AGENDA
RESILIENT SAANICH TECHNICAL COMMITTEE
Saanich Municipal Hall, Council Chambers
Thursday, December 16, 2021, 6:30-8:30 pm

To listen to this meeting by telephone call **1-833-214-3122** and use code **630 699 190#** during the time noted above. NOTE: MS Teams callers are identified by their phone number which can be viewed on screen by all attendees of the meeting.

1.	**Call to Order**	Chair T. Stevens	
2.	**Territorial Acknowledgement & Diversity, Equity and Inclusion Statement**	Clr R. Mersereau	
3.	**Approval of Agenda**	Chair, T. Stevens	5 mins
4.	**Adoption of Minutes** • **November 23, 2021**		5 mins
5.	**Receipt of Correspondence**		
6.	**Selection of next Technical Committee Chair**	Clr. R. Mersereau	10 mins
7.	**Update on November 30, 2021 meeting between RSTC and W̱SÁNEĆ Leadership Council Environment Committee**	Clr. R. Mersereau Chair T. Stevens	15 mins
8.	**Update on December 11, 2021 Workshop on Resilient Saanich Principles, Goals & Objectives**	Chair T. Stevens	5 mins
9.	**Discussion of Saanich GIS Mapping**	A. Pollard N. Barrette	40 mins
10.	**Discussion on Saanich Naturescaping Program**	C. Richman	40 mins
11.	**Discussion on RFP's for State of Biodiversity Report and Biodiversity Conservation Strategy**	A. Pollard	5 mins
12.	**Report of Biodiversity Working Group**	T. Ennis	5 mins
13.	**Report of Mapping/Stewardship Working Group**	B. Wilkes	5 mins
14.	**Discussion of SEI Mapping**	B. Wilkes	10 mins
15.	**Motion to adjourn**		

*** * Next Meeting: January 25, 2022 at 6:30 p.m. * ***
Please RSVP your attendance to lynn.merry@saanich.ca

MINUTES
RESILIENT SAANICH TECHNICAL COMMITTEE
To be Held in Council Chambers
Saanich Municipal Hall, 770 Vernon Avenue
Tuesday, November 23, 2021, 7 p.m.

Present: Councillor Rebecca Mersereau (Council Liaison), Kevin Brown, Tim Ennis, Purnima Govindarajulu, Chris Lowe, Stewart Guy, Kear Porttris, Tory Stevens (Chair), Brian Wilkes, Bev Windjack

Staff: Eva Riccius, Senior Manager, Parks; Thomas Munson, Senior Environmental Planner, Adriane Pollard**,** Manager of Environmental Services; Carolyn Richman, Environmental Education Officer; and Lynn Merry, Senior Committee Clerk

Guests: Alex Nelson, Nella Nelson, Sebastian Silva, First Nations Elders and Kim Walker, consultant

Regrets: Jeremy Gye

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1. **CALL TO ORDER**

The meeting was called to order at 7:00 p.m.

2. **TERRITORIAL ACKNOWLEDGEMENT & DIVERSITY, EQUITY AND INCLUSION STATEMENT**

Councillor Mersereau read the Territorial Acknowledgement and the Diversity, Equity and Inclusion Statement.

3. **APPROVAL OF AGENDA**

MOVED by S. Guy and Seconded by B. Windjack: "That the Agenda for the November 23, 2021 Resilient Saanich Technical Committee be approved, as amended."

The agenda was amended to include an update on the Biodiversity work.

CARRIED

4. **ADOPTION OF MINUTES**

MOVED by C. Lowe and Seconded by B. Windjack: "That the minutes of the October 26, 2021 Resilient Saanich Technical Committee be adopted."

CARRIED

5. **RECEIPT OF CORRESPONDENCE**

The correspondence was received for information.

6. CULTURAL SAFETY INTRODUCTION WITH FIRST NATIONS ELDERS

Roundtable introductions took place in preparation for the upcoming learning session.

Committee members brought forward ideas for items to be considered at the learning session including:
- It would be helpful to learn how to not be “colonial”.
- Where are the special harvesting lands and how do First Nations feel when non-First Nations people are on that land?
- Can First Nations provide knowledge on how to stop the loss of biodiversity?
- What did the lands look like prior to colonization and are there types of stewardship opportunities that First Nations can recommend.
- How can First Nations support the committee?
- What does “reconciliation” mean to First Nations people and to settlers?

