

Gordon Brent Ingram, Ph.D. side stream environmental design¹

321 Railway Street #108 Vancouver V6A 1A4 Canada

telephone 1 604 669 0422 email: gordon_brent_ingram@telus.net

3 January, 2002

Discussion paper for the
Conservation Planning & Site Protection Recovery Action Group of the
Garry Ecosystems Recovery Team



**Some information needed for
making a list of priority areas with currently unprotected
Garry oak ecosystems warranting immediate protection**

Through meetings #8 (7 January 2001), #9 (early March), and #10 (early May) of the Conservation Planning & Site Protection Recovery Action Group (CP & SP RAG), the first list will be made of priority areas of currently unprotected Garry oak ecosystem (GOE) areas that warrant immediate protection. This discussion paper is intended to outline some of the decisions that are necessary, particularly in meeting #8, around the use and computation of information in order to compile a scientifically based and defensible list.

Background

The CP & SP RAG has a terms of reference that involves two major phases of activities (as currently defined in the GOE Recovery Strategy). Creating and periodically revising a list of priority areas currently unprotected and that warrant protection, is the major activity of the CP & SP RAG in 2002 and 2003. At some point, when enough data is available and an adequate methodology has been established, the second phase of the

* Garry oak scrub Belly-Rising-Up site, Tsawout Nation, Central Saanich, Vancouver Island

¹ This paper represents the position of the author, solely, and does not represent that of any group or institution. The paper is intended solely for the use of the Conservation Planning & Site Protection Recovery Action Group for its discussions and decisions in 2002 and may not be transmitted or used outside of these activities and purposes. A number of questions emerge for meeting #8.

RAGs work can be initiated. In this work, more comprehensive planning and design for a network of protected areas, for the preservation of GOE biodiversity, can be initiated.

This second phase of the work of this RAG will extend to the planning and design of buffers, corridors and restoration. Perhaps a year or more of preparation is necessary before such planning and design can be initiated – suggesting that this RAG has perhaps a year to discuss the preparatory phases of such an ambitious project. Such more comprehensive conservation planning will require compilation of terrestrial ecosystem mapping (TEM) data along with a range of other data, maps and models not directly linked to the data fields covered by TEM. And currently there are a number of organizations, agencies, consulting groups and individuals already involved in aspects of this more comprehensive work. Thus, the information outlined in this discussion paper, on the minimum information requirements for the first phase of the work of this RAG, also has implications for the subsequent and more comprehensive decisions around GOE conservation planning – and for the work of partner organization and individuals.

The underlying question in this discussion paper is what can this RAG expect itself to do (and be prepared to defend) until more comprehensive TEM data is available in some comprehensive and complete form? And since the TEM data, for the work of this RAG, must be particularly comprehensive and even in quality, geographically, it will be a number of years before such information were available. Two contradictions emerge around such a foreseen lag. GOEs are being rapidly degraded and even destroyed and therefore conservation planning priorities, if not specific designs, are needed in 2002. Secondly, while GOERT may not be ready for more comprehensive conservation planning for GOE biodiversity, a number of partner organizations (and other groups choosing not to participate in GOERT) are going ahead with such efforts. In this dynamic situation, a list of locations and sites warranting immediate conservation efforts, and the data used to determine and defend it, could provide a key to catalyzing, ‘jump starting’, broader efforts at conservation of GOE habitat and biodiversity. **And the first draft of this powerful ‘tool’ for GOE biodiversity conservation is due in a matter of months.**

Given that the CP & SP RAG’s sister RAG, the IMP RAG, is not in a position to provide much data at the present time, the central question for meetings #8 and #9 is ‘what can be done until the IMP RAG data comes’? This is a typical biodiversity conservation-planning problem. Over the last two decades, hundreds of pieces of literature and technical reports have been produced on this problem. Unfortunately, there is limited around a research on Garry oak ecosystems though considerable on archipelagos and mixed mosaics of forest, woodland and grassland. For meetings #8 and #9, a number of general questions emerge.

1. What relevant (‘nonTEM’) research is currently available?

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2. What are minimum acceptable levels of data and data quality needed in order for RAG members to make a list and defend it scientifically?
3. How can this data be treated, synthesized and presented – within the RAG and to the public as part of the dissemination of the list?
4. When will the data be sufficiently compiled and analyzed to be able to make the decisions leading to the recommendations about priority locations for additional protection?
5. Which of the necessary tasks can be taken on as part of the other paid (or volunteer) work of RAG members and when will organizing specially funded projects and even contracts be necessary? Who would do this work?

The intended uses of and needs for data

The technical group of this RAG agreed to work with the following criteria for evaluating unprotected areas. In an October 11, 2001 meeting of the subcommittee of the RAG, the following categories of concerns, as a basis for selection criteria, were proposed for identifying and evaluating inadequately protected landscapes and sites (for inclusion in the first list):

1. landscape / habitat size;
2. biological richness;
3. integrity and present ecosystem condition;
4. geographical stratification and representativeness
5. degree of threat; and
6. species and communities at risk.

