



# **KEY ISSUES IN BIODIVERSITY OFFSET LAW AND POLICY**

## **A Comparison of Six Jurisdictions**

Ontario  
Nature 



# Key Issues in Biodiversity Offset Law and Policy: A Comparison of Six Jurisdictions

June 2015

by  
David W. Poulton, M.A., LL.M.  
Poulton Environmental Strategies  
for  
Ontario Nature

## Acknowledgements

I am grateful to several people who have contributed to this report. First and foremost, the work was the inspiration of Anne Bell of Ontario Nature, who was unfailingly positive and encouraging. Several experts did me the service of reviewing drafts of the summaries of their respective jurisdictions of focus. For that thanks to Laurence Barea (New Zealand,) Marianne Darbi (Germany), Carrie Nugent and Jennifer Psyllakis (British Columbia), and Nicholas Winfield (Canada). Any distortion of the details in those jurisdictions in the commentary of this report is entirely inadvertent and my own responsibility.

DWP

This report was made possible through the generous support of The George Cedric Metcalf Foundation.



Author: David W. Poulton  
Review: Dr. Anne Bell  
Copy-editor: Geri Savits-Fine  
Design: Lisa Rebnord  
Cover photo: Don Johnston

Download this guide free of charge at: [ontarionature.org/publications](http://ontarionature.org/publications)  
Copyright ©2015: Ontario Nature

---

# Contents

<b>1. Introduction</b>	<b>3</b>
<b>2. Biodiversity Offsets and Key Issues</b>	<b>7</b>
a. Mitigation Hierarchy	7
b. Goals of Offsetting	7
c. Limits to Offsetting and Non-Offsetability Criteria	8
d. Establishing Equivalence	8
e. Duration of Offsets	9
f. Proximity	10
g. The Use of Averted Losses as Offsets	11
h. Administration and Oversight	11
i. Other Issues and Features	12
<b>3. A Review of Six Offset Jurisdictions</b>	<b>14</b>
a. British Columbia	14
b. Canada (Fisheries)	16
c. Federal Republic of Germany	21
d. New Zealand	23
e. United States (Wetlands)	26
f. Victoria, Australia (Native Vegetation)	30
<b>4. Discussion: Key Themes Across the Six Jurisdictions</b>	<b>33</b>
a. The Mitigation Hierarchy	33
b. Overall Net Gain	34
c. Limits to Offsetting and Non-Offsetability Criteria	35
d. Establishing Equivalency	36
e. Duration of Offsets	37
f. Proximity	38
g. The Use of Averted Losses as Offsets	39
h. Administration and Oversight	39
<b>5. conclusion</b>	<b>41</b>
Summary of Recommendations	41



# 1. Introduction

**BIODIVERSITY OFFSETTING** is the process whereby the negative impacts of development on biodiversity are compensated for by the intentional production of positive environmental impacts of an equivalent magnitude and (usually) kind. Offsets may be undertaken voluntarily, or may be mandated by a regulator, or by law or policy.

The possibility of offsetting the negative human impact on biodiversity is receiving increasing attention in business, academic and policy circles around the world. A 2011 study found that there were 45 offset programs in various jurisdictions, and another 27 under development.<sup>1</sup> Several other offset policies and programs have been developed since that time, including new policies in Alberta<sup>2</sup> and British Columbia.<sup>3</sup> Concurrently, several jurisdictions (Canada, the United States, at least two Australian states) have revisited their offset policies in recent years, making major amendments or minor tweaks.

This official interest has been matched by an explosion in the past decade of academic literature on biodiversity offsetting. Interest has emerged from the business world, policy-makers and researchers, manifest in the Business and Biodiversity Offset Programme (BBOP), a non-profit organization with dozens of supporters and participants from around the globe.<sup>4</sup> BBOP has worked to develop principles for biodiversity offsetting, which are a touchstone for many from all sectors interested in the subject. Those principles are set out in Box 1 on page 4 of this report. BBOP held its first international conference in London in June 2014, attracting almost 300 people from 32 countries.

The rising prominence of the concept of offsets has also been greeted with some opposition and controversy. The viability of offsetting has frequently attracted healthy skepticism, but that reached a new level when the United Kingdom's Department of Environment, Food & Rural Affairs released a study proposing biodiversity offsetting.<sup>5</sup> Several British conservation groups were highly critical of the whole concept,<sup>6</sup> and a well-known British journalist spoke damningly of it and other economic tools for environmental protection.<sup>7</sup>

Despite such occasional flare-ups, thoughtful work on the best way to conceive of and implement biodiversity offsets continues and grows in many corners of the world. That includes Ontario, where offsets are being increasingly used to spur the creation of benefits for endangered species.<sup>8</sup>

This report is a continuation of the work of Ontario Nature to build understanding and stimulate discussion on the use of biodiversity offsets as a means of maintaining and enhancing biodiversity in Ontario. The first phase of that work was commenced in July 2013. From October 2013 to May 2014, the organization hosted a series of five workshops and meetings among offset experts and practitioners, stakeholders and members of First Nations communities where offsets experiences, practices and principles were discussed and debated. In total 89 individuals participated and 38 organizations were represented in these discussions. Ontario Nature published a detailed summary of the nature and outcomes of these meetings in August 2014.<sup>9</sup> Among the outcomes was strong support for seven key principles that participants agreed should guide offsetting policy and practice (see Box 2 on page 5 of this report).

## Business and Biodiversity Offset Programme: Principles on Biodiversity Offsets 2009.

### BOX 1

Biodiversity offsets are measurable conservation outcomes resulting from actions designed to compensate for significant residual adverse biodiversity impacts arising from project development\* after appropriate prevention and mitigation measures have been taken. The goal of biodiversity offsets is to achieve no net loss and preferably a net gain of biodiversity on the ground with respect to species composition, habitat structure, ecosystem function, and people's use and cultural values associated with biodiversity.

These principles establish a framework for designing and implementing biodiversity offsets and verifying their success. Biodiversity offsets should be designed to comply with all relevant national and international law, and planned and implemented in accordance with the Convention on Biological Diversity and its ecosystem approach, as articulated in National Biodiversity Strategies and Action Plans.

- 1. Adherence to the mitigation hierarchy:** A biodiversity offset is a commitment to compensate for significant residual adverse impacts on biodiversity identified after appropriate avoidance, minimization and on-site rehabilitation measures have been taken according to the mitigation hierarchy.
- 2. Limits to what can be offset:** There are situations where residual impacts cannot be fully compensated for by a biodiversity offset because of the irreplaceability or vulnerability of the biodiversity affected.
- 3. Landscape context:** A biodiversity offset should be designed and implemented in a landscape context to achieve the expected measurable conservation outcomes taking into account available information on the full range of biological, social and cultural values of biodiversity, and supporting an ecosystem approach.
- 4. No net loss:** A biodiversity offset should be designed and implemented to achieve, in situ, measurable conservation outcomes that can reasonably be expected to result in no net loss and preferably a net gain of biodiversity.
- 5. Additional conservation outcomes:** A biodiversity offset should achieve conservation outcomes above and beyond results that would have occurred if the offset had not taken place. Offset design and implementation should avoid displacing activities harmful to biodiversity in other locations.
- 6. Stakeholder participation:** In areas affected by the project and by the biodiversity offset, the effective participation of stakeholders should be ensured in decision-making about biodiversity offsets, including their evaluation, selection, design, and implementation and monitoring.
- 7. Equity:** A biodiversity offset should be designed and implemented in an equitable manner, which means the sharing among stakeholders of the rights and responsibilities, risks and rewards associated with a project and offset in a fair and balanced way, respecting legal and customary arrangements. Special consideration should be given to respecting both internationally and nationally recognized rights of indigenous peoples and local communities.
- 8. Long-term outcomes:** The design and implementation of a biodiversity offset should be based on an adaptive management approach, incorporating monitoring and evaluation, with the objective of securing outcomes that last at least as long as the project's impacts and preferably in perpetuity.
- 9. Transparency:** The design and implementation of a biodiversity offset, and communication of its results to the public, should be undertaken in a transparent and timely manner.
- 10. Science and traditional knowledge:** The design and implementation of a biodiversity offset should be a documented process informed by sound science, including an appropriate consideration of traditional knowledge.

\* While biodiversity offsets are defined here in terms of specific development projects (such as a road or a mine), they could also be used to compensate for the broader effects of programs and plans.

The purpose of this report is to examine six jurisdictions where offsets are currently used or planned, to see how their offsetting policies and practices deal with some major issues, and how they reflect the principles that have been under consideration. My intention is to identify effective policies and practices, to pinpoint gaps and to derive recommendations for policy-makers.

The jurisdictions selected for this survey are Canada (federal fisheries management), the United States (federal wetlands compensatory mitigation), the Federal Republic of Germany (Impact Mitigation Regulation), New Zealand (general guidance on biodiversity offsetting), Victoria, Australia (native vegetation clearing), and British Columbia (environmental mitigation policy and procedures). Each of these offset regimes is briefly described (in alphabetical order) in section 3 of this report.

These six jurisdictions were selected because of the diversity of approaches and subject matters that they offer. Among them are:

- Four national-level regimes (Canada, the United States, Germany, New Zealand) and two sub-national (Victoria and British Columbia);
- Three systems covering environmental mitigation generally (Germany, New Zealand, British Columbia) and three focusing on particular ecosystem components (Canada, the United States, Victoria);
- Four systems requiring offsets by law or regulation (Canada, the United States, Germany, Victoria) and two offering guidance for voluntary or discretionary application (New Zealand, British Columbia);
- Four systems that have operated for several years, but have recently been revised (Canada, the United States, Germany, Victoria) and two newly developed systems (New Zealand, British Columbia).

## Key Principles from Ontario Nature Discussions

### BOX 2

Among participants in the Ontario Nature 2013 – 2014 workshops there was strong support for these seven principles to guide biodiversity offset policy and practices:

1. Offsetting should be set within a clear mitigation hierarchy. First, negative impacts should be avoided wherever possible. Second, any unavoidable negative impacts should be minimized to the extent possible. Offsetting would then offer a means to deal with residual impacts that cannot be addressed through avoidance or minimizing harm.
2. Offsetting should require achievement of an overall net gain.
3. Some sites, features and habitats should be off-limits to offsetting, based for example on vulnerability and irreplaceability. The “no-go” criteria should be informed by science and Aboriginal traditional knowledge.
4. In establishing equivalence, the offset must take into account not only quantity (size) but also quality with respect to the condition of both sites and their landscape context.
5. The outcomes secured through an offset should last at least as long as the project’s impacts, and ideally in perpetuity.
6. The offset location should be based on desired conservation outcomes.
7. The pricing of offsets should cover the complete costs of the delivery of the offsets (including costs of entering into an agreement, creation and maintenance of the offsets, monitoring and reporting).

Of course, the jurisdictions also have a wide diversity of ecosystems, development patterns and threats of concern.

The selection of jurisdictions was not systematic or comprehensive. The jurisdictions examined here are not necessarily reflective or representative of the state of offset thinking or implementation among the 45 plus jurisdictions where offset policies are in place. Rather, they are simply intended to provide a diversity of circumstances and experiences from which to learn about the possible application of the principles and recommendations discussed.

The review of these jurisdictions provided here is based upon, and limited to, legislative and policy documents. It does not purport to take into account actual frontline practices, which may refine or depart from official dictates.

The report begins with a general description of the nature of biodiversity offsetting and some of the issues commonly associated with it. This is necessary to lay a groundwork of understanding for the following descriptions and discussion. The next section reviews each of the six jurisdictions, focusing on a common set of key issues. Then I focus on each of these key issues, drawing together the policies and experience of each of the jurisdictions. The purpose of this synthesis is to attempt to identify trends and patterns, best practices, potential problems or other lessons to be learned. It is hoped that this may add value to the consideration of biodiversity offsets and to policy development in Ontario and elsewhere.



## 2. Biodiversity Offsets and Key Issues

**THE MOST COMMONLY CITED DEFINITION** of “biodiversity offsets” is that of BBOP:

[M]easurable conservation outcomes resulting from actions designed to compensate for significant residual adverse biodiversity impacts arising from project development after appropriate prevention and mitigation measures have been taken. The goal of biodiversity offsets is to achieve no net loss and preferably a net gain of biodiversity on the ground with respect to species composition, habitat structure, ecosystem function, and people’s use and cultural values associated with biodiversity.<sup>10</sup>

The concept prescribes that the negative impact on biodiversity occasioned by a human development of any type may be compensated for by an intentional positive impact of an equivalent magnitude at a second somewhat proximate site, with a view to producing a net neutral or positive impact when the two sites are considered together in a regional context.<sup>11</sup>

### a. Mitigation Hierarchy

Biodiversity offsetting requires that a development proponent assess and quantify the residual negative impact of its development, after it has taken all reasonable and practical measures to avoid and minimize that impact. The sequential steps of avoidance and minimization (including on-site mitigation and restoration), followed by offsetting of the residual impact, are commonly referred to as “the mitigation hierarchy.”

Commitment to the mitigation hierarchy, expressed in various ways, is near universal in discussions of biodiversity offsets and in offset policies. Adherence to the hierarchy is the first BBOP Principle (see Box 1 on page 4). The hierarchy is an expression of the value of leaving natural ecosystems intact, and the risks and uncertainties inherent in human interventions to minimize disturbance, and to restore, enhance or construct ecosystems to create effective offsets. Strict adherence to the hierarchy is a safeguard against development proponents or regulators relying too heavily on offsets, using them as a justification for short-cutting avoidance and minimization requirements.

### b. Goals of Offsetting

The BBOP definition of biodiversity offsetting contains within it the alternative goals of “no net loss and preferably a net gain of biodiversity on the ground.” This is frequently summarized as “no net loss or better.” It is a formulation that is used in many, but not all, offset systems. BBOP acknowledges that some biodiversity compensation efforts may not have the ambition of “no net loss or better,” but declines to call them offsets. According to BBOP, compensation for biodiversity impacts is a continuum, and only those compensation measures that are designed to achieve no net loss or better qualify as offsets.<sup>12</sup>

The virtue of the no net loss standard is that it is specific and objectively measurable. This means that the adequacy of actions and outcomes can be assessed and calibrated to the goal. These characteristics

may be found in other goals, but the goals should be clearly defined. This includes the goal of a “net gain of biodiversity on the ground,” as called for by BBOP. It should be guided by some policy objective that defines which species, habitat, functions or services are valued and to be promoted. In the absence of this, the notion of “gain” or “better” is subjective and can be so flexible as to be counter-productive. For this reason, no net loss should be seen as a default goal, with any departure from it to be guided by a clearly stated policy objective.

In the discussions hosted by Ontario Nature, most of those consulted endorsed an offset goal of “an overall net gain” (see Box 2 page 5). It is clear from the summary of the meetings that this recommendation is the product of the combination of two distinct but related concerns.<sup>13</sup> The first is that in the face of a general decline in biodiversity, offsetting should be a positive force. This is an argument for a true net gain. As stated above, however, it requires more definition if it is to be effectively operationalized.

The second concern is that a net gain objective is necessary to compensate for the inadequacies, uncertainties and risks of offsetting. In this position it is necessary to overshoot our target if we are to be sure of hitting it. This is essentially the common argument for the use of offset multipliers to compensate for weaknesses in offsetting.

### **c. Limits to Offsetting and Non-Offsetability Criteria**

The credibility of offsetting as a tool for conserving biodiversity depends upon our ability to reliably replicate, by positive activities at the offset site, the valued ecosystem conditions lost at the development site. We must be forthright, therefore, when we do not have sufficient evidence of our ability to succeed, or where the consequences of failure are so severe that the risk should not be courted. Under these conditions, offsetting is an inappropriate tool to rely on.<sup>14</sup> This is BBOP Principle 2, as found in Box 1 on page 4. In such cases, proactive forms of environmental protection, such as the designation of a protected area, are more suitable. If the social value of the proposed development is so high that the particular environmental values are to be sacrificed, then offsetting should not be used as a veil to hide behind.

Biodiversity offset systems, therefore, should contain criteria that define the limits of offsetting (or “non-offsetability”).

### **d. Establishing Equivalence**

The quantification of the negative impact of the development is to be carried out using a metric that reflects both the ecological significance and social value of the ecosystem components affected. This process requires the drawing of some equivalency between ecological conditions at the development and offset sites. This is a challenging notion given that the two will share some characteristics with one another, but each will be unique and distinct in other respects. The drawing of equivalencies, therefore, requires a prioritization of ecosystem function and values. Further, these factors have to be reduced to a single, or small number, of numerical measurements by which the ecological losses and gains can be assessed. This “currency” should then be used to plan and measure the extent of the ecological gain intended for the offsetting site.

Establishing equivalence is one of the stickiest issues in biodiversity offsetting, but it is also the one most critical to the credibility of the process. It combines considerations of kind, quantity, condition, location and function, and perhaps many more. It also requires the mixing of social values (always uncertain) with

scientific knowledge (always incomplete) to arrive at a conclusion that is both scientifically justifiable and socially acceptable.

The process of establishing equivalency of the values at the impact and offset sites is very often dependent on the particular context, especially of the disturbance at the impact site. The ecosystem features and functions found there, and their social value, should establish the parameters that guide the search for appropriate offset opportunities.

