supply facilities;
- C. Structures that enclose, screen or cover the elements listed in Subsections A and B above;
- D. A flagpole;
- E. An antenna; and
- F. A satellite dish, provided that no part of such element shall exceed a vertical distance of 25 metres measured from average grade, and further provided that in the case of the elements listed in Subsections A, B and C above, the total area of all of those elements together shall not cover more than 30 percent of the area of the roof.

**HOTEL** - A commercial establishment offering temporary accommodations on a daily or weekly rate to the public, and where all rooms, suites, apartments or similar forms of accommodation are owned by a single owner or entity.

TORONTO MUNICIPAL CODE  
CHAPTER 492, GREEN ROOFS

INDUSTRIAL BUILDING - A building or a building addition exclusively used or designed or intended for use for or in connection exclusively with the manufacturing, producing or processing of goods, warehousing or bulk storage of goods, self-storage facility, distribution centre, truck terminal, research and development in connection with manufacturing, producing or processing of goods, and:

- A. Includes office uses and the sale of commodities to the general public where such uses are accessory to and subordinate to an industrial use;
- B. Does not include:
  - (1) A building used exclusively for office or administrative purposes unless it is attached to an industrial building as defined above; or
  - (2) Warehouse clubs and retail warehouses, including commercial establishments which have as their principal use the sale of goods and merchandise in a warehouse format.

NURSING HOME - A building or portion of a building licensed as a nursing home under the Nursing Homes Act.

PODIUM - The base of a building consisting of a base and a tower above the base where the base is two storeys or greater.<sup>2</sup>

PRIVATE TERRACE - Outdoor amenity area on a roof that is available exclusively for use by the occupants of an abutting residential unit for recreational or social activities.

RENEWABLE ENERGY - Energy obtained from solar energy or wind energy.

REQUIRED OUTDOOR AMENITY SPACE - An area located on the roof of a building, intended for recreational use by the residents of the building, but does not exceed the minimum area required under the applicable zoning by-law for the building for outdoor amenity space.  
**[Added 2012-11-29 by By-law 1598-2012]**

RESIDENTIAL BUILDING - A building or building addition where more than 60 percent of the gross floor area of the building or building addition is used, designed or intended to be used for one or more dwelling units, including accessory uses naturally and normally incidental in purpose and exclusively devoted to the residential use, but does not include a nursing home, retirement home or lodge, or hotel.

RETIREMENT HOME OR LODGE - A building or portion of a building which provides room and board accommodation for senior citizens and is not presently governed under any Provincial Act.

---

<sup>2</sup> Editor's Note: The definition for "Outdoor Amenity Space" was deleted November 29, 2012 by By-law 1598-2012.

TORONTO MUNICIPAL CODE  
CHAPTER 492, GREEN ROOFS

ROOF - The overhead structural component of a building or a part of a building supported by walls or columns and which functions primarily to shelter the interior of the building from the effects of weather and the infiltration of water.

SOLAR ENERGY - Energy from the sun that is converted to produce electrical or thermal energy.

SOLAR REFLECTANCE INDEX - With reference to an Industrial Building or building addition, is a measurement of a roof's ability to reject solar heat, where a reference black roof (solar reflectance 0.05, thermal emittance 0.90) is 0 and a reference white roof (solar reflectance 0.80, thermal emittance 0.90) is 100. [Added 2011-12-01 by By-law 1381-2011]

STOREY - The portion of a building, other than a basement, between any floor level and the floor, ceiling or roof immediately above it.

STREET - A public highway.

TORONTO GREEN ROOF CONSTRUCTION STANDARD - The minimum mandatory standards for construction of a green roof as set out in Article IV of this chapter.

TOWER - The portion of a building above the podium of the building, where the tower portion of the building is at least 12 storeys.

TRANSIT BUILDING - The premises or facilities, excluding tracks and tunnels between buildings, for the use and operation of a mass transit system or a transportation system that is provided by, or on behalf of, the City of Toronto, Province of Ontario or Government of Canada, or is privately operated and Federally regulated. [Added 2017-11-09 by By-law 1273-2017]

TRANSIT LINE - A contiguous, discrete group of Transit Buildings connected by a mass transit system or transportation system that is provided by, or on behalf of, the City of Toronto, Province of Ontario or Government of Canada, or is privately operated and Federally regulated. [Added 2017-11-09 by By-law 1273-2017]

VEGETATION - Plants selected in accordance with the plant selection criteria of the Toronto Green Roof Construction Standard.

WIND ENERGY - Energy from the wind that is converted to produce electrical energy.

ARTICLE II  
**Requirement for Green Roofs**

**§ 492-2. Green roofs required.**

- A. Every building or building addition constructed after January 30, 2010, with a gross floor area of 2,000 square metres or greater shall include a green roof with a coverage of available roof space in accordance with the following chart:

TORONTO MUNICIPAL CODE  
CHAPTER 492, GREEN ROOFS

<b>Gross Floor Area (Size of Building)</b>	<b>Coverage of Available Roof Space (Size of Green Roof)</b>
2,000 - 4,999 square metres	20 percent
5,000 - 9,999 square metres	30 percent
10,000 - 14,999 square metres	40 percent
15,000 - 19,999 square metres	50 percent
20,000 square metres or greater	60 percent

and no person shall construct a green roof or cause a green roof to be constructed unless a permit therefor has been issued by the Chief Building Official. Notwithstanding the foregoing, where a development consists of two or more buildings under a Complete Site Plan Application and the buildings are to be constructed on a phased basis, the first phase of the development shall comply with the Green Roof requirements of this chapter for the building permit being issued and any Green Roof area provided in excess of the minimum Green Roof area required may be applied to subsequent phases of the development. **[Amended 2012-11-29 by By-law 1598-2012]**

- B. Every building or building addition consisting of a tower above a podium, where no storey in the tower above the podium level has a floor with a floor plate area exceeding 750 square metres, shall be permitted to provide the required green roof area on available roof space at the podium roof level or levels and the roof area of the tower shall not be considered as part of the available roof space for a green roof.
  
- C. In the case of an Industrial Building or a building addition to an Industrial Building, constructed after April 29, 2012, with a Gross Floor area of 2,000 square metres or greater, the provisions in Subsection A above shall not apply, but the building or addition shall include: **[Amended 2011-02-08 by By-law 182-2011; amended 2011-12-01 by By-law 1381-2011]**
  - (1) a Green Roof with a minimum coverage of Available Roof Space that is equal to the lesser of 2,000 square metres or 10 percent of the Available Roof Space of the building or addition; or; **[Amended 2012-11-29 by By-law 1598-2012]**
  
  - (2) a roof that uses Cool Roofing Materials for 100% of the Available Roof Space and complies with the stormwater management performance measures required through the Site Plan Approval process, pursuant to Section 114 of the City of Toronto Act, 2006, or where Site Plan Approval is not required, retains or collects for re-use at least the first 5 millimetres from each rainfall or 50 percent of annual rainfall volume falling on the roof through systems that incorporate roof surfaces.

TORONTO MUNICIPAL CODE  
CHAPTER 492, GREEN ROOFS

- D. In the case of a Transit Line, the requirements of Subsection A which would otherwise have applied to each individual Transit Building in the Transit Line may be consolidated such that the total green roof coverage required for all the Transit Buildings in the Transit Line combined may be provided on one or more Transit Buildings in the Transit Line to the satisfaction of the Chief Planner or designate. [Added 2017-11-09 by By-law 1273-2017]

**§ 492-3. Maintenance of green roofs and health of vegetation.**

Every green roof required to be constructed pursuant to this chapter shall be maintained in accordance with the maintenance plan required in the Toronto Green Roof Construction Standard.

**§ 492-4. Permit required.**

- A. No person shall construct, or cause to be constructed, a green roof required pursuant to this chapter unless a permit has been obtained from the Chief Building Official in accordance with the requirements of this chapter.
- B. No person shall materially alter, or cause to be materially altered, a green roof required pursuant to this chapter unless a permit has been obtained from the Chief Building Official in accordance with the requirements of this chapter.
- C. Where a green roof is constructed in conjunction with a building or building addition the Chief Building Official may issue a single permit under section 8 of the Building Code Act, 1992, for the building or building addition and for the green roof.
- D. Where a green roof is proposed although not required under this chapter no person shall construct a green roof or cause a green roof to be constructed unless a permit has been obtained from the Chief Building Official in accordance with the Toronto Green Roof Construction Standard.

**§ 492-5. Exemption.**

- A. Section 492-2 does not apply to a building or building addition if:
- (1) A complete building permit application in accordance with section 8 of the Building Code Act, 1992, has been submitted for the building or building addition prior to January 31, 2010; or
  - (2) A complete site plan application has been submitted for the building or building addition prior to January 31, 2010.
- B. Section 492-2 does not apply to a residential building or building addition to a residential building with a height less than or equal to the greater of six storeys or 20 metres.

TORONTO MUNICIPAL CODE  
CHAPTER 492, GREEN ROOFS

- C. Section 492-2 does not apply to an industrial building or building addition to an industrial building constructed prior to April 30, 2012. [**Amended 2011-02-08 by By-law 182-2011**]
- D. Section 492-2 does not apply to commercial greenhouses located at grade, temporary structures and air supported structures. [**Added 2012-11-29 by By-law 1598-2012**]

ARTICLE III  
**Application and Fees**

**§ 492-6. Application for approval.**

An application for a permit for construction of a green roof shall be made to the Chief Building Official on forms, including a "Green Roof Declaration Form," that may be prescribed by the Chief Building Official from time to time. The "Green Roof Declaration Form" may require information including, but not limited to: structural design; intended use of the roof and whether or not it will be accessible to the public; and fire safety provisions.

**§ 492-7. Fees and charges.**

- A. Where an application for a required green roof is made in conjunction with an application for a permit for construction of a building or building addition under section 8 of the Building Code Act, 1992, there shall be no additional fee for the green roof.
- B. Where an application for a permit is made for an alteration or renovation to construct a green roof, the fee for the application shall be the same as for the building permit classification "Re-Roofing with structural work, raise roof structure" provided in Chapter 363, Building Construction and Demolition.

ARTICLE IV  
**Toronto Green Roof Construction Standard**

**§ 492-8. Purpose of Toronto Green Roof Construction Standard: relation to Ontario Building Code.**

- A. The purpose of the Toronto Green Roof Construction Standard is to set out minimum requirements for the construction and maintenance of green roofs. The design and construction of a green roof shall meet the City's minimum requirements for green roof construction while also meeting the Ontario Building Code (OBC) requirements. The Toronto Green Roof Construction Standard does not replace or alter any existing OBC requirements, or define a singular code-compliant green roof design.
- B. A designer of a green roof shall apply the measures described in this article with reference to the principles governing the OBC requirements related to each measure.

TORONTO MUNICIPAL CODE  
CHAPTER 492, GREEN ROOFS

- C. This article is considered an acceptable solution for the design and construction of a green roof in addition to the acceptable solutions contained in parts 3 to 12, Division B, of the OBC. Designs shall meet the OBC objectives to demonstrate compliance with the OBC; however a design that complies with the provisions of § 492-9 shall be deemed to comply to such objectives.
- D. A green roof designed to the Toronto Green Roof Construction Standard may be constructed on both combustible and non-combustible buildings.

**§ 492-9. Toronto Green Roof Construction Standard: mandatory provisions.**

The following standards shall be met in the design and construction of a green roof:

A. Green roof assembly.

A green roof assembly shall, as a minimum, consist of a root repellent system, a drainage system, a filtering layer, a growing medium and plants, and shall be installed on a waterproof membrane of an applicable roof.

B. Gravity loads.

- (1) The applicant shall calculate green roof gravity loads following the protocol provided by the ASTM standard: "ASTM E2397.05 - Standard Practice for Determination of Dead Loads and Live Loads Associated with Green Roof Systems."
- (2) The density of the growing media shall be determined:
  - (a) In accordance with "ASTM E2399.05 - Standard Test Method for Maximum Media Density for Dead Load Analysis of Green Roof Systems"; or alternatively
  - (b) The designer may use an un-factored, saturated density of the growing media of 2,000 kg/m<sup>3</sup>.
- (3) The applicant shall include design loads definition as part of the "Green Roof Declaration" form which shall be required as part of an application for building permit.