In that meeting, we talked of this information laying the basis for minimum standards or ‘thresholds’ for a location to be further considered (and possibly selected and prioritized). These criteria were later formalized by the entire RAG (see minutes to meeting #7) and were the topic of the November meeting of the technical group. In that November meeting, the technical group discussed the data fields being created the comprehensive data base being created by Allan Lidstone (the 1 2002 Lidstone list). In the same period, members of the technical also reviewed the following:

1. list of GOE locations of Wayne Erickson (Erickson’s comprehensive list),
2. the Edwards and Meagher list of some locations (Edwards and Meagher’s list), and
3. the data on GOEs in the Conservation Data Centre’s *Catalogue of Site Records* (the CDC catalogue).

In considering the requirements of information needed in making (defensible and scientific) decisions about conservation of biological diversity, a number of additional sources could be considered including the following:

- aerial photographs sometimes available in time series;
- maps;
- field notes;
- reports and files (including land management and ownership dossiers and plans);
and
- material available from web sites.

But are the four lists plus some of the already available background information, indicated above, going to be able to adequately provide the basis to evaluate locations as based on the list of conservation criteria above (or for that matter any other defensible framework for analyzing unprotected sites and proposing the protection of some is more important or timely than others?). Determining these questions has been central to the work of this RAG and in recent meetings we have been eager to complete a first cut list in the coming months.

Determining the form of the output of the CP & SP RAG's first list

To begin to grapple with the questions above, the RAG can first determine what information should be in its initial priority list. The following is the information that has been talked about in the RAG and in the technical group:

1. name of site i.e. Mt. Maxwell
2. descriptive location i.e. south side of Mt. Maxwell, Salt Spring Island
3. jurisdiction information such as regional district or municipality; whether part of Islands Trust etc.
4. general location map at 1:50,000
5. finer-scaled map or copy of an aerial photo with presence of GOEs (and species of interest to GOERT) -- at 1:5,000
6. a reserve design at 1:5,000 with key areas for conservation – to protect key elements and to optimize long-term viability of vulnerable native species – along with ownership information on particular parcels

There are numerous other kinds of information that would be worthwhile and which could be compiled by the CP & SP RAG but this might take more time and human resources than RAG members currently have. But before a range of other additional

decisions can be made in meeting #8, determining the specific date fields of the RAG's intended output is necessary.

Initial information needed for consideration of an unprotected location or site

Yesterday, Allan Lidstone began circulating the most exhaustive list of Garry oak ecosystems in Canada to date. How can the RAG focus on a smaller subset for further examination and discussion – in meetings #9 and #10? The following is a progression, the beginning of a decision tree, for working with the list above and analyzing relevant area in terms of the conservation criteria outlined above.

1. Determining the geographic label of the areas of interest and the minimum area of locations for consideration

- What are a small number of characteristics that can be identified – the presence of which on a site would indicate the presence of Garry oak and associated ecosystems?
- In considering Garry oak **and associated** ecosystems, it may be prudent to add to an area with indicators of GOEs an adjacent margin of perhaps 50 to 100 meters (at the least). This is particularly relevant to the issue of GOEs being overgrown by young Douglas fir trees because of fire suppression. If such a margin were considered appropriate, how could it be applied and how wide would it be?
- Should and, if so, how can smaller 'sites' be differentiated from larger, relatively intact, landscape mosaics? There is quite an extensive set of discussions on this topic and the CDC has used the concept of a 'macrosite'. For oak grassland and woodland ecosystems, the concept of the broader landscape unit or 'dynamic mosaic' is relevant.
- Should a series of fragments be considered in isolation or, since landscape linkages and buffers could eventually be relevant, should there be some way to recognize proximity, even current connectivity and the former presence of a larger landscape unit?
- How can we cross-reference names of areas that might have some allusion to a broader landscape unit? A general name along with a specific name may be useful i.e. Hornby-Whaling Station Bay.
- What is the minimum area of an unprotected area, with Garry oak and associated ecosystems, to be considered by this RAG in the first phase of its work? Further in this discussion, there is an outline of viability and population resilience for reserve design. But what can be the minimum size for initial consideration of a GOE location once it is on the Lidstone list?

2. Determining whether a location qualifies as being unprotected

- Many areas with GOEs have some forms of formal and informal protection but what is the threshold for the location, area or site to be considered by the CP & SP RAG and NOT by the Restoration and Management RAG?
- Many areas with GOEs have some protected parcels and most currently protected areas would be more effective at protecting biodiversity by having buffers or the addition of less strategic parcels. So where can we draw the line in which highly unprotected locations to consider?
- Many protected areas with GOEs would be more effective at maintaining local biodiversity with a higher level of protection: from a conservation covenant to park status and from municipal park status to provincial park or national park status. But when should a site be considered for additional protection? And some of the larger and most strategic landscape mosaics are military lands where there may not be formal protection but there is a commitment to stewardship (that is often more effective than in many other local protected area categories) and some involvement with GOERT.
- What should be the role, if any, of the ratings on protection urgency provided by the Conservation Data Centre?