Related to the issue of equivalency is whether the positive impact created at the offset site is necessarily of the same nature as that lost at the development site. While “like-for-like” offsets are often considered the norm, in particular circumstances an argument may be made that greater ecological value may be derived by pursuing offset measures to create ecosystem components or functions different from those lost to development. For example, Thomas J. Habib and co-authors have argued that to offset for oil sands mining in Alberta, it would be much more cost-effective to dedicate offset resources to the conservation priorities of caribou or the Dry Mixedwood natural region, than to replicate the conditions lost at the oil sands mine sites on a like-for-like basis.<sup>15</sup> When such “out-of-kind” offsetting is pursued, it significantly complicates the task of assessing equivalency, as some proportionality must be drawn between different ecosystem features or characteristics.

## **e. Duration of Offsets**

BBOP states the principle (Principle 8, see Box 1 on page 4) that offset outcomes should last at least as long as the negative impacts of the development project. Those consulted by Ontario Nature echoed this approach (see Principle 5 in Box 2 on page 5). In both cases the principles go further to express a preference for offsets effective and secured in perpetuity.

The concept that the duration of the offset should match the duration of the impact is easily justified by reference to the goal of no net loss. That goal should not be read as referring only to a quantity of factors relevant to biodiversity, but also to temporal dimension. A short-term benefit will not offset a long-term loss.

Note that the BBOP principle refers to the duration of the offset *outcome*. Given that there may be a significant time lag between the initiation of the offset and the achievement of its desired outcomes (because various ecosystem components take time to become established and to mature), this may mean that the actual duration of an offset may have to be significantly longer than that of the development project in order for no net loss to be approximated.

Many developments, such as urban development, are envisioned as permanent. Others may have a very long time period planned before retirement and reclamation. Reclamation or restoration techniques may not achieve an actual restoration of prior ecological conditions. All of these reasons suggest that it is very difficult to predict the duration of a development impact with any great confidence, and that having offsets function securely in perpetuity may be preferable.

The issue of offset duration involves several aspects: long-term planning, governance and management structures, financial arrangements, monitoring regimes and legal protection against conflicting uses that would undermine offset objectives. It is also tied to the trajectory of ecosystem succession expected for the offset. All of these factors must be taken into account if the offset is to match or exceed the development disturbance in a temporal sense.

They also require particular institutional infrastructure, such as the ability to establish and manage groups that are liable for offset management after the initial actors have moved on. A well-established community of land stewardship organizations is often the best means for providing for the long-term management of offset sites.

Long-term management and security also require legal tools that can establish the liability for proper management, and that can protect against incompatible uses of the offset site. This may involve outright acquisition, sometimes followed by transfer to a responsible state authority, or may be accomplished by more limited tools such as conservation easements or covenants.<sup>16</sup> These assume, of course, that a stable and reliable system of land tenure exists, which, fortunately, is not an issue in Canada.

In its discussions, Ontario Nature found that those consulted were willing to temper the general principle of striving for offset permanence with a realization that such a requirement might deter landowners from participating in offset schemes, and, if tied to a specific location, may not be optimal from an ecological perspective if the offset target is a feature likely to move over time.<sup>17</sup> The possible reluctance of landowners to adopt obligations for the very long term was exhibited in Alberta in a biodiversity offset pilot program, which found that most landowners were interested in contracts of 20 years or less.<sup>18</sup>

Both Ontario Nature and the Government of Ontario have made note that one way to ease landowner reluctance is to include “safe harbour” provisions in offset arrangements.<sup>19</sup> Under such arrangements a landowner has the right to back out of the commitment to undertake the offset implementation without incurring a penalty.

While such a safe harbour arrangement may increase landowner participation, it does pose a challenge for the administration of an offset system. In order for a development proponent to undertake offsets, it must be assured that it will receive a secure number of credits upon which it will ordinarily expect to be severed from any further liability for the offset (usually by transferring that liability to third party, such as a land trust). Thus the number of credits must be clearly defined at a particular point in time. Since the development proponent will want to apply those credits to its development project, it will want those credits secure and usable at as early a date as possible. This poses a challenge in that the offset activities may not successfully yield the intended outcome, and that challenge is compounded significantly if, at the will of the landowner, the project may be abandoned altogether. In such circumstances, who holds responsibility, if anyone, for making the offset project whole? If no one is clearly identified as holding this liability, then the development project was allowed to proceed without any effective offset, even if one was paid for. This issue should be addressed if safe harbour arrangements are to be included in an offset system.

## **f. Proximity**

The selection of the site (or sites) for offsetting is one important factor in establishing equivalence, which is discussed above. The particular ecological characteristics and human use patterns of the site will determine its current ecological and social value, its future potential and its similarity to the impact site. While these aspects, particularly the last, may tend to correlate to proximity with the impact site, that is dependent on context. Quite distinct ecosystem types may exist in close proximity, while similar ones may be far apart. On the other hand, it may be difficult to demonstrate how distant sites contribute similar ecosystem functions within the region.



If one is designing out-of-kind offsets to serve strategic conservation objectives, then proximity may have very little relevance. Rather, the site will be selected according to the objective.

Finally, proximity has an important social aspect. Particular human communities may lose ecological services when the impact site is developed. If other communities benefit from the implementation of the corresponding offset, then winners and losers have been created, which may create inequities and dissension.<sup>20</sup>

For all of these reasons a flexible approach to proximity is advisable, and this is found in both the Ontario Nature and BBOP principles.

## **g. The Use of Averted Losses as Offsets**

An averted loss is potentially creditable as an offset where an existing site of some ecological value is secured in its current state in the face of a perceived threat to its ecological integrity. Its value as an ecological gain is measured as the difference between its continued current (and naturally evolving) state and the destruction or degradation that would have occurred had the site not been protected and the perceived threat actually come about (i.e., the counterfactual).<sup>21</sup> The assessment of that value, therefore, depends upon a projection of what would have happened to the site had the extra protection measures not been taken. Put another way, averted losses accept the maintenance of the status quo on the landscape as a gain against an expected future of continued degradation.

Typically, loss is averted by acquiring an interest in the threatened site, either through outright acquisition of the freehold title or placement of a conservation easement or covenant.

One argument for the use of averted loss is that it does provide a more certain outcome than the more uncertain ones projected when positive management actions are used.<sup>22</sup> When surveying an existing site and assessing its actual ecological characteristics, one knows what one is getting.

On the other hand, projecting when a site may be lost to a threat, and how much will be lost, is a more speculative exercise. Unless the threat is obvious and imminent, this aspect calls for a certain amount of speculation. This raises the question of what sort of threat must exist, and what evidence can be relied upon in making that determination.

Averted losses do not produce a gain as measured against the ecological status quo. Yet, if they are used as offsets, they will facilitate the loss of ecological values at the development site.

These factors all contribute to the use of averted losses being treated with skepticism, and a need for clarity in this area of offset policy.

## **h. Administration and Oversight**

Obviously the administration of an offset policy or system ought to follow the principles of good public policy: coherence and consistency, fairness, transparency, cost-effectiveness, etc. There are, in addition, some special challenges with respect to setting up and administering an offset program. These are based on an inherent tension that exists in any offset program.

On the one hand there is an interest in avoiding uncertainty, delay and other transaction costs. This interest is, at least in part, served by having standards, procedures and information protocols. The interest is

shared by both system administrators and development proponents who see the success of the system in its smooth and efficient operation.

The other interest is the public interest in conservation and a healthy environment. It may be best served by taking the time to gather detailed information to feed into the offset assessment, and by taking a skeptical look at issues and uncertainties, such as those covered in this report. This interest tends to slow the system and create information costs. This interest is diffused among the broad public, though it may find champions in particular individuals and civil society groups. Those individuals and groups, however, are unlikely to have any direct role in the administration of the offset system, and may have little opportunity to participate in it. This means that there is a danger that the focused, shared interest of administrators and development proponents in having the system function smoothly may dominate the diffuse public interest in environmental protection.

For this reason, it has been suggested by Salzman and Ruhl<sup>23</sup> (from whose work the above perspective is derived) that an offset system should have an independent oversight committee made up of concerned stakeholders, including civil society groups concerned with substantive conservation. As well, we might expect that those agencies that are responsible for substantive environmental policy are not best suited to the day-to-day administration of offsetting. Let those whose focus is environmental protection and are free from the pressure to make an offset system efficient, protect the public interest. The tension can then take the form of a healthy dialogue, rather than a conflict of interests.

## i. Other Issues and Features

The above is a list of some of the issues and questions that arise in any offset system. It is far from an exhaustive list, however. There are many other questions that might be asked, or features that may be constructed as a part of an offset system, depending on policy goals, and on social and ecological conditions.

In this subsection I will briefly touch on a few matters that may be of interest in the Ontario and Canadian context. My purpose in doing so is to make the reader aware that they are receiving attention in discussions in Canada and elsewhere, but not to discuss them at any length. Fortunately, there is a rich body of literature and experience developing, which can serve as a reference for all of us interested in this area.

- **Offset Credit Banking** – In some systems offset credits are generated proactively through conservation actions and outcomes prior to any particular corresponding development. An offset credit bank is created when outcomes are verified and credited. Credits from the bank may then be applied later to development projects needing offsets. A banking system offers the advantage that offsets are put in place before the development they will compensate for, avoiding some of the time lag that usually occurs between negative and positive ecological outcomes. It also has the potential to create a group of specialists producing offset credits as a profession, creating opportunities for innovation and efficiency. Banking may take the form of “first-party banking,” where a development proponent establishes a bank of offset credits in anticipation of its later offset needs, or “third-party banking,” where offsets may be created by third parties and made available for sale to developers who need them.
- **Credit Stacking** – As various offset systems are developed, questions will arise as to how they harmonize with one another, and how compliance with one system might affect compliance in another. One particular manifestation of this is referred to as a “stacking” issue. Simply put, the actions and

outcomes undertaken for the purposes of generating a credit in one system may also be available as the basis for a credit in another offset system. For example, the reforestation of an area might generate a biodiversity credit under one system, but the growth of that forest might also sequester carbon. Should that same area of forest, planned and managed in exactly the same way, also generate a carbon credit? That is the essence of the stacking question, and it is not a question that lends itself to easy answers.<sup>24</sup>

- **Social Engagement** – While biodiversity offsetting is in large part a scientific exercise to maintain and improve biodiversity, we must always remember that it is also a social exercise. The larger community, beyond scientists and developers, must be involved in the offset dialogue. Local residents will have special knowledge of development and offsets sites, and their experience of those sites will have created special connections, meaning and values. In no realm is this truer and more important than with Aboriginal peoples who have formed connections with lands and waters over millennia. Their traditional knowledge, and their values and traditions derived from the landscape, are particularly deserving of attention and respect as land use and offset planning is undertaken. Of course, in Canada this is not just good practice, but also a frequent legal requirement. In this regard, take note of BBOP Principles 6, 7 and 10 in Box 1 on page 4.<sup>25</sup>

I now turn to each of the selected six jurisdictions to examine how they treat these and other issues.

# 3. A Review of Six Offset Jurisdictions

## α. British Columbia

### Legislation and Key Policy Documents:

*Policy for Mitigating Impacts on Environmental Values (Environmental Mitigation Policy)*  
(May 13, 2014)

*Procedures for Mitigating Impacts on Environmental Values (Environmental Mitigation Procedures)* (May 27, 2014)

Both online at [env.gov.bc.ca/emop](http://env.gov.bc.ca/emop).

### Overview

Finalized in 2014, British Columbia's Environmental Mitigation (EM) Policy establishes the mitigation hierarchy, including offsetting, as the standard for considering the mitigation of all types of regulated development. Together with its accompanying EM Procedures, the policy sets out a set of principles, considerations and processes to guide regulators and proponents looking at mitigation. It does not set a specific goal, and the application of the policy in particular circumstances is left to the discretion of the responsible regulator or volunteering proponent.

### Key Elements:

#### Mitigation Hierarchy

The application of the mitigation hierarchy is explicitly prescribed by the *EM Policy*, which provides:

6.1 The mitigation hierarchy and its corresponding types of mitigation measures to be applied under this Policy are outlined here, in order of priority. All feasible measures should be considered and applied at one level before moving to the next.

- a. avoid impacts on environmental values and associated components.
- b. minimize impacts on environmental values and associated components.
- c. restore on-site the environmental values and associated components that have been impacted.
- d. offset impacts on environmental values and associated components.

6.2 Considerations made in the moving from one level of the hierarchy to the next should be documented in a detailed mitigation plan.<sup>26</sup>

The application of the hierarchy is spelled out in more detail in the *EM Procedures*, which prescribe the considerations for moving from one level to the next.<sup>27</sup> The thresholds for movement between levels of the hierarchy depend upon “feasibility” and “practicability” of measures. For greater certainty respecting the latter term, the *Procedures* refer<sup>28</sup> to a General Bulletin of the Forest and Range Practices Act, which suggests a meaning of “capable of being carried out in action” after consideration of all the rele-



vant circumstances, including “reasonable commercial considerations.”<sup>29</sup> The development proponent is required to prepare a mitigation plan including a rationale for how each step in the mitigation hierarchy was considered and why movement from one level to the next was considered reasonable.<sup>30</sup>

Further, the *Procedures* enunciate the principle that the higher the assigned risk to an environmental value posed by a development project, the more protective mitigation measures should be, and the more likely offsetting will be required.<sup>31</sup>

### **Overall Net Gain**

The B.C. policy does not commit to a specific goal. Indeed, it specifically says that not all impacts may have to be mitigated, and that an acceptable level of impact of a project is the responsibility of the statutory decision-maker. “The Policy and Procedures are about ensuring that the approach to mitigation is rationalized and documented.”<sup>32</sup> There is in the *Procedures*, however, a general statement of intent to “sustain environmental values and components that are important to British Columbians, now and for the future.”<sup>33</sup>

### **Offsetability and Non-Offsetability Criteria**

The *Procedures* set out criteria for determining the priority of particular ecological values: rarity, sensitivity to disturbance, current condition, replaceability, ecosystem structure, ecosystem function and dependencies.<sup>34</sup> The rating of a site as high priority does not mean that its values are placed beyond the application of offsetting. Rather, the earlier step of avoidance of impacts is said to be “particularly important” for high priority ecological values and related components.<sup>35</sup>

On the other hand, recalling that the B.C. scheme is intended to give guidance to regulators and stakeholders on mitigation measures, and not to dictate particular outcomes, the *Procedures* state that generally the higher the risk posed by the development, the more likely that offset measures will have to be considered (as opposed to limiting mitigation to on-site minimization of impacts including restoration).<sup>36</sup> Uncertainty in the success of offset measures is to be taken into account and invoke the use of appropriate multiplier ratios (i.e., ratios between damage incurred and compensation required, whereby higher uncertainty would require a higher level of compensation).<sup>37</sup> In a practical sense the prescription of higher ratios, with their associated costs, if adopted by regulators, may deter projects posing a high risk or impacting high priority ecological values.

### **Establishing Equivalence**

Ecological equivalence between the impacts of development and those of proposed offset measures is to be determined by reference to a single environmental value and its associated components, and a single unit of measurement is to be applied to both negative and positive impacts.<sup>38</sup> The goal is to provide similar ecosystem functions as those impacted by development, though it is acknowledged that it may only be practical to provide similar structure.<sup>39</sup> There is a preference for offsetting on a like-for-like basis, but deviation may be considered where a case is made that such a deviation will lead to better environmental outcomes.<sup>40</sup>

### **Duration of Offsets**

While stating as a principle that offsets must be legally secured for their intended duration,<sup>41</sup> the *Procedures* express a preference for offset measures to be secured in perpetuity. With respect to conservation covenants (i.e., voluntary, legally binding agreements between a landowner and an authorized body), the document states: “[c]onservation covenants need to be enforceable in perpetuity, or until other mitigation

measures have completely mitigated the on-site impact (e.g., impacted habitat is fully restored).<sup>42</sup> The use of the present perfect tense in the latter clause in this dictate is potentially significant. It suggests that that qualification will only apply retrospectively when the result of full restoration has been achieved. If so, this would rule out any specific time limit being written into a covenant in anticipation of future successful restoration.

On a separate aspect of permanence, the *Procedures* express a preference for land acquisition over conservation covenants as a means to secure offset measures.<sup>43</sup> Caution is advised when using covenants “as they may be difficult to maintain or enforce (e.g., sale of the property or failure of the organization [holding the covenant]) and thus will not fully address offsetting.”<sup>44</sup>

### **Location/Proximity of Offsets**

The location of the offset site is to be selected based on consideration of where the measures are most likely to achieve ecological function equivalent to the impacted site.<sup>45</sup> This is not based strictly on proximity (i.e., distance between the sites), but rather the two sites being part of the same biogeoclimatic zone, watershed, landscape unit, etc.<sup>46</sup> Of course, these elements may suggest proximity in particular circumstances.

### **Use of Averted Loss**

Land securement in the face of a threat is provided as one permissible form of offsetting, but the onus is on the proponent to document the rationale for this option and how it meets the criteria of ecological equivalency.<sup>47</sup> As stated above, securement may be implemented by outright acquisition of land, or by conservation covenant, but the former is preferred because of its greater certainty.<sup>48</sup> In any case, land securement must maintain or improve upon the status quo.<sup>49</sup>

### **Oversight Mechanisms**

The B.C. system does not establish a separate agency to oversee the implementation of the mitigation hierarchy. Rather it is intended to provide guidance to the various regulators having jurisdiction to permit activities on the landscape. It is they who have responsibility for administration and oversight.