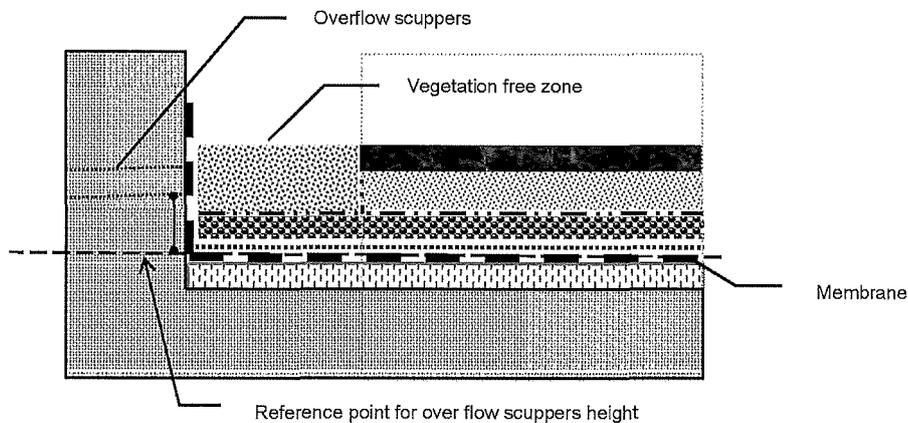
C. Slope stability.

All roofs with slopes in excess of 10° (17 percent) that support green roof assemblies shall incorporate anti-shear measures.

D. Parapet height and/or overflow scupper locations.

TORONTO MUNICIPAL CODE  
CHAPTER 492, GREEN ROOFS

- (1) Parapets and scuppers shall be specified in the design, as required, to limit retained rain water loads to within structural limits in the event of obstructed internal drains.
- (2) Analysis shall be done in conformance with OBC Division B 4.1.6.4.(4).(3).
- (3) The referenced point for the overflow scuppers height must be clearly indicated to avoid the possibility of confusing the overflow scupper height as being measured above the finished green surface or other layer above the waterproofing resulting in higher water load than accounted for by the design as indicated in the sketch below.



E. Wind uplift.

The applicant shall provide a report, stamped by an engineer, providing wind uplift pressures being designed for (including a description of how the pressures were determined), and describing how the design addresses these pressures.

F. Fire safety.

Where roof penetrations, intersecting walls, parapets, upturns or mechanical equipment are clad with combustible materials the design shall include a vegetation-free border zone abutting such features and the vegetation-free border shall be equal to the vegetation height at maturity but in no case be less than 0.5 metres.

G. Occupancy and safety.

The applicant shall state, in a green roof declaration form and the green roof application, the use of the roof and whether or not it will be accessible to the public.

TORONTO MUNICIPAL CODE  
CHAPTER 492, GREEN ROOFS

H. Waterproofing.

- (1) The design and construction shall include the installation of a root barrier in all vegetated roofing systems.
- (2) Immediately prior to installation of the green roof, the applicant shall cause to be conducted one of the following leakage testing protocols:
  - (a) Flood test;
  - (b) Electric field vector mapping;
  - (c) Impedance test;
  - (d) Infrared (IR) thermal imaging;
  - (e) Low voltage testing;
  - (f) High voltage testing;
  - (g) Moisture sensors;

and a report documenting a successful test, signed by an architect or engineer, shall be provided to the Chief Building Official.

I. Drainage.

- (1) The design hydraulic load shall be evaluated assuming that the green roof system is fully saturated prior to the maximum fifteen-minute rainfall.
- (2) Positive slope to drain shall be provided at the level of the waterproofing membrane.
- (3) The system shall permit effective drainage beneath the growth media.
- (4) Vegetation-free zones shall be provided around all drains.

J. Water retention.

- (1) Water retention mats or equivalent materials shall be employed as required to promote vegetation growth.
- (2) The drainage layer shall be appropriate for storm water retention and must be selected following "ASTM E2398-05 Standard Test Method for Water Capture and Media Retention of Geo-composite Drain Layers for Green Roof Systems."

TORONTO MUNICIPAL CODE  
CHAPTER 492, GREEN ROOFS

K. Vegetation performance.

In order to support plant survivability:

- (1) When structurally possible, the growing media shall be at a minimum 100 millimetres; or
- (2) The applicant shall provide a report confirming that the engineered system as designed provides plant survivability comparable to that of an un-irrigated system with growing media at minimum 100 millimetres.

L. Plant selection.

- (1) Vegetation on a green roof shall not include any noxious weeds as defined in Ontario Regulation 1096 under the Weed Control Act, as may be amended from time to time.
- (2) The plant selection and design shall be such that within three years of the planting date the selected plants shall cover no less than 80 percent of the vegetated roof.
- (3) Compliance with the plant coverage required in the preceding sentence can be satisfied by a design that will provide one or more of the following:
  - (a) That seeds for groundcover plantings shall be sown at a rate not less than 325/m<sup>2</sup>;
  - (b) That cuttings shall be distributed not less than 12kg/100m<sup>2</sup>; and
  - (c) Either that pre-grown plugs shall be installed not less than 11/m<sup>2</sup> or a report from the designer that describes how the design fulfills this coverage requirement shall be provided with the application.

M. Irrigation.

Adequate measures shall be provided to permit irrigation necessary to initiate and sustain the vegetation during the service life of the green roof.

N. Maintenance plan.

- (1) The applicant shall develop a maintenance plan for the green roof as per CSA-S478-95 "Guideline on Durability in Buildings" which shall define programs of routine maintenance and inspection sufficient to ensure that the green roof components perform their required functions for the duration of their design service lives.

TORONTO MUNICIPAL CODE  
CHAPTER 492, GREEN ROOFS

- (2) The maintenance plan shall address the requirements of the specified growth media and vegetation for vegetation survival.
- (3) The maintenance plan shall address re-planting, in the event that re-planting should become necessary, and assure that complete coverage at canopy level is achieved within three growing seasons and maintained for the service life of the green roof.
- (4) The maintenance plan shall be submitted with the application for a permit for a green roof.

ARTICLE V  
**Approval of Application**

**§ 492-10. Approval by Chief Building Official.**

The Chief Building Official shall approve an application for construction of a green roof that conforms to this chapter by issuing a permit in accordance with section 8 of the Building Code Act, 1992, in conjunction with an application for construction of a building or structure that includes a green roof.

**§ 492-11. Exemption or variation of coverage requirement for a green roof by the Chief Planner.**

**[Amended 2012-11-29 by By-law 1598-2012]**

- A. If an applicant is unable to provide the green roof coverage as required in this chapter, application may be made to the Chief Planner for either a complete exemption to the requirement to provide a green roof or to provide a smaller green roof area than would otherwise be required, provided that a cash-in-lieu payment is made in accordance with this chapter, and the Chief Planner shall approve such application and shall notify the local Councillor(s) of the decision.
- B. Where an application for a reduced green roof requirement is made to the Chief Planner pursuant to subsection A, no alteration or variance to the technical standards for construction of green roofs as provided in the Toronto Green Roofs Construction Standard shall be permitted.
- C. Where the Chief Planner has approved an exemption or variance and the cash-in-lieu payment is made, the Chief Building Official may issue a permit for the related building or building addition as though the applicant was in compliance with this chapter.

**§ 492-12. Cash in lieu of construction of a green roof.**

- A. Where less than the required green roof coverage than otherwise would be required by this chapter is provided, either because of a variance or exemption approved by the Chief

TORONTO MUNICIPAL CODE  
CHAPTER 492, GREEN ROOFS

Planner, the applicant shall make a payment of cash-in-lieu of construction of a green roof for the reduced or exempted area based on the average actual cost of construction of a green roof which at the time of the passing of this chapter shall be deemed to be \$200.00/m<sup>2</sup>. [Amended 2012-11-29 by By-law 1598-2012]

- B. The Chief Planner shall from time to time, and at least bi-annually, report to City Council on the cost of construction for a green roof and shall recommend changes to the base sum in Subsection A to ensure that it reflects the prevailing average actual cost of construction of a green roof.
- C. All of the funds collected as cash in lieu of construction of a green roof shall be segregated and directed to the Eco-Roof Incentive Program of the City for the provision of green roofs. [Amended 2012-11-29 by By-law 1598-2012]

ARTICLE VI  
**Green Roof Technical Advisory Group**

**§ 492-13. Green Roof Technical Advisory Group.**

- A. The Chief Building Official shall appoint a chair and 10 members of the Green Roof Technical Advisory Group.
- B. The Chair and members of the Green Roof Technical Advisory Group shall be appointed for a term of three years, and may be re-appointed for an additional term of three years.
- C. The Office of the Chief Building Official shall provide staff support, including secretariat duties, for the Green Roof Technical Advisory Group.

**§ 492-14. Qualifications for Chair and members of the Green Roof Technical Advisory Group.**

- A. Persons appointed as the Chair or as a member of the Green Roof Technical Advisory Group shall possess expert knowledge and professional qualification concerning green roof technology and have a working familiarity with the building code.
- B. Membership in the Green Roof Technical Advisory Group shall be representative of various sectors including the following:
  - (1) Enforcement of regulations and administration of the building code sector including but not limited to members from staff of Toronto Building and the Building and Development Branch of the Ministry of Municipal Affairs;
  - (2) Design sector;
  - (3) Material and component manufacturers and suppliers sector;

TORONTO MUNICIPAL CODE  
CHAPTER 492, GREEN ROOFS

- (4) Construction sector;
- (5) Research sector including but not limited to persons involved in green roof research and testing in a professional academic institution, school of engineering or architecture; and
- (6) Green roof industry sector being individuals working in the green roof industry.

**§ 492-15. Purpose of the Green Roof Technical Advisory Group.**

- A. The Green Roof Technical Advisory Group shall make recommendations for consideration by the Chief Building Official with respect to:
- (1) Technical issues relating to the creation, implementation and development of the City of Toronto Green Roof Construction Standard;
  - (2) Possible amendments to the Toronto Green Roof Construction Standard; and
  - (3) Take part in periodic review of the Toronto Green Roof Construction Standard.

**§ 492-16. Recommendations of the Green Roof Technical Advisory Group.**

- A. The Green Roof Technical Advisory Group shall consider and comment upon the following matters in making recommendations for consideration by the Chief Building Official:
- (1) Policy directions from City Council related to requiring and constructing green roofs;
  - (2) The City's green roof strategy as expressed in the document "Making Green Roofs Happen";
  - (3) Consultations with stakeholders from government, industry, and the community at large;
  - (4) Technical viability of existing or proposed standards for green roofs;
  - (5) Consistency of the green roof standards with objectives of the building code;
  - (6) Impacts of the green roof standard on the interests of stakeholders and the economic feasibility of the recommendation; and
  - (7) The enforceability of the recommendation if implemented as part of the green roof standard.

TORONTO MUNICIPAL CODE  
CHAPTER 492, GREEN ROOFS

**§ 492-17. Meetings of the Green Roof Technical Advisory Group.**

- A. The Green Roof Technical Advisory Group shall meet at the call of the Chief Building Official and the meeting shall consider the matters set out in a meeting agenda prepared by Toronto Building staff.

ARTICLE VII  
**Changes to the Technical Standards**

**§ 492-18. Changes to technical standards.**

- A. The Chief Building Official shall periodically review the Toronto Green Roof Construction Standard and, after consultation with the Green Roof Technical Advisory Group, recommend amendments to City Council to reflect the City's experience with green roofs and new construction techniques and materials.

ARTICLE VIII  
**Chief Building Official to Publish Guideline**

**§ 492-19. Chief Building Official to publish guideline.**

- A. The Chief Building Official shall, after consulting with the Green Roof Technical Advisory Group, periodically develop and publish green roof construction guidelines and best practices to assist designers and others to design and construct green roofs in accordance with the Toronto Green Roof Construction Standard.

ARTICLE IX  
**Miscellaneous**

**§ 492-20. Offences.**

- A. Every person who contravenes a provision of this chapter is guilty of an offence.
- B. Every director or officer of a corporation who knowingly concurs in a contravention of this chapter by the corporation is guilty of an offence.
- C. Every person who fails to comply with a term or condition of a green roof permit under this chapter is guilty of an offence.
- D. Every person who contravenes an order under subsection 384(1) or 385(1) of the City of Toronto Act, 2006, is guilty of an offence.

**§ 492-21. Penalty.**

Every person convicted of an offence under this chapter is liable to a maximum fine of not more than \$100,000.