3. Information needed to determine and justify choice of some locations over others

The following six categories of criteria for choosing priority areas for protection are intended to involve

1. **conservation objectives** (embodied in the range of priority sites chosen) that involve the defensible application of conservation biology and related natural and social sciences;
2. **data fields** to evaluate each location in the subset of the 170 sites in Lidstone's 1 2002 list that are further considered by the RAG;
3. **formulas for analyzing data** including formulae, algorithms and minimum requirements ('standards').

With 6 categories of criteria and with goals and data fields to be quickly determined for each (and with limited time and resources available within RAG before paid contracts were necessary), the key for the first list of priorities is to keep it clear and simple (especially for defensibility).

There one issue that this RAG has not fully discussed or come to terms with. There is a substantial body of information that is typically needed for this kind of biodiversity conservation planning (especially for relatively expensive lands and

potentially conflicting social pressures). In just this first phase, some of the necessary data is not included nor can always be inferred from the standard TEM data fields. For example, there are particular aspects of succession, landscape ecology, habitat, cultural and historical factors, and land use and ownership that no other RAG (or other bodies or researchers) may have been or currently be in a position to be interested in or have collected or being collecting. There was a proposal to add an additional sheet to the TEM data for GOEs that could partially alleviate this obstacle in the long-term. But without a clear strategy to respond to this deficiency, defensibility of such a list would be so compromised as to limit support for the list – even from within the RAG and its partner organizations. So obtaining and compiling this information could be the responsibility (or desire) of the members of this RAG – especially if this information were deemed essential to development of a defensible list. With these dynamics in mind, the following are some of the typical ways that such biodiversity conservation objectives are ‘spatialized’ and worked into proposals over land.

landscape / habitat size

- biodiversity conservation objectives: The comparative areas of GOE habitat units, fragments, isolates and matrices have tremendous implications for desirability of protection and long-term viability of associated biodiversity. Larger areas with smaller edge / area ratios, with isolation factors that are more biophysical than social, are preferable over small and highly fragmented areas. Along with
 - **area** are factors related to
 - **shape**,
 - **edge** (and edge / area ratio), and
 - **comparative isolation & connectivity** (with some unique processes and both negative and positive factors associated with each).
- data fields:
 - Total area of a mosaic of GOEs can be the **combined hectares of sites with specific GOEs elements and indicators** have been confirmed. However, is a rather onerous process that requires extensive use of aerial photos and ground-truthing. Such an approach is justifiable, and often cost-effective, where land is expensive and where species at risk are possibly present.
 - Another for of setting area is more viable, in the shorter-term and with more limited budgets. A smaller number of indicators can be used, centred on aerial and field confirmation of the presence of Garry oak and associated grassland and dry Douglas fir woodland. Around canopy indicators, an exterior margin can be drawn (such as of 100 meters) and possibly non-GOE communities and elements can be just added into the broader **dynamic mosaic**.
 - The **edge / area ratio** can be confirmed through aerial photos and field visits.
 - Various measures of **connectivity** and **isolation** can involve measures in kilometres.
- Ways to analyze the data could include:

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- comparison of hectares with actual GOE elements;
- comparison of hectares of dynamic mosaics;
- comparison of edge / area ratios (of both actual area with GOE elements and of the dynamic mosaics); and
- comparison of relative isolation and connectivity of canopy, successional conditions (such as species at risk, old-growth, snags, fire-influenced vegetation and areas under threat of or with the presence of invasive species).

biological richness

- biodiversity conservation objectives:
 - Historically, biological richness has been associated with classical indicators of alpha (species), beta and gamma (combined species and landscape) diversity. Specific biodiversity richness indicators could be developed for northern GOEs – and even more specifically for mainland, Vancouver Island (matrix and isolate landscapes) and small island ecosystems. But the kinds of comprehensive species inventories necessary (even if just emphasizing vascular plants and vertebrates) take years to complete and are best associated with collection of TEM data. The only GOE researchers who have been able to begin to work a complete (vascular plant) species lists, as part of an initial notion of richness, have been Roemer and a quarter century later, Erickson.
 - The number of plant associations present (GOEs or otherwise), in a particular dynamic mosaic, is a relatively easy way to have some sense of landscape-level diversity.
 - Species, community and landscape attribute indicators, such as ‘indicator species’, have often been used to identify and map areas of supposed species richness – though confirmation is only partial. There has been extensive discussion of indicator species in the Pacific Northwest – including related to many of the species in northern island GOEs.
 - There are purely landscape-level indicators of richness (fragments, edges, matrices) but they are usually linked to indicator species.
- Some data fields can be the following:
 - numbers of species, in certain groups such as vascular plants or birds, between different landscape mosaics (or even sites);
 - landscape level, successional diversity (combined with sufficient areas of individual habitat units for viability); and
 - presence of indicator species or habitat attributes.
- Ways to analyze the data include the following:
 - comparison of number of groups of species;
 - comparison of presence and numbers of indicator species;
 - comparison of presence and associated spatial relationships of successional factors and, in particular, fragments, interiors, edges, matrices, flow and corridors.
- Evidence of cultural factors in the landscape particularly related to Salish land use involve an additional set of ‘diversity’ factors and could include the following:

Some information needed for making a list of priority areas with currently unprotected Garry oak ecosystems warranting immediate protection

- presence of food, medicinal and technology species;
- presence of gathering and preparation (such as camas pits);
- areas with indications of frequent burning; and
- village sites.

integrity and present ecosystem condition

- Some biodiversity conservation objectives could include:
 - presence of late successional phases;
 - presence of a range of successional conditions (and indicators);
 - presence of detritus food webs such as snags;
 - indications of historic or recent fire (and presence of low fuel levels that would allow reintroduction of fire);
 - lack of (particularly) invasive species;
 - relative isolation from source points for further invasions; and
 - prospects for eradication of invasive species.
- Some data fields could include:
 - comparative areas (and indices) of certain and combinations of successional phases;
 - numbers of particular successional and habitat attributes such as snags of certain species (and age classes);
 - presence and extent of indicator species of certain successional phases; and
 - various indicators and classes (as in interval data) of presence or absence of invasive species and potentials for subsequent invasions.
- There are ways to analyze the data:
 - comparison of areas,
 - numbers of species and landscape indicators, and
 - indices related to areas as portions of mosaics.
- The presence of cultural factors related Salish land use could include the following:
 - historical indications of aboriginal use
 - presence of species still utilized by aboriginals; and
 - indications of aboriginal settlements and land stewardship.

geographical stratification and representativeness

- The biodiversity conservation objectives here could include:
 - even spatial distribution across the historic range of GOEs in British Columbia;
 - even distribution across basic ecosystem types including
 1. mainland,
 2. Vancouver Island (matrix),
 3. Vancouver Island (isolates),
 4. larger Gulf Islands, and
 5. smaller islands (perhaps islands dominated by GOEs 20 hectares or less);
 - even distribution across regional districts;

- distribution in regional districts based on historic occurrence within particular regional districts;
- even distribution across biogeographic (or biotic) districts as based on:
 1. watersheds on Vancouver Island,
 2. larger Gulf Islands,
 3. smaller islands, and
 4. sub-watersheds on the mainland.
- Some relevant data fields include:
 - maps and
 - spatialized boundaries determined as based on landscapes, climates, soils, and species.
- Ways to analyze this data include
 - maps and distances between GOE locations and
 - representation within zones and biogeographical districts.

degree of threat

- The biodiversity conservation objectives for this kind of threat (see above for biological invasions) is related to impending and projected human activities that would destroy, degrade, and / or fragment GOE habitat.
- Data fields could include:
 - the threat rating from the Conservation Data Centre
 - land ownership;
 - documents, dossiers and interviews involving owners, neighbours, and government personnel;
 - economic projections; and
 - applications.
- Ways to analyze the data could include the following:
 - development of a 4 or 10 interval rating system for degree of threat or
 - development of a cumulative formula producing a number such as 0 to 1.0 or 1 to 10.

species and communities at risk

- These biodiversity conservation objectives relate directly to the ecosystems and species defined at risk through SERA, the Blue and Red Lists, GOERT and any expanded federal or provincial legal frameworks that might one day be in place.
- Data fields could include the following:
 - presence of any species at risk;
 - the number of species at risk; and
 - assessment of the extent of species occurrences and the strategic role of particular sites and landscapes.
- Ways to analyze the data could include the following:
 - the number of presence of any species at risk;

- indices of the viability of a particular site for the local persistence of a species at risk; and
- indices of the extent of species occurrences and the strategic role of particular sites and landscapes.

Choice of data and analyses for the first list of priority areas

If the RAG wishes to go ahead with determining a top ten list in the coming months, the work will need to focus on the data that is already available and most notably:

1. the 1 2002 Lidstone list;
2. the Erickson list;
3. the Edwards and Meagher list; and the
4. analysis of the *Catalogue of Site Records*

and along with the following:

1. topographic and other maps;
2. aerial photographs; and
3. field notes.

The problem is that this information does not provide the basis for a defensible list particularly with defensible proposals for protected area designs.