### **Other Issues and Features**

The *Procedures* recognize that consultation with stakeholders, communities and First Nations may be an important part of identifying environmental values. In particular they note that some environmental values may be identified with First Nations treaty rights.<sup>50</sup>

---

## **b. Canada (Fisheries)**

### **Legislation and Key Policy Documents:**

Fisheries Act, 1985, RSC 1985, c F-14.

Fisheries and Oceans Canada, *Fisheries Protection Policy Statement, October 2013* (Ottawa: Ecosystem Programs Policy, Fisheries and Oceans Canada, 2013), online: Fisheries and Oceans Canada, [dfo-mpo.gc.ca/pnw-ppe/pol/PolicyStatement-EnoncePolitique-eng.pdf](http://dfo-mpo.gc.ca/pnw-ppe/pol/PolicyStatement-EnoncePolitique-eng.pdf).

Fisheries and Oceans Canada, *Fisheries Productivity Investment Policy: A Proponent's Guide to Offsetting (2013 Guide), November 2013* (Ottawa: Ecosystems Programs Policy, Fisheries and Oceans Canada, 2013), online: Fisheries and Oceans Canada, [dfo-mpo.gc.ca/pnw-ppe/offsetting-guide-compensation/offsetting-guide-compensation-eng.pdf](http://dfo-mpo.gc.ca/pnw-ppe/offsetting-guide-compensation/offsetting-guide-compensation-eng.pdf).

## Overview

Canada has had for some time a federal fisheries regime that requires offsetting as the final stage in the mitigation hierarchy. From 1985 to 2013 any “harmful alteration, disruption or destruction” of fish habitat was generally only permitted if no net loss of habitat could be achieved through offsetting. In 2013, the statutory basis for the system was amended, which ushered in a new wave of policy and guidance documents. The new regime moved the focus of concern away from the habitat of any fish to “serious harm to fish,” though that phrase encompasses “the death of fish or any permanent alteration, or destruction of, fish habitat.”<sup>51</sup>

## Key Elements: Mitigation Hierarchy

One of the potentially significant aspects of the 2013 amendments to the Act was the inclusion of avoidance, mitigation and offsetting within the text of the legislation itself, elevating it from its previous status of mere policy. The wording of the provision, however, raises questions about how it might be applied. Section 6 reads:

6. Before recommending to the Governor in Council that a regulation be made in respect of the section 35 ... and before exercising any power under ... paragraph 35(2)(b) or subsection 35(3) ... or with regard to harm to fish the Minister shall consider the following factors:

(c) whether there are measures or standards to avoid, mitigate or offset serious harm to fish that are part of a commercial, recreational or Aboriginal fishery, or that support such a fishery ...

There are at least three questions arising out of this section. The first is what it means for the minister to “consider” the listed factors. What level of consideration is required and what evidence of such consideration? The second is what measures or standards might qualify for such consideration. Does this include standard industry practices, best practices or emerging innovative techniques? Do such practices and standards have to be recorded or encoded somewhere in order for them to receive consideration? Thirdly, while the provision lists “avoid, mitigate and offset” it does not make clear that this is a hierarchy or sequence, which raises the question of whether it will be interpreted and applied in a manner consistent with the usual understanding of the mitigation hierarchy.

The *2013 Policy Statement* addresses the latter point with a clearer description and endorsement of the mitigation hierarchy.<sup>52</sup> It notes that the hierarchy is an internationally recognized standard and refers to the work of the Business and Biodiversity Offset Programme and the International Union for the Conservation of Nature and International Council on Mining and Minerals.<sup>53</sup> The rationale of the hierarchy is explained as follows:

Fish dynamics and fish habitat functions are complex. It is much more difficult and expensive to repair or restore damaged ecosystems to maintain fisheries productivity than it is to avoid adverse impacts. For this reason the Department emphasizes avoidance and mitigation as the main steps in the hierarchy, followed by offsetting as a means of last resort.<sup>54</sup>

The threshold for movement from one level of the hierarchy to the next is prescribed indirectly through the use of the qualifiers “to the extent possible”<sup>55</sup> and “whenever possible.”<sup>56</sup> The extent of the development proponent’s responsibility is summarized as:

Proponents will be required to submit an offsetting plan to demonstrate that measures and standards have been fully applied to first avoid, then mitigate, and finally offset any *serious harm to fish* that are a part of or support commercial, recreational or Aboriginal fisheries.<sup>57</sup>

It should be noted that, like the statute itself, this statement does not clarify what measures and standards are expected, perhaps because that is likely highly dependent on the context of a particular project.

### **Overall Net Gain**

The fisheries offset system does not prescribe a specific objective. Rather it suggests that the purpose of offsetting is to “counterbalance” unavoidable serious harm to fish. This word suggests that a net neutral result is the default objective.

This is also reflected in the *2013 Guide*, which refers to “the goal of maintaining or improving the productivity” of the subject fisheries,<sup>58</sup> suggesting that an objective of net gain is available but not required.

The policy also states that offsetting “should support available fisheries management objectives and local restoration priorities.”<sup>59</sup> The system seems, therefore, to be designed to be adaptable to a variety of objectives, suggesting that offsetting out of kind is a possibility.

### **Offsetability and Non-Offsetability Criteria**

The federal fisheries regime uses the mitigation hierarchy, including offsets, as the central approach to all fisheries mitigation. The *2013 Policy Statement*, however, admits that there may be some (unspecified) circumstances where the public interest may be served by actions other than application of the hierarchy.<sup>60</sup> Conceivably this discretion might be used to define a domain of non-offsetability, though no criteria are provided to clarify when this discretion may be exercised. Conceivably social, economic and even political considerations might be brought to bear, as might ecological ones.

While not referring specifically to any doctrine of non-offsetability or limits to offsetting, Section 37 of the Act allows the minister to review plans of any project causing serious harm to fish, or work in ecologically significant areas as defined in regulations.<sup>61</sup> If the minister is of the opinion that harm to fish is likely to occur, then she/he may impose modification or restrictions, including closing or ending the work for any period of time considered necessary.<sup>62</sup> This authority could be used to create a sphere exempt from the application of the mitigation hierarchy, where the impacts of development or activities might simply be prohibited. This section is, however, subject to the requirement of prior consideration of the mitigation hierarchy.<sup>63</sup>

As well, it may be useful or necessary to have reference to other federal legislation, such as the Species at Risk Act,<sup>64</sup> to define such limits to the use of offsetting.

### **Establishing Equivalence**

Both the *2013 Policy Statement* and the *2013 Guide* say that, dependent on circumstances, offsets may be of the same kind as the negative impacts, or may be out of kind. In other words, offsetting may be “like-for-like” or may be used to promote an environmental value different than that impacted by the development.

Offsetting in kind is to be measured by the use of a currency that reflects the material nature of the common aspect. For example, the destruction of habitat is to be compensated for by restoration or creation of the same area of habitat, plus an extra amount to address time lags and uncertainties.<sup>65</sup>



The guide goes on to describe both the potential advantages and the challenges of out-of-kind offsets:

Out-of-kind offsetting measures require more complex analyses to ensure that the offsetting measures balance losses. A variety of equivalency analyses exist; generally they require the calculation of a common currency that may be used to compare losses and gains across fish life stages, species and habitat types. These methods may be data intensive and require specific expertise. An overview is provided in publications by DFO's Canadian Science Advisory Secretariat. Quantifying equivalency opens the door to more flexible approaches to offsetting. However, in the absence of data to support the calculation of equivalency, fisheries productivity may be better served by in-kind offsetting measures.<sup>66</sup>

The guidance referred to from the Canadian Science Advisory Secretariat was published in December 2014.<sup>67</sup> The document invokes international studies and standards in describing a range of equivalency analyses that may be applied to different situations and concerns. Its analysis is too detailed to review here, but it is recommended for the interested reader. One of the document's strengths is that it recognizes that equivalency analysis is an area of study still under development, so that any methodology used in Canada for fisheries protection should be periodically reviewed and refined.<sup>68</sup>

To summarize, the federal fisheries regime allows consideration of out-of-kind offsetting, but rather firmly suggests that in-kind offsetting is likely an easier way to demonstrate the equivalence that proper offsetting requires.

### **Duration of Offsets**

The duration of the adverse impact is one of the considerations relevant to determining if a development project or activity will be found to be likely to cause serious harm to fish.<sup>69</sup> Offsets "must generate self-sustaining benefits over the long term," for "at least as long as the impacts of the development project."<sup>70</sup>

No legal mechanism is prescribed to secure offset measures taken. As with the use of averted loss discussed below, one possible reason for the absence of a prescription is the paucity of legal tools within federal jurisdiction for a private party to protect aquatic habitat.

### **Location/Proximity of Offsets**

The *2013 Policy Statement* maintains flexibility on both the preferred location and type of offset to be provided, both dependent on the particular circumstances:

Offsetting measures could take a variety of forms ranging from local improvements to fish habitat to more complex measures that address limiting factors to fish production. The choice of appropriate offsetting measures will be guided by threats to fisheries productivity and fisheries management objectives. In some instances, the most desirable offsetting measures may be a replacement of the same type of habitat that is affected by the project. In other situations, better outcomes for fisheries may be achieved by undertaking offsetting in water bodies or for fish species other than those affected by the project.<sup>71</sup>

Notwithstanding this flexibility, the *2013 Guide* expresses a preference for offsets "in the vicinity of the project or within the same watershed" and within the same province or territory.<sup>72</sup>

### **Use of Averted Loss**

While the federal policy does not preclude the use of averted loss offsets, neither does it appear to contemplate them. The *2013 Policy Statement* says that offsets are intended to provide "tangible conser-

vation outcomes.”<sup>73</sup> Arguably, losses averted are less tangible than improvements from positive management actions. The examples provided of possible offset activities – localized improvements, replacement of habitat, improvement of fish access of off-channel habitat, the removal of anthropogenic barriers to movement<sup>74</sup> – all speak to positive management actions, rather than averted losses.

As well, the *2013 Guide* outlines four categories of offsets (habitat restoration and enhancement, habitat creation, chemical or biological manipulations, and limited “complementary measures” such as contributions to research), none of which is aimed at protecting a fishery against perceived threats.<sup>75</sup>

It should be noted that there is a relative shortage of measures within federal jurisdiction to provide long-term protection of aquatic habitat, which may explain the preference for positive actions apparent in the policy.

### **Oversight Mechanisms**

The federal fisheries offset program is designed and administered by Fisheries and Oceans Canada without oversight from any other department. Of course, general federal oversight, such as that of the auditor general and the Commissioner of the Environment and Sustainable Development, applies.

### **Other Issues and Features**

As part of the revamping of the fisheries compensation system, active consideration is being given to increasing the role of banking.<sup>76</sup> A small degree of first party banking has been a long-standing, if little known, feature. Explorations and discussions are now underway as to how to allow banking, including third-party banking, to become a more regular part of the systems operations.

The new regime recognizes the economic, social and cultural value of Aboriginal fisheries, by making such fisheries a key target, along with recreational and commercial fisheries. In addition to seeking to protect these interests, the *2013 Guide* makes clear that these groups and others in the community have a role to play in addressing the threats to these fisheries:

The potential to address these impacts is through restorative action and partnerships with government, Aboriginal organizations, local group and others in the fisheries conservation field. Many groups share a common interest in the conservation and restoration of fisheries ... Working together toward common goals, tangible progress can be made in this area.

To this end, legislative amendments to the Fisheries Act were put in place to strengthen partnerships with partners and stakeholders to enhance fisheries protection. These changes allow the Minister of Fisheries and Oceans to enter into agreements with third parties (Aboriginal organizations, recreational fishing and angling groups, conservation groups, provinces, industry) to undertake measures and make investments to enhance fisheries protection, with the objective of improving fisheries productivity.<sup>77</sup>

This appears to open the door to much greater community engagement in the management of the relevant fisheries, which is commendable.

## c. Federal Republic of Germany

### Legislation and Key Policy Documents:

Federal Nature Conservation Act (Bundesnaturschutzgesetz), 2009

#### Overview

The German Impact Mitigation Regulation, part of the Federal Nature Conservation Act (FNCA), is a series of requirements that apply broadly to all ecosystem features and functions (as well as the aesthetic and recreational benefits provided by nature), and to all types of development or activities that would impact those natural values. The system aims at full compensation for all natural values impacted.

There are exceptions to this general application, however. Agriculture, forestry and fisheries have special provisions respecting their environmental performance, which exempt them from the general operation of the regulation.<sup>78</sup>

#### Key Elements:

##### Mitigation Hierarchy

The FNCA prescribes the mitigation hierarchy for all parties (with the above exceptions) whose activity may intervene on landscapes having natural features:

Intervening parties shall primarily avoid any significant adverse effects on nature and landscape. Unavoidable significant adverse effects are to be offset via compensation measures (Ausgleichsmaßnahmen) or substitution measures (Ersatzmaßnahmen) or, where such offset is not possible, via monetary substitution.<sup>79</sup>

The requirement of avoidance is more clearly set out in Article 15(1):

Adverse effects shall be considered avoidable if reasonable alternatives are available for achieving the purpose of the intervention, at the same location, with lesser or no adverse effects on nature and landscape. Where adverse effects cannot be avoided, reasons for such unavoidability must be provided.<sup>80</sup>

This is a fairly narrow concept of avoidance in that it does not allow for consideration of the purpose or location of the development project or activity. On the other hand, procedurally, reasons must be provided why planned measures are unavoidable.

The other levels of the German hierarchy are clearly explained by Darbi and co-authors as:

- a. Compensatory measures (Ausgleichsmaßnahmen) being in-kind compensation on the development site or closely proximate lands;
- b. Substitute remediation ((Ersatzmaßnahmen) refers to offsetting done at a further distance from the development site or the application of out-of-kind measures (either on-site or offsite), but still aimed at providing equivalent value to the net residual impact;
- c. Where a net impairment remains after application of avoidance, compensatory measures, and substitution remediation, that net impairment is to be the basis for a compensation payment (i.e., in-lieu fee).<sup>81</sup>

Compensatory and substitute remediation have equal standing in the scheme, with compensatory payments being a residual and rarely used measure.<sup>82</sup>

## Overall Net Gain

The dominant goal of the German system is “full compensation” such that the succession of measures in the mitigation hierarchy should provide a cumulative effect of full restoration of the functions impaired by the development in question.<sup>83</sup> It does not appear to contemplate the pursuit of net gain as a routine goal of the offset system.

## Offsetability and Non-Offsetability Criteria

The FNCA contains a reference to non-offsetability:

An intervention [i.e., development] may not be permitted or carried out if the relevant adverse effects are unavoidable or cannot be compensated for or substituted in some other way within an appropriate period of time, and the interests of nature conservation and landscape management take precedence over the other concerns in weighing up of all the requirements applying to nature and landscape.<sup>84</sup>

The final phrase in this provision appears to provide a broad and quite vague qualification such that many other considerations may override this doctrine in the “weighing up” of concerns.

Wende et al. suggest indirectly that a lack of appropriate sites for offset measures has been a reason in the past why offsets have been insufficient, one of the factors leading to a continuing decline in biodiversity.<sup>85</sup> They suggest that recent liberalization of provisions for substitution remediation were opening the door to more innovation, such as habitat banking and pooling, and that these offered a path to improved overall success of the goals of the Impact Mitigation Regulation system.<sup>86</sup>

The FNCA provides for several different means for the protection of nature, including protected areas and conservation areas of various types. These tools may be the appropriate means of dealing with the sites of extraordinary value to which offsetting might not appropriately apply.

## Establishing Equivalence

The Impact Mitigation Regulation sets out a national framework that prescribes attention to ecosystem functions and services (species and their habitats, soil, water, climate, air quality) and the aesthetic and recreational aspects of the landscape. It does not, however, prescribe a methodology for the evaluation of these things. Different states have prescribed different methodologies, and Darbi and Tausch found more than 40 methods suggested in research literature.<sup>87</sup> There does not appear to be a single recognized method for establishing equivalence. There is, however, a preference for biotope-based approaches, which combine area, classifications and condition ratings of biotopes.<sup>88</sup>

## Duration of Offsets

The FNCA provides that “[c]ompensation and substitution measures shall be maintained throughout the relevant required period and shall be legally protected.”<sup>89</sup> The meaning of “relevant required period” is not clear. The development proponent is held responsible for implementing, maintaining and securing the compensation or substitution measures for the duration of this period, whatever it may be.<sup>90</sup>

## Location/Proximity of Offsets

The Impact Mitigation Regulation gives no strict guidance on the necessary proximity of impact and offset sites. However, it is clear from the legal provisions that compensation measures refer to on-site restoration measures,<sup>91</sup> i.e., very narrow spatial limits. By contrast, substitution measures can be decoupled from the impact site, but are required to be implemented “in the relevant natural area,”<sup>92</sup> which in



practice is referring to the natural regions or natural landscape units (“Naturraum”). This is the essential difference between compensatory and remediation measures, both of which are contemplated but are not ranked.<sup>93</sup>

### **Use of Averted Loss**

In contrast with most biodiversity offset systems, the German system does not recognize averted loss to be a creditable compensation measure. Rather physical enhancement is required so as to demonstrate an actual benefit to nature.<sup>94</sup>

### **Oversight Mechanisms**

The Impact Mitigation Regulation is a federal framework, which is administered and applied at the state level as part of the project approval process.<sup>95</sup>

### **Other Issues and Features**

Wende and co-authors have noted that the fairly recent revisions to the German Impact Mitigation Regulation have facilitated “compensation pooling” (or habitat banking), and that this is a positive development, which is helping to address an earlier problem with a shortage of appropriate compensation sites.<sup>96</sup>

---

## **d. New Zealand**

### **Legislation and Key Policy Documents:**

Resource Management Act 1991

Crown Minerals Act 1991

Conservation Act 1987

New Zealand Government, *Guidance on Good Practice Biodiversity Offsetting in New Zealand* (August 2014), online: Department of Conservation, [doc.govt.nz/about-us/our-policies-and-plans/guidance-on-biodiversity-offsetting](http://doc.govt.nz/about-us/our-policies-and-plans/guidance-on-biodiversity-offsetting). (Other resources on biodiversity offsetting are made available on this site.)

