Conservation Assessment Project

Due Date: Tuesday October 25

Recommended Length: 1–2 pages, including any maps, tables, or figures.

Individual Project: complete one of two project options described below.

(1) Wildlife reintroduction assessment

(2) Restoration assessment for Chuckanut Community Forest/Hundred Acre Wood

(1) Wildlife reintroduction assessment

Wildlife reintroductions and translocations are being used increasingly as conservation strategies to restore extirpated species and to augment populations at risk of extinction. Success depends in part on effective planning and preparation. Inadequate implementation risks high opportunity cost: failure may preclude future attempts. Unfortunately, many translocation decisions rely on luck: they are made without adequate of consideration of factors related to success or failure. Pérez et al. (2012) addressed this problem by developing a translocation decision framework to ensure that risks have been mitigated and essential preparations have been made. The framework includes ten criteria, arranged hierarchically into categories of translocation necessity, risk, and practical suitability (Table 1).

For this project option, select a wildlife reintroduction or translocation project conducted in the last ten years, and evaluate it relative to the ten criteria in Pérez et al. (2012; Table 1). Your assessment should consist of a one paragraph summary of the project and a yes/no/partial evaluation relative to each criterion. Your report should include a brief justification for each evaluation. It should conclude with an overall conclusion: was the project justified according to your assessment?

Table 1. Existing criteria for translocations Perez et al. 2012

Level	*Criteria*	*Guidelines*
1st Necessity of the translocation	(1) Is the species or population under threat?	IUCN (1987, 1998)
	(2) Have the threatening factors been removed or controlled, or were they absent in the release area?	IUCN (1987, 1998); Kleiman (1989); Dodd and Seigel (1991); Kleiman *et al.* (1994); Miller *et al.* (1999)
	(3) Are translocations the best tool to mitigate conservation conflicts?	IUCN (1987, 1998); Kleiman (1989); Kleiman *et al.* (1994)
2nd Risk evaluation	(4) Are risks for the target species acceptable?	IUCN (1987, 1998); Williams *et al.* (1988); Kleiman (1989); Dodd and Seigel (1991); Stanley-Price (1991); Kleiman *et al.* (1994); Cunningham *et al.* (1996); Miller *et al.* (1999)
	(5) Are risks for other species or the ecosystem acceptable?	Williams *et al.* (1988); Stanley-Price (1991); Cunningham *et al.* (1996); IUCN (1998)
	(6) Are the possible effects of the translocation acceptable to local people?	IUCN (1987, 1998); Reading *et al.* (1991); Stanley-Price (1991); Kleiman *et al.* (1994)
3rd Technical and logistical suitability	(7) Does the project maximize the likelihood of establishing a viable population?	IUCN (1987, 1998); Williams *et al.* (1988); Griffith *et al.* (1989); Kleiman (1989); Dodd and Seigel (1991); Reading *et al.* (1991); Stanley-Price (1991); Short *et al.* (1992); Kleiman *et al.* (1994); Cunningham *et al.* (1996); Wolf *et al.* (1996); Miller *et al.* (1999)
	(8) Does the project include clear goals and monitoring?	IUCN (1987, 1998); Williams *et al.* (1988); Kleiman (1989); Dodd and Seigel (1991); Short *et al.* (1992); Cunningham *et al.* (1996); Miller *et al.* (1999)
	(9) Do enough economic and human resources exist?	IUCN (1987, 1998); Kleiman (1989); Reading *et al.* (1991); Stanley-Price (1991); Kleiman *et al.* (1994); Miller *et al.* (1999)
	(10) Do scientific, governmental, and stakeholder groups support the translocation?	Kleiman (1989); Reading *et al.* (1991); Kleiman *et al.* (1994); IUCN (1998)

Notes: Criteria are grouped into three levels within the Hierarchical Decision-making System for Translocations; these are obtained from recommendations and guidelines pertaining to translocations (see also WebPanel 1).