7. DISCUSSION OF RESILIENT SAANICH PRINCIPLES, GOALS AND OBJECTIVES

K. Walker, consultant, presented to the committee and made the following comments:
- The Vision, Principles, Goals and Objectives (VPGO) will be revised to add clarity and provide substance.
- The thematic areas will be included.
- First Nations feedback will be considered.
- The deadline for the revisions is January 7, 2022.
- The illustration could be done by Saanich’s graphic designer.
- There is a need to streamline the principles; there are 2-3 additional principles that have been added.
- There will be principles that will be stand alone.
- Test scenarios will be run.
- The documents will be sent out as soon as possible to ensure that the committee can review prior to the workshop.

Councillor Mersereau stated:
- A presentation will take place with the WLC and they may possibly be attending a future meeting.

8. DISCUSSION OF RFQ’S FOR STATE OF BIODIVERSITY REPORT AND BIODIVERSITY CONSERVATION STRATEGY

The Manager of Environmental Services stated:
- Purchasing has everything needed to move forward with the Request for Quotation (RFQ).
- If there are organizations that are recommended by the committee, they can be notified that the bid opportunity is available.
- The RFQ will be sent to the committee to forward to their contacts.

9. **REPORT OF BIODIVERSITY WORKING GROUP**

The Manager of Environmental Services and the Senior Manager, Parks made the following comments:

- The document has been reviewed and there are some suggestions recommended.
- Content has been copied into the Glossary.
- The document should be provided to the consultant, when hired.
- Who the audience is should be considered.

10. **REPORT OF MAPPING/STEWARDSHIP WORKING GROUP**

B. Wilkes made the following comments:

- The next step is to have a meeting with staff to review the map layers.
- Stewardship opportunities are being reviewed.

11. **ADJOURNMENT**

MOVED by K. Brown and Seconded by B. Windjack: "That the meeting of the Resilient Saanich Technical Committee be adjourned."

CARRIED

The meeting adjourned at 8:53 p.m.

NEXT MEETING

December 16, 2021 at 6:30 p.m.

Workshop – December 11, 2021, 9 a.m. to Noon

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Tory Stevens, Chair

I hereby certify these Minutes are accurate.

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Committee Secretary

Lynn Merry

From: Brian Emmett [redacted]
Sent: Thursday, December 02, 2021 4:33 PM
To: biodiversity
Cc: Rebecca Mersereau; [redacted] Adriane Pollard
Subject: (External Email) The compelling need for a marine shoreline EDPA
Attachments: existing.jpg; adjacent.jpg

Dear committee
I have been working on a Green Shores rating and certification for a property on Agate Lane in Cordova Bay – the attached photo shows the property with a well designed, coastal riparian buffer of dune grasses and salal. The development of this property was undertaken under the now rescinded EDPA regulation, and will likely achieve a Green Shore gold rating – the highest possible rating under the Stewardship of BC program. Contrast this with the second photograph, an adjacent property recently re-developed with no EDPA in place. In this second case the 15m setback for a permanent structure has likely been met but the 15m riparian setback is overwhelmingly concrete. There are several problems with this second case:

1. There is no ecological value to either the coastal terrestrial or intertidal environment
2. With sea level rise the concrete bulkhead will generate erosion in the toe area (beach interface) further reducing intertidal values AND potentially lowering the beach elevation, restricting public access along the beach.
3. Large storm surges coupled with wave action will toss logs onto the concrete area, resulting in a higher potential for property damage than the more natural beach of the adjacent property.

Concern has been expressed by RSTC members as to the accuracy of Saanich's environmentally sensitive area (ESA) mapping, with particular concern related to the need for ground truthing and documentation of invasive species within designated ESAs. While this concern appears legitimate in certain situations, it does not apply to marine coastal areas. ALL of our shore areas are inherently sensitive to development as well as impacts from sea level rise and increasing storm intensity, with sediment shores like Cordova and Cadboro Bay being particularly sensitive. I urge the Committee to give special consideration for EDPAs for marine shorelines, separate from the specific considerations appropriate for upland areas. I would be happy to provide the Committee with further background on the importance of marine riparian areas if you wish. It is extremely discouraging for me to see the cumulative losses of coastal riparian values from the type of development practices illustrated by the second photo.
Regards
Brian Emmett, R.P.Bio.
Foreshore Habitat Biologist