### **Overview**

Neither New Zealand law nor policy requires biodiversity offsetting as a matter of routine. Rather, the laws managing land and resource development enable regulators to weigh the positive and adverse effects of a development project across financial, social and environmental dimensions, and to impose appropriate conditions on development or activity permits. On occasion regulators have used this authority to require forms of offsetting for particular development projects. As well, some development proponents have voluntarily undertaken offsetting. Because of the inconsistency in the use or requirement of offsets, and the consequent uncertainty, in 2014 the New Zealand government issued its *Guidance on Good Biodiversity Offsetting in New Zealand* (“the Guidance”). The Guidance draws heavily on the work and principles of the Business and Biodiversity Offset Programme (BBOP), adapting them for application in the New Zealand legal, policy and ecological context. The Guidance is not a legal document and does not require any particular action. Rather, as the name implies, it offers guidance as to how offsetting should be done in cases where it is to be pursued as a matter of regulatory requirement or voluntary action. In this it is comparable to the British Columbia policy and procedures reviewed above.

## Key Elements:

### Mitigation Hierarchy

The Resource Management Act 1991, New Zealand's statute governing the development of natural resources, does not prescribe the mitigation hierarchy. Rather, it imposes a "duty to avoid, remedy, or mitigate any adverse effect on the environment arising from an activity ..." [carried out under the auspices of the Act].<sup>97</sup> This list of measures, however, is not seen as a hierarchy of priorities.<sup>98</sup>

The BBOP principle of adherence to the mitigation hierarchy, however, is specifically endorsed by *the Guidance*.<sup>99</sup> A common rationale for the hierarchy is offered, as follows:

Avoiding or minimising adverse effects provides greater certainty that biodiversity values will persist despite project development, because it is easier and more certain to retain biodiversity than to attempt to recreate biodiversity values elsewhere through an offset. Biodiversity offsetting is therefore the final step in the mitigation hierarchy.<sup>100</sup>

*The Guidance* points out that many of the steps and procedures called for by the mitigation hierarchy are consistent with activities that might be performed under statutory or regulatory duties of environmental assessment. It recommends that all steps be documented in order to be able to demonstrate efforts, options and decisions at each stage of the hierarchy.<sup>101</sup>

### Overall Net Gain

New Zealand's legislation does not prescribe any particular level of desired outcome, but *the Guidance* adopts BBOP's definition of biodiversity offset, including the goal of "no net loss and preferably a net gain of biodiversity on the ground."<sup>102</sup> Again, however, this is recommended, not mandatory.

### Offsetability and Non-Offsetability Criteria

*The Guidance* refers to and elaborates on the BBOP principle of limits to offsetting. It prescribes a framework based upon the notion that, "[i]n general, the more vulnerable or irreplaceable the biodiversity, the greater the risk of loss associated with project impacts and the less likely that an offset can be achieved."<sup>103</sup> Two classification systems specifically applicable to New Zealand are recommended to assist in determining vulnerability and irreplaceability.<sup>104</sup> Other factors to be taken into account in determining offsetability are the magnitude of the impact, the availability of offsets sites and actions, and the feasibility of the offset producing the desired outcomes.<sup>105</sup>

Where, in light of these factors, offsetting is deemed not to be an acceptable means of addressing residual negative impacts, the development proponent is offered the choice of redesigning the development project in order to avoid the high-value components, or proposing some ecological compensation falling short of the no net loss goal of an offset.<sup>106</sup> Presumably in the latter case, the proponent would have to convince a permitting authority of the overriding value of the project notwithstanding the likely environmental loss.

### Establishing Equivalence

The difficulty in establishing equivalence in the pursuit of no net loss is acknowledged in *the Guidance*: "Demonstrating no net loss is challenging. Biodiversity is enormously complex, and it is not possible to measure it completely or exactly."<sup>107</sup> Rather than dwell on the philosophical aspects of the question, *the Guidance* offers practical advice to describe and quantify the loss of biodiversity at the impact site, to select a currency that is reflective of the significant aspects of those losses, and to select offsetting

measures.<sup>108</sup> In doing so it reviews many of the sticky issues that arise on this subject.

*The Guidance* expresses a strong preference for like-for-like offsetting when pursuing a no net loss goal, noting that no net loss is difficult to demonstrate when different ecosystem components experience losses and gains.<sup>109</sup> The option of like-for-unlike (or trading up) is admitted where the component gained is of much higher conservation value and the components lost of low value, as established by expert opinion and stakeholder input.<sup>110</sup> Even in these circumstances, however, the exchange is characterized as not fulfilling the no net loss goal, though “it may still contribute to conservation gains at the offset site.”<sup>111</sup>

### **Duration of Offsets**

*The Guidance* speaks of the duration of offset actions and outcomes as a matter of proper planning and management. The use of a legal instrument, such as a covenant on title, is one optional means to secure such measures.<sup>112</sup> It recommends that a management and monitoring regime be established (with adequate financing) for the duration of the impact of the development, which may be perpetual.<sup>113</sup>

### **Location/Proximity of Offsets**

No specific guidance or limits are placed on the proximity of offsets by *the Guidance*. Rather the general advice is that “nearby impact and offset sites are more likely to contain similar biodiversity features (e.g., in the same ecological district, catchment or other natural boundary).”<sup>114</sup> The distance between the two sites is also described in terms of equity between users and stakeholders at the two sites, suggesting that close consultation should be undertaken on this issue.<sup>115</sup>

### **Use of Averted Loss**

*The Guidance* is succinct in its approach to averted loss as an offset:

To be defensible, averted loss offsets must show that any on-going or impending threats are either operating or are highly likely to occur in the imminent future (and certainly within the timeline with the project) and will have a significant impact on local biodiversity. Averted loss does not lead to ‘no net loss’ in biodiversity compared to what currently exists, but only in terms of what is likely to exist in the future, in the absence of the offset activity. However, averted loss offsets can still be good practice if they meet the principle of additionality ...<sup>116</sup>

The reference to additionality refers to the principle, virtually universal to offset systems, that in order for offsets measures to be creditable, they must produce outcomes over and above (i.e., additional to) what would have been done otherwise. (See, for example, BBOP Principle 5 in Box 1 on page 4.) In this context it means that the prospective loss must be averted by more effective means than would otherwise have applied. It also suggests that the threat must be reasonably apprehended. Otherwise, measures to avert the threat would not actually produce a difference in the long-term management of the land and conservation outcomes.

This treatment of averted loss is much more detailed in its prescription than are many offset policies. The requirement that the averted threats be “either operating or are highly likely to occur in the imminent future” dictates against using a supposed averted loss where a threat is merely hypothetical, remote or inchoate. It raises the question, however, of what evidence is to be relied upon in determining when a threat is to be recognized for this purpose.

## Oversight Mechanisms

The New Zealand legal system does not establish an oversight mechanism specifically for offsets. Rather, they may be required as a condition of specific development permits. The purpose of *the Guidance* is to inform regulators, or development proponents who wish to act voluntarily, of good practices. Oversight, therefore, depends on the content of resource consent conditions produced during the decision-making process. It does note, however, that stakeholders should be involved in the ongoing monitoring and evaluation of the offset project.<sup>117</sup> This embraces the spirit of the recommendation of Salzman and Ruhl mentioned above.

## Other Issues and Features

The New Zealand *Guidance* contains an admirable endorsement of the importance of stakeholder engagement in line with the quoted BBOP Principles.<sup>118</sup>

---

## e. United States (Wetlands)

### Legislation and Key Policy Documents:

Clean Water Act 33 USC 1251 § 404

Compensatory Mitigation for Losses of Aquatic Resources – Final Rule, 33 CFR § 325, § 332; 40 CFR § 230 (2008) [*Section 404(b)(1) Guidelines*]

### Overview

The U.S. wetland compensation program is one of the most long-standing offset systems in the world. It is based upon provisions of the Clean Water Act requiring a permit for any dredging or filling of federal U.S. waters, which includes many wetlands. The policy framework for the issue of such permits, and its encoding in regulatory guidelines, lays out the process for “compensatory mitigation,” the term used for offsetting. The compensatory mitigation program was established to fulfil the goal of no net loss of wetland values and function through application of the mitigation hierarchy. Its major innovation was the development of mitigation banking, but it allows offsets to be developed by means of any of (in order of preference) mitigation banks, in-lieu fee programs or permittees themselves.

### Key Elements:

#### Mitigation Hierarchy

Throughout its history the wetlands mitigation program established under Section 404 of the Clean Water Act (often and hereinafter referred to as the “Section 404 program.”) has emphasized the importance of the mitigation hierarchy. Virtually every major policy document has repeated “avoidance, minimization, then compensation as a last resort.” The hierarchy is even written into the regulatory definition of compensatory mitigation:

*Compensatory mitigation* means the restoration (re-establishment or rehabilitation), establishment (creation), enhancement, and/or in certain circumstances preservation of aquatic resources for the purpose of *offsetting unavoidable impacts which remain after all appropriate and practicable avoidance and minimization has been achieved*.<sup>119</sup>

Appropriateness and practicability are, therefore, the threshold criteria for moving from one level of the hierarchy to the next. Practicability is further defined:

The term *practicable* means available and capable of being done after taking into consideration cost, existing technology, and logistics in light of overall project purposes.<sup>120</sup>

A development proponent is required to undertake an analysis of practicable alternatives in order to demonstrate that its project is the least environmentally damaging of these. This may include consideration of alternative locations providing that they could reasonably be obtained or utilized.<sup>121</sup>

There is, however, scant evidence of the effective application of the first two steps in the hierarchy. Indeed, the system has been criticized as putting too much emphasis on facilitating compensation, and not nearly enough on encouraging avoidance and minimization. Hough and Robertson have commented:

Permit denials are vanishingly rare (only 0.25% of all permit applications were denied in 2004 and 2005), and the regulatory staff may struggle to remember the last time a permit was denied solely for lacking an implementation or enforceable compensation plan, or because remaining significant degradation was simply uncompensatable. However, the language [of the 1990 Memorandum of Agreement between the Environmental Protection Agency and the U.S. Army Corps of Engineers, one of the foundational documents of the U.S. wetlands compensation system] is strong and may acquire more practical meaning in the future.<sup>122</sup>

It is possible that the very existence of the Section 404 program leads potential developers to make avoidance decisions early on in their considerations, so they are never reflected in regulatory records. Such is the nature of the deterrence provided by a price signal. If, however, an offset system is to claim principled adherence to the mitigation hierarchy, better tools for both practising, documenting and assessing the application of avoidance and minimization should be developed.

### **Overall Net Gain**

The goal of no net loss has been a virtual constant, explicitly or implicitly, in wetland policy documents since a 1990 Memorandum of Agreement between the U.S. Army Corps of Engineers and the Environmental Protection Agency.<sup>123</sup> While it has not been brought explicitly into the Clean Water Act nor the *Section 404(b)(1) Guidelines*, Congress has given the U.S. Army Corps of Engineers statutory direction that its interim goal for water resources development is to be “no net loss of the Nation’s remaining wetlands base, as defined by acreage and function,” and its long-term goal the increased quantity and quality of wetlands by the same criteria.<sup>124</sup>

### **Offsetability and Non-Offsetability Criteria**

There is no explicit mention in the U.S. law or regulation of criteria for judging when offsetting is unlikely to provide sufficient compensation for wetland values lost to development, or how that situation might guide decision-making. In its stead the *Section 404(b)(1) Guidelines* provide direction that the most conservative offset types (in-kind restoration, enhancement or preservation) – but not the less certain establishment from scratch – are to be undertaken in higher risk situations:

For difficult-to-replace resources (e.g., bogs, fens, springs, streams, Atlantic white cedar swamps) if further avoidance and minimization is not practicable, the required compensation should be provided, if practicable, through in-kind rehabilitation, enhancement, or preservation since there is greater certainty that these methods of compensation will successfully offset permitted impacts.<sup>125</sup>

In the quotation above (regarding the mitigation hierarchy) Hough and Robertson note that the fact that a negative impact is uncompensatable has apparently not resulted in development permits being denied.

## Establishing Equivalence

The U.S. system delegates the demonstration of equivalence to offset proponents, being either permittees themselves, habitat bankers or in-lieu fee program sponsors. In each case those proposing an offset project must satisfy an Interagency Review Team, consisting of representatives of all relevant federal and state agencies that the “service area” of the proposed wetland is appropriate. The service area is that area of sufficient proximity and ecological similarity to be deemed equivalent for offset purposes.

The currency of the compensation exchange is still under development. Since the 2008 guidelines increased emphasis on wetland functions, the responsible agencies have promoted the use of a hydrogeomorphic method, which combines hydrologic, biogeochemical and physical habitat considerations and measures.<sup>126</sup>

## Duration of Offsets

There is an expectation that offset measures will be permanent where legally possible. The official commentary to the 2008 amendments to the *Section 404(b)(1) Guidelines* makes it clear that “[t]he goal of the rule is to ensure permanent protection of all compensatory mitigation project sites.<sup>127</sup> It was the agencies’ view, however, that in some states perpetual restriction on the use of real estate cannot be legally provided.<sup>128</sup> Therefore, the amendments most commonly refer to the provision of “long-term protection.”

This includes both legal and ecological management aspects. The mitigation plan for all three types of earning credits is to include a description of the legal arrangements for long-term protection.<sup>129</sup> These are to be provided by “real estate instruments such as conservation easements held by entities such as federal, tribal, state, or local resource agencies, non-profit conservation organizations, or private land managers; the transfer of title to such entities; or by restrictive covenants.”<sup>130</sup> Appropriate comparable arrangements for long-term security of mitigation are called for on public lands: “For government property, long-term protection may be provided through federal facility management plans or integrated natural resources management plans.”<sup>131</sup>

Despite the qualms expressed in the commentary respecting perpetual restrictions, where preservation is the means of earning credits, one of the criteria for approval is “permanent protection” through an appropriate legal instrument.<sup>132</sup>

With respect to ecological management, the mitigation plan for all projects is to include:

A description of how the compensatory mitigation project will be managed after performance standards have been achieved to ensure the long-term sustainability of the resource, including long-term financing mechanisms and the party responsible for long-term management.<sup>133</sup>

The plan is also to provide for adaptive management for foreseen or unforeseen changes to the site conditions or terms of management.<sup>134</sup>

Mitigation banks and in-lieu fee projects are subject to the further provision that:

To the maximum extent practicable, mitigation banks and in-lieu fee project sites must be planned and designed to be self-sustaining over time, but some active management and maintenance may be required to ensure their long-term viability and sustainability.<sup>135</sup>



There is no explicit requirement that the duration of the compensatory mitigation correspond with the duration of the development disturbance, though that may be inferred from the need to demonstrate the adequacy of compensation.

### **Location/Proximity of Offsets**

An offset proponent (permittee, banker or in-lieu bank sponsor) bears the responsibility for defining a service area for the offset measure, being the area of sufficient ecological equivalence and proximity as to render the offset applicable as compensation.<sup>136</sup> This is to be approved by an Interagency Review Team comprised of representatives of all relevant resource agencies.

### **Use of Averted Loss**

The U.S. wetland regime allows credits for restoration, enhancement, establishment and (under certain conditions) preservation (i.e., averted loss).<sup>137</sup> Of these, restoration is the stated preferred option, and preservation the least preferred. Its use as compensation is conditional upon the preserved site providing important physical, chemical or biological functions for the watershed and contributing to the ecological sustainability of the watershed, a determination of appropriateness and practicability by the district engineer, the existence of a threat, and the use of an appropriate permanent legal instrument.<sup>138</sup> As well, where preservation credits are relied upon, higher multiplier ratios are to apply.<sup>139</sup> Further, preservation “to the extent appropriate and practicable” is to be conjoined with the positive management measures of restoration, establishment or enhancement.<sup>140</sup>

This bias against averted losses as a form of offsetting, and resulting restrictions on its use, are an important reflection of the inadequacies associated with it. While averted losses may provide extra security to an existing ecosystem, they do not actually add anything material to the characteristics or functions of that ecosystem. The U.S. approach encourages them to be used in only exceptional circumstances.

### **Oversight Mechanisms**

The U.S. wetlands system has a divided jurisdiction. The system is administered by the U.S. Army Corps of Engineers, but under the (legally binding) guidance of the Environmental Protection Agency. The 2008 version of the *Section 404(b)(1) Guidelines*, which is currently the predominant regulatory document, was developed by the two agencies jointly following an EPA-commissioned review of the effectiveness of the system under earlier versions of the guidelines.