(2) Restoration assessment: Chuckanut Community Forest/Hundred Acre Wood

Chuckanut Community Forest (CCF) was acquired as public open space due to its outstanding environmental values, desirable natural aesthetic character, and strong potential for outdoor recreational uses (Eissinger 2017). Among the most important environmental attributes in CCF is a network of wetlands. The wetland network was degraded by roads constructed to facilitate timber harvest a century ago, which impede surface and subsurface hydrologic flows. (Eissinger 2017). In recent years, extent and condition of those wetlands have degraded, due to impacts of recreational activities, a warming and drying climate, and loss of beavers. In addition, recent trail construction, widening, and associated loss of vegetation have degraded the forest throughout the park.

For this project option, conduct an assessment of the Chuckanut Community Forest/Hundred Acre Wood (CCF/HAW), using the 1st edition restoration standards developed by the Society for Ecological Restoration (McDonald et al. 2016). The "reference ecosystem" should be low elevation old growth forest dominated by Douglas fir (*Pseudotsuga menziesii*) and Western hemlock (*Tsuga heterophylla*) trees and hydrologically connected old growth forested wetlands dominated by Western redcedar (*Thuja plicata*) trees. Use the five star rating system defined by McDonald et al. (2016), Table 2, and the attributes and star criteria described in McDonald et al. (2016) Table 3. You should record the star rating and rationale for each in the evaluation table below (Appendix 2, McDonald et al. 2016). You should supplement each of your rationale phrases in the table with a sentence or two describing the rationale. Then summarize your ratings graphically by filling in a "Recovery wheel," similar to the example in Figure 2 (McDonald et al. 2016). Based on your assessment, identify the greatest restoration priority for CCF/HAW. All tables and figures from McDonald et al. (2016) cited above are copied below.

References

Eissinger A. 2017. Chuckanut Community Forest Baseline Documentation Report. prepared for Chuckanut Community Forest Park District, Bellingham, WA. [online] https://chuckanutcommunityforest.com//files/CCF-Baseline-Documentation-Report-Final-5-8-17.pdf

McDonald T, Gann GD, Jonson J, and Dixon KW. 2016. International standards for the practice of ecological restoration – including principles and key concepts. Society for Ecological Restoration, Washington, D.C. [online] https://seraustralasia.com/wheel/image/SER_International_Standards.pdf

Pérez I, JD Anadoón, M Díaz, GG Nicola, JL Tella, A Giménez. 2012. What is wrong with current translocations? A review and a decision-making proposal. Front.Ecol.Environ. 10(9): 494-501. doi: 10.1890/110175

(McDonald et al. 2016)

Table 2. Summary of generic standards for 1-5 star recovery levels

[**Note 1:** Each level is cumulative. **Note 2:** The different attributes will progress at different rates –see Table 3 that shows more detailed generic standards for each of the six key ecosystem attributes. **Note 3:** This system is applicable to any level of recovery where a reference ecosystem is used]

Number of stars	SUMMARY OF RECOVERY OUTCOME *(Note: Modelled on an appropriate local native reference ecosystem)*
★	Ongoing deterioration prevented. Substrates remediated (physically and chemically). Some level of native biota present; future recruitment niches not negated by biotic or abiotic characteristics. Future improvements for all attributes planned and future site management secured.
★★	Threats from adjacent areas starting to be managed or mitigated. Site has a small subset of characteristic native species and low threat from undesirable species onsite. Improved connectivity arranged with adjacent property holders.
★★★	Adjacent threats being managed or mitigated and very low threat from undesirable species onsite. A moderate subset of characteristic native species are established and some evidence of ecosystem functionality commencing. Improved connectivity in evidence.
★★★★	A substantial subset of characteristic biota present (representing all species groupings), providing evidence of a developing community structure and commencement of ecosystem processes. Improved connectivity established and surrounding threats being managed or mitigated.
★★★★★	Establishment of a characteristic assemblage of biota to a point where structural and trophic complexity is likely to develop without further intervention. Appropriate cross boundary flows are enabled and commencing and high levels of resilience is likely with return of appropriate disturbance regimes. Long term management arrangements in place.