---

## RECLAIMING NATURE: ECO-RESTORATION OF LIMINAL SPACES

BENJAMIN J. RICHARDSON\*

*Past environmental damage is a major hindrance to sustainability, yet its restoration is a low priority of Australian environmental law compared to current and future impacts. The governance of eco-restoration is fragmented and incomplete, with little regulatory influence in regard to landscape or ecosystem-scale restoration. In many cases eco-restoration is not viable because of irreparable environmental damage, and in a few cases - wild areas - it is generally less necessary. But in the extensive liminal spaces that have suffered some damage, restoration and better governance of it is needed. Remediation of old mines or brownfield sites – the current focus of Australian eco-restoration law – is not a useful precedent for ecosystem restoration of liminal landscapes. A number of fascinating biodiversity-focused restoration projects are underway across Australia, but are without a coherent governance framework that would enable such projects to likely have a more decisive and widespread impact. Some reforms could be undertaken to improve the legal framework for eco-restoration in Australia, especially in regard to terminology, goals and tools.*

### I ENVIRONMENTAL LAW'S MISSING AGENDA

Past environmental desecration in Australia has left a wretched legacy that limits the scope for sustaining what is left. Mitigating new environmental impacts, rather than remedying previous ones, is the focus of our environmental laws and policies. This article scrutinises this missing agenda in Australian environmental law with an argument that environmental restoration (hereafter 'eco-restoration') of 'liminal spaces' (i.e., areas either not irreparably changed by humankind nor so substantially intact that restoration is not a priority or is unnecessary) should be elevated to a more fundamental status. The discussion is structured around three main themes: (i) to explain the rationale for eco-restoration and its contribution to sustainability; (ii) to review the ad hoc and sparse provisions in Australian legislation relevant to eco-restoration, and to illustrate their modest governance potential by reference to some examples of biodiversity and landscape restoration in liminal spaces; and (iii) to identify some policy and governance challenges and make recommendations for building better legal foundations for eco-restoration law in Australia. This brief foray into this hugely important subject will hopefully help guide future empirical research to evaluate eco-restoration governance in more detail and focus law reform.

In our planet with virtually no place unscathed by humankind, and indeed much of it ravaged in the name of 'progress', eco-restoration is crucial. It is especially so in Australia,

with a grim environmental record that is among the gravest of any country.<sup>1</sup> Without restoration, environmental conditions may incrementally slip, a phenomenon labelled the ‘shifting environmental baseline’ syndrome.<sup>2</sup> Coined by Daniel Pauly,<sup>3</sup> the syndrome expresses how successive human generations – specifically natural resource managers – tend to lose perspective of historic natural conditions because they use the state of the environment during their lifetimes as their reference point.<sup>4</sup> Its pernicious effect is to blind decision-makers to the magnitude of cumulative losses. Environmental law can perpetuate it when current standards do not take into account past disturbances. The pursuit of sustainability is jeopardised when prevailing environmental conditions serve as baselines for legal protections, because sustainability may require recalibrating baselines back to historic environmental conditions. Restricting clearance of native vegetation on properties that were once heavily logged may be futile in protecting remnant wildlife or preventing soil erosion without more ambitious reparation of past losses, to illustrate.

Curiously, Australian environmental law displays a rather insouciant attitude to past losses, at least apparently from the statutory texts to be canvassed shortly in this article. Governance of eco-restoration tends to be quarantined to discrete contexts where there are discernible temporal and spatial boundaries to the targeted problem, such as a recently closed mine or a brownfield site – distinct parcels of land with identifiable actors who can be obliged to remediate within manageable parameters.<sup>5</sup> The more ambitious task of restoring degraded ecological communities on a regional scale tends to be omitted from legislative mandates, which offer (if at all) just cursory or glib references to eco-restoration without elaboration of its purpose or methods.<sup>6</sup> Restoration work is commonly relegated to non-regulatory approaches including financial grants, voluntary agreements and community partnerships – all potentially very useful, so long as there is goodwill.

The latter may themselves, of course, be conceptualised as a form of ‘governance’, as scholarship on legal pluralism and regulatory theory suggests in regard to the social ordering capacities of non-state actors such as community groups or business enterprises.<sup>7</sup> Australia’s tradition of landcare and other grassroots environmental stewardship has been an indelible dimension of community governance of rural landscapes. But reliance on non-state entities may inappropriately lead to the state relinquishing responsibilities in an area where more

---

\* Professor of Environmental Law, University of Tasmania Faculty of Law and the Institute for Marine and Antarctic Science. The author welcomes any questions or comments via email: B.J.Richardson@utas.edu.au

<sup>1</sup> Stephen Dovers (ed), *Australian Environmental History: Essays and Cases* (Oxford University Press, 1994).

<sup>2</sup> Frans Vera, ‘The Shifting Baseline Syndrome in Restoration Ecology’ in Marcus Hall (ed) *Restoration and History: The Search for a Usable Environmental Past* (Routledge, 2010) 98.

<sup>3</sup> Daniel Pauly, ‘Anecdotes and the Shifting Baseline Syndrome of Fisheries’ (1995) 10 (10) *Trends in Ecology and Evolution* 430.

<sup>4</sup> Ibid; See also Sarah Papworth et al, ‘Evidence for Shifting Baseline Syndrome in Conservation’ (2009) 2(2) *Conservation Letters* 93, 94.

<sup>5</sup> Gerry Bates, *Environmental Law in Australia* (LexisNexis Butterworths, 8<sup>th</sup> ed, 2013) 589. And see more generally Marie-Louise Larsson (ed.), *The Law of Environmental Damage: Liability and Reparation* (Martinus Nijhoff Publishers, 1999).

<sup>6</sup> This is also a deficiency of eco-restoration law in other jurisdictions: e.g, David Hughes. ‘Land Conservation and Restoration: Moving to the Landscape Level’ (2002-2003) 21 *Virginia Environmental Law Journal* 115.

<sup>7</sup> Bettina Lange, ‘Regulatory Spaces and Interactions: An Introduction’ (2003) 12(4) *Social & Legal Studies* 411; Brian Tamanaha, ‘Understanding Legal Pluralism: Past to Present, Local to Global’ (2008) 30 *Sydney Law Review* 375.

national leadership and accountability are so important in the midst of deteriorating environmental performance indicators. Recent cuts to landcare and associated programs by the federal government suggest Australia is drifting even further behind its eco-restoration challenges.<sup>8</sup>

One may speculate as to why eco-restoration is so marginalised in our legal system compared to sustainable development, a concept lavished with attention. Possibly, restoration is perceived by regulators as beyond their capacity for reasons of insufficient resources, the impossibility of the task (as for extinct species or landscapes buried under houses and roads) or the greater political salience of current environmental threats and greater political obstacles to coercing landowners to repair degradation. The legislative insouciance may also reflect policy-makers' lack of awareness about the enormity of past losses.

Whatever the reasons – which this article does not seek to decipher – in order to understand how eco-restoration should be better governed and contribute to sustainability, we need some insight into the contested issues of restoration, particularly relating to terminology, purpose and methods. Three specific concerns are:

- (i) *Undefined terminology.* Environmental legislation typically omits mention of eco-restoration, and even where it does acknowledge it, the concept is left undefined. The presence of inconsistent language such as 'remediate', 'repair' or 'restore' can be confusing. This absence of statutory guidance may diminish public accountability for eco-restoration projects as well as foster diverse and potentially counter-productive practices.
- (ii) *Unclear goals.* Further, the purpose of eco-restoration is generally not explained, except in limited circumstances such as to repair environmental damage created by a nominated statutory offence. Without knowing the goals of restoration, it may be difficult to define when it is feasible and worth funding. For instance, eco-restoration sometimes must be linked to an historic environmental baseline that serves as the reference point – a contentious scientific issue given the choices available as well as the difficulty of accounting for background environmental change and accommodating future change in the rehabilitated area.
- (iii) *Inadequate tools.* Legislation also lacks adequate mechanisms to facilitate and govern restoration in a strategic and comprehensive manner. Regulations touching restoration tend to be confined to ad hoc, discrete situations, such as conditions attached to mining permits. To tackle the more important and challenging task of restoring biodiversity and functionality to entire ecological communities, reliance is placed on a miscellany of conciliatory mechanisms such as conservation covenants, tax incentives and financial grants. They tend to involve high transaction costs, are difficult to enforce and often rely on uncertain cooperation with numerous stakeholders.

It is perhaps unsurprising that environmental law is not particularly attentive to healing past environmental losses when its conceptual focus is mainly spatial rather than temporal. Environmental law approaches its subject matter around static spatial dimensions, as articulated most strongly through legal doctrines on property rights and jurisdiction, and the emphasis on management of the physicality of ecological problems.<sup>9</sup> To the extent that it explicitly conceptualizes time, the law is prospective rather than retrospective,<sup>10</sup> a stance that

<sup>8</sup> Tony Allan, 'Landcare and research cuts in Budget' *ABC Rural* (Online) 13 May 2014 <<http://www.abc.net.au/news/2014-05-13/budget-overview/5441510>>.

<sup>9</sup> Jane Holder and Carolyn Harrison (eds), *Law and Geography: Current Legal Issues 2002*, (Oxford University Press, 2003) vol 5; Robert Verchick, 'Critical Space Theory: Keeping Local Geography in American and European Environmental Law' (1999) 73(3) *Tulane Law Review* 739; David Grinlinton and Prue Taylor, *Property Rights and Sustainability* (Brill, 2011).

<sup>10</sup> Richard Lazarus, *The Making of Environmental Law* (University of Chicago Press, 2004), ch 1; Barton Thompson Jr, 'The Trouble with Time: Influencing the Conservation Choices of Future Generations'

has been described as a 'present future' orientation.<sup>11</sup> It focuses on how present actions may have future adverse effects, such as global warming.<sup>12</sup> Environmental impact assessment and land use planning law epitomise this approach. The notion of sustainable development, environmental law's temporal ballast, reinforces this future bias via its focus on intergenerational environmental responsibilities.<sup>13</sup> In downplaying the past, the 'present future' outlook may obfuscate our understanding of anthropogenic ecological changes that are rooted in historic conditions. Hence, declines in wildlife populations such as koalas may appear troublesome from the vantage of recent decades, but catastrophic over a longer time frame of a century.<sup>14</sup> Perception of environmental degradation may also be temporally warped by the tendency to look at proximate causes when the primary origin may be much older. The disappearance of a creature might be attributed to a new invasive species, when in fact climatic shifts, which enable such intruders to thrive, may better explain the loss.

There are other elements of environmental law, and the legal system more generally, that work against respect for natural history. The principle of non-retroactivity, another temporally significant contrivance, can thwart accountability for past errors that enjoyed the imprimatur of legality.<sup>15</sup> Statutes of limitations can similarly curb environmental accountability for historic harms by limiting the period in which to pursue legal action.<sup>16</sup> 'Grandfather' clauses, which shield long-standing resource users or polluters from transitions to more stringent regulatory standards, likewise blunt responsibility for past harms.<sup>17</sup>

This future stance of environmental law embodies a particular theoretical approach to time. Academics have theorised various models of temporality,<sup>18</sup> of which the dominant, and the one reflected in much environmental law, is the linear progression of time. It depicts time's arrow as marching forward, implying that the past can never be retrieved or fades into irrelevance.<sup>19</sup> The main rival model portrays time's movement as 'cyclical', it being associated with infinitely repeated events and processes - diurnal, lunar and seasonal rhythms, along with the predictable daily habits of eating and sleeping, and life and death of individual creatures.<sup>20</sup> These distinctions reflect the subject-matter of this article: eco-restoration evokes

---

(2004) 44 *Natural Resources Journal* 601; John Applegate, 'The Temporal Dimension of Land Pollution: Another Perspective on Applying the Breaking the Logjam Principles to Waste Management' (2008) 17 *New York University Environmental Law Journal* 757.

<sup>11</sup> Lisa Heinzerling, 'Environmental Law and the Present Future' (1999) 87 *Georgetown Law Journal* 2025.

<sup>12</sup> Edith Brown Weiss, *In Fairness to Future Generations* (Transnational Publishers, 1989).

<sup>13</sup> De Manila and Peter Brandon, 'The Time Horizon in the Evaluation of Sustainable Development' (2012) 6(3) *Journal of Civil Engineering and Architecture* 344.

<sup>14</sup> Jeremy Hsu, *Overfishing Goes Back Centuries, Log Books Reveal* (25 May 2009) <<http://www.livescience.com/5445-overfishing-centuries-log-books-reveal.html>>.

<sup>15</sup> Charles Sampford et al, *Retrospectivity and the Rule of Law* (Oxford University Press, 2006).

<sup>16</sup> Gary Milhollin, 'Long-Term Liability for Environmental Harm' (1979) 41(1) *University of Pittsburgh Law Review* 1.

<sup>17</sup> Heidi Robertson, 'If Your Grandfather Could Pollute, So Can You: Environmental "Grandfather Clauses" and Their Role in Environmental Inequity' (1995-96) 45 *Catholic University Law Review* 131.

<sup>18</sup> Penelope Corfield, *Time and the Shape of History* (Yale University Press, 2007); John Brough and Lester Embree (eds), *The Many Faces of Time* (Kluwer Academic, 2000); L. Nathan Oaklander and Quentin Smith (eds), *The New Theory of Time* (Yale University Press, 1994).