Further, as all other U.S. federal agencies and programs, the program may be, and has been, reviewed by the Government Accountability Office.

### **Other Issues and Features**

The U.S. wetlands system was one of the first major biodiversity offset systems established. Accordingly it has been on the leading edge, and sometimes on the bleeding edge, of offset thought. Perhaps its greatest single contribution to consideration of offset policy is the development of offset credit banking and exchange. While initially based on a foundation of mere policy, not law, the banking system has grown rapidly, especially after the 2008 reform of the system. The Regulatory In-Lieu Fee and Bank Information Tracking System (“RIBITS”) website, the official web-based listing of mitigation banks and in-lieu fee programs, currently lists 2,149 such programs with available credits,<sup>141</sup> indicating the dynamism of this sector.

## f. Victoria, Australia (Native Vegetation)

### Legislation and Key Policy Documents:

Planning and Environment Act 1987 (Vic)

*Victoria Planning Provisions* (Vic)

State of Victoria, Department of Environment and Primary Industries, *Permitted Clearing of Native Vegetation – Biodiversity Assessment Guidelines September 2013* (Melbourne: Victoria, DEPI, 2013), online: Department of Environment and Primary Industries, [depi.vic.gov.au/\\_\\_data/assets/pdf\\_file/0011/198758/Permitted-clearing-of-native-vegation-Biodiversity-assessment-guidelines.pdf](http://depi.vic.gov.au/__data/assets/pdf_file/0011/198758/Permitted-clearing-of-native-vegation-Biodiversity-assessment-guidelines.pdf).

### Overview

The loss of native vegetation through clearing has been a major concern throughout Australia. Native vegetation is often seen as one of the foundations for the continent's unique array of species and ecosystems. The State of Victoria, located in Australia's southeast corner, has conditionally allowed offsetting for the clearing of native vegetation since 2002. In 2013, the State's approach to offsetting and the mitigation hierarchy was substantially revised. The goal of the program is now "[t]o ensure permitted clearing of native vegetation results in no net loss in the contribution made by native vegetation to Victoria's biodiversity."<sup>142</sup>

The new regime uses a risk-based approach, whereby the rigour of regulation is determined by the presumed risk of a project. As a result there is a tiered regulatory regime, with different provisions applying depending on the perceived risk. Risk is *prima facie* determined by reference to a state-provided dataset known as "NaturePrint." The great majority of the state is deemed to be low risk.

### Key Elements:

#### Mitigation Hierarchy

Avoidance, while stated to be an important part of the "no net loss" goal,<sup>144</sup> is applied only sparingly to the review of individual development permits. For such permits, avoidance and minimization are to be encouraged by unspecified incentives<sup>145</sup> (perhaps the simple existence of the regulatory process), but not required for most applications.

For low risk clearing projects, proponents and regulators may proceed directly to examining offsets, without considering avoidance or minimization. For moderate risk projects, and the default category within high risk, a development proponent must show it has taken reasonable steps to minimize impacts before proceeding to offsetting. Developers and regulators are only required to apply avoidance for that subset of high risk projects that demonstrate an impact on native vegetation making "a significant contribution to Victoria's biodiversity."<sup>146</sup>

The 2013 guidelines, however, prescribe that avoidance is to be an important part of regional "strategic planning" aimed at preserving native vegetation.<sup>147</sup>

#### Overall Net Gain

The new Victoria regime has a "no net loss" goal, but applies that goal to only those conditions in which native vegetation makes a demonstrable contribution to the state's biodiversity.<sup>148</sup> The general thrust of the 2013 reforms was to back away from the presumption that all native vegetation is valuable for biodiversity and, instead, to rank each site according to its demonstrated or deemed contribution. That ranking then forms the basis for the assignment of sites to different risk-based regulatory pathways.

## Offsetability and Non-Offsetability Criteria

The Victoria system does not categorically prescribe any circumstances where the combination of clearing and offsetting is considered too risky to be acceptable. Rather, for those circumstances deemed to be of highest risk to biodiversity, very high standards of investigation, offset performance (tailored to the specific attributes of the development site) and offset multipliers apply.<sup>149</sup> In practice, the application of these high standards may mean that development of high risk sites may be rendered commercially impractical.

## Establishing Equivalence

Victoria's new default prescription for measuring the biodiversity value of a development or offset is the multiplication of a "habitat hectare score" (itself the multiplication of area by a factor representing condition as compared against a model natural state) by a "strategic biodiversity score," a numerical rating (assigned according to the State's NaturePrint dataset and modelling) from .01 to 1.0 "identifying] the value of a site [in terms of its biodiversity characteristics] relative to the value of all other Victoria locations."<sup>150</sup> The result is a "general biodiversity equivalence score."<sup>151</sup> The offset project is to have at least 80 per cent of the strategic biodiversity score of the development project.<sup>152</sup> A standard multiplier of 1.5 applies.<sup>153</sup>

To try to add some clarity to this through an example, a development site may be 10 hectares in size, and 70 per cent intact. If it is an area that is deemed by the NaturePrint system to have a strategic biodiversity score of 0.6, the calculation will be as follows:

10 hectares x 70% intact = 7.0 habitat hectares

7.0 habitat hectares x 0.6 strategic biodiversity score (SBS) =  
4.2 general biodiversity equivalence score (GBES)

4.2 GBES x 1.5 multiplier = 6.3 Required GBES of offset, with SBS ≥ .048  
(80% of 0.6)

If offset SBS = 0.48, then offset must be 13.125 habitat hectares  
(e.g., 26.25 hectares restored from 0 to 50% intactness).

There are two notable exceptions to this norm, one at each end of the risk scale. For low risk applications the proponent can simply rely on the "mapped condition score" of the site, as derived from the State's dataset and modelling, avoiding the need to prepare a site-specific habitat hectare assessment.

For moderate and high risk developments, however, the requirement of an on-the-ground habitat hectare assessment remains. Proponents of these developments are also required to determine if the impacted site is habitat for rare or threatened species (as listed under specified legislation).<sup>154</sup> If so then a further "specific biodiversity equivalence score" is to be determined for each such species. The offset obligation is to provide substitute habitat for each such species, and do so with a multiplier of 2.<sup>155</sup>

## Duration of Offsets

All offsets must be permanent, secured by an agreement with the relevant government agency, registered on title or by transfer of title to a Crown land reserve.<sup>156</sup>

## Location/Proximity of Offsets

General offsets must be located in the same Catchment Management Area (officially demarcated watershed) or municipal district,<sup>157</sup> but need not represent the same vegetation community as is impacted by

the development. These restrictions do not apply for specific offsets for rare or threatened species.<sup>158</sup>

### **Use of Averted Loss**

Offset credits may be generated by entering into a permanent security agreement with the State, and by undertaking management measures to avoid threats to vegetation condition.<sup>159</sup> In keeping with the doctrine of additionality, such measures must be beyond the landowner's current legal management obligations.

The current guidance does not appear to explicitly prioritize either averted losses or positive management actions as a preferred offset mechanism. This is in contrast to the previous (2002) policy guidance, which explicitly prioritized averted losses on the theory that "natural is best."<sup>160</sup>

### **Oversight Mechanisms**

Victoria's native vegetation offset provisions are prescribed by the State's Department of Environment and Primary Industries through the *Victoria Planning Provisions* (VPPs), which are the regulatory instruments by which guidance is provided to municipalities. Municipalities are largely responsible for land-use planning and project decisions. In the past it has been noted that municipal authorities may "have regard to" the VPPs, as they are required to, without necessarily acting in accordance with their objectives. This has been pointed to as a reason for slippage in the application of the previous native vegetation framework.<sup>161</sup>

# 4. Discussion: Key Themes Across the Six Jurisdictions

## α. The Mitigation Hierarchy

Each of the jurisdictions surveyed has an explicit reference to a form of the mitigation hierarchy, either in legislation or in policy. While they provide varying levels of direction as to how the hierarchy is to be applied, none provides clear direction on the sticky matters of how avoidance is to be enforced or what thresholds are to apply to allow movement from one level of the hierarchy to the next.

Most counsel avoidance of negative impacts, without elaborating on what considerations are to be included in that. This is significant, because it has been noted that (in the context of Canadian and American wetlands conservation) avoidance has been interpreted in many different ways.<sup>162</sup> Shari Clare and co-authors have pointed out that regulators may not feel empowered to review the purpose or the location of the project, key variables when one is considering what constitutes reasonable or practical measures for avoidance.<sup>163</sup> Likewise, the German Impact Mitigation Regulation has one of the more carefully structured expressions of the mitigation hierarchy, and it makes clear that impacts are to be considered avoidable “if reasonable alternatives are available for the same purpose . . . , at the same location, with lesser or no adverse effects on nature and landscape.”<sup>164</sup> This, again, seems to exempt considerations of purpose or location from the duty to avoid. The result may be that the purpose and location are so narrowly defined that alternatives that might bring greater avoidance are effectively ruled out from the moment the application is drafted.

The other policies surveyed do not make explicit what factors are to be considered respecting avoidance, but several recommend or dictate that considerations for moving from one level of the mitigation hierarchy to the next should be documented and provided to authorities (Germany, British Columbia, New Zealand, Canada). The threshold for justifying such movement between levels is often very vague, however. The British Columbia *Environmental Mitigation Policy and Procedures*, for example, refer to the “feasibility” and “practicability” of measures, the latter term of which is suggested to mean “capable of being carried out in action” after consideration of all of the relevant circumstances including “reasonable commercial considerations.”<sup>165</sup> Likewise, the U.S. wetland compensatory mitigation regime provides for movement between levels of the hierarchy based upon what is “appropriate and practicable.”<sup>166</sup> There “practicable” is defined in regulation to mean “capable of being done after taking into consideration cost, existing technology, and the logistics in light of overall project purposes.”<sup>167</sup> These provisions suggest that the mitigation hierarchy is not to be applied so strictly that the validity or commercial viability of the project are put in question. While other regimes are not so explicit in their direction, a similar approach likely applies in practice.

The outlying jurisdiction with respect to the application of the mitigation hierarchy is the State of Victoria, Australia. Under its new native vegetation clearing guidelines, a risk analysis based upon size and location is to be applied upfront to any proposed development. The great majority of projects are classified as low risk. For such low risk projects avoidance and mitigation are not required, and a proponent can proceed directly to considering offsets. For medium risk projects only minimization and offsets need be

considered, not avoidance. It is only for a small subset of high risk projects that proponents are required to demonstrate full compliance with all steps of the mitigation hierarchy. This means that the ecological certainty and risk reduction that avoidance and minimization are intended to provide will be reduced for the great majority of projects in Victoria.

Despite being frequently cited, the application of the mitigation hierarchy seems to remain a vague and inconsistent process. That may be inevitable to some extent, in that the availability of opportunities for avoidance and minimization will be heavily dependent on the nature of the individual development proposal. Nevertheless, any offset policy should make clear the factors to be considered in application of the hierarchy. These should include the availability of practicable alternative locations, designs, construction and operational techniques, on-site restoration methods, etc.

The consideration of the purpose of the proposed development requires a lighter touch. Consideration of overall need and benefits of the project is likely part of an overall regulatory framework, and the mitigation hierarchy should not be used as a way of duplicating or undermining this process. Rather the mitigation analysis should be carried out within the confines of the defined need and benefits. These should be framed sufficiently broadly, however, that alternative means of achieving the same purpose are open for review.

**Recommendation:** The mitigation hierarchy should be clearly stated as part of any biodiversity offset policy. Development proponents should be required to document all measures taken to avoid and minimize negative impacts on biodiversity, including consideration of alternative locations, designs, construction and operational techniques, on-site restoration methods, etc., which might reasonably and practicably serve the same purpose with less environmental damage. Regulators should not defer to proponents with respect to these matters, but carry out their own analysis and reach their own conclusions. Where insufficient efforts have been made to avoid or minimize negative impacts on biodiversity, permits should be denied or projects sent back for redesign.

## b. Overall Net Gain

None of the offset jurisdictions surveyed has a general goal of true net gain for biodiversity, though doors are left open in a couple of instances. New Zealand's *Guidance* adopts, for example, the language of BBOP, referring to a preference for net gain. Canadian fisheries policy also refers to the "maintenance or improvement" of the productivity of the fisheries to which it applies,<sup>168</sup> suggesting the permissibility of a net gain.

Four of the jurisdictions surveyed include language that either explicitly or implicitly suggests a no net loss goal. The most explicit of these is the U.S. wetland mitigation system, which has had a goal of "no net loss of the Nation's remaining wetlands base, as defined by acreage and function" since 1990.<sup>169</sup> Victoria's native vegetation regime has a much more qualified goal of "no net loss in the contribution made by native vegetation to Victoria's biodiversity,"<sup>170</sup> which suggests (as is manifest in several aspects of Victoria's new system) that not all native vegetation makes such a contribution.

Neither Canada's fisheries regime nor Germany's Impact Mitigation Regulation use the explicit language of no net loss. They appear to imply it with more subtle wording. The Canadian fisheries policy calls for offsetting to "counterbalance" the serious harm to fish, suggesting a net neutral or no net loss objective.



Likewise, the German statute sets the goal of the mitigation hierarchy at “full compensation.”<sup>171</sup>

Finally, neither British Columbia nor New Zealand prescribes a particular objective for the application of their offset guides. This is likely because in both cases the official offset guides are not policy in themselves, but simply guidance that may be used at the discretion of decision-makers in government or the private sector. Presumably the ambition and goals of any offset program is to be set by those decision-makers.

Almost all of the systems surveyed require or allow the use of multipliers to counter the uncertainties of offsetting. In some cases (Victoria) multiplier ratios are fixed by policy. In most, however, an offset proponent is required to demonstrate the adequacy of their offset plans, including the use of multipliers as needed.

**Recommendation:** Any offset system should have clear goals that are capable of objective measurement. In the absence of other compelling policy objectives, that goal should be, at a minimum, no net loss, and where possible a net gain, of identified ecosystem components or functions of value. Departure from no net loss should follow clear policy objectives.

### c. Limits to Offsetting and Non-Offsetability Criteria

None of the jurisdictions surveyed provides explicit criteria for a category of impact beyond which offsets may not be safely or effectively applied. The fullest discussion of the concept, drawing on both BBOP and academic literature, comes from New Zealand in its *Guidance* published in 2014.<sup>172</sup> It is, however, not mandatory.

The German legislation also contains quite a strong statement respecting offsetability, but it seems to be subject to an important qualification. The statute provides that a development may not be permitted if its adverse effects cannot be avoided, mitigated or effectively offset.<sup>173</sup> This applies, however, only in circumstances where “the interests of nature conservation and landscape management take precedence over other concerns.”<sup>174</sup> This suggests that where other interests are paramount, development may still be permitted.

The Canadian federal fisheries regime does not explicitly refer to any doctrine or criteria for non-offsetability. It does, however, provide that there may be circumstances where the public interest may be served by actions other than the application of the mitigation hierarchy.<sup>175</sup> This could facilitate a type of non-offsetability if it were framed in such a way that the inadequacies of using offsetting when it was likely to be ineffective were presented as contrary to the public interest. As well, Section 37 of the Fisheries Act, 1985, allows the minister to review any project that is likely to cause serious harm to fish (including, presumably, from inappropriate or ineffective offset plans) and to order modifications, including the closing or ending of the project for a period of time.<sup>176</sup>

Rather than dictate a realm of non-offsetability, the B.C. and Victoria policies seem to prefer an approach of setting very high offset standards in situations of high risk and vulnerability. British Columbia also stresses the importance of avoidance in these exceptional circumstances.<sup>177</sup> Those high standards may well work to deter development proponents from considering a certain piece of land of high ecological value or vulnerability, which would yield the same result as a doctrine of non-offsetability.

The U.S. wetland compensation program is weakest with respect to this topic. It merely provides that for “difficult-to-replace resources” compensation (after applications of avoidance and minimization) should be

provided “through in-kind rehabilitation, enhancement or preservation since there is greater certainty that these methods of compensation will successfully offset permitted impacts.”<sup>178</sup>

**Recommendation:** Any offset systems should identify those conditions under which offsets are unlikely to produce the desired outcomes, whether because the ecosystem components lost to development are irreplaceable, or the consequences of offset failure are unacceptably high. Under these circumstances policy-makers should be forthright about the choice they face between protecting the valued environmental component or sacrificing it in order that development might proceed. Offsets that are unlikely to succeed should not be used to mask this decision.

## d. Establishing Equivalency

Given that the exercise of establishing equivalency is so context-dependent, it is not surprising that government agencies tend to put the onus for it on the development proponent. In fact, all of our case-study jurisdictions do this, often with little detailed technical guidance.

Typical of this approach is the U.S. wetlands mitigation system. It requires that the proponent or sponsor of a development project, a wetland bank or an in-lieu fee fund develop its own proposal for establishing offset equivalency and submit it to an Interagency Review Team (consisting of representatives of all relevant state and federal resource agencies) for review and approval. The currency used to quantify equivalency of amount is still under development, but leans toward a hydrogeomorphic method, which combines hydrological, biochemical and physical habitat considerations and measures.<sup>179</sup> The U.S. system is able to look toward such a single currency mechanism because it is dealing with a single (though extremely varied) ecological feature, wetlands.