It is

Report on SEI Site visits. December 6, 2021

Brian Wilkes and Stewart Guy

The purpose was to look at Sensitive Ecosystem polygons, identified on the Saanich SEI map layer, to see for ourselves if they were in fact, sensitive ecosystems.
In order to be sensitive ecosystems, these parcels need to be one of the seven sensitive ecosystem types identified in the Vancouver Island SEI Methods, and be *relatively unmodified*. We interpret relatively unmodified to mean they are in excellent or good condition, according to the condition criteria in the BC standards for mapping ecosystems at risk. That means they have minimal fragmentation and contain less than 5% invasive species in a vegetation layer. If a parcel is fragmented and invasive species occupy more than 5% to 20% of a vegetation layer, the parcel is in only fair condition, and if more than 20% invasives, in poor condition. Parcels in fair or poor condition are considered too modified to meet the criteria to be called sensitive ecosystems. However, we believe these parcels do offer valuable voluntary stewardship opportunities.

1. Wilkinson Rd at Loenholm Rd. Mapped as WD, or woodland, but is mostly shrubs including red-osier and rose. Some of the property is fenced and cannot be accessed. From what we saw, its in fair condition.
2. Rogers Court lots 825, 828, 829. Mapped as WD. Or woodland, but in those lots it is lawn and garden under trees. No sensitive ecosystem.
3. 4040 Nelthorpe St. at Lakeview. Mapped as WD, or woodland. Nice grove of Garry oak but completely overwhelmed by invasive blackberry, ivy, daphne. No sensitive ecosystem.
4. Milner Rd 978B. Mapped as WD, or woodland. Cleared of shrubs, ground cover blackberry and agronomic grasses; some garden escapes. No sensitive ecosystem. Not a woodland.
5. Lynnfield Cres 4169. Mapped as WD, woodland. Lot has been stripped of shrub layer; only blackberry, ivy and agronomic grasses on ground. Not a sensitive ecosystem. Not a woodland.
6. Payton Place 1430. Mapped as WD. Open field with several trees. Filled with thistle, queen Anne's lace, agronomic grasses and other invasives. Not a sensitive ecosystem
7. Malton Ave, near 4084. Mapped as WD, woodland. Dominated by ivy and blackberry. Not a sensitive ecosystem
8. Simon Rd, behind 1446, viewed from Birring PL. Mapped as WD, woodland. Open area of agronomic grasses under trees. Not a sensitive ecosystem.

Of the 8 sites visited, only the first was close to being a sensitive ecosystem and even that was modified by both invasives and whatever vegetation management occurs under the hydro towers. There are many more SEI polygons on the Saanich SEI map layer. Based on these findings, we are concerned that many more are too modified to be actual sensitive ecosystems. If true, much of the Saanich map SEI sites map layer is incorrect, and the map should be modified accordingly.

A different name needs to be found to describe these parcels that are of interest, but do not meet the definition of sensitive ecosystem. We thought Stewardship Opportunity Areas might be appropriate, and they can become the focus for local voluntary stewardship activities.

Results of Assessing the Ecological Condition in Major Saanich Parks using a Rapid Assessment Technique.

Brian Wilkes

Introduction

For the past several months, 18 of the major Saanich nature parks have been visited and traversed for the purpose of applying a rapid assessment technique to determine the ecological condition of the park vegetation.[1] The condition assessment follows the condition criteria in Standards for Mapping Ecosystems at Risk in BC, 2006. [2] From that document, page 43, "Condition is an assessment of the composition, structure, and ecological function of the ecological community. Condition can be thought of as the degree of departure from the structure, function, and distribution of late seral ecological communities prior to European settlement."

The procedure was to walk the trails in the parks, covering as much as possible, and stop at points where there seemed to be a vegetation change, to estimate the proportion of native to invasive species within view. Basically, a minor cover of invasives, less than 5%, resulted in good condition. Fair condition was the result if an estimated 5% to 20% of a vegetation layer was invasives species. If it was estimated that more than 20% of what was in view was dominated by invasives, then the area was assessed as in poor condition. These are considered preliminary results; this is by no means a substitute for detailed mapping, which would identify specific locations of each ecosystem type.