<sup>19</sup> Peter Coveney and Roger Highfield, *The Arrow of Time: A Voyage Through Science to Solve Time's Greatest Mystery* (Ballantine Books, 1992).

<sup>20</sup> Diane Hughes and Thomas Trautmann (eds), *Time: Histories and Ethnologies* (University of Michigan Press, 1995), passim.

time's cycle while the sustainability framework manifests time's arrow.<sup>21</sup>

The challenge addressed by this article, to improve the legal framework for eco-restoration, is thus ensconced in a larger challenge to advance a better 'timescape' for environmental law and policy that respects nature's history and the interrelationships between the past, present and future. The next section of this article canvasses some examples of current landscape restoration projects in Australia, in order to give some insight into recent practices and their potential, before examining the existing statutory provisions for eco-restoration so that the extent of the challenge to be overcome through legal reform can be appreciated.

## II ECO-RESTORATION PROCESS

Eco-restoration is becoming popular in Australia, perhaps counter-intuitively to its sparse legislative framework. Many projects are underway through the efforts of community groups, environmental nongovernmental organisations (NGOs) and other stakeholders. Many such efforts aim to revegetate landscapes, restore extirpated wildlife and create connectivity corridors between fragmented, remnant bushlands. Examples include Arid Recovery (South Australia), Gondwana Link (Western Australia) and Kosciusko2Coast (New South Wales).<sup>22</sup> It is worthwhile to convey a few details of some, before looking at the legislative context, in order to understand their aspirations and limitations.

### A *Arid Recovery*

Australia's arid zone has been severely blighted by weeds, livestock, rabbits, cats and foxes since European settlement, and urgently needs rehabilitation. Medium-sized desert mammals have suffered gravely. Arid Recovery is thus an interesting initiative, aiming to restore the depleted biodiversity of a patch of South Australian outback.<sup>23</sup> Launched in 1997, the 'recovery' centres on a 123km<sup>2</sup> fenced reserve about 550 km north of Adelaide that aims to exclude numerous feral pests. Part of the enclosure, one of the largest of its kind in Australia, is used as a dingo pen experiment to determine whether cats and foxes can be controlled naturally using dingoes. Arid Recovery also encompasses a larger 200 km<sup>2</sup> buffer area where less intensive feral animal control methods are trialled. Several locally extinct mammal species have since been successfully reintroduced to the reserve.

Arid Recovery is an advanced multi-stakeholder partnership between a business corporation, the state government, University of Adelaide and community environmentalists. The involvement of a business entity is unusual for voluntary eco-restoration in general, but essential in this specific context because the fenced reserve is situated partly on the Olympic Dam Mine Lease and adjoining pastoral properties leased by BHP Billiton. Arid Recovery's success also owes to financial assistance from the state and federal governments, the South Australian Arid Lands Natural Resource Management Board and the Natural Heritage Trust respectively.

Though Arid Recovery might be dismissed as a trivial gesture relative to the enormity of degraded outback lands needing restoration, it has wider positive ramifications because it

<sup>21</sup> Marcus Hall, 'Introduction: Tempo and Mode in Restoration', in Hall, above n 2, 4.

<sup>22</sup> For more examples, see Stuart Whitten, *A Compendium of Existing and Planned Australian Wildlife Corridor Projects and Initiatives, and Case Study Analysis of Operational Experience* (CSIRO, 2011), viii.

<sup>23</sup> The discussion of Arid Recovery draws on <<http://aridrecovery.org.au>>.

generates transferable information and techniques for broad scale landscape management of Australia's arid zone, and also because of its demonstration of how mining, pastoralism and conservation organisations can collaborate to achieve ecological outcomes. The Arid Recovery reserve now has five times as many small native mammals compared to the outside areas, and its vegetation has recovered significantly since the purging of rabbits.<sup>24</sup>

The critical question is whether and how the Arid Recovery model could be replicated in other areas in the absence of such goodwill among stakeholders. It is doubtful that a mining company would altruistically agree to set aside land for conservation that would otherwise offer it lucrative financial returns. It is also improbable that the crucial government funding provided to Arid Recovery can be extended on a broad scale throughout the vast desert tracts needing restoration. But it is also likely that coercive regulation to require the kind of intensive care provided by Arid Recovery could not be imposed on private landowners on a large-scale without a severe political and community backlash.

### B *Kosciuszko2Coast*

Kosciuszko2Coast (K2C) seeks to restore ecologically significant landscapes in southeast NSW and some adjacent areas in the ACT and Victoria,<sup>25</sup> and K2C itself is a subcomponent of the mammoth Great Eastern Ranges initiative.<sup>26</sup> The main drivers for launching K2C were habitat loss and habitat fragmentation from agriculture, human settlement and forestry, coupled with the threat of climate change. In NSW, 88 percent of the state is privately owned and the remainder under various forms of Crown land, a distribution that makes it imperative to mobilise lands in private hands towards nature conservation and restoration.<sup>27</sup>

The K2C initiative unites 12 organisations (including land care groups and Greening Australia) and numerous landowners to conserve and recover grasslands, woodlands, riparian and wetland areas and their inhabitants especially small bush birds and arboreal mammals. The creation of the corridor linking the national parks in the Southern Alps with the coast has centred on selective acquisition of key stepping stone properties, such as the 1300 hectare 'Scottsdale' property bought by Bush Heritage Australia, and placing conservation covenants on other lands remaining in private hands. Other components of K2C include the Landscape Links for Small Bushland Birds (LLSBB) project, which erects a sequence of 'exclosures' in grazed paddocks to recouple remnant vegetation enclaves.

Unlike Arid Recovery, the K2C has additional challenges because of the large region it covers and the numerous stakeholders it engages. K2C relies on collaborations, community mobilisation, ad hoc grants, public education, and voluntary mechanisms. It has little public law undergirding, apart from some potential support from municipal and state land use planning schemes. Private law mechanisms based on contracts and conservation covenants are used to formalize some of the conservation commitments, but these commitments require goodwill and voluntary support at the outset.

<sup>24</sup> Barry FitzGerald, 'Olympic Dam Haven Pays Off for Endangered Local Wildlife' *The Australian* (Sydney) 20 September 2014.

<sup>25</sup> This discussion draws on the Kosciuszko2Coast website, <<http://k2c.org.au>>.

<sup>26</sup> Office of Environment and Heritage, *Great Eastern Ranges Initiative: A Report to the NSW Environmental Trust describing funded activities from 2007 to 2011*, (2012) available at <<http://www.greateasterranges.org.au/>>.

<sup>27</sup> Data (from 1993) from Geoscience Australia, <<http://www.ga.gov.au/scientific-topics/geographic-information/land-tenure>>.

---

### C *Gondwana Link*

In what one international authority heralds as ‘one of the most concerted efforts to resurrect nature ever attempted’,<sup>28</sup> Gondwana Link is repairing a vast 1000 km swathe in south western Australia that has suffered catastrophic land degradation from farming.<sup>29</sup> It is also a biodiversity ‘hot spot’, being one of the world’s 34 internationally recognised such areas and the only one in Australia.<sup>30</sup> Began in 2002, the project’s vision is: ‘[r]econnected country across south-western Australia, from the Karri forests of the far [southwest] to the woodlands and mallee bordering the Nullarbor Plain, in which ecosystem function and biodiversity are restored and maintained’.<sup>31</sup> Its method is outright purchase or conservation covenants on private properties that are then subject to restorative interventions and ongoing better management. Land purchases are typically made where the extent of eco-restoration is considered ‘just too massive to achieve through the largesse of any one landholder, or group of landholders, particularly farmers. It is unfair to expect farmers to carry the main burden of achieving landscapes’.<sup>32</sup> The project is backed by funding and technical support from a diverse cohort of private and public sponsors.

Interestingly, Gondwana Link cultivates a business case for eco-restoration. It emphasizes working with farmers to focus on turning degraded soils into more viable and profitable farming opportunities through restoration of native vegetation. It is also supporting ecologically and economically beneficial enterprises such as sandalwood growing, a small tree that produces a valuable food crop and essential oils. Planting sandalwood also aids carbon sequestration, thereby providing potential future revenue from businesses wanting to offset their carbon emissions.

Another distinctive feature is the project’s collaboration with local Aboriginal communities and other stakeholders beyond the standard ensemble of land care and environmental NGOs found in many eco-restoration initiatives. Gondwana Link negotiated a memorandum of understanding with Aborigines holding native title in the area in order to foster cooperative land management and to incorporate the Noongar people’s history and culture into the restoration practices. Local artists are also engaged by the project. MIX Artists, from Albany, have collaborated since 1999 to foster innovative art activity in the region. The MIX Artists have worked in local communities through workshops and exhibitions to highlight the natural wonders of areas targeted by Gondwana Link in order to stir the public’s environmental awareness and respect for its eco-restoration work.

Gondwana Link is impressive for its ambition and collegiality, and although it will likely be some years before its full impact is appreciated, early signs are encouraging.<sup>33</sup> The relevant question is whether and how its objectives might be facilitated by a more direct and comprehensive legal presence beyond private law techniques (conservation covenants) and funding contracts with state agencies. If Gondwana Link’s activities were incorporated into local and regional land use planning systems it might be more effective. More flexible legal

---

<sup>28</sup> Caroline Fraser, *Rewilding the World: Dispatches from the Conservation Revolution* (Picador, 2009) 327.

<sup>29</sup> See <<http://www.gondwanalink.org>>.

<sup>30</sup> Virginia Jealous, ‘Gondwana Filling the Gaps’ *The Australian* (Sydney) 5 February 2011.

<sup>31</sup> Gondwana Link, ‘Vision’, <<http://www.gondwanalink.org/abouts/vision.aspx>>.

<sup>32</sup> Gondwana Link, ‘Work We Directly Support’, <<http://www.gonwanalink.org>>.

<sup>33</sup> Lisa Morrison, ‘Gonwana Links to Success: Survey’ *The Western Australian* (12 February 2014)

arrangements for negotiating legal covenants and extension of legal protections to key linkage areas, not just core enclaves, might also be useful, as recommended by some literature.<sup>34</sup> It is thus worthwhile now to catalogue and assess existing federal and state legal provisions that may support eco-restoration in such liminal spaces.

### III LEGISLATIVE PROVISIONS

#### A *Environmental Legislation*

Despite Australia's environmental losses, the subject of eco-restoration receives sparse explicit legal recognition. The principal statutes largely omit restoration from their core mandates or purposes, while acknowledging the subject only in isolated contexts such as sanctioning pollution offenders or sequestering financial assurance from resource operators to enable future site remediation. Unhelpfully, the concept of eco-restoration or related terminology is usually not defined, and nor are criteria set for where it should be undertaken or which liminal spaces should be a priority. Based on a cursory reading of the legislation, anyone not familiar with Australia's environmental history could be excused for believing there has been little trauma.

The most elaborate eco-restoration provisions inhabit legislation governing remediation of contaminated lands and restoration of derelict mines. Western Australia contains representative examples in its *Contaminated Sites Act 2003* (WA) and the *Mining Rehabilitation Fund Act 2012* (WA). Likewise, similar provisions are found in New South Wales' *Contaminated Land Management Act 1997* (NSW) and the *Mining Act 1992* (NSW). Such laws are useful for mitigating particularly degraded or polluted properties, but they cannot support the large scale landscape restoration work found in Gondwana Link or K2C, which involve 'reactivating simultaneous natural processes in astonishingly complex living systems that include plants and insects, water, soil and sunlight'.<sup>35</sup>

The lodestar environmental management and protection statutes, where one could expect to find such provisions, are disappointing. The *Environment Protection and Biodiversity Conservation Act 1999* (Cth), Australia's premier legislative gesture in this field, lacks explicit reference to eco-restoration or related terms, even within its statement of objects and its definition of 'ecologically sustainable development'.<sup>36</sup> The closest acknowledgement is in the Act's provisions for 'recovery' of threatened species, but these are far too narrow to support comprehensive eco-restoration projects.<sup>37</sup>

At the state level, the *Environmental Planning and Assessment Act 1979* (NSW) and the *Protection of the Environment Administration Act 1991* (NSW), the principal environmental statutes in this jurisdiction, likewise overlook eco-restoration except in regard to the exceptional provisions for biobanking.<sup>38</sup> The promisingly entitled *Environmental Restoration and Rehabilitation Trust Act 1990* (NSW) is not a regulatory instrument but rather creates a financial trust 'to encourage and support restoration and rehabilitation projects in both the

<sup>34</sup> Ian Pulsford, James Fitzsimons and Geoff Wescott (eds), *Linking Australia's Landscapes: Lessons and Opportunities from Large-scale Conservation Networks* (CSIRO Publishing, 2013).