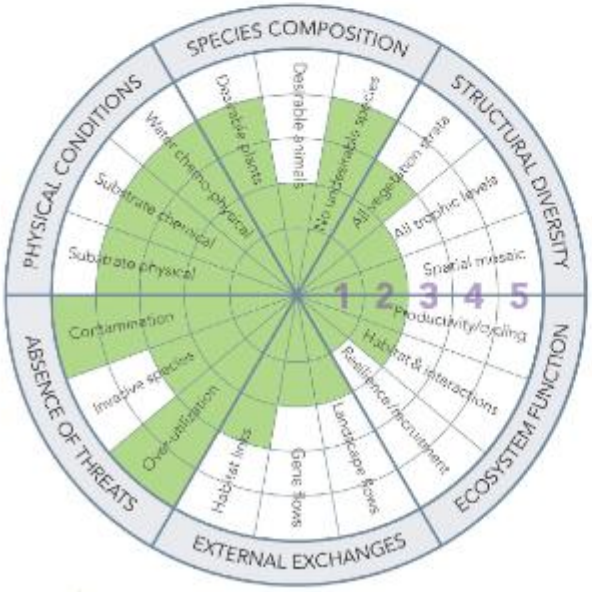


Figure 2. Progress evaluation 'recovery wheel' depicting a hypothetical 1-year old reconstruction project on its way to a 4-star condition. This template allows a manager to illustrate the degree to which the ecosystem under treatment is recovering over time. A practitioner with a high level of familiarity with the goals, objectives and site specific indicators set for the project and the recovery levels achieved to date can shade the segments for each sub-attribute after formal or informal evaluation. (Blank templates for the diagram and its accompanying proforma are available in Appendix 2.) Note: Sub-attribute labels can be adjusted or more added to better represent a particular ecosystem.

(McDonald et al. 2016)

Table 3. Generic 1-5 star recovery scale interpreted in the context of the six key ecosystem attributes used to measure progress towards a self-organizing status. See interpretive notes, next page.

Note: This 5-star scale represents a cumulative gradient from very low to very high similarity to the reference ecosystem. It provides a generic framework only; requiring users to develop indicators and a monitoring metric specific to the ecosystem and sub-attributes identified.

(McDonald et al. 2016)

ATTRIBUTE	★	★★	★★★	★★★★	★★★★★
Absence of threats	Further deterioration discontinued and site has tenure and management secured.	Threats from adjacent areas beginning to be managed or mitigated.	All adjacent threats managed or mitigated to a low extent.	All adjacent threats managed or mitigated to an intermediate extent.	All threats managed or mitigated to high extent.
Physical conditions	Gross physical and chemical problems remediated (e.g., contamination, erosion, compaction).	Substrate chemical and physical properties (e.g., pH, salinity) on track to stabilize within natural range.	Substrate stabilized within natural range and supporting growth of characteristic biota.	Substrate securely maintaining conditions suitable for ongoing growth and recruitment of characteristic biota.	Substrate exhibiting physical and chemical characteristics highly similar to that of the reference ecosystem with evidence they can indefinitely sustain species and processes.
Species composition	Colonising native species (e.g., ~2% of the species of reference ecosystem). No threat to regeneration niches or future successions.	Genetic diversity of stock arranged and a small subset of characteristic native species establishing (e.g., ~10% of reference). Low onsite threat from exotic invasive or undesirable species.	A subset of key native species (e.g., ~25% of reference) establishing over substantial proportions of the site. Very low onsite threat from undesirable species.	Substantial diversity of characteristic biota (e.g. ~60% of reference) present on the site and representing a wide diversity of species groups. No onsite threat from undesirable species.	High diversity of characteristic species (e.g., >80% of reference) across the site, with high similarity to the reference ecosystem; improved potential for colonization of more species over time.
Structural diversity	One or fewer strata present and no spatial patterning or trophic complexity relative to reference ecosystem.	More strata present but low spatial patterning and trophic complexity, relative to reference ecosystem.	Most strata present and some spatial patterning and trophic complexity relative to reference site.	All strata present. Spatial patterning evident and substantial trophic complexity developing, relative to the reference ecosystem.	All strata present and spatial patterning and trophic complexity high. Further complexity and spatial pattering able to self-organize to highly resemble reference ecosystem.
Ecosystem functionality	Substrates and hydrology are at a foundational stage only, capable of future development of functions similar to the reference.	Substrates and hydrology show increased potential for a wider range of functions including nutrient cycling, and provision of habitats/resources for other species.	Evidence of functions commencing - e.g., nutrient cycling, water filtration and provision of habitat resources for a range of species.	Substantial evidence of key functions and processes commencing including reproduction, dispersal and recruitment of species.	Considerable evidence of functions and processes on a secure trajectory towards reference and evidence of ecosystem resilience likely after reinstatement of appropriate disturbance regimes.
External exchanges	Potential for exchanges (e.g. of species, genes, water, fire) with surrounding landscape or aquatic environment identified.	Connectivity for enhanced positive (and minimized negative) exchanges arranged through cooperation with stakeholders and configuration of site.	Connectivity increasing and exchanges between site and external environment starting to be evident (e.g., more species, flows etc.).	High level of connectivity with other natural areas established, observing control of pest species and undesirable disturbances.	Evidence that potential for external exchanges is highly similar to reference and long term integrated management arrangements with broader landscape in place and operative.