There was some doubt at first about the veracity of this rapid assessment technique. However, the more it was used, the more there was a sense that it gave a fairly accurate first cut picture of ecological condition, at least for what was in view. Readers inclined to do so should try it for themselves. The overwhelming impact of invasive grasses such as orchard grass, annual brome grass, sweet vernal grass and reed canary grass, among others, was made clear. But the pervasive presence of Himalayan blackberry, English ivy, spurge laurel, thistle, broom, curled dock, English hawthorn, hairy cat's ear, periwinkle, (and many other invasive species), was notable. Indeed, the parks are being overgrown by these weeds, despite the very valuable efforts of the volunteer weed pulling crews.

Why this is Important

Most of the public would consider the parks as protected areas. And, they are mostly protected from urban development. But they are *not* protected from the very distinct decline in ecological condition being wrought by the spread and presence of invasive species. The parks are also not protected from human trampling on fragile vegetation on rock outcrops, many of which are now seriously degraded. That means the character of the parks has changed and is changing, as is their ability to support native biodiversity. Important plants such as Camas and

[1] Many thanks to vegetation ecologist Ted Lea who accompanied me in the field on the park site visits.
[2] Standard for Mapping Ecosystems at Risk in BC. 2006. BC Ministry of Environment. See definitions, page 9 below.

chocolate lily will continue to be crowded out by aggressive invasive grasses, and will gradually disappear from our landscape. And, as demonstrated by Tallamy[3] and others, invasive plants do not support native species important to the food chain as do native plants.

In view of the commitment made by Saanich to restore parks over the next decade, these findings should help focus on the actions that are needed. (See February 3, 2021 press release from Saanich, https://www.saanich.ca/EN/main/news-events/news-archives/2021/saanich-supports-un-s-decade-on-ecosystem-restoration.html).

A 10-year recovery and rehabilitation plan and supporting budget is required for the parks, if that commitment is to be fulfilled.

The following table summarizes the findings of the rapid assessment technique. Note that where there is a zero, that only means that it was not observed. It does not mean there is no presence that could be seen if a more thorough mapping program was undertaken.

Park	**Ecosystem[4]**	**Excellent**	**Good**	**Fair**	**Poor**	**Comments**
Knockan Hill 84,700 m^2 8.4 ha	OF	0	0	5%	95%	Significant snowberry – some other natives; understory covered in ivy, daphne, blackberry, and holly
	WD/HT	0	2%. More small areas of licorice fern could be added with detailed mapping	2%	96%	The good condition portion is not mapped as WD or any SEI category - patches of Camas under trees and in protected areas – some other natives in meadows – invasive grasses predominate – significant degradation by foot traffic and off-leash dogs
Cedar Hill 69, 720 m^2 6.9 ha	WD/HT	0	0	Very small area along SE drainage	99 %	Dominantly snowberry – English ivy community – diluted patches of Camas in open areas however, invasive grasses predominate – some other natives still occur
Panama Hill 8.97 ha	WD/HT	0	Very small undamaged rock outcrop	0	estimated 99 %	Area dominantly covered with English hawthorn and invasive grasses Needs more detailed mapping

[3] Tallamy, D.W. Nature's Best Hope. 2019. Timber Press
[4] See ecosystem codes at the end of this table

Park	Ecosystem[4]	Excellent	Good	Fair	Poor	Comments
	RI	0	0	0	100 %	Invasive shrubs and trees
Panama Flats 25 ha	WD	0	0	0	100 %	Small areas with many invasives
	WN	0	0	?	?	Unknown condition – needs a wetland specialist
	RI	0	0	0	100%	Very small cottonwood areas along fringe, but reed canary grass beneath
Colquitz Park	RI	0	Small areas of Black cottonwood, red-osier dogwood in a few locations along the river	Small amounts along the river	90 %	Not mapped – areas along river where foot access has resulted in compacted soils.
	WD (Garry oak)	0	0	0	100%	Cannot determine areal extent without more detailed mapping
	WD (Trembling Aspen)	0	0	Small areas without ivy	95%	Very small areas with native shrub understory. Mostly invasive species understorey
	WN	0	0	0	100 %	Cannot determine areal extent without more detailed mapping
Copley East	RI	0	0	0	100%	Riparian area needs to be mapped. Coniferous trees not delineated
Copley West	RI	0	0	0	100%	Riparian versus coniferous forest not delineated
Swan Creek (to McKenzie) 11 ha	RI	0	0	0	100%	Not mapped – significant invasives including hawthorn
	SG/OG	0	0	0	100%	Not mapped – English ivy understory
	Upland (possibly GO)	0	0	0	100%	Not mapped – dominated by English hawthorn
Hyacinth Park	RI	0	0	0	100 %	Invasive willows dominate