The Canadian fisheries regime underwent a substantial revision in 2013, and has not yet settled on a single approach to establishing equivalency in offsetting. The official offset guide issued in 2013 expresses a preference for in-kind offsetting, but allows that out-of-kind offsetting may be considered depending on the circumstances.<sup>180</sup> The Canadian Science Advisory Secretariat has recently published a review of methods for establishing equivalency for the reference of development proponents.<sup>181</sup> This should prove to be valuable for both practitioners and others interested in the operation of the system.

The German Impact Mitigation Regulation prescribes that any compensation scheme must take into account ecosystem services and functions, as well as the aesthetic and recreational value of the impacted landscape.<sup>182</sup> It does not, however, offer guidance as to how these matters should be evaluated and quantified into a currency for offsetting, leaving the review of offsetting to the state level of government. A recent study has found more than 40 different methods either used or suggested by academic literature in Germany.<sup>183</sup>

The official guides for both British Columbia and New Zealand place the establishment of ecological equivalency squarely on the proponent, cautioning that it is an important and complex process, and pointing to key factors for consideration. Both express a preference for like-for-like offsets, but admit the possibility of out-of-kind offsets where circumstances allow for an ecological gain.

The greatest contrast to this loose and context-dependent approach is found in the new regime for native vegetation in the State of Victoria. Under its previous regime, the State was a leader in developing

the currency of “habitat hectares,” which combined area with a condition score.<sup>184</sup> The 2013 revisions to the system retained that metric, but further multiply it by a “strategic biodiversity score,” which is a rating assigned to a region by the State to yield a product of a “general biodiversity equivalency score.”<sup>185</sup> This score is the starting point for the calculation of offset size, a calculation that includes both constraints and multipliers. We saw above the complex calculation that this system requires. While this creates a mathematical certainty, one wonders if its rigidity will serve the needs of the ecosystem.

The assessment of equivalency between the impact and offset is inherently problematic. The more one seeks to take into account the particular features of either site or activity, the further one strays from the commonalities that must underlie equivalency. If it is a difficult exercise in an individual case, it is even more difficult to establish a broadly applicable policy prescription. Likely the best one can hope for is a set of policy principles administered with understanding and rigour. The best model, therefore, might be the Canadian and U.S. systems, which take this approach.

**Recommendation:** A biodiversity offset policy should include a set of principles for the drawing of equivalency between impacts and offsets. The application of these principles in particular circumstances should be flexible. The initial onus might be placed on project proponents, but this should be reviewed by public servants with a combination of understanding and rigour.

## e. Duration of Offsets

The expectation that an offset be of at least the same duration as the development impact, or at least for the long term, is expressed in all of the jurisdictions surveyed, though with differing levels of firmness. Some have a clearer preference, or requirements, that offsets be arranged to last in perpetuity.

The clearest expressions of the expectation that offsets be permanent are in the Victoria and American offsets systems. In Victoria, the requirement of permanence is absolute, and all offsets must be secured by an agreement registered on title or by transfer of land to a Crown land reserve.<sup>186</sup>

In the U.S. wetland offsets system “the goal ... is to ensure permanent protection of all compensatory mitigation project sites.”<sup>187</sup> This expectation is qualified by the understanding that in some states there may not be a legal instrument to achieve permanent protection, in which case the goal is “long-term protection.” This applies not only to legal arrangements but to all aspects of long-term ecological management of the offset site.

British Columbia’s voluntary offset procedures express a preference that offset measures be secured in perpetuity.<sup>188</sup> They provide an interesting option, however: if the impacts on the development site are fully mitigated or restored, then relief from the ongoing offset obligations may be sought.<sup>189</sup> This option does not appear to be available prospectively, but only upon demonstration of the actual attainment of the required mitigation or restoration. This means that an offset may start out as perpetual, but, guided by the goal of no net loss, if and when the original impact is wholly remedied, the requirement to maintain the offset may be extinguished.

The Canadian fisheries regime, the German Impact Mitigation Regulation and the New Zealand voluntary guidance merely speak of long-term measures or measures matching the duration of the development impact. They make no commitment to permanent offsets.

## f. Proximity

As noted above, a flexible approach to proximity is advisable, and this is found in both the Ontario Nature and BBOP principles. It is also found in all of the provisions of the six jurisdictions surveyed. Five of the six have provisions that express some preference for proximity between the impact and offset sites, based upon a presumption that this may contribute to equivalence. In each case this is worded somewhat softly:

- The Canadian Fisheries policy and guide together indicate a preference for offsets “in the vicinity of the project or within the same watershed,”<sup>190</sup> while at the same time pointing out that the choice of site and offset methods will be tailored to particular objectives and the quest for best outcomes.<sup>191</sup>
- British Columbia’s mitigation procedures suggest that offsets should be in the same biogeoclimatic zone, watershed, landscape unit, etc., as the impact site, and that this may be more likely in proximate sites.<sup>192</sup>
- New Zealand’s *Guidance* notes that “nearby impact and offset sites are more likely to contain similar biodiversity features (e.g., in the same ecological district, catchment or other natural boundary).”<sup>193</sup>
- Germany’s Impact Mitigation Regulation mixes considerations of likeness of offset type and proximity in prescribing offset options.
- In the United States, an offset proponent has the onus of demonstrating the “service area” for a proposed offset, being the area(s) where an acceptable degree of ecological equivalence can be found in an anticipated development site.<sup>194</sup> Proximity is merely one factor in determining this.

Once again, the State of Victoria takes a different approach on this issue, using the boundaries of the Catchment Management Area (an officially demarcated watershed) or municipal district, to limit the distance of general offsets (as defined in the Victoria system).<sup>195</sup> Within these geographic limits the offset need not be in a similar vegetation community as the impact. This approach suggests that the social consequences (particularly as reflected in the use of municipal district boundaries) may weigh more heavily than ecological equivalence. It is important to note, however that this constraint for general offsets does not apply to specific offsets for rare or threatened species. In that case the offset may be located wherever the best outcomes may be produced for the target species.<sup>196</sup>

Of the regulatory and policy documents reviewed, the New Zealand voluntary guidance provides the most explicit recognition of the social aspect of selecting offset locations, noting that the locations of the impact and offset sites have important implications for equity, and therefore decisions should be taken in close consultation with stakeholders.<sup>197</sup>

**Recommendation:** The proximity of the impact and offset sites should be determined by reference to the objectives of the offset program, the ecological characteristics at each site, and the equitable distribution of social costs and benefits. This is not amenable to a single formula or prescription, so guidelines in this respect should provide flexibility for application of these principles.

## g. The Use of Averted Losses as Offsets

All of the six jurisdictions surveyed show a fair degree of skepticism about the use of averted losses as offsets. The official (but voluntary) guidance provided in British Columbia and New Zealand both note the weaknesses in the approach, and suggest that the proponent of such an offset provide a specific rationale as to its use in the particular circumstances.<sup>198</sup> British Columbia dictates a means of land securement (preferably outright acquisition) that will maintain or improve upon the status quo in order to meet the requirement of additionality.<sup>199</sup>

The United States has a more structured approach with respect to offsetting for wetlands. Preservation (i.e., averted loss) is the least preferred of four offset options (restoration, enhancement, establishment and preservation). The use of preservation is dependent upon a demonstration of the site's importance to the ecological function and sustainability of the wetland, the identification of a threat, and the use of a permanent legal instrument, all of which are to be demonstrated to the satisfaction of a district engineer of the U.S. Army Corps of Engineers.<sup>200</sup> Higher multipliers apply when protection is used to satisfy offset obligations.<sup>201</sup> Finally, protection is to be combined, where practical, with other positive management action.<sup>202</sup>

In Victoria, in order for an averted loss to be recognized as a creditable offset it must be combined with some extra management measures on the site (such as a weed control program).<sup>203</sup>

Neither Canada's fisheries management program nor Germany's Impact Mitigation Regulation appear to contemplate or allow the use of averted losses as offsets. In Canada, the requirement is for *tangible* outcomes, and the examples given are all of positive management actions.<sup>204</sup> Germany requires that a physical enhancement to the benefit of nature be undertaken if recognition as compensation is sought.<sup>205</sup>

**Recommendation:** The crediting of averted losses as offsets should only be allowed where there is clear objective evidence of an imminent threat, and where long-term legally binding protection is arranged that neutralizes that threat. Caution should be taken that the protective action on the offset site does not simply displace the threat to another site in the area where environmental values might then be threatened.

## h. Administration and Oversight

The Ontario Nature discussions uncovered a concern that government officials who implement an offset system may not demonstrate rigour and skepticism reflective of the uncertainties of offsetting.<sup>206</sup> The author's own concern in this regard was noted, which finds its source in the study of the U.S. wetlands compensation system by Salzman and Ruhl.<sup>207</sup> That work noted the similarity of interests of offset system administrators, and development and offset proponents. Those entities share an interest in making the system work smoothly and efficiently. That interest may conflict with the detail and procedures necessary to optimize ecological outcomes. Salzman and Ruhl, therefore, recommend an external oversight committee consisting of knowledgeable stakeholders and experts.

None of the six jurisdictions surveyed has constituted such a committee, or any external oversight mechanisms beyond those typical of all government operations (i.e., an auditor general, Government Accountability Office, etc.). In several of the jurisdictions, however, some independent perspective is provided

by a division of responsibilities between different levels or agencies of government. Most formally, under Section 404 of the U.S. Clean Water Act the Environmental Protection Agency is responsible for the development of (legally enforceable) policy guidance, which is administered by the U.S. Army Corps of Engineers.<sup>208</sup> This means that an agency other than (i.e., in addition to) the direct administrator has a stake in the credibility and success of the program (with success being the validity of its environmental outcomes).

Less formally, the Victoria native vegetation clearance regime policy and procedures are produced by the Department of Environment and Primary Industries, but are applied by the local development authorities. This is very similar to the German system, where the federal Impact Mitigation Regulation is applied by the sub-national state authorities. The official guidances issued by the British Columbia and New Zealand governments are intended to be applied at the volition and discretion of regulators or interested proponents.

The only jurisdiction in which policy development and day-to-day administration reside within the same agency is the Canadian fisheries management system, where Fisheries and Oceans Canada holds sole responsibility.

**Recommendation:** For the reasons set out above and in Section 2.h. of this report, it is best if the agency that is responsible for the day-to-day administration of an offset system be separate and distinct from that which is responsible for substantive environmental outcomes. The latter may then independently assess the adequacy of the outcomes produced by the work of the former, and the former may strive for administrative efficiencies. A healthy dialogue may be created between process efficiency and substantive outcomes.

Secondly, the formation of a standing independent committee, consisting of experts and stakeholders, ought to provide at least periodic oversight over an offset system. This will not only assure the proper operation of the system, but will be able to vouch for its bona fides to concerned citizens.



## 5. Conclusion

**BIODIVERSITY OFFSETTING** is a high level concept for reconciling development with the conservation of valued biodiversity. There are common issues that arise in offsetting, many of which are inherent to the concept. The credibility of offsetting as a tool to address biodiversity loss is dependent on addressing those issues. One source of answers is the principled application of logic as applied to the goal of no net loss and the nature of the offset model. This is typified by the BBOP Principles, and, in many ways, by the recommendations arising out of the Ontario Nature discussions.

The application of these principles, however, must be customized, taking into account the social, economic and political nature of each jurisdiction, as well as the ecological characteristics of each landscape. No single policy prescription can fit all jurisdictions and all circumstances. The purpose of this report has been to examine how some common issues, with corresponding well-established principles, have been addressed in six jurisdictions with offset systems.

While we have seen that there is variation among these systems, there is also a remarkable similarity in recognizing the issues and assuring that they are constructively addressed. For example, all recognize the wisdom of the mitigation hierarchy, but all wrestle with how to interpret and enforce it.

While trying to avoid being judgmental about the course that any jurisdiction has taken, I have tried to derive some policy recommendations that ought to apply in most circumstances, and that seem to be realistic based on the experience of the jurisdictions examined. Hopefully, this process will prove to be of value to stakeholders and policy-makers in Ontario and elsewhere.

### Summary of Recommendations

1. The mitigation hierarchy should be clearly stated as part of any biodiversity offset policy. Development proponents should be required to document all measures taken to avoid and minimize negative impacts on biodiversity, including consideration of alternative locations, designs, construction and operational techniques, on-site restoration methods, etc., which might reasonably and practicably serve the same purpose with less environmental damage. Regulators should not defer to proponents with respect to these matters, but carry out their own analysis and reach their own conclusions. Where insufficient efforts have been made to avoid or minimize negative impacts on biodiversity, permits should be denied or projects sent back for redesign.
2. Any offset system should have clear goals that are capable of objective measurement. In the absence of other compelling policy objectives, that goal should be, at a minimum, no net loss, and where possible a net gain, of identified ecosystem components or functions of value. Departure from no net loss should follow clear policy objectives.
3. Any offset systems should identify those conditions under which offsets are unlikely to produce the desired outcomes, whether because the ecosystem components lost to development are irreplaceable, or the consequences of offset failure are unacceptably high. Under these circumstances policy-makers should be forthright about the choice they face between protecting the valued

environmental component or sacrificing it in order that development might proceed. Offsets that are unlikely to succeed should not be used to mask this decision.

4. A biodiversity offset policy should include a set of principles for the drawing of equivalency between impacts and offsets. The application of these principles in particular circumstances should be flexible. The initial onus might be placed on project proponents, but this should be reviewed by public servants with a combination of understanding and rigour.
5. The proximity of the impact and offset sites should be determined by reference to the objectives of the offset program, the ecological characteristics at each site, and the equitable distribution of social costs and benefits. This is not amenable to a single formula or prescription, so guidelines in this respect should provide flexibility for application of these principles.
6. The crediting of averted losses as offsets should only be allowed where there is clear objective evidence of an imminent threat, and where long-term legally binding protection is arranged that neutralizes that threat. Caution should be taken that the protective action on the offset site does not simply displace the threat to another site in the area where environmental values might then be threatened.
7. For the reasons set out above and in Section 2.h. of this report, it is best if the agency that is responsible for the day-to-day administration of an offset system be separate and distinct from that which is responsible for substantive environmental outcomes. The latter may then independently assess the adequacy of the outcomes produced by the work of the former, and the former may strive for administrative efficiencies. A healthy dialogue may be created between process efficiency and substantive outcomes.
8. Secondly, the formation of a standing independent committee, consisting of experts and stakeholders, ought to provide at least periodic oversight over an offset system. This will not only assure the proper operation of the system, but will be able to vouch for its bona fides to concerned citizens.