<sup>35</sup> Marcus Hall, *Earth Repair: A Transatlantic History of Environmental Restoration* (University of Virginia Press, 2005) 3.

<sup>36</sup> *Environment Protection and Biodiversity Conservation Act 1999* (Cth) ss 3,3A.

<sup>37</sup> *Ibid* s2(e)(i), pt 13 div 5.

<sup>38</sup> *Environmental Planning and Assessment Act 1979* (NSW) ss 891,115ZC(2)(c).

public and private sectors'.<sup>39</sup> Extraordinarily, not even this legislation defines the terms restoration or rehabilitation. Victoria's principal law, the *Environment Protection Act 1970* (Vic) also generally ignores the subject except in limited circumstances such as for addressing offences that precipitate environmental damage.<sup>40</sup> Western Australia's main environmental decree, the *Environmental Protection Act 1986* (WA), is bereft of any substantial provisions for facilitating eco-restoration, with its only reference also confined to the Act's compliance and sanctions provisions.<sup>41</sup>

Among other states, Tasmania's *Environmental Management and Pollution Control Act 1994* (Tas) is notable for designating eco-restoration among its statutory objectives,<sup>42</sup> along with the routine mention of it in the compliance sections.<sup>43</sup> However, the legislation lacks specific mechanisms to give effect to eco-restoration. Queensland's *Environmental Protection Act 1994* (Qld) is interesting because, although it has few relevant provisions,<sup>44</sup> it requires that the quadrennial state of the environment report must, inter alia, 'review significant programs, activities and achievements of persons and public authorities about the protection, *restoration* or enhancement of Queensland's environment'.<sup>45</sup>

Perhaps the most ambitious language sits in the objects clause of South Australia's *Environmental Protection Act 1993* (SA), which include that 'proper weight should be given ... to environmental protection, *restoration* and enhancement' and 'to ensure that all reasonable and practicable measures are taken to protect, *restore* ... the environment having regard to the principles of ecologically sustainable development'.<sup>46</sup> As in Queensland, this legislation also requires information about eco-restoration efforts to be included in state environmental reports.<sup>47</sup>

Nature conservation legislation offers few references to eco-restoration. Encouragingly, the *National Parks and Wildlife Act 1974* (NSW) provides that the objectives of a management plan for each park will 'take into consideration' the *rehabilitation* of landscapes and the reinstatement of natural processes',<sup>48</sup> although the Act does not define 'rehabilitation' (a term more commonly associated with former mining sites than restoration of landscapes or ecosystems). On the other hand, where the government declares a 'wild river', the Act prescribes 'restoration' (a more relevant term) among the governing management principles for such a place.<sup>49</sup> The Act also allows court orders to repair environmental damage created by offences.<sup>50</sup> Queensland's *Nature Conservation Act 1992* (Qld) lists some peremptory management principles that include, in relation to any declared 'special management area', 'the manipulation of the area's natural and cultural resources to ... *restore* the area's natural or cultural values'.<sup>51</sup> It also empowers a court to order costs for any necessary rehabilitation

<sup>39</sup> Ibid s 6.

<sup>40</sup> *Environmental Protection Act 1970* (Vic) ss 62A, 67AC.

<sup>41</sup> *Environmental Protection Act 1986* (WA) s 99X.

<sup>42</sup> *Environmental Management and Pollution Control Act 1994* (Tas) subs-ss 3(d), (j).

<sup>43</sup> Ibid s 63.

<sup>44</sup> *Environmental Protection Act 1994* (Qld) ss 274, 292, 501.

<sup>45</sup> Ibid ss 5477(2)(c) (my emphasis).

<sup>46</sup> *Environmental Protection Act 1993* (SA) ss 10(1)(a)(ii), 10(1)(b) (my emphasis). The Act contains numerous other references to 'rehabilitation'.

<sup>47</sup> Ibid sub-s 112(3)(c).

<sup>48</sup> *National Parks and Wildlife Act 1974* (NSW) s 72AA(1)(h) (my emphasis).

<sup>49</sup> Ibid s (61)5.

<sup>50</sup> Ibid s 200.

<sup>51</sup> *Nature Conservation Act 1992* (Qld) sub-s 17(1A)(a)(i) (my emphasis).

work.<sup>52</sup> Such a provision is also the only acknowledgement of restoration in the Northern Territory's *Parks and Conservation Act 2006* (NT).<sup>53</sup>

Despite the paucity of legislative provisions, some states are leveraging eco-restoration through broad, omnibus statutory powers. The NSW government is planning to reintroduce about ten mammals that are presumed extinct in the state, such as the numbat and golden bandicoot.<sup>54</sup> Victoria may soon release Tasmanian Devils into the Wilsons Promontory National Park in an attempt to re-establish an ecological balance between feral cats, foxes and native wildlife.<sup>55</sup> But with explicit legal provisions governing such biodiversity restoration, such actions might happen more quickly and widely.

Many Australian waterways need restoration. Rivers and lakes are usually Crown assets, although the surrounding water catchments may straddle a range of property tenures. Eco-restoration in such contexts may thus require collaboration with many stakeholders over a significant area. Tasmania's *Water Management Act 1999* (Tas) provides that a 'riverworks district' may be declared by the government, whose purposes may include to 'repair' watercourses and lakes.<sup>56</sup> The *Water Management Act 2000* (NSW) has a more emphatic approach, as its objects include: 'to protect, enhance and *restore* water sources, their associated ecosystems, ecological processes and biological diversity and their water quality'.<sup>57</sup> Water management plans prepared under this Act also refer to restoration,<sup>58</sup> as do the equivalent provisions under the federal *Water Act 2007* (Cth).<sup>59</sup> But one can also readily find statutes that omit such provisions, such as the *Water Resources Act 1997* (SA).

Australia's vast marine waters provide an even more daunting challenge for eco-restoration, and although management of marine waters might seem more straightforward because they are under Crown control, marine ecosystems can be blighted by distant terrestrial activities. The Great Barrier Reef, for instance, is saturated by farm runoff and has reportedly lost about 50 per cent of its coral since 1985 despite being in a protected area.<sup>60</sup> The *Great Barrier Reef Marine Park Act 1975* (Cth) addresses eco-restoration only in regard to offences causing damage to the reef.<sup>61</sup> The limitation of this provision (like other legislative examples canvassed in this article) is that it does not empower or oblige the Minister to initiate eco-restoration when no offence has occurred. Some state marine conservation laws acknowledge eco-restoration. Western Australia's *Conservation and Land Management Act 1984* (WA) states that the 'reservation of a marine nature reserve shall be for the ... *restoration* of the natural environment',<sup>62</sup> but the lack of specific implementation tools or performance targets

<sup>52</sup> Ibid s 168.

<sup>53</sup> *Parks and Conservation Act 2006* (NT) s 118.

<sup>54</sup> Office of Environment and Heritage, *A Project to Reintroduce Locally Extinct Mammals – Questions and Answers*, Office of Environment and Heritage <<http://www.environment.nsw.gov.au/savingourspecies/mammalprojfaqs.htm>>.

<sup>55</sup> Nardine Groch, 'Scientists Call for Tasmanian Devils to be Reintroduced as Mainland Predators to Combat Feral Cats' *ABC News* (Online) 12 October 2014 <<http://www.abc.net.au/news/2014-10-12/tas-devils-to-prey-on-feral-cats-holder/5806242>>.

<sup>56</sup> *Water Management Act 1999* (Tas) s 193(j).

<sup>57</sup> *Water Management Act 2000* (NSW) s 3(b) (my emphasis).

<sup>58</sup> Ibid sub-s 46(1)(a).

<sup>59</sup> *Water Act 2007* (Cth) sub-ss 3(d)(ii), 21(2)(b), 28(1)(d).

<sup>60</sup> Juliet Eilperin, 'Great Barrier Reef has Lost Half its Corals Since 1985, New Study Says' *Washington Post* (Washington DC) 1 October 2012.

<sup>61</sup> *Great Barrier Reef Marine Park Act 1975* (Cth) s 61A, s 61AHA, for instance

<sup>62</sup> *Conservation and Land Management Act 1984* (WA) sub-s 13A(1)(a) (my emphasis). See also Ibid ss 13B, 56.

in the legislation renders such provisions as just aspirational without the capacity to hold regulators accountable.

Forestry legislation accommodates eco-restoration to some extent, albeit for the purpose of perpetuating resource harvesting rather than restoring the full panoply of ecological functions of a forest. The Regional Forest Agreements negotiated between the Commonwealth and the states in the late 1990s contain miscellaneous provisions for 'regeneration' of forests for such purposes.<sup>63</sup> Climate change policy is also facilitating some projects to regenerate forests and other vegetation as a means of offsetting greenhouse gas emissions. The federal *Carbon Credits (Carbon Farming Initiative) Act 2011* (Cth) is promoting the development of carbon offset markets through reforestation.

### B Other Legislative Contexts

Australia's belated legal recognition of Aboriginal people's rights in the land and sea can provide a framework for eco-restoration.<sup>64</sup> State legislation such as the *Aboriginal Land Rights Act 1983* (NSW) may facilitate such outcomes. Federally, the *Native Title Act 1993* (Cth) process for recognising Aboriginal land claims can enable the restoration of Aboriginal environmental practices on lands returned to the traditional owners. The Act's provisions for negotiation of Indigenous Land Use Agreements (ILUA) can also leverage this outcome.<sup>65</sup> Some 50,000 years of active land management by Aboriginal peoples, particularly through strategic use of fire, fundamentally altered the continent's vegetation and the wildlife that inhabits it.<sup>66</sup> The loss or decline of much biodiversity, especially in the outback, has been attributed to the curtailment of Aboriginal fire burning practices.<sup>67</sup> The restoration of these landscapes socialised by Aboriginal peoples can be crucial for rebuilding biodiversity and abundance, and is already an important facet of Gondwana Link.<sup>68</sup>

As remarked at the outset of this article, much of the governance of eco-restoration is articulated through non-regulatory processes that rely on financial grants, tax breaks and cooperative mechanisms with landowners such as conservation covenants. The *Income Tax Assessment Act 1997* (Cth) can incentivize restoration and conservation work where it provides eligible deductions against taxable business income, such as soil protection, fencing of regenerating vegetation and similar land care operations.<sup>69</sup> A tax deduction is also available to businesses that plant forests for sequestering carbon dioxide, and for businesses that remediate polluted or degraded land in order to return it to economic production. Such incentives are most beneficial to farmers and other economic developers, while of little value

<sup>63</sup> See Department of Agriculture, (7 August 2015) Regional Forest Agreements <<http://www.agriculture.gov.au/forestry/policies/rfa>>.

<sup>64</sup> Damien Short, *Reconciliation and Colonial Power: Indigenous Rights in Australia* (Ashgate, 2008).

<sup>65</sup> An ILUA is a voluntary agreement between a native title group and other persons about the use of land and waters and may apply to places not yet determined to have native title: Donna Craig, 'Native Title and Environmental Planning: Indigenous Land Use agreements' (2000) 17 *Environmental and Planning Law Journal* 440.

<sup>66</sup> Bill Gammage, *The Biggest Estate on Earth. How Aboriginies Made Australia* (Allen & Unwin, 2011).

<sup>67</sup> Ibid.

<sup>68</sup> Neil Burrows, Andrew Burbidge and Phil Fuller, *Integrating Indigenous Knowledge of Wildland Fire and Western Technology to Conserve Biodiversity in an Australian Desert*, Millenium Ecosystem Assessment, <<http://www.millenumassessment.org/en/Bridging.Proceedings.aspx>>.

<sup>69</sup> Margaret McKerchar and Cynthia Coleman, 'The Australian Income Tax System: Has It Helped or Hindered Primary Producers Address the Issue of Environmental Sustainability' (2003) 6 *Journal of Australian Taxation* 201.

to land owners who hold vacant land purely for conservation purposes. Moreover, the tax system contains some perverse incentives for environmentally damaging industries, such as the fossil fuel sector, in effect subsidising further environmental harm that eventually needs repair.<sup>70</sup>

Direct financial aid for eco-restoration, which can be most helpful to entities not earning taxable income, is available via the *Natural Heritage Trust Act 1997* (Cth). The Act's Natural Heritage Trust (NHT) was set up by the federal government in 1997 to help restore and conserve Australia's natural treasures, primarily by channelling financial assistance. The Act lists several environmental initiatives whose objectives include restoration. For instance, the stated objective of the 'National Vegetation Initiative' includes 'restoring, by means of revegetation, the environmental values and productive capacity of Australia's degraded land and water'.<sup>71</sup> The Act's helpful definition of 'environmental protection' includes 'conserving or restoring Australia's biodiversity'.<sup>72</sup> The NHT ceased on 30 June 2008, with its functions incorporated into the 'Caring for our Country' funding programme until this initiative was effectively axed by the Abbott Government's 2014 budget. Other related federal funding schemes, past or ongoing, include the National Action Plan for Salinity and Water Quality, National Landcare Programme and the Environmental Stewardship Programme.