Choice of data and analyses for the first and second revisions of the list in 2003 & 2004

If the RAG were to begin a programme of information collection, to build on the Lidstone list and to synthesize the information in the other lists, some of the following objectives, data fields and modes of analysis (that are far more

landscape / habitat size

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 - **area** are factors related to
 - **shape**,
 - **edge** (and edge / area ratio), and
 - **comparative isolation & connectivity** (with some unique processes and both negative and positive factors associated with each).
- data fields:
 - Total area of a mosaic of GOEs can be the **combined hectares of sites with specific GOEs elements and indicators** have been confirmed. However, is a

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- rather onerous process that requires extensive use of aerial photos and ground-truthing. Such an approach is justifiable, and often cost-effective, where land is expensive and where species at risk are possibly present.
- Another form of setting area is more viable, in the shorter-term and with more limited budgets. A smaller number of indicators can be used, centred on aerial and field confirmation of the presence of Garry oak and associated grassland and dry Douglas fir woodland. Around canopy indicators, an exterior margin can be drawn (such as of 100 meters) and possibly non-GOE communities and elements can be just added into the broader **dynamic mosaic**.
 - The **edge / area ratio** can be confirmed through aerial photos and field visits.
 - Various measures of **connectivity** and **isolation** can involve measures in kilometres.
- Ways to analyze the data could include:
 - comparison of hectares with actual GOE elements;
 - comparison of hectares of dynamic mosaics;
 - comparison of edge / area ratios (of both actual area with GOE elements and of the dynamic mosaics); and
 - comparison of relative isolation and connectivity of canopy, successional conditions (such as species at risk, old-growth, snags, fire-influenced vegetation and areas under threat of or with the presence of invasive species).

biological richness

- biodiversity conservation objectives:
 - The number of plant associations present (GOEs or otherwise), in a particular dynamic mosaic, is a relatively easy way to have some sense of landscape-level diversity.
 - There are purely landscape-level indicators of richness (fragments, edges, matrices) but they are usually linked to indicator species.
- Some data fields can be the following:
 - landscape level, successional diversity (combined with sufficient areas of individual habitat units for viability); and
 - presence of indicator species or habitat attributes.
- Ways to analyze the data include the following:
 - comparison of number of groups of species;
 - comparison of presence and numbers of indicator species;
 - comparison of presence and associated spatial relationships of successional factors and, in particular, fragments, interiors, edges, matrices, flow and corridors.
- Evidence of cultural factors in the landscape particularly related to Salish land use involve an additional set of 'diversity' factors and could include the following:

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- partial list suggesting any presence of food, medicinal and technology species;
- partial list suggesting any presence of gathering and preparation (such as camas pits);
- partial list suggesting any areas with indications of frequent burning; and
- partial list suggesting any village sites.

integrity and present ecosystem condition

- Some biodiversity conservation objectives could include:
 - presence of late successional phases;
 - presence of a range of successional conditions (and indicators);
 - presence of detritus food webs such as snags;
 - indications of historic or recent fire (and presence of low fuel levels that would allow reintroduction of fire);
 - lack of (particularly) invasive species;
 - relative isolation from source points for further invasions; and
 - prospects for eradication of invasive species.

- Some data fields could include:
 - comparative areas (and indices) of certain and combinations of successional phases;
 - numbers of particular successional and habitat attributes such as snags of certain species (and age classes);
 - presence and extent of indicator species of certain successional phases; and
 - various indicators and classes (as in interval data) of presence or absence of invasive species and potentials for subsequent invasions.

- There are ways to analyze the data:
 - comparison of areas,
 - numbers of species and landscape indicators, and
 - indices related to areas as portions of mosaics.

- The presence of cultural factors related Salish land use could include the following:
 - partial list suggesting any historical indications of aboriginal use
 - partial list suggesting any presence of species still utilized by aboriginals; and
 - partial list suggesting any indications of aboriginal settlements and land stewardship.

geographical stratification and representativeness

- The biodiversity conservation objectives here could include:
 - even spatial distribution across the historic range of GOEs in British Columbia;
 - even distribution across basic ecosystem types including
 1. mainland,

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2. Vancouver Island (matrix),
 3. Vancouver Island (isolates),
 4. larger Gulf Islands, and
 5. smaller islands (perhaps islands dominated by GOEs 20 hectares or less);
- even distribution across regional districts;
 - distribution in regional districts based on historic occurrence within particular regional districts;
 - even distribution across biogeographic (or biotic) districts as based on:
 1. watersheds on Vancouver Island,
 2. larger Gulf Islands,
 3. smaller islands, and
 4. sub-watersheds on the mainland.
- Some relevant data fields include:
 - maps and
 - spatialized boundaries determined as based on landscapes, climates, soils, and species.
 - Ways to analyze this data include
 - maps and distances between GOE locations and
 - representation within zones and biogeographical districts.

degree of threat

- The biodiversity conservation objectives for this kind of threat (see above for biological invasions) is related to impending and projected human activities that would destroy, degrade, and / or fragment GOE habitat.
- Data fields could include:
 - the threat rating from the Conservation Data Centre
 - land ownership;
 - documents, dossiers and interviews involving owners, neighbours, and government personnel;
 - economic projections; and
 - applications.
- Ways to analyze the data could include the following:
 - development of a 4 or 10 interval rating system for degree of threat or
 - development of a cumulative formula producing a number such as 0 to 1.0 or 1 to 10.

species and communities at risk

- These biodiversity conservation objectives relate directly to the ecosystems and species defined at risk through SERA, the Blue and Red Lists, GOERT and any expanded federal or provincial legal frameworks that might one day be in place.