Park	Ecosystem[4]	Excellent	Good	Fair	Poor	Comments
	WD (trembling aspen)	0	0	0	100 %	Cannot determine areal extent without more detailed mapping
	WD (Garry oak)	0	0	0	100 %	Needs detailed mapping
Mount Douglas Park (PKOLS)	WD/HT Garry oak	0	0	5%	380,000 m^2 38 ha	Extremely high proportion of invasives – broom, invasive grasses – few native species remain – significant degradation by overuse for recreation – significant bare rock on HT units from decades of foot traffic and no restrictions
	WD/HT arbutus, maple etc.	0	0	0	100%	Small amounts, dominated by invasive ground cover
	OF	0	80%-90%	5%	5%	Significant removal of invasives by volunteers over multiple decades Volunteers with the Saanich Pulling Together Volunteer Program and the Friends of Mount Douglas Park Society have been assisting with rehabilitating the natural areas since 1991. This collaborative approach has removed .5 km^2 (50 hectares) of invasive species and planted thousands of native trees and shrubs. Need delineation of ecosystems and assessment on north side of mountain. Significant impacts from foot traffic widening of trails
Christmas Hill 11 ha	WD/HT Garry oak meadows	0	0	5%	95%	Still patches of camas and other natives - Invasive grasses dominate. – significant bare rock on HT units from decades of foot traffic and few restrictions

Park	Ecosystem[4]	Excellent	Good	Fair	Poor	Comments
	WD/HT Licorice Fern	0	Estimate almost a hectare	5%	95%	East side of Park – needs further investigation
	WD Osoberry - snowberry	0	Estimate over a hectare	some	95%	North side of Park – needs further investigation
Vic Derman Park 3.2ha	WD/HT Garry oak	0	0	0	100%	
Mount Tolmie 18ha	WD/HT Garry oak	0	0	10%	90%	Still patches of camas and other natives, in parts of the park but invasive grasses dominate throughout - significant degradation by overuse for recreation – significant bare rock on HT units from decades of foot traffic and no restrictions
Quick's Bottom	WN – shrub, wetland grasses	0	0	0	100%	invasive grass understory
	RI - forested	0	0	Very small area just along the Colquitz River and small cottonwood area	99%	Needs better mapping
	RI - shrub	0	0	0	100%	Not delineated
	WD/HT Garry oak	0	0	0	100%	Most not mapped; much of the upland area probably was originally Garry oak ecosystems or Douglas-fir forests – mostly English hawthorn now
	SH	0	0		100%	much of the upland area probably was originally Garry oak ecosystems or Douglas-fir forests – mostly English hawthorn now

Park	Ecosystem[4]	Excellent	Good	Fair	Poor	Comments
Rithet's Bog	WD/HT Garry oak	0	0	0	100%	English hawthorn taken over uplands of park along with other natives; invasive grasses predominate open areas
	WN – shrub graminoid	0	25%	0	75%	Significant areas of shrub wetland and invasive grass wetland; needs full detailed assessment of wetland areas by wetland expert
	WN – shore pine bog	?	?	?	?	Unknown ecological condition. Not accessible
	RI – black cottonwood	0	some	90%?	some	Not mapped. Needs more assessment – some red-osier dogwood, with blackberry and English hawthorn
Swan Lake	WD/HT Garry oak	0	0	Small areas where invasives have been removed.	95%	Not mapped. Significant invasive grasses and shrubs
	WD Trembling Aspen	0	50%	0	50%?	Not mapped. Significant invasive species removed by volunteers
	RI - Cottonwood	0	50%?	0	50%?	Small area needs further investigation.
	WN	0	0	0	100 %	Significant invasive grasses, needs wetland specialist
	WN – shrub swamp	0	70%?	0	30%?	Needs further investigation. Significant invasive species removal by volunteers
	WN pond/cattail	0	0	0		Needs aquatic condition assessed.
	OF/SG/YF	0	30%	0	70%	Good condition where invasives have been removed by volunteers – needs further delineation