Such financial assistance is sometimes given to private land owners who place their properties under a conservation covenant, a tool of small but increasing importance for nature conservation given the constraints to expanding Crown protected areas.<sup>73</sup> Covenants have been particularly important for K2C and Gondwana Link. In Tasmania, to illustrate their extent, there were 760 covenants covering about 96,142 hectares as of December 2014,<sup>74</sup> compared to approximately 2.5 million hectares in the state's reserve system (i.e., about 3.5 per cent of land under covenant).<sup>75</sup> In theory, covenants can efficiently allow additional lands to be brought under stricter conservation controls without the expensive financial outlays of outright acquisition of the land. The negotiation of conservation covenants is an interesting form of contractual governance in which environmental protocols are negotiated between the state and private actors, and sometimes with assistance from intermediaries such as the Tasmanian Land Conservancy or the Nature Conservation Trust of NSW.

From the perspective of eco-restoration, covenants may help provide greater legal security for landowners and environmental groups that make investments in restoring natural values. The expenditure to labour and money on replanting trees, whose lifespan may exceed 100 years, will benefit from legal safeguards to ensure that such expenditure is secured in perpetuity. There may be a disincentive to provide financial assistance or other kinds of support if a landowner is at liberty to remove the replanted trees after a short period of say 10 or 20 years, as is found in some short-term conservation contracts.

<sup>70</sup> Chris Ready and Mark Diesendorf, 'Financial Subsidies to the Australian Fossil Fuel Industry' (2003) 31(2) *Energy Policy* 125.

<sup>71</sup> *Natural Heritage Trust Act 1997* (Cth) s 10(c).

<sup>72</sup> *Ibid* s 15(c).

<sup>73</sup> Vanessa Adams and Katie Moon, 'Security and Equity of Conservation Covenants: Contradictions of Private Protected Area Policies in Australia' (2013) 30(1) *Land Use Policy* 114.

<sup>74</sup> Tasmania Department of Primary Industries, Parks, Water and Environment, *The Running Postman*, (7 December 2014) <<http://dpi.pwe.tas.gov.au/Documents/Running%20Postman%20December%202014.pdf>>.

<sup>75</sup> Tasmania Parks and Wildlife Service, *Reserve Summary Report* <<http://www.parks.tas.gov.au/file.aspx?id=28768>>.

Conversely, covenants may have several limitations, though not limitations that are relatively more problematic than that affecting public reserves. First, covenants primarily emphasise negative obligations, such as prohibitions on clearing vegetation, mustering stock or building infrastructure, while positive duties to revegetate, restore soil or other environmental improvements are acknowledged less prominently. Legislation enabling such covenants generally does not refer to eco-restoration,<sup>76</sup> though their provisions are broad enough to encompass restorative work.<sup>77</sup> A second possible limitation is that covenants tend to be utilised for properties safe from serious environmental threats because such areas are unsuitable for resource harvesting (e.g., forestry or agriculture).<sup>78</sup> This is not an intrinsic limitation of covenants, but rather a limitation of any *voluntary* approach to nature conservation. Thirdly, conservation covenants are vulnerable to poor compliance. Landowners' positive duties are usually qualified by discretionary language such as to use 'best endeavours' or 'if feasible' (e.g., for eradicating weeds or feral animals).<sup>79</sup> Government officials also rarely have enough time to be vigilant in monitoring compliance; in Tasmania, only two staff are assigned to oversee the state's some 760 covenanted properties, with contact with each landowner limited to one telephone call per year and (in theory) one site visit every five years.<sup>80</sup> On the other hand, management of conservation reserves under direct government control is also often poorly resourced and implemented. Where a covenant is under the custody of a committed landowner, it may be much better managed on a day-to-day basis than any large park.<sup>81</sup> An example of such committed land stewardship in the private domain is the 'Blue Mountain View' eco-sanctuary in southwest Tasmania.<sup>82</sup>

Further considerations relevant to an assessment of the role of covenants or other legal techniques are the available resources and expertise for private landowners. Some may quite understandably lack the necessary expertise to be restorationists. Though covenants typically provide for technical advice from government, it may not be significant for the same reason government monitoring of the implementation of covenants is not robust. A further hindrance is that an assortment of covenanted properties, even within the same region, may lack sufficient spatial connection to provide an integrated and comprehensive framework for management and restoration of a landscape. No landowner can be coerced to accept a covenant, and consequently gaps in landscape protection can arise. The foregoing considerations do not imply that covenants are not useful; indeed, they make a valuable contribution to nature conservation and eco-restoration, but covenants alone cannot provide the complete legal framework for such efforts on private tenures.

In conclusion, the foregoing survey of Australian environmental law reveals a smattering of provisions that speak directly or indirectly to eco-restoration, but without any clarity on what is meant by 'restoration' nor guidance on where it should be undertaken, what are its goals or how eco-restoration relates to the broader agenda of promoting sustainable development. The absence of a robust statutory framework has not precluded environmental NGOs taking the initiative to restore some of Australia's liminal spaces, but their voluntary efforts, however

<sup>76</sup> See, e.g., *Nature Conservation Act 2002* (Tas) ss 34-9; *Nature Conservation Act 1992* (Qld) s 51.

<sup>77</sup> E.g., *Nature Conservation Trust Act 2001* (NSW) s 10.

<sup>78</sup> Covenants, however, can usefully protect scenic coastal landscapes open for residential development and subdivision.

<sup>79</sup> E.g., Tasmanian Land Conservancy (TLC), *Nature Conservation Plan for 199 Rosedale Road, Bicheno* (TLC, June 2013), 17.

<sup>80</sup> Personal Communication, Tasmanian Land Conservancy, 15 November 2014.

<sup>81</sup> Personal communication, former staff member of the Tasmanian Forest Practices Authority, 15 June 2015.

<sup>82</sup> See <[www.bluemountainview.com.au](http://www.bluemountainview.com.au)>.

successfully implemented, require further efforts in order to meet the challenge posed by over two centuries of environmental ruin.

#### IV IMPROVING ECO-RESTORATION GOVERNANCE

##### A *Terminology*

What is ‘environmental restoration’? The foregoing legislative survey reveals no clear answer, but potentially filling this gap are definitions developed by scientists. A description of eco-restoration in any form must recognise that it is not simply a scientific phenomenon but also a human practice where governance is a ‘key operational component of the definition’.<sup>83</sup> In other words, the practice of restoring natural places should be seen as embedded within a legal framework that determines what is it, when it should be done, and how it should be undertaken. In the manner that Australian legislation has elaborated principles for ‘ecologically sustainable development’, so too it should specify a legal template for eco-restoration. Two particularly crucial definitional issues to clarify – as previously noted in this article – are whether to choose an historic baseline as the reference point for restoration, and whether and how to accommodate any culturally significant human modifications to the environment.<sup>84</sup> A ‘liminal space’ to restore this implies some degree of human modification, but not irreparable change. A clear statutory definition of eco-restoration will thus help ensure improved implementation and accountability of regulators and other parties involved in restorative work.

Eco-restorationist scientists have forged a rich language, spanning the traditional terms of ‘remediation’ and ‘rehabilitation’ to colourful additions such as ‘regardening’, ‘renaturing’ and ‘rewilding’.<sup>85</sup> The diverse nomenclature reflects the variety of goals and methods of eco-restoration, and thus behoves legislators to issue guidance to differentiate and prioritise terms so that persons undertaking restoration understand what variant they are working within. According to the Society of Ecological Restoration (SER), the peak international body for professionals working in this area, ‘ecological restoration’ means ‘an intentional activity that initiates or accelerates the recovery of an ecosystem with respect to its health, integrity and sustainability’.<sup>86</sup> An ecosystem is considered ‘restored’ when it can ‘sustain itself structurally and functionally’, showing sufficient ‘resilience to normal ranges of environmental stress and disturbance’.<sup>87</sup> This approach thus defines eco-restoration in a manner that encompasses broad ecological services and functions, as would be relevant to projects such as K2C and Gondwana Link. But it still leaves unclear what ‘ecosystem’ means and how one interprets ‘stress and disturbance’. The point is that legislative provisions could probably never cover all potential permeations of a definition of eco-restoration, and so a process for providing supplementary guidance would be valuable.

<sup>83</sup> Anastasia Telesetsky, ‘Ecoscapes: The Future of Place-based Ecological Restoration Laws’ (2013) 14 *Vermont Journal of Environmental Law* 494, 503.

<sup>84</sup> For example, some restorationists identify rural, farmed landscapes as important to protect both for their cultural and biodiversity values: David Sprague and Nobusuke Iwasaki, ‘Reflooding the Japanese Rice Paddy’, in Hall, above n 2, 171.

<sup>85</sup> Hall, above n 2, 2-3.

<sup>86</sup> Society for Ecological Restoration (SER) International Science & Policy Working Group, *The SER International Primer on Ecological Restoration* (SER, 2004).

<sup>87</sup> *Ibid* s 10.

‘Rehabilitation’ is another term found in some legislation, and it emphasises ‘reparation of ecosystem processes, productivity and services, whereas the goals of restoration also include the re-establishment of the pre-existing biotic integrity in terms of species composition and community structure’.<sup>88</sup> The related term of ‘reclamation’ also appears in some laws and policies, and it commonly refers to the treatment of former mined lands or industrial areas in order to stabilise the terrain, remove pollutants and improve aesthetics. Neither concept is clearly broad enough to encompass restoration at the landscape level as discussed in this article.

The intriguing concept of ‘rewilding’ has entered the lexicon of eco-restoration in recent years, offering a highly emotive and symbolic ideal that is helping to galvanise popular interest in restoring nature’s sovereignty. The movement arose from collaboration between David Foreman and Michael Soulé in the late 1980s, when they established the Wildlands Project to foster scientific and political support for enlarged networks of wilderness regions.<sup>89</sup> The Rewilding Europe Initiative, one prominent example, aims to ‘restore missing species and function’ to ten areas each of 100,000 hectares by 2020.<sup>90</sup> Rewilding emphasizes the pivotal role of keystone species, such as top carnivores, in regulating ecosystems, and advocates extensive terrain and habitat linkages for these species to thrive.<sup>91</sup> For globally vanished species, it may be necessary to translocate approximate ‘taxon substitutes’ – such as by substituting an Asian camel for an extinct North American equivalent. One effort is the Pleistocene rewilding campaign that is translocating some African and Asian mega-fauna to parts of North America and Siberia that have evolved without these species since the Pleistocene.<sup>92</sup> In some cases, rewilding has also entailed removal of human infrastructure such as dams and roads to enable wildlife habitat to improve.<sup>93</sup>

The concept of rewilding has garnered popularity in recent years as high-proliferate environmentalists such as George Monbiot have lauded its virtues.<sup>94</sup> But the concept may be deficient in the sense that Monbiot uses it of letting nature ‘run wild’, because it ignores the need for human assistance in liminal landscapes. As the SER explains:

the restored ecosystem often requires continuing management to counteract the invasion of opportunist species, the impacts of various human activities, climate change, and other unforeseeable events. In this respect, a restored ecosystem is no different from an undamaged ecosystem of the same kind, and both are likely to require some level of ecosystem management.<sup>95</sup>

Such an imperative has been articulated most strongly in the development of the associated

<sup>88</sup> Ibid.

<sup>89</sup> Chris Sandom et al, ‘Rewilding’ in David MacDonald and Katherine Willis (eds), *Key Topics in Conservation Biology II* (John Wiley and Sons, 2013) 430, 431.

<sup>90</sup> See Emma Marris, ‘Reflecting the Past’ (2009) 462 *Nature* 30, 31.

<sup>91</sup> Dave Foreman, ‘The Wildlands Project and the Rewilding of North America’ (1998) 76 *Denver University Law Review* 535, 548.

<sup>92</sup> Dustin Rubenstein et al, ‘Pleistocene Park: Does Re-wilding North America Represent Sound Conservation in the 21st Century?’ (2006) 132(2) *Biological Conservation* 232, 233.

<sup>93</sup> Michael Blumm and Andrew Erickson, ‘Dam Removal in the Pacific Northwest: Lessons for the Nation’ (2012) 42(4) *Environmental Law* 1043, 1047.