- Data fields could include the following:
 - CDC data on presence of any species at risk;
 - CDC data on the number of species at risk; and
 - CDC data on assessment of the extent of species occurrences and the strategic role of particular sites and landscapes.

- Ways to analyze the data could include the following:
 - the number of presence of any species at risk;
 - indices of the viability of a particular site for the local persistence of a species at risk; and
 - indices of the extent of species occurrences and the strategic role of particular sites and landscapes.

Creation of documentation protocols to enhance defensibility and to create a historical record

To manage data and to be able to defend decisions, a number of protocol decisions will be necessary. These questions can be best discussed by the technical group with recommendations to the RAG. By the end of Meeting #10, sets of documentation protocols are necessary for:

1. inclusion of locations for consideration (as in the 1 2002 Lidstone List);
2. choice of sub-set of locations for ongoing investigation;
3. development of an dossier format for locations of interest;
4. complete notes on analyses, determinations and major aspects of all decisions leading to priorities;
5. revisions of information; and
6. revisions of decisions.

Possible time lines for development of the first list of priorities

In meeting #8, the RAG has a few alternatives about a work plan for the first phase of its work. Below are but two are a number of alternatives.

ALTERNATIVE 1

MOVING FAST WITH POORLY DEFENSIBLE DATA

- The RAG could move ahead and create its first list in the coming months.
- This work to do this would probably require several hours a week of research and compilation for most members of the RAG or some paid consultancies.
- With such incomplete data, on such factors as actual location of GOEs and areas, to name but a few data fields, the RAG could make itself vulnerable to lack of

credibility at a time when it would be in a good position to apply for its own funding, for research and compilation, through partners.

possible deadlines

- The data fields for the first list could be set by the end of meeting #9 (early March).
- Technical meetings on the 6 conservation criteria could be between meeting #8 and #9.
- The approach to the analysis and initial determinations could be developed by the technical group between meetings #9 and #10 (early May) with an initial example of the rankings being sent out as preparation for meeting #10.
- In meeting #10, the RAG could instruct the technical group on any refinements that it would like for review in meeting #11 (early July).

ALTERNATIVE 2

POLISHING THE LIDSTONE LIST & DEFERRING SETTING A 'TOP TEN' UNTIL 2003

The problem with Alternative 1 is the constraints on human resources until there was funding to cover some of the technical aspects of the work around setting the lists. An alternative to setting a list of 10+ in 2002 (before a lot more information is available) is to refine the Lidstone list and to include a 5 to 10 page discussion of the importance of all of these locations – especially the ones that would (after further research) to rate high in terms of the conservation criteria.

This alternative would not necessarily be a 'cop out'. The RAG could highlight the need for swift, new interventions for protection of these habitats – while also highlighting the need for data collection (and funding) directly related to evaluating the locations in terms of the conservation criteria mentioned above. This alternative would also be prudent in the sense that the RAG would not force itself to become 'over-committed' to a list where it also recognized that there was inadequate data available to defend such a list with other biodiversity conservation scientists and professionals. Such a strategy could provide the following benefits.

- A. Such an interim solution would essentially buy the RAG a year's time in which to compile dossiers on each location and site.
- B. By circulating the list over a year, a number of other informants would come forward – making the list, itself, more defensible as the departure point for our eventual list.

- C. Such an alternative, of circulating Lidstone's complete list, would prepare the public and professionals for a list in 2003 by highlighting the severe situation with GOE habitat degradation and conversion including relatively small number of larger and relatively altered GOE landscapes and 'pocket wildernesses' (down to between 20 and 30). The initial Lidstone list and associated text could highlight the need to conserve ALL remaining and relatively intact GOEs and the complimentary need to restore those areas that have been degraded.
- D. This alternative would allow the RAG to apply for funding for well-justified research with proposals through one or more of the RAG's partners. This could mobilize the resources to pay for relatively comprehensive research (that did not duplicate but complemented the collection of TEM data) more specifically oriented to biodiversity conservation objectives the RAG sets for these ecosystems.
- E. The text with the Lidstone list could be a conservation biology education tool, for land use decision-makers, in criteria for and standards of biodiversity conservation and respective environmental planning. This would then soften land use planners into considering more clearly principles, data and standards in the protected areas that ultimately they, and not this RAG, will plan and design.

possible deadlines

- further refinement of the 1 2002 Lidstone list between #8 and #9
- discussion on the form of the output for the initial list of GOE locations (the 1 2002 Lidstone list) between meetings #8 and #11 (July)
- meetings on conservation objectives between meetings #8 and #11
- development of draft of accompanying text of the Lidstone List for review for meeting #11
- recommendations strategy for initial dissemination of Lidstone's List and text for review by meeting #11
- determination of a subset of the Lidstone List for investigations and creation of dossiers by meeting #12 (September)
- compilation of aerial photographs by meeting #14 (January 2003)
- compilation of other information for the dossiers by meeting #15 (March 2003)
- analysis and rankings of locations of interest by meeting #16 (May 2003)
- dissemination of the first 'top ten' list at meeting #17 (July 2003)

Conclusions

Planning for viable conservation of biodiversity requires a fairly high quality of data and analysis – even 'just' for a list of locations of addition protection. So far, this RAG has not had a budget and has effectively received no resources from GOERT even when GOERT has received funding that it has directed at some of the RAGs. A substantial

portion of the core members of this RAG is contributing through effectively unpaid overtime or as volunteers. While such a situation may be acceptable in the very initial phases for this work, to try to achieve the first phase of the RAGs work without a budget or a RAP, effectively without a basis for applying for outside funding for technical support, would trivialize biodiversity conservation planning and undermine the mission of the RAG.