Park	Ecosystem[4]	Excellent	Good	Fair	Poor	Comments
Cuthbert Holmes/ Tillicum 25.3 ha	WD/HT Garry oak and WD Arbutus – Douglas-fir	0	0	0	100%	Dominated by hawthorn, ivy, blackberry with components of native shrubs – not mapped Need mapping of all ecosystems in these two Parks.
	WD Trembling Aspen	0	0	0	100%	Small areas in both Parks – not mapped
	RI	0	Very small area of sedge meadow	0	100%	Small Areas of Sedge meadow along Colquitz River in Good Condition
	OF/SG	0	2%	0	98%	Small, fenced areas have had invasive species removed that would meet the criteria of Good Condition
	WN	0	100%	0		Very small cattail marsh by Silver City Theatre. Surrounded by invasive species.
	SH	0	0	0	100%	Very large open areas dominated by invasive hawthorn, grasses, and other invasive species.
Layritz	WD/HT Garry oak	0	0	0	100% 6.2 ha	Some areas of Garry oak woodland not mapped
	WD Trembling Aspen	0	0	0	100%	Trembling aspen woodland not mapped
	WN	0	0	0	100%	Wetland not mapped
	OF	0	0	Small areas of fair condition	95%	Older Forest polygon not mapped
	SG	0	0	Small areas in fair condition	95%	SG not mapped
	SH	0	0	0	100%	Large field full of invasives – could be planted to Garry oak
Glencoe Cove/	CB	0	0	0	100%	Heavily impacted by foot traffic and mostly covered with invasive species – Species at

Park	Ecosystem[4]	Excellent	Good	Fair	Poor	Comments
Kwatsech Park 3.6ha						risk populations are decreasing in abundance with no protection, fencing or other management actions
	WD Garry Oak	0	0	0	100%	Dense ivy understory
	SH	0	0	0	100%	Dense ivy understory

List of Sensitive Ecosystem Codes

WD – Woodland – includes Garry oak, Arbutus-Douglas-fir and Trembling Aspen Woodlands

HT – Terrestrial Herbaceous

CB – Coast Bluff

OF – Older Forest – over 100 years

SG – Second Growth Forest – 60 to 100 years – not a defined Sensitive Ecosystem

RI - Riparian

WN - Wetland

SH – Shrub – not a defined Sensitive Ecosystem

SF – Seasonally flooded Agricultural Field

Condition	Description (from Mapping Ecosystems at Risk in BC)
Excellent	a. Typical climax vegetation. b. No anthropogenic disturbances or changes to natural disturbance regimes have altered the Element Occurrence (including fire exclusion or flood control), no vegetation or soil removal has occurred. Forested ecological communities are generally late seral vegetation. Wetland and riparian communities have intact hydrologic regimes. There is minimal influence of domestic grazing. c. No alien species occur at the site. d. No artificial structures occur at the site. e. There is little or no internal fragmentation (< 5%) of the occurrence.
Good	a. Typical mature seral vegetation. b. For forested communities, there has been no soil removal or disturbance to soil surface; little or no influence of old road beds or skid tracks, no construction evidence, old selection harvesting only, minimal changes to natural disturbance regimes (including fire exclusion or flood control). Forested ecological communities are late seral or mature, or younger if originating from natural disturbance. Wetland and riparian communities have largely intact hydrologic regimes. There is low-moderate influence of domestic grazing. c. Minor cover of alien species (<5% except <20% in grasslands) may occur at the site. Some earlier successional species occur. d. Some artificial structures may occur at the site (< 2% of total area of occurrence). e. There is little or no internal fragmentation (<5%) of the occurrence.
Fair	a. Anthropogenic disturbances and changes to natural disturbance regimes have occurred. Forested ecological communities are young seral stages after harvesting. There is moderate to high influence of domestic grazing in grassland ecological communities. There may be significant alterations to the hydrologic regime in wetlands and riparian ecosystems. b. Significant cover of alien species occurs (5-20% in forests and riparian systems, up to 60 % in grasslands). Most of the plants in grassland communities are early successional species. c. Some artificial structures may be present (less than 10% of total area).
Poor	a. Significant anthropogenic disturbances have occurred, particularly removal or disturbance of soil materials and vegetation. There are significant alterations to the hydrologic regime of wetlands and riparian ecosystems.

	b. Alien species may dominate a vegetation layer or may total more than 20% (>60% for grasslands) cover overall. c. Significant artificial structures occur (>10% of total area of occurrence). d. The element occurrence is fragmented by artificial structures or barriers.