<sup>94</sup> George Monbiot, *Feral. Searching for Enchantment on the Frontiers of Rewilding* (Penguin, 2013).

<sup>95</sup> Society of Ecological Restoration, SER International Primer on Ecological Restoration, <<http://ser.org/resources/resources-detail-view/ser-international-primer-on-ecological-restoration>>.

concepts of ‘regardening’ or ‘conservation gardening’, as advocated mainly by restorationists working in Europe, such as Chris Smout, who sees rewilding as impractical in liminal landscapes burdened by anthropogenic change.<sup>96</sup>

Clearly, eco-restoration is not a simple, one-dimensional ideal but rather is a cupola housing a variety of approaches for repairing ecological damage. Thus, shallow statutory provisions about restoration, as found in Australian environmental laws, are potentially misleading and unhelpful. All major federal and state environmental management and protection statutes should include eco-restoration among their stated goals and define the terminology precisely so that decision-makers and the general community can understand the parameters of eco-restoration, acknowledging the spectrum from remediation of discrete parcels such as former mines to expansive rewilding of liminal landscapes on a regional scale. Nuanced statutory definitions that capture such differences would thereby help to improve implementation and signal to stakeholders the importance of restoration.

## B Goals

Just as key terminology needs legislative definition, the goals of eco-restoration need to be enunciated in law. Goals serve many purposes, including to efficiently channel efforts towards specific outcomes, provide motivations to achieve them and criteria for judging success and ensuring accountability. Glib statements about eco-restoration in statutory objects would hardly suffice, as we need legal guidance to identify the circumstances in which specific goals will be sought.

There are many reasons to practice eco-restoration, with the justifications coalescing around three primary considerations.<sup>97</sup> First, on scientific grounds, restoration is said to help rebuild natural capital, such as to restore wildlife populations, mitigate climate change, re-establish blunted evolutionary processes, and improve water and soil quality and other ecological services. The result can also be economic improvements such as more productive agriculture. This is the primary rationale for landscape restorations in Australia such as Gondwana Link. A second rationale has an ethical basis, affirming humankind’s collective responsibility to restore ecosystems that we have damaged, even if previous generations, rather than our own, caused it. This perspective is not particularly evident in Australian eco-restoration, but rather is largely an academic viewpoint. The third basis is an aesthetic one, which identifies value in the beauty and spiritual dimensions of wilderness, separated from human presence. The wilderness movement is one of the oldest strands of environmentalism, and its reverence of primeval wild places also provides a powerful driver for some rewilding campaigns, such as in regard to Tasmania’s dammed Lake Pedder.<sup>98</sup>

All of these rationales may have a role in articulating the case for eco-restoration by appealing to the variable interests of different stakeholders and the different contexts in which restoration may occur. The legal system can help articulate these rationales by

<sup>96</sup> Chris Smout, ‘Regardening and the Rest’, in Hall, above n 2, 111.

<sup>97</sup> See the diverse rationales explained in David Foreman, *Rewilding North America: A Vision for Conservation in the 21st Century* (Island Press, 2004); Francisco Comin (ed), *Ecological Restoration: A Global Challenge* (Cambridge University Press, 2010); James Boyce, Sunita Narain and Elizabeth Stanton (eds), *Reclaiming Nature: Environmental Justice and Ecological Restoration* (Anthem Press, 2007).

<sup>98</sup> Benjamin Richardson, ‘Rewilding Tasmania’s Lake Pedder: Past Loss as Nature’s Lex Ferenda’ (2014) 33(2) *University of Tasmania Law Review* 194.

structuring different approaches to eco-restoration. If climate change mitigation is the aim, the law can create a framework for landowners to participate in reforestation to earn marketable carbon credits, in the manner sought by the *Carbon Credits (Carbon Farming Initiative) Act 2011* (Cth) (though a flawed statute in its execution because of the burdensomely high compliance costs for participating landowners).<sup>99</sup> Restoration purely for carbon farming may also be suitable in a wide variety of environments including places that would not otherwise be considered ‘liminal’ because of the gravity of ecological change and decline: revegetation may be feasible even in densely inhabited urban areas. Alternatively, the law may seek to restore biodiversity on private land, and articulate that purpose by expanding existing conservation covenant schemes to make them more attractive to landowners. The point here is that the governance framework for eco-restoration should explicitly enunciate its aims, and recognise that distinct laws may be needed to further distinct aims.

Another reason to differentiate eco-restoration goals in legislation is the outcomes sought may infer different historic baselines to work from. Reforestation to sequester greenhouse gases does not necessarily need to be done with reference to any historic benchmark, whereas it is likely to be crucial for a biodiversity recovery project that aims to re-establish the fauna and flora of a bygone era. As already noted, choosing a historic reference point can be contentious because, as restoration ecologist Eric Higgs explains, ‘[t]here is no original condition for an ecosystem in any meaningful sense; one cannot fix a specific point in time’.<sup>100</sup>

Just as law should define when to undertake eco-restoration, it may need to discourage it when an ecosystem cannot be returned ‘to its historic trajectory’.<sup>101</sup> Some ecological damage is effectively irreparable, as in regard to heavily urbanised and intensely farmed landscapes: these are not ‘liminal’ spaces. The theory of ‘novel ecosystems’ advanced by Australian academic Richard Hobbs and others suggests that some landscapes have undergone such fundamental changes in their species composition and ecological processes that rehabilitation to their former state is effectively impossible.<sup>102</sup> While most restorationists recognise that ‘[t]he restored ecosystem will not necessarily recover its former state, since contemporary constraints and conditions may cause it to develop along an altered trajectory’,<sup>103</sup> the ‘novel ecosystems’ theory goes further to contend that some places have undergone a ‘threshold shift’ that ‘in practice is irreversible’,<sup>104</sup> or what has been analogised as trying to put the toothpaste back into the tube.<sup>105</sup> Much of rural Australia could be characterised as having shifted to a novel state, because of the massive land clearance and decimation of native plants and animals by invasive weeds and feral pests. Yet, some native species can adapt to new conditions that can continue to provide equivalent ecological function, such as providing

<sup>99</sup> Penny van Oosterzee, ‘Carbon Farming Initiative Will Fail Farmers and Rural Communities’ *The Conversation* (8 July 2014), <<http://www.theconversation.com/carbon-farming-initiative-will-fail-farmers-and-rural-communities-28276>>.

<sup>100</sup> Eric Higgs, *Nature by Design* (MIT Press, 2003), 38.

<sup>101</sup> Society of Ecological Restoration, above n 94.

<sup>102</sup> Richard Hobbs, Eric Higgs and Carol Hall (eds), *Novel Ecosystems: Intervening in the New Ecological World Order* (Wiley-Blackwell, 2013).

<sup>103</sup> Society of Ecological Restoration, above n 94.

<sup>104</sup> Lauren Hallett et al, ‘Towards a Conceptual Framework for Novel Ecosystems’ in Hobbs, Higgs and Hall, above n 101, 17-18.

<sup>105</sup> Joseph Mascaro, ‘Origins of the Novel Ecosystems Concept’, in Hobbs, Higgs and Hall, above n 101, 51.

habitat and food for bird species.<sup>106</sup> For a novel ecosystem, the focus of law shifts from eco-restoration to management of the area's ecological functions with the goal of achieving equivalent ecosystem services such as clean water, fertile soils and habitat for wildlife.

*Liminal* spaces, or what some commentators call 'hybrid' ecosystems, which have undergone some changes in their species composition and/or abiotic conditions, but potentially can be returned to an approximation of their historic states, are thus realistically the principal objects of eco-restoration.<sup>107</sup> Outside of these liminal zones are areas ravaged by irreparable environmental changes (for which eco-restoration is now probably unfeasible) and areas that substantially retain their original ecological qualities (for which eco-restoration is less necessary or not a priority). The liminal or in-between spaces are where environmental law needs to target resources to reclaim nature, and science has a crucial role to inform regulations and standards to determine which places fall within this category. The legal system needs to direct policy-makers to work out which parts of Australia are 'liminal' as against 'novel' or 'wild', and then channel restoration efforts accordingly, though recognising that there will often be no bright line distinctions here but rather some overlap between these categories. Of course, ambitious legislative aspirations alone cannot ensure outcomes are met, which depends on a host of additional factors including well-designed tools and carefully allocated resources, but the starting point is at least to create a clear principled framework for eco-restoration.

### C Tools

How should restoration of liminal spaces occur? It usually requires human intervention to allow natural processes to re-establish themselves, although as rewilders assert, some degree of regeneration can happen without human assistance through natural ecological succession (as notably evident, for instance, in the New England region of the United States where forests have regrown vociferously in the past half century following the cessation of agriculture).<sup>108</sup> But more often some human aid is necessary, such as to eliminate weeds, replant trees and remove infrastructure, tasks that are evoked by the notion of 'regardening' that has become fashionable in the restorationist literature.<sup>109</sup>

The degree of 'regardening' varies greatly, depending on the ecological impacts to overcome, the size of the area and the number of stakeholders. Eco-restoration governance at a landscape level requires tools that can incentivise, discipline and coordinate numerous actors over large areas. The context and ensuing challenges are unlike the remediation of a former mined site, involving a relatively small parcel with few actors. In more challenging landscape restorations, no single tool can possibly address all the multi-faceted dimensions, with the optimal combination of tools likely depending on a variety of variables such as ownership of the property to be restored, the actors involved, the financial resources available and the ecological issues to be addressed.

Within the Crown estate, especially in protected areas, eco-restoration is relatively straightforward. Despite the paucity of explicit statutory provisions in conservation

<sup>106</sup> Hallet et al, above n 103, 21 (referring to Carnaby's black cockatoos in Western Australia relying on pine seeds).

<sup>107</sup> Ibid 17.

<sup>108</sup> Alexander Plaff, 'From Reforestation to Deforestation in New England, United States' (2000) 2 *World Forests* 67.

<sup>109</sup> Smout, above n 95.

legislation, as observed earlier in this article, park agencies enjoy broad plenary powers to manage places under their auspices and may undertake eco-restoration through, for instance, recovery plans for endangered species and bush regeneration programs. Legislative direction is still needed, however, in order to make eco-restoration a priority for Crown agencies, which should be inculcated through performance targets subject to judicial review.

Eco-restoration is a more daunting task on privately owned or managed land, both because of the often deeper history of intensive land use (farming, logging or settlement) as well as the legal obstacles that flow from the nature of the land tenure. One major Australian study of wildlife corridors and connectivity projects observed that '[g]overnance and institutional arrangement for such cross-jurisdictional corridor initiatives will always be a challenge because there is such a diversity of tenures, partners and stakeholders'.<sup>110</sup> So far, an assortment of policy tools have been utilised, including biodiversity offsets, vegetation clearance controls, conservation covenants, land purchases, contractual agreements and tax concessions. Many of these examples are non-regulatory in character, relying on education, negotiation and financial assistance to communities and property owners – which reflects the political difficulties in governing private land use. The eco-restoration examples discussed in this article tend to rely on such approaches for the same reason. We lack empirical research on which tools are most effective for eco-restoration, and whether this ensemble is adequate at all and whether the smorgasbord approach is too inefficient and confusing for stakeholders. But already we can discern that private property rights are the likely common impediment to eco-restoration that these mechanisms try to navigate.

Property law hinders eco-restoration for three reasons. First, the concept of ownership in the common law emphasises the rights and entitlements enjoyed by landowners rather than their custodial duties of its stewardship. The relationship between people and places is proprietary, in which the ecological integrity of the land is subordinate to the economic or other utilitarian interests of the landowner. As Nicole Graham, an Australian legal scholar who specialises in this subject explains, '[l]aws of ownership that fail to enquire, understand and accept the capacities and limits of the earth's systems fail to achieve the ultimate purpose – to regulate viable land and water use practices on an enduring basis'.<sup>111</sup> In this common law paradigm, there is no legal duty on a landowner to restore the environment, even for damage caused directly by the landowner. Only a leaseholder is potentially liable to restore the land if damaged by his or her actions, and even here accountability is to the landlord rather than any larger public interest in a healthy environment. Property law thus constructs a relationship with the land that potentially condones maladaptive land use practices, and certainly does not address past damage by previous owners.<sup>112</sup>

The second problem with property law is that it embodies a temporally static view of the environment that fails to account for the need to alter legal entitlements in response to shifting environmental conditions over time. Because earth is a dynamic, living system – the climate changes, forests grow and species evolve – there should be a corresponding flexibility in those legal entitlements to take account of these changes over time. But property law per se lacks such flexibility and thus the legal entitlements it gives landowners can become environmentally dysfunctional. For example, if a landowner has a fixed water allocation from

<sup>110</sup> Whitten, above n 22, vii.