EVALUATION OF ECOSYSTEM RECOVERY (McDonald et al. 2016)

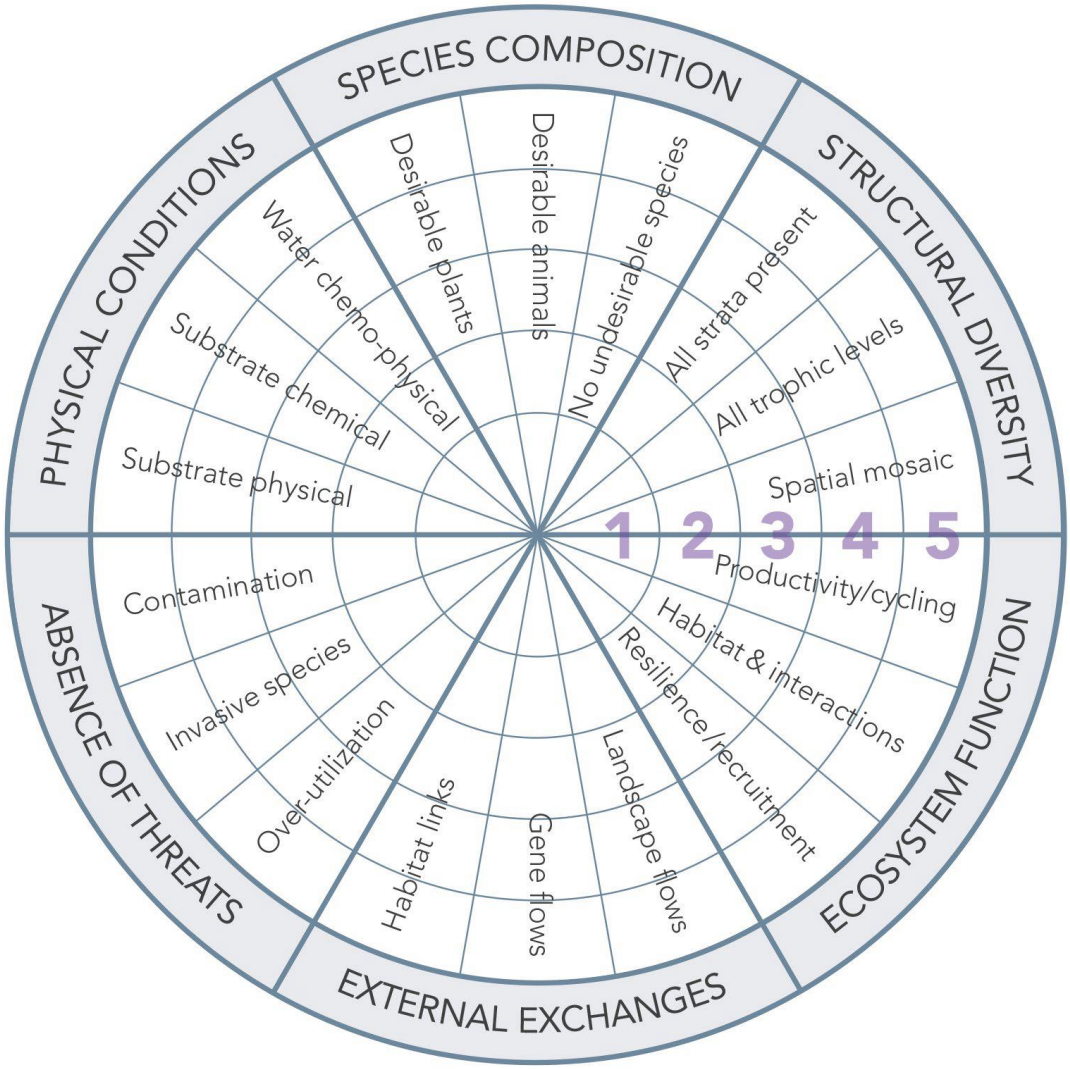
Site _____

Assessor _____

Date_____

ATTRIBUTE CATEGORY	RECOVERY LEVEL (1-5)	EVIDENCE FOR RECOVERY LEVEL
ATTRIBUTE 1. Absence of threats		
Over-utilization		
Invasive species		
Contamination		
ATTRIBUTE 2. Physical conditions		
Substrate physical		
Substrate chemical		
Water chemo-physical		
ATTRIBUTE 3. Species composition		
Desirable plants		
Desirable animals		
No undesirable species		
ATTRIBUTE 4. Structural diversity		
All vegetation strata		
All trophic levels		
Spatial mosaic		
ATTRIBUTE 5. Ecosystem functionality		
Productivity, cycling etc		
Habitat & plant-animal interactions		
Resilience, recruitment etc		
ATTRIBUTE 6. External exchanges		
Landscape flows		
Gene flows		
Habitat links		

(McDonald et al. 2016)



Evaluation: Maximum 100 points possible. A blank evaluation form is shown below.

ESCI 439/539 Conservation of Biological Diversity
Conservation Assessment Project Evaluation Sheet Name _____

Option (1) Wildlife reintroduction assessment

Project summary (10 pts)	_____
Necessity criteria evaluations (10 pts)	_____
Necessity criteria rationale statements (10 pts)	_____
Risk criteria evaluations (10 pts)	_____
Risk criteria rationale statements (10 pts)	_____
Technical & logistical suitability criteria evaluations (10 pts)	_____
Technical & logistical suitability rationale statements (10 pts)	_____
Overall conclusion (20 pts)	_____
Writing and Presentation (10 pts)	_____