- 1 Becca Madsen et al., 2011 Update: State of Biodiversity Markets (Washington, DC: Ecosystem Marketplace, 2011) at 2–3, online: Ecosystem Marketplace, [forest-trends.org/documents/files/doc\\_2848.pdf](http://forest-trends.org/documents/files/doc_2848.pdf).
- 2 Alberta Government, Alberta Wetland Policy (n.p.: Alberta Government, 2013), online: Water for Life, [waterforlife.alberta.ca/documents/Alberta\\_Wetland\\_Policy.pdf](http://waterforlife.alberta.ca/documents/Alberta_Wetland_Policy.pdf).
- 3 British Columbia Ministry of Environment, Environmental Mitigation Policy (May 13, 2014), online: BCMOE, [env.gov.bc.ca/emop](http://env.gov.bc.ca/emop) [BC EM Policy].
- 4 Business and Biodiversity Offset Programme (BBOP), To No Net Loss and Beyond: an Overview of the Business and Biodiversity Offsets Programme (Washington, DC: Forest Trends, 2013), online: BBOP, [forest-trends.org/documents/files/doc\\_3319.pdf](http://forest-trends.org/documents/files/doc_3319.pdf) [BBOP Overview]. The BBOP website, [bbop.forest-trends.org](http://bbop.forest-trends.org), is recommended for an abundance of useful resources and materials on biodiversity offsetting. By way of disclosure, the author is a member of the BBOP Advisory Group.
- 5 For more on the British proposal see the Department for Environment, Food & Rural Affairs (DEFRA) website on the subject: online: [consult.defra.gov.uk/biodiversity/biodiversity\\_offsetting](http://consult.defra.gov.uk/biodiversity/biodiversity_offsetting).
- 6 John Vidal, “Conservationists Split over ‘Biodiversity Offsetting’ Plans,” online: The Guardian, [theguardian.com/environment/2014/jun/03/conservationists-split-over-biodiversity-offsetting-plans](http://theguardian.com/environment/2014/jun/03/conservationists-split-over-biodiversity-offsetting-plans).
- 7 George Monbiot, “The Price of Everything,” online: George Monbiot, [monbiot.com/2014/07/24/the-pricing-of-everything](http://monbiot.com/2014/07/24/the-pricing-of-everything). For an extended and thoughtful response to Monbiot see Bartosz Bartowski, “Is Economic Valuation a ‘Neo-Liberal Road to Ruin’? A Response to George Monbiot,” online: Blog: The Sceptical Economist (July 24, 2014), [zielonygrzyb.wordpress.com/2014/07/24/is-economic-valuation-a-neoliberal-road-to-ruin-a-response-to-george-monbiot/#comment-1902](http://zielonygrzyb.wordpress.com/2014/07/24/is-economic-valuation-a-neoliberal-road-to-ruin-a-response-to-george-monbiot/#comment-1902).
- 8 Ian Crawford, “Biodiversity Offsets and Ontario’s Endangered Species Act: We Built It, They Came, and We Can Do Better,” Day 2 Presentation, online: Institute of the Environment, [ie.uottawa.ca/tiki-calendar\\_edit\\_item.php?viewcalitemId=54](http://ie.uottawa.ca/tiki-calendar_edit_item.php?viewcalitemId=54).
- 9 Ontario Nature, Insights into Biodiversity Offsetting in Ontario: Summary of Ontario Nature’s 2013–2014 Project (Toronto: Ontario Nature, 2014), online: Ontario Nature, [ontarionature.org/discover/resources/PDFs/reports/Biodiversity\\_Offsetting\\_Ontario.pdf](http://ontarionature.org/discover/resources/PDFs/reports/Biodiversity_Offsetting_Ontario.pdf).
- 10 BBOP Overview, supra note 4 at 4.
- 11 For more full discussions of the concept see *ibid*; Joseph W. Bull et al., “Biodiversity Offsets in Theory and Practice” (2013), *Fauna and Flora International*, Oryx 1; David W. Poulton, *Biodiversity Offsets: A Primer for Canada* (Ottawa: Sustainable Prosperity and the University of Ottawa Institute of the Environment, 2014), online: Sustainable Prosperity, [sustainableprosperity.ca/article3857](http://sustainableprosperity.ca/article3857).
- 12 BBOP, Standard on Biodiversity Offsets (Washington, DC: Forest Trends, 2012) at 13–14 online: BBOP, [forest-trends.org/documents/files/doc\\_3078.pdf](http://forest-trends.org/documents/files/doc_3078.pdf).
- 13 Ontario Nature, supra note 9 at 12–14.
- 14 See BBOP, Resource Paper: Limits to What Can Be Offset (Washington, DC: Forest Trends, 2012); John D. Pilgrim et al., “A Process for Assessing the Offsetability of Biodiversity Impacts” (2013) 6:5 *Conservation Letters* 376.
- 15 Thomas J. Habib et al., “Economic and Ecological Outcomes of Flexible Biodiversity Offset Systems” (2013) 27:6 *Conservation Biology* 1313.
- 16 Conservation easements or covenants are a form of interest in land, provided by statute in many jurisdictions, by which a landowner gives up rights of development or use in order to protect certain natural functions or features. The counterparty is typically a land trust (such as the Nature Conservancy of Canada, Ducks Unlimited Canada or many smaller such groups) or a government agency. The landowner retains title to the land and the right to use it in all manners not forbidden by the easement or covenant, while the land trust or government agency has the right to enforce the terms of the easement or covenant. Typically an easement or covenant may be registered on title, so that it is binding on all future owners of the land.
- 17 Ontario Nature, supra note 9 at 19–21.
- 18 Kimberly Good & Rachelle Haddock, Southeast Alberta Conservation Offset Pilot: Linking Decisions and Assumptions with Generally Accepted Offset Principles (Calgary: Miistakis Institute, 2014) at 18, online: Miistakis Institute, [rockies.ca/project\\_info/seacop-gap-report-miistakis.pdf](http://rockies.ca/project_info/seacop-gap-report-miistakis.pdf).
- 19 Ontario Nature, supra note 9 at 25–26; Crawford, supra note 8 at slides 11–12.
- 20 James Salzman & J.B. Ruhl, “Currencies and the Commodification of Environmental Law” (2000) 53 *Stanford Law Review* 607 at 626–29.
- 21 J.W. Bull et al., “Importance of Baseline Specification in Evaluating Conservation Interventions and Achieving No Net Loss of Biodiversity” (2014) 28:3 *Conservation Biology* 799. The authors distinguish between a “baseline” (a known historical state) and a “counterfactual” (a projected alternative scenario of what would have taken place without the intervention).
- 22 For a discussion of the uncertainty of results from restoration and their implication for biodiversity offsets see Martine Maron et al., “Faustian Bargains? Restoration Realities in the Context of Biodiversity Offset Policies” (2012) 155 *Biological Conservation* 141.
- 23 Salzman & Ruhl, supra note 22.
- 24 See Royal C. Gardner & Jessica Fox, “The Legal Status of Environmental Credit Stacking” (2013) 40:4 *Ecological Law Quarterly* 101, online: Social Science Research Network [ssrn.com/abstract=2375858](http://ssrn.com/abstract=2375858); Morgan Robertson, “Stacking Ecosystem Services” (2014) 12:3 *Frontiers in Ecology and the Environment* 186; David W. Poulton, “Stacking of Multiple Environmental Credits: An Alberta Discussion Paper,” prepared for Alberta Innovates Bio Solutions, August, 2014, online: Social

Science Research Network papers.ssrn.com/sol3/papers.cfm?abstract\_id=2560656.

25 See also BBOP, Biodiversity Offsets and Stakeholder Participation: A BBOP Resource Paper (Washington, DC: Forest Trends, 2009), online: BBOP, forest-trends.org/documents/files/doc\_3082.pdf.

26 BC EM Policy, supra note 3 at s 6.

27 British Columbia Ministry of Environment, Environmental Mitigation Procedures (May 27, 2014) at 16-44, online: BCMOE, env.gov.bc.ca/emop [BC EM Procedures].

28 Ibid at 21.

29 FRPA General Bulletin Number 3: Use of the Term “Practicable” Under the Forest and Range Practices Act (FRPA) and Regulations at 2, online: for.gov.bc.ca/ftp/hth/external/publish/Web/frpa-admin/frpa-implementation/bulletins/frpa-general-no-3-defining-practicable-under-frpa-jun-9-2005.pdf..

30 BC EM Procedures, supra note 29 at 19.

31 Ibid at 17.

32 Ibid at 18; see also BC EM Policy, supra note 3 at s 4.2.

33 BC EM Procedures, supra note 29 at 28.

34 Ibid at 13.

35 Ibid at 20.

36 Ibid at 17.

37 Ibid at 30, 40, 56.

38 Ibid at 29-30.

39 Ibid at 66.

40 Ibid at 31.

41 Ibid at 29.

42 Ibid at 36.

43 Ibid at 35.

44 Ibid at 36.

45 Ibid at 31-32.

46 Ibid at 67.

47 Ibid at 34-37.

48 Ibid at 35.

49 Ibid at 34.

50 Ibid at 59.

51 Fisheries Act, 1985, RSC 1985, c F-14, s 2(2) [Act].

52 Fisheries and Oceans Canada, Fisheries Protection Policy Statement, October 2013 (Ottawa: Ecosystem Programs Policy, Fisheries and Oceans Canada, 2013) at 12-15, online: Fisheries and Oceans Canada, dfo-mpo.gc.ca/pnw-ppe/pol/PolicyStatement-EnoncePolitique-eng.pdf [2013 Policy Statement]; see also Fisheries and Oceans Canada, Fisheries Productivity Investment Policy: A Proponent's Guide to Offsetting, November 2013 (Ottawa: Ecosystems Policy Program, Fisheries and Oceans Canada, 2013) at 6-9, online: Fisheries and Oceans Canada, dfo-mpo.gc.ca/pnw-ppe/offsetting-guide-compensation/offsetting-guide-compensation-eng.pdf [2013 Guide].

53 Ibid at 12-13, n 10.

54 Ibid at 13.

55 2013 Policy Statement, supra note 54 at 6.

56 Ibid at 7.

57 Ibid at 15 [emphasis in original].

58 2013 Guide, supra note 54 at 7. The goal of neutral or positive impact is also depicted graphically at 9. See also the 2013 Policy Statement, supra note 54 at 15.

59 Ibid at 14.

60 Ibid at 15.

61 Act, supra note 53, s 37 (1)-(1.1).

62 Ibid s 37(2).

63 Ibid s 6.

64 SC 2002, c 29.

65 2013 Guide, supra note 54 at 17.

66 Ibid at 17.

67 Keith D. Clarke & Michael J. Bradford, “A Review of Equivalency in Offsetting Policies,” Canadian Science Advisory Secretariat Research Document 2014/19 (Ottawa: DFO, December 2014), online: Fisheries and Oceans Canada, dfo-mpo.gc.ca/csas-sccs/publications/resdocs-docrech/2014/2014\_109-eng.pdf.

68 Ibid at 14.

69 2013 Policy Statement, supra note 54 at 16.

70 2013 Guide, supra note 54 at 11.

71 2013 Policy Statement, supra note 54 at 14-15. See also 2013 Guide, supra note 54 at 10.

72 Ibid at 7.

73 2013 Policy Statement, supra note 54 at 14 [emphasis added].

74 Ibid at 14-15.

75 2013 Guide, supra note 54 at 11-12.

76 Kyle Hunt, Paul Patrick & Michael Connell, Fish Habitat Banking in Canada: Opportunities and Challenges, Economic and Commercial Analysis Report 180 (n.p.: Her Majesty the Queen in Right of Canada, 2011).

77 2013 Guide, supra note 54 at 3.

78 Federal Nature Conservation Act (Bundesnaturschutzgesetz), 2009, Art 14 (unofficial translation published online): Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety, bmub.bund.de/en/service/publications/downloads/details/artikel/federal-nature-conservation-act-bnatschg-1 [FNCA].

79 Ibid, Art 13.

80 Ibid, Art 15(1).

81 Marianne Darbi et al., Impact Mitigation and Biodiversity Offsets – Compensation Approaches from Around the World: A Study on the Application of Article 14 of the CBD (Convention on Biological Diversity). (Bonn: Bundesamt Für Naturschutz, p. 249 and Naturschutz Und Biologische Vielfalt, 101 2010 at 34.

82 Marianne Darbi, personal communication, March 24, 2015.

83 FNCA, supra note 80, Art 15(2); Darbi et al., supra note 83 at 34.

84 FNCA, supra note 80, Art 15(5).

85 Wolfgang Wende, Alfred Herberg & Angela Herzberg, “Mitigation Banking and Compensation Pools: Improving the Effectiveness of Impact Mitigation Regulation in Project Planning Procedures” (2005) 23:2 Impact Assessment and Project Appraisal at 101-102.

- 86 Ibid.
- 87 Marianne Darbi & Christian Tausch, “Loss-Gain Calculations in German Impact Mitigation Regulation,” online: BBOP, [forest-trends.org/documents/files/doc\\_2404.pdf](http://forest-trends.org/documents/files/doc_2404.pdf).
- 88 Marianne Darbi, personal communication, March 24, 2015. A biotope is an area characterized by a particular set of environmental conditions supporting a biological community.
- 89 FNCA, supra note 80, Art 15(4).
- 90 FNCA, supra note 80, Art 15(4).
- 91 FNCA Art 15(2).
- 92 Ibid.
- 93 Marianne Darbi, personal communication, March 24, 2016.
- 94 Darbi et al. 2010 at 36.
- 95 Darbi et al. 2010 at 31.
- 96 Wende et al., supra note 87.
- 97 Resource Management Act 1991, s 17(1).
- 98 New Zealand Government, Guidance on Good Practice Biodiversity Offsetting in New Zealand (August 2014) at 8, online: Department of Conservation, [doc.govt.nz/about-us/our-policies-and-plans/guidance-on-biodiversity-offsetting](http://doc.govt.nz/about-us/our-policies-and-plans/guidance-on-biodiversity-offsetting) [Guidance]; Astrid van Meeuwen-Dijkgraaf, “Biodiversity Offsetting in New Zealand: Lessons Learned” webinar, August 6, 2013, online: Vimeo, [vimeo.com/71920580](https://vimeo.com/71920580).
- 99 Guidance, supra note 100 at 18.
- 100 Ibid at 18.
- 101 Ibid at 19.
- 102 Ibid at 3, 20.
- 103 Ibid at 15. The approach to non-offsetability recommended by the framework is based upon Pilgrim et al., supra note 16, which is linked as a resource on the Guidance website.
- 104 Guidance, supra note 100 at 15.
- 105 Ibid at 15–16.
- 106 Ibid at 14.
- 107 Ibid at 21.
- 108 Ibid at 21–29.
- 109 Ibid at 21–22.
- 110 Ibid at 22.
- 111 Ibid at 22.
- 112 Ibid at 33,38. The nature of open space covenants in New Zealand is described online: QEII National Trust, [openspace.org.nz/Site/About\\_covenanting/default.aspx](http://openspace.org.nz/Site/About_covenanting/default.aspx).
- 113 Guidance, supra note 100 at 38.
- 114 Ibid at 29.
- 115 Ibid at 32.
- 116 Ibid at 27.
- 117 Ibid at 13.
- 118 Ibid at 13.
- 119 33 CFR § 332.2 (2008) (First italics in original, second added).
- 120 40 CFR § 230.3(q) (2008) (Italics in original); 33 CFR § 332.1(c)(2) (2008).
- 121 40 CFR § 230.10(a).
- 122 Palmer Hough & Morgan Robertson, “Mitigation Under Section 404 of the Clean Water Act: Where it Comes From, What It Means” (2009) 17 Wetlands Ecology and Management 15–33. See also Royal C. Gardner, *Lawyers, Swamps, and Money: U.S. Wetland Law, Policy, and Politics* (Washington, DC: Island Press, 2011) at 192.
- 123 55 Fed Reg 9210 (1990).
- 124 33 USC § 2317(a)(1).
- 125 33 CFR § 332.3(e)(3) – following a provision describing discretion to allow out-of-kind mitigation.
- 126 Interview with David B. Olson, Regulatory Programs Manager, United States Army Corps of Engineers (Washington, DC, April 25, 2013). A brief description of the hydrogeomorphic method and a comparison of it to biological assessment may be found online at (EPA), [water.epa.gov/type/wetlands/assessment/fact6.cfm](http://water.epa.gov/type/wetlands/assessment/fact6.cfm).
- 127 73 Fed Reg 19594 at 19646 (2008).
- 128 73 Fed Reg 19594 at 19646 (2008).
- 129 33 CFR § 332.4(c)(iii)(4) (2008); 40 CFR § 230.94(c)(iii)(4) (2008).
- 130 33 CFR § 332.7(a)(1) (2008); 40 CFR § 230.97(a)(1) (2008).
- 131 33 CFR § 332.7(a)(1) (2008); 40 CFR § 230.97(a)(1) (2008).
- 132 33 CFR § 332.3(h)(1)(v) (2008); 40 CFR § 230.93(1)(v) (2008).
- 133 33 CFR § 332.4(c)(11) (2008); 40 CFR § 230.94(c)(11) (2008).
- 134 33 CFR § 332.4(c)(12) (2008); 40 CFR § 230.94(c)(12) (2008).
- 135 33 CFR § 332.8(a)(2) (2008); 40 CFR § 230.98(a)(2) (2008).
- 136 33 CFR § 332.4(c); 33 CFR § 332.8(d) (2008); 40 CFR § 230.98(d) (2008).
- 137 33 CFR § 332.3(a)(2) (2008); 40 CFR § 230.93(a)(2) (2008).
- 138 33 CFR § 332.3(h)(1) (2008); 40 CFR § 230.93(h)(1) (2008).
- 139 33 CFR § 332.8(o)(6) (2008); 40 CFR § 230.98(o)(6) (2008).
- 140 33 CFR § 332.2(h)(2) (2008); 40 CFR § 230.92(h)(2) (2008).
- 141 Regulatory In-Lieu Fee and Bank Information Tracking System, online: U.S. Army Corps of Engineers, [https://ribits.usace.army.mil/ribits\\_apex/f?p=107:2](https://ribits.usace.army.mil/ribits_apex/f?p=107:2).
- 142 Victoria Planning Provisions (Vic), cl 52.17, as amended by VC105. For a full discussion of the nature of the earlier native vegetation management offset system and the reforms of 2013–14 see David W. Poulton, *Conservation Offset Policy for Alberta: A Comparative Legal Analysis* (LLM Thesis, University of Calgary, Faculty of Law, 2014) [unpublished] at 92–125.
- 143 Derived from Biodiversity Interactive Map, online: State of Victoria, Department of Environment, Land, Water & Planning, <http://www.slideshare.net/IEUO/crawford-biodiversity-offsets>
- 144 State of Victoria, Department of Environment and Primary Industries, *Permitted Clearing of Native Vegetation – Biodiversity Assessment Guidelines*, September 2013 (Melbourne: Victoria, DEPI, 2013) at 6 [Biodiversity Assessment Guidelines 2013].
- 145 Ibid at 6.
- 146 Ibid at 5,8.
- 147 Ibid at 2, 5.
- 148 Victoria Planning Provisions (Vic) cl 52.17, as amended by VC105.
- 149 Biodiversity Assessment Guidelines 2013, supra note 144 at 17–22.