<sup>111</sup> Nicole Graham, 'Owning the Earth', in Peter Burdon (ed), *Exploring Wild Law: The Philosophy of Earth Jurisprudence* (Wakefield Press, 2011) 259, 262.

<sup>112</sup> Robert Goldstein, 'Green Wood in the Bundle of Sticks: Fitting Environmental Ethics and Ecology into Real Property Law' (1997-1998) 25 *Boston College Affairs Environmental Law Review* 347.

a river that flows through her land, that allocation should be adjusted during a drought. Likewise, an open entitlement to plant or remove vegetation should be considerate of shifts in the conservation status of the flora and fauna.

The third difficulty with property law for eco-restoration is that it fragments landscapes by disaggregating them into numerous, smaller and discrete parcels, which results in environmental management occurring parcel-by-parcel without the necessary degree of coordination and integration required for action on a landscape level. Eco-restoration becomes much harder to coordinate when numerous property owners must be shepherded towards a common effort. Important corridors for wildlife movement for example can become disrupted. When conservation covenants must be negotiated to protect and restore natural values over a landscape imprinted with a mosaic of legal tenures, such as requirements to protect trees and remove weeds, the implicit message is that property owners could lawfully do otherwise.

Of course, property law does not operate in a vacuum: 'property rights are defined by whatever legal instruments create and govern that right. Typically this will be a mixture of contracts and statute', explain experts Paul Martin and Miriam Verbeek.<sup>113</sup> In other words, the entitlements of property ownership are neither fixed nor innate but rather change with time and context. The activities of Australian landowners are subject to wide-ranging regulations, including land use planning schemes that govern building works, and controls on vegetation clearance, water use and a host of other environmental impacts. But the regulatory envelope that sequesters some of the traditional common law property privileges carries a significant political and resource burden on the state, so their enforcement is not easily assured. With academic research suggesting that regulation is more likely to succeed when it governs with a lighter touch, and thereby facilitating rather than dictating change,<sup>114</sup> the scope for inculcating environmental stewardship and restoration responsibilities within property law is perhaps most likely to be found in new incentive, flexible and collaborative approaches rather than traditional 'command-and-control' rules.

So, what legal reforms might facilitate eco-restoration of the genre exemplified in K2C or Gondwana Link? Of course, that requires some detailed empirical research that this article is not designed to provide, but some ideas can be briefly canvassed here to guide such research.

The current approaches to eco-restoration comprise of too many small and piecemeal accomplishments without a strategy for connecting these accomplishments into a larger self-sustaining governance approach. Such an approach is unlikely to be politically feasible or legally practicable if it peddles an idealistic vision of a pre-human world, both because in most of Australia there are existing land users who must be accommodated, and also prior to 1788 the Australian landscape was already actively managed by Aborigines in a manner that, after an initial wave of extinctions, reached an apparently healthy, biodiverse equilibrium. Also, reclaiming nature through landscape-level projects should also not be reduced to the problematic trend of disaggregating nature into a basket of marketable 'ecosystem goods and

---

<sup>113</sup> Paul Martin and Miriam Verbeek, 'Property Rights and Property Responsibility' in C. Mobbs and K. Moore (eds), *Property: Rights and Responsibilities. Current Australian Thinking* (Land and Water Australia, 2002) 1, 2.

<sup>114</sup> Cameron Holley, Neil Gunningham, and Clifford Shearing, *The New Environmental Governance* (Routledge, 2013).

services',<sup>115</sup> such as water purification or carbon sequestration, because it risks losing perspective of the complex interrelationships and resulting in some ecological facets being relegated as less important. As environmental writer David Quammen once amusingly described the limitations of this approach, one large carpet is functionally very different compared to the same carpet cut into thirty-six small fragments.<sup>116</sup>

The first priority must be a more intelligent system of environmental planning scaled at a regional, landscape level that transcends the artificial political and juridical boundaries of state and local governments.<sup>117</sup> Bioregional planning must not only look to the future but also to the past. The federal *Water Act 2007* (Cth), which inter alia provides a framework for managing the Murray-Darling River Basin, is a positive step. Its statutory objects include: 'to protect, *restore* and provide for the ecological values and ecosystem services of the Murray-Darling Basin',<sup>118</sup> with further references to restoration in sections dealing with the development of management plans<sup>119</sup> (although regrettably without definition of key terms). To strengthen bioregional planning, governments should purchase private lands that are particularly critical to these frameworks, such as properties that link wildlife corridors, and fund such purchases (if necessary) by relinquishing Crown assets of less environmental importance. To limit further disaggregation of landscapes into small parcels that impede eco-restoration, planning subdivision controls must be tightened to not only stop further divisions but also to create financial incentives to 'reaggregate' land holdings.

Second, regulators could treat certain types of development proposals as not only an opportunity to address potential ecological impacts but also to consider how to heal past ones. This reorientation would entail looking at how some major proposals, such as those subject to environmental impact assessment procedures, could be redesigned or implemented to facilitate environmental restoration of past harm. A significant new economic development would in other words become an opportunity to achieve net environmental gains by restoring damage from past mistakes. To illustrate, a proposal to clear land for a new property subdivision could be tied to an assessment of how to restore other lands or waters of at least comparable ecological value. Offsetting, although controversial when used as a ploy to allow intensification of environmentally problematic development, can generate environmental gains if we shift its goal from 'offsets' to 'net gains'. The net gain could be satisfied, for instance, by assistance to landowners participating in eco-restoration projects such as those found in K2C and Gondwana Link. Australian legislation and policy already accommodates biodiversity offsets, but they tend to be used more narrowly, as a last resort when alternatives to avoid or mitigate impacts are impractical.<sup>120</sup> A better approach is reflected in the Victorian Government's 2002 policy on biodiversity offsets and net gains.<sup>121</sup>

Such a proposal, while potentially useful for large-scale projects, will not take us very far for routine and smaller scale land use activities. In this context, eco-restoration could be ramped

<sup>115</sup> Richard Norgaard, 'Ecosystem Services: From Eye-Opening Metaphor to Complexity Blinder' (2010) 69(6) *Ecological Economics* 1219.

<sup>116</sup> David Quammen, *Song of the Dodo: Island Biogeography in an Age of Extinctions* (Scribner, 1996) 11.

<sup>117</sup> Michael V. McGinnis (ed.), *Bioregionalism* (Routledge, 1999).

<sup>118</sup> *Water Act 2007* (Cth) s 3(d)(ii) (my emphasis).

<sup>119</sup> Ibid sub-ss 21(2)(b) and 28(1)(d).

<sup>120</sup> Philip Gibbons and David Lindenmayer, 'Offsets for Land Clearing: No Net Loss or the Tail Wagging the Dog?' (2007) 8(1) *Ecological Management and Restoration* 26.

<sup>121</sup> Department of Natural Resources and Environment, *A Framework for Action: Native Vegetation Management in Victoria* (Government of Victoria, 2002), 5, 14.

up by embedding within the definition of property rights, such as freehold tenure and leaseholds of Crown land, a duty of environmental stewardship and restoration measured against variable performance criteria articulated through land use planning schemes. To the extent that adverse land use changes are attributable to previous landowners, the duty should be matched with one on regulators to provide technical and financial assistance in the manner found in some conservation covenants. Properties under Crown leases are the easiest to target, and the Delbessie Agreement in Queensland is a seminal example.<sup>122</sup> This 2007 Agreement, which was abandoned in 2012 by the previous Newman government not particularly sympathetic to environmental concerns,<sup>123</sup> had partnered the Queensland Government, AgForce, and the Australian Rainforest Conservation Society to promote the sustainable utilisation of rural leasehold land, applying to approximately 1800 rural leases for agricultural purposes covering (in theory) about 86.6 million hectares (or about 50 per cent of Queensland's land area). The Agreement linked the maintenance of land condition and rehabilitation of environmental values (such as through the establishment of nature refuges) to extension of lease terms. The Delbessie Agreement was implemented through a package of measures and guidelines that were structured around the 'duty of care' in the *Land Act 1994* (Qld) to reduce land degradation<sup>124</sup> and a land management agreement negotiated between each leaseholder and the state government that outlined the leaseholder's natural resource management obligations. Guidelines for the development of such agreements advised that they could include measures to 'remediate degraded areas' through revegetation, soil amelioration and other measures.<sup>125</sup> The use of negotiated agreements here, while potentially carrying high transaction costs, should have been much more appealing to landowners than rigid regulations.

Because eco-restoration should not be constrained by a regulatory process that is only triggered when a new development is proposed, environmental law also needs a process for actively identifying areas suitable for restoration and to facilitate strategic thinking on a very large scale. The former Resources Assessment Commission (RAC), a Commonwealth entity that conducted major public environmental enquiries in the early 1990s, is the type of institutional model that might effectively support such a role.<sup>126</sup> Rather than scrutinise specific development proposals, the RAC was empowered to investigate natural resources conflicts and other agendas on a broad and regional scale.<sup>127</sup> Its ability to gather and sift through diverse scientific evidence, consult with the public and make recommendations for government action, suggest this model could be useful for building an eco-restoration strategy across Australia. Although resurrecting the RAC is probably unrealistic, a similar public inquiry process could still be initiated under the *Environment Protection and Biodiversity Conservation Act 1999* (Cth) or through the parliamentary committee of

<sup>122</sup> Queensland Department of Natural Resources and Water (DNRW), Delbessie Agreement: State Rural Leasehold Land Strategy (DNRW, 2007).

<sup>123</sup> Amy Phillips, 'Delbessie Agreements Out the Door in Leasehold Review' ABC Rural 22 November 2012 <  
<http://www.abc.net.au/site-archive/rural/qld/content/2012/11/s3638258.htm>>.

<sup>124</sup> *Land Act 1994* (Qld) s 199.

<sup>125</sup> Queensland Department of Natural Resources and Mines, *Guide to Developing a Land Management Agreement* (Queensland Government, 2010) 13.

<sup>126</sup> Established under the Resource Assessment Commission Act, 1989 (Cth).

<sup>127</sup> E.g., Resource Assessment Commission, Coastal Zone Inquiry – Final Report (RAC, 1993); Resource Assessment Commission, Forest and Timber Inquiry – Final Report (RAC, 1992). See further on the role of the RAC and other such institutions, Benjamin J. Richardson and Ben Boer, 'Contribution of Public Inquiries to Environmental Assessment' (1995) 2(2) *Australian Journal of Environmental Management* 90.

inquiries. Concomitantly, state and federal sustainability plans should include a restorative strategy. These routes can help enshrine eco-restoration enshrined as a meta-norm to guide all environmental law in Australia.

## V CONCLUSION

The magnitude of human impacts on the natural world in the long term must be addressed through eco-restoration. Sustaining what we have will not suffice if we do not recover some of what we have lost. This article makes a modest contribution to a debate about how to reclaim and heal nature in those liminal spaces where nature has not been irreparably trashed. Law has an essential role in the implementation of restoration science because it is through regulation and other governance mechanisms that decisions are rendered about which species will be rescued, which land and seascapes will be rehabilitated and which other ecological processes will continue to function. Private actors appear to be playing a significant role in promoting large-scale landscape restoration in Australia. Their efforts should be applauded and supported. But the apparent success in Gondwana Link and Arid Recovery and other projects should not become an excuse for government inaction and they cannot entirely or primarily substitute for it. Few legal scholars are talking about restoration as a guiding norm of environmental law and governance compared to the many that dwell on sustainable development.<sup>128</sup> The plethora of scientific research on this subject, as evident in the establishment of specialist journals such as *Ecological Management and Restoration*, *Restoration Ecology*, and *Restoration Ecology Journal*, has not been matched by similar advances in knowledge on the governance of eco-restoration, let alone advances in actual legal reform.

But in arguing for a more prominent legal framework for eco-restoration in Australia, this article is not naively suggesting that a swathe of legislation that coerces change will work. Rather, the legal system should be cognisant that restoration of liminal spaces requires 'collaboration, conversation, and commitment at all levels of public and private governance'.<sup>129</sup> Government funding can jumpstart eco-restoration, but its long-term success will depend on imaginative new ideals and tools that inspire landowners and other resource managers to make certain concessions and adjustments. At stake is the need for a new timescape of environmental law and sustainability that shifts our focus from the current or the future to the past as well.

---

<sup>128</sup> E.g., Joseph Sax, 'The New Age of Environmental Restoration' (2001) 41 *Washburn Law Journal* 1; Richardson, above n 97; Telesetsky, above n 82; Dan Tarlock, 'Slouching Toward Eden: The Eco-Pragmatic Challenges of Ecosystem Revival' (2003) 87 *Minnesota Law Review* 1173.

<sup>129</sup> Telesetsky, above n 82, 548.