Option (2) Restoration assessment for Chuckanut Community Forest/Hundred Acre Wood

Restoration assessment table, 18 ratings and evidence phrases (30 pts)	_____
Rationale statement for each rating, 18 statements (40 pts)	_____
Recovery wheel graphic (10 pts)	_____
Greatest restoration priority (10 pts)	_____
Writing and Presentation (10 pts)	_____
Total (100 pts)	_____

Evaluation rubric: Descriptions that fully meet the following criteria will earn full credit.

Option (1) Wildlife reintroduction assessment

Project summary: Description includes essential information about the project, including species, location(s), dates, number of animals released, source population(s), lead agency or organization, and basic logistical details.

Criteria evaluations (necessity, risk, technical & logistical suitability): ratings are appropriate, given project details and stated rationale.

Rationale statements (necessity, risk, technical & logistical suitability): statements are logical, well-reasoned, and appropriate to the project.

Overall conclusion: evaluation is appropriate and follows from criteria assessments and criteria priorities.

Option (2) Restoration assessment for Chuckanut Community Forest/Hundred Acre Wood

Assessment table: ratings are appropriate, given CCF/HAW conditions and stated rationale.

Rationale statements: statements are logical, well-reasoned, and appropriate.

Recovery wheel graphic: clearly presented, and consistent with ratings.

Greatest restoration priority: appropriate and consistent with star ratings and rationale statements.