- 150 Legend of Strategic Biodiversity Score map derived from Biodiversity Interactive Map online: Victoria, Department of Environment, Land, Water & Planning, [mapshare2.dse.vic.gov.au/MapShare2EXT/imf.jsp?site=bim](http://mapshare2.dse.vic.gov.au/MapShare2EXT/imf.jsp?site=bim). Like the location risk rating shown in Figure 1, the great majority of the state bears a low strategic biodiversity score.
- 151 *Ibid* at 18.
- 152 Biodiversity Assessment Guidelines 2013, *supra* note 144 at 22.
- 153 *Ibid* at 21–22.
- 154 *Ibid* at 17, 19.
- 155 *Ibid* at 19, 21–22.
- 156 *Ibid* at 23.
- 157 *Ibid* at 22.
- 158 *Ibid* at 22.
- 159 State of Victoria, Department of Environment and Primary Industries, Native Vegetation Gain Scoring Manual, Version 1 (Melbourne: DEPI, 2013) at 10, online: DEPI, [depi.vic.gov.au/\\_\\_\\_data/assets/pdf\\_file/0005/198968/Gain\\_manual\\_NVR.pdf](http://depi.vic.gov.au/___data/assets/pdf_file/0005/198968/Gain_manual_NVR.pdf) [NV Gain Scoring Manual].
- 160 State of Victoria, Department of Natural Resources and Environment, Victoria's Native Vegetation Management: A Framework for Action (n.p.: State of Victoria, Department of Natural Resources and Environment, 2002) at 6.
- 161 Rachael Webb, "Victoria's Native Vegetation Framework – Achieving 'Net Gain' at the Urban Growth Boundary?" (2009) 26 Environmental and Planning Law Journal 236.
- 162 Shari Clare et al., "Where is the Avoidance in the Implementation of Wetland Law and Policy?" (2011) 19 Wetlands Ecology and Management 165.
- 163 *Ibid* at 170.
- 164 Federal Nature Conservation Act (Bundesnaturschutzgesetz) Art 15(1).
- 165 See PAPRAGRAPH CURRENTLY AT TOP OF 15. PIN-POINT IN AFTER FINAL LAYOUT INDIVATES PAGE NUMBER? .
- 166 33 CFR § 332.2 (2008).
- 167 40 CFR § 230.3(q) (2008); 33 CFR § 332.1(c)(2) (2008).
- 168 2013 Guide, *supra* note 54 at 7.
- 169 55 Fed Reg 9210 (1990).
- 170 Victoria Planning Provisions, cl 52.17, as amended by VC105.
- 171 FNCA, *supra* note 80, Art 15(2).
- 172 Guidance, *supra* note 100 at 15.
- 173 FNCA, *supra* note 80, Art 15(5).
- 174 *Ibid*.
- 175 2013 Policy Guidance, *supra* note 54 at 15.
- 176 Fisheries Act 1985, *supra* note 53, s 37.
- 177 BC EM Procedures, *supra* note 29 at 20.
- 178 33 CFR § 332.3(e)(3).
- 179 Interview with David B. Olson, Regulatory Programs Manager, USACE, in Washington, DC (April 25, 2013).
- 180 2013 Guide, *supra* note 54 at 17.
- 181 Clarke & Bradford, *supra* note 69.
- 182 FNCA, *supra* note 80 Art 1.
- 183 Darbi & Tausch, *supra* note 89.
- 184 David Parkes, Graeme Newell & David Cheal, "Assessing the Quality of Native Vegetation: The 'Habitat Hectares' Approach" (2003) 4 (Supp) Ecological Management & Restoration S29.
- 185 Biodiversity Assessment Guidelines 2013, *supra* note 146 at 18.
- 186 *Ibid* at 23.
- 187 73 Fed Reg 19594 at 19646 (2008).
- 188 BC EM Procedures, *supra* note 29 at 36.
- 189 *Ibid* at 36.
- 190 2013 Guide, *supra* note 54 at 7.
- 191 *Ibid* at 10; 2013 Policy Statement, *supra* note 54 at 14–15.
- 192 BC IM Procedures, *supra* note 29 at 67.
- 193 Guidance, *supra* note 100 at 29.
- 194 33 CFR § 332.4(c); 33 CFR § 332.8(d) (2008); 40 CFR § 230.98(d) (2008).
- 195 Biodiversity Assessment Guidelines 2013, *supra* note 146 at 22.
- 196 *Ibid* at 22.
- 197 Guidance, *supra* note 100 at 32.
- 198 *Ibid* at 27; BC IM Procedures, *supra* note 29 at 34–37.
- 199 *Ibid* at 34–35. "Additionality" is the concept that the outcome of a conservation action, in order to be creditable as an offset, must be over and above (i.e., additional to) what would have come about in the absence of that action. See BBOP Principle 5.
- 200 33 CFR § 332.3(h)(1) (2008); 40 CFR § 230.93(h)(1) (2008).
- 201 33 CFR § 332.8(o)(6) (2008); 40 CFR § 230.98(o)(6) (2008).
- 202 33 CFR § 332.2(h)(2) (2008); 40 CFR § 230.92(h)(2) (2008).
- 203 NV Gain Scoring Manual, *supra* note 160 at 10.
- 204 2013 Policy Statement, *supra* note 54 at 14–15.
- 205 Darbi et al., *supra* note 83 at 36.
- 206 Ontario Nature, *supra* note 9 at 30–31.
- 207 Salzman & Ruhl, *supra* note 22.
- 208 33 USC 1251 § 404(b)(1).



# References

## Laws and Policies

- Alberta Government. Alberta Wetland Policy. 2013. [waterforlife.alberta.ca/documents/Alberta\\_Wetland\\_Policy.pdf](http://waterforlife.alberta.ca/documents/Alberta_Wetland_Policy.pdf).
- British Columbia Ministry of Environment. Environmental Mitigation Policy – Working Document. May 13, 2014. [env.gov.bc.ca/emop](http://env.gov.bc.ca/emop).
- British Columbia Ministry of Environment. Environmental Mitigation Procedures. May 27, 2014. [env.gov.bc.ca/emop](http://env.gov.bc.ca/emop).
- British Columbia. FRPA General Bulletin Number 3: Use of the Term “Practicable” Under the Forest and Range Practices Act (FRPA) and Regulations. 2005. [for.gov.bc.ca/ftp/hth/external/publish/Web/frpa-admin/frpa-implementation/bulletins/frpa-general-no-3-defining-practicable-under-frpa-jun-9-2005.pdf](http://for.gov.bc.ca/ftp/hth/external/publish/Web/frpa-admin/frpa-implementation/bulletins/frpa-general-no-3-defining-practicable-under-frpa-jun-9-2005.pdf).
- Canada. Fisheries Act, 1985, RSC 1985, c F-14.
- Fisheries and Oceans Canada. Fisheries Protection Policy Statement. October 2013. [dfo-mpo.gc.ca/pnw-ppe/pol/PolicyStatement-EnoncePolitique-eng.pdf](http://dfo-mpo.gc.ca/pnw-ppe/pol/PolicyStatement-EnoncePolitique-eng.pdf)
- Fisheries and Oceans Canada. Fisheries Productivity Investment Policy: A Proponent’s Guide to Offsetting. November 2013. [dfo-mpo.gc.ca/pnw-ppe/offsetting-guide-compensation/offsetting-guide-compensation-eng.pdf](http://dfo-mpo.gc.ca/pnw-ppe/offsetting-guide-compensation/offsetting-guide-compensation-eng.pdf).
- Germany. Federal Nature Conservation Act (Bundesnaturschutzgesetz). 2009. (Unofficial translation published online: Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety.) [bmub.bund.de/en/service/publications/downloads/details/artikel/federal-nature-conservation-act-bnatschg-1](http://bmub.bund.de/en/service/publications/downloads/details/artikel/federal-nature-conservation-act-bnatschg-1).
- New Zealand. Resource Management Act. 1991.
- New Zealand. Guidance on Good Practice Biodiversity Offsetting in New Zealand. August 2014. [doc.govt.nz/about-us/our-policies-and-plans/guidance-on-biodiversity-offsetting/](http://doc.govt.nz/about-us/our-policies-and-plans/guidance-on-biodiversity-offsetting/).
- USA. Clean Water Act 33 USC 1251.
- USA. Compensatory Mitigation for Losses of Aquatic Resources – Final Rule. 2008. [water.epa.gov/lawsregs/guidance/wetlands/upload/2008\\_04\\_10\\_wetlands\\_wetlands\\_mitigation\\_final\\_rule\\_4\\_10\\_08.pdf](http://water.epa.gov/lawsregs/guidance/wetlands/upload/2008_04_10_wetlands_wetlands_mitigation_final_rule_4_10_08.pdf).
- USA. Guidelines, 55 Fed. Reg. 9210, 9211 (March 12, 1990).

## Other References

- Bartowski, B. “Is Economic Valuation a ‘Neo-Liberal Road to Ruin’? A Response to George Monbiot.” Blog: The Sceptical Economist. July 24, 2014. [zielonygrzyb.wordpress.com/2014/07/24/is-economic-valuation-a-neoliberal-road-to-ruin-a-response-to-george-monbiot/#comment-1902](http://zielonygrzyb.wordpress.com/2014/07/24/is-economic-valuation-a-neoliberal-road-to-ruin-a-response-to-george-monbiot/#comment-1902).
- Bull, J. W., A. Gordon, E.A. Law, K.B. Suttle, and E.J. Milner-Gulland. “Importance of Baseline Specification in Evaluating Conservation Interventions and Achieving No Net Loss of Biodiversity.” *Conservation Biology* 28:3 (2014): 799–809.
- Bull, J. W., K.B. Suttle, A. Gordon, N.J. Singh and E.J. Milner-Gulland. “Biodiversity Offsets in Theory and Practice.” *Fauna & Flora International*, Oryx 1 (2013):1–12.
- Business and Biodiversity Offsets Programme (BBOP). Biodiversity Offsets and Stakeholder Participation: A BBOP Resource Paper. Washington, DC: BBOP, 2009. [forest-trends.org/documents/files/doc\\_3082.pdf](http://forest-trends.org/documents/files/doc_3082.pdf).
- Business and Biodiversity Offsets Programme (BBOP). Resource Paper: Limits to What Can Be Offset. Washington, DC: BBOP, 2012. [forest-trends.org/documents/files/doc\\_3128.pdf](http://forest-trends.org/documents/files/doc_3128.pdf).
- Business and Biodiversity Offsets Programme (BBOP). Standard on Biodiversity Offsets. Washington, DC: BBOP, 2012. [forest-trends.org/documents/files/doc\\_3078.pdf](http://forest-trends.org/documents/files/doc_3078.pdf).
- Business and Biodiversity Offsets Programme (BBOP). To No Net Loss and Beyond: an Overview of the Business and Biodiversity Offsets Programme. Washington, DC: BBOP, 2013. [forest-trends.org/documents/file/doc\\_3319.pdf](http://forest-trends.org/documents/file/doc_3319.pdf).
- Clarke, K.D. and M. J. Bradford, “A Review of Equivalency in Offsetting Policies.” Canadian Science Advisory Secretariat Research Document 2014/109. Ottawa: Fisheries and Oceans Canada. December 2014. [dfo-mpo.gc.ca/csas-sccs/publications/resdocs-docrech/2014/2014\\_109-eng.pdf](http://dfo-mpo.gc.ca/csas-sccs/publications/resdocs-docrech/2014/2014_109-eng.pdf).
- Crawford, I. “Biodiversity Offsets and Ontario’s Endangered Species Act: We Built It, They Came, and We Can Do Better.” Presentation at the Biodiversity Offsets in Canada Conference. Ottawa: February 13–14, 2014. [www.slideshare.net/IEUO/crawford-bioiversity-offsets](http://www.slideshare.net/IEUO/crawford-bioiversity-offsets).

Darbi, M., H. Ohlenburg, A. Herberg, and W. Wende. Impact Mitigation and Biodiversity Offsets-Compensation Approaches from Around the World: A Study on the Application of Article 14 of the CBD (Convention on Biological Diversity). Bonn: Bundesamt für Naturschutz and also Naturschutz und biologische Vielfalt, 2010.

Darbi, M. Personal communication, March 24, 2015.

Darbi, M. and C. Tausch. "Loss-Gain Calculations in German Impact Mitigation Regulation." [forest-trends.org/documents/files/doc\\_2404.pdf](http://forest-trends.org/documents/files/doc_2404.pdf).

Department for Environment, Food and Rural Affairs. Biodiversity Offsetting in England. [consult.defra.gov.uk/biodiversity/biodiversity\\_offsetting](http://consult.defra.gov.uk/biodiversity/biodiversity_offsetting).

Environmental Protection Agency, USA. Wetland Biological Assessments and HGM Functional Assessment. [water.epa.gov/type/wetlands/assessment/fact6.cfm](http://water.epa.gov/type/wetlands/assessment/fact6.cfm).

Gardner, R.C. Lawyers, Swamps, and Money: U.S. Wetland Law, Policy, and Politics. Washington, DC: Island Press, 2011.

Gardner, R. C. and J. Fox. "The Legal Status of Environmental Credit Stacking." *Ecology Law Quarterly* 40:4 (2013): 713–57.

Good, K. and R. Haddock. Southeast Alberta Conservation offset Pilot: Linking Decisions and Assumptions with Generally Accepted Offset Principles. Calgary: Miistakis Institute, 2014. [rockies.ca/project\\_info/seacop-gap-report-miistakis.pdf](http://rockies.ca/project_info/seacop-gap-report-miistakis.pdf).

Habib, T.J., D. R. Farr, R. R. Schneider, and S. Boutin. "Economic and Ecological Outcomes of Flexible Biodiversity Offset Systems." *Conservation Biology* 27:6 (2013): 1313–23.

Hough, P. and M. Robertson. "Mitigation Under Section 404 of the Clean Water Act: Where It Comes From, What It Means." *Wetlands Ecology and Management* 17 (2009): 15–33.

Hunt, K., P. Patrick, and M. Connell. Fish Habitat Banking in Canada: Opportunities and Challenges, Economic and Commercial Analysis Report 180. Ottawa: Her Majesty the Queen in Right of Canada, 2011.

Madsen, B., N. Carroll, D. Kandy, and G. Bennett, 2011 Update: State of Biodiversity Markets: Offset and Compensation Programs Worldwide. Washington, DC: Forest Trends, 2011. Available at: [forest-trends.org/documents/files/doc\\_2848](http://forest-trends.org/documents/files/doc_2848).

Maron, M. et al. "Faustian Bargains? Restoration Realities in the Context of Biodiversity Offset Policies." *Biological Conservation* 155 (2012): 141–48.

Monbiot, G. "The Price of Everything." July 24, 2014. [monbiot.com/2014/07/24/the-pricing-of-everything/](http://monbiot.com/2014/07/24/the-pricing-of-everything/).

Olson, D.B. Regulatory Programs Manager, United States Army Corps of Engineers. Interview. Washington, DC: April 25, 2013.

Ontario Nature. Insights into Biodiversity Offsetting in Ontario: Summary of Ontario Nature's 2013–2014 Project. Toronto: Ontario Nature, 2014. [ontariounature.org/discover/resources/PDFs/reports/Biodiversity\\_Offsetting\\_Ontario.pdf](http://ontariounature.org/discover/resources/PDFs/reports/Biodiversity_Offsetting_Ontario.pdf).

Pilgrim, J.D. et al. "A Process for Assessing the Offsetability of Biodiversity Impacts." *Conservation Letters* 6:5 (2013): 376–84. [doc.govt.nz/Documents/our-work/biodiversity-offsets/pilgrim-et-al-2013.pdf](http://doc.govt.nz/Documents/our-work/biodiversity-offsets/pilgrim-et-al-2013.pdf).

Poulton, D.W. "Stacking of Multiple Environmental Credits: An Alberta Discussion Paper." August 28, 2014. [papers.ssrn.com/sol3/papers.cfm?abstract\\_id=2560656](http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2560656).

Poulton, D. W. Biodiversity Offsets: A Primer for Canada. Ottawa: Sustainable Prosperity and the University of Ottawa Institute of the Environment, 2014. [sustainableprosperity.ca/article3857](http://sustainableprosperity.ca/article3857).

QEII National Trust. About Covenanting. [openspace.org.nz/Site/About\\_covenanting/default.aspx](http://openspace.org.nz/Site/About_covenanting/default.aspx).

Robertson, M. et al. "Stacking Ecosystem Services." *Frontiers in Ecology and the Environment* 12:3 (2014): 186–93.

Salzman, J. and J.B. Ruhl, "Currencies and the Commodification of Environmental Law." *Stanford Law Review* 53:3 (2000): 607–94.

Van Meeuwen-Dijkgraaf, A. "Biodiversity Offsetting in New Zealand: Lessons Learned." Webinar, August 6, 2013. [vimeo.com/71920580](http://vimeo.com/71920580).

Vidal, J. "Conservationists Split Over 'Biodiversity Offsetting' Plans." *The Guardian*. June 3, 2014. [theguardian.com/environment/2014/jun/03/conservationists-split-over-biodiversity-offsetting-plans](http://theguardian.com/environment/2014/jun/03/conservationists-split-over-biodiversity-offsetting-plans).

Wende, W., A. Herberg, and A. Herzberg. "Mitigation Banking and Compensation Pools: Improving the Effectiveness of Impact Mitigation Regulation in Project Planning Procedures." *Impact Assessment and Project Appraisal* 23:2 (2005): 101–11.



Ontario's Greenway

Noah Cole

Bobolink



Scott Fairbairn

# SUPPORT ONTARIO NATURE

Join our community today  
and help protect  
wild species and wild spaces  
in Ontario.

Visit [ontarionature.org](https://ontarionature.org) or  
call 416-444-8419 to learn more.

Ontario  
Nature 



## About Ontario Nature

Ontario Nature protects wild species and wild spaces through conservation, education and public engagement. It connects thousands of individuals and communities with nature through more than 150 member groups across the province (charitable registration #10737 8952 RR0001).



214 King Street West, Suite 612

Toronto, ON M5H 3S6

Tel: 416-444-8419

Fax: 416-444-9866

Toll free (within Ontario): 1-800-440-2366

[info@ontarionature.org](mailto:info@ontarionature.org)

**OntarioNature.org**