The 1 2002 Lidstone list represents a significant achievement in the work of conserving GOEs. The list represents a major achievement of GOERT – even when the work of the RAG has received little or no resources through GOERT funds. The 1 2002 Lidstone list warrants a lot of polishing and study – and review, dissemination, and use by the public and environmental professionals.

One of the key underlying functions of the RAG is to exchange information and to building up expertise in biodiversity conservation planning for GOEs. To rush into making a ‘top ten’ list, in the first half of 2002, would put a great deal of pressure on individuals without providing them with the time or resources to respond to the challenges of this work.

Why rush into the work of the RAG without a budget – and sufficient scientific, planning and design support?

APPENDIX 1
PROPOSED DECISIONS TO BE MADE IN MEETING #8

0. Determining the form of the output of the CP & SP RAG's first list

- Before further decisions can be made, the RAG first needs to determine what information should be in its initial priority list.

1. Determining the geographic label of the areas of interest and the minimum area of locations for consideration

- What are a small number of characteristics that can be identified – the presence of which on a site would indicate the presence of Garry oak and associated ecosystems?
- In considering Garry oak **and associated** ecosystems, it may be prudent to add to an area with indicators of GOEs an adjacent margin of perhaps 50 to 100 meters (at the least). This is particularly relevant to the issue of GOEs being overgrown by young Douglas fir trees because of fire suppression. If such a margin were considered appropriate, how could it be applied and how wide would it be?
- Should and, if so, how can smaller 'sites' be differentiated from larger, relatively intact, landscape mosaics? There is quite an extensive set of discussions on this topic and the CDC has used the concept of a 'macrosite'. For oak grassland and woodland ecosystems, the concept of the broader landscape unit or 'dynamic mosaic' is relevant.
- Should a series of fragments be considered in isolation or, since landscape linkages and buffers could eventually be relevant, should there be some way to recognize proximity, even current connectivity and the former presence of a larger landscape unit?
- How can we cross-reference names of areas that might have some allusion to a broader landscape unit? A general name along with a specific name may be useful i.e. Hornby-Whaling Station Bay.
- What is the minimum area of an unprotected area, with Garry oak and associated ecosystems, to be considered by this RAG in the first phase of its work? Further in this discussion, there is an outline of viability and population resilience for reserve design. But what can be the minimum size for initial consideration of a GOE location once it is on the Lidstone list?

2. Determining whether a location qualifies as being unprotected

- Many areas with GOEs have some forms of formal and informal protection but what is the threshold for the location, area or site to be considered by the CP & SP RAG and NOT by the Restoration and Management RAG?
- Many areas with GOEs have some protected parcels and most currently protected areas would be more effective at protecting biodiversity by having buffers or the addition of less strategic parcels. So where can we draw the line in which highly unprotected locations to consider?
- Many protected areas with GOEs would be more effective at maintaining local biodiversity with a higher level of protection: from a conservation covenant to park status and from municipal park status to provincial park or national park status. But when should a site be considered for additional protection? And some of the larger and most strategic landscape mosaics are military lands where there may not be formal protection but there is a commitment to stewardship (that is often more effective than in many other local protected area categories) and some involvement with GOERT.
- What should be the role, if any, of the ratings on protection urgency provided by the Conservation Data Centre?

3. Information needed to determine and justify choice of some locations over others

The following biodiversity conservation criteria, data fields and modes of analysis warrant discussion and some clear decisions over meetings #8, #9 and #10.

landscape / habitat size

some typical conservation objectives:

some typical data fields:

some typical ways to analyze the data:

biological richness

some typical conservation objectives:

some typical data fields:

some typical ways to analyze the data:

cultural factors & Salish land use

integrity and present ecosystem condition

some typical conservation objectives:

some typical data fields:

some typical ways to analyze the data:

cultural factors & Salish land use

Discussion paper for the

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Some information needed for making a list of priority areas with currently unprotected Garry oak ecosystems warranting immediate protection

geographical stratification and representativeness

some typical conservation objectives:

some typical data fields:

some typical ways to analyze the data:

degree of threat

some typical conservation objectives:

some typical data fields:

some typical ways to analyze the data:

species and communities at risk

some typical conservation objectives:

some typical data fields:

some typical ways to analyze the data:

4. Creation of documentation protocols to enhance defensibility and to create a historical record

5. Possible time lines for development of the first list of priorities

ALTERNATIVE 1

MOVING FAST WITH POORLY DEFENSIBLE DATA

ALTERNATIVE 2

POLISHING THE LIDSTONE LIST & DEFERRING SETTING A 'TOP TEN' UNTIL 2003

APPENDIX II
RECOMMENDATIONS FOR
PROPOSED DECISIONS TO BE MADE IN MEETING #8

**O. Determining the form of the output of the CP & SP RAG's first list
RECOMMENDATION:**

The following is the minimum kind of information that could be in a useful and defensible first list of areas for protection:

- A. name of site i.e. Mt. Maxwell
- B. descriptive location i.e. south side of Mt. Maxwell, Salt Spring Island
- C. jurisdiction information such as regional district or municipality; whether part of Islands Trust etc.
- D. general location map at 1:50,000
- E. finer-scaled map or copy of an aerial photo with presence of GOEs (and species of interest to GOERT) -- at 1:5,000
- F. a reserve design at 1:5,000 with key areas for conservation – to protect key elements and to optimize long-term viability of vulnerable native species – along with ownership information on particular parcels
- G. other information that RAG members have the time and resources to commit to researching, confirming and compiling

1. Determining the geographic label of the areas of interest and the minimum area of locations for consideration

- A. What are a small number of characteristics that can be identified – the presence of which on a site would indicate the presence of Garry oak and associated ecosystems? RECOMMENDATION:
- B. In considering Garry oak **and associated** ecosystems, it may be prudent to add to an area with indicators of GOEs an adjacent margin of perhaps 50 to 100 meters (at the least). This is particularly relevant to the issue of GOEs being overgrown by young Douglas fir trees because of fire suppression. If such a margin were considered appropriate, how could it be applied and how wide would it be? RECOMMENDATION:
- C. Should and, if so, how can smaller 'sites' be differentiated from larger, relatively intact, landscape mosaics? There is quite an extensive set of discussions on this topic and the CDC has used the concept of a 'macrosite'. For oak grassland and woodland ecosystems, the concept of the broader landscape unit or 'dynamic mosaic' is relevant. RECOMMENDATION:

Some information needed for making a list of priority areas with currently unprotected Garry oak ecosystems warranting immediate protection

- D. Should a series of fragments be considered in isolation or, since landscape linkages and buffers could eventually be relevant, should there be some way to recognize proximity, even current connectivity and the former presence of a larger landscape unit? RECOMMENDATION:
- E. How can we cross-reference names of areas that might have some allusion to a broader landscape unit? A general name along with a specific name may be useful i.e. Hornby-Whaling Station Bay. RECOMMENDATION:
- F. What is the minimum area of an unprotected area, with Garry oak and associated ecosystems, to be considered by this RAG in the first phase of its work? Further in this discussion, there is an outline of viability and population resilience for reserve design. But what can be the minimum size for initial consideration of a GOE location once it is on the Lidstone list? RECOMMENDATION:

2. Determining whether a location qualifies as being unprotected

- Many areas with GOEs have some forms of formal and informal protection but what is the threshold for the location, area or site to be considered by the CP & SP RAG and NOT by the Restoration and Management RAG? RECOMMENDATION:
- Many areas with GOEs have some protected parcels and most currently protected areas would be more effective at protecting biodiversity by having buffers or the addition of less strategic parcels. So where can we draw the line in which highly unprotected locations to consider? RECOMMENDATION:
- Many protected areas with GOEs would be more effective at maintaining local biodiversity with a higher level of protection: from a conservation covenant to park status and from municipal park status to provincial park or national park status. But when should a site be considered for additional protection? And some of the larger and most strategic landscape mosaics are military lands where there may not be formal protection but there is a commitment to stewardship (that is often more effective than in many other local protected area categories) and some involvement with GOERT. RECOMMENDATION:
- What should be the role, if any, of the ratings on protection urgency provided by the Conservation Data Centre? RECOMMENDATION:

3. Information needed to determine and justify choice of some locations over others

The following biodiversity conservation criteria, data fields and modes of analysis warrant discussion in meetings #8, #9 and #10.

RECOMMENDATIONS FOR DEVELOPMENT OF CONSERVATION OBJECTIVES AND DATA FOR FIRST DRAFT OF LIST

If the RAG wishes to go ahead with determining a top ten list in the coming months, the work will need to focus on the data that is already available and most notably:

1. the 1 2002 Lidstone list;
2. the Erickson list;
3. the Edwards and Meagher list; and the
4. analysis of the *Catalogue of Site Records*

and along with the following:

1. topographic and other maps;
2. aerial photographs; and
3. field notes.

The problem is that this information does not provide the basis for a defensible list particularly with defensible proposals for protected area designs.

RECOMMENDATIONS FOR DEVELOPMENT OF CONSERVATION OBJECTIVES AND DATA FOR SECOND DRAFT OF LIST

If the RAG were to begin a programme of information collection, to build on the Lidstone list and to synthesize the information in the other lists, some of the following objectives, data fields and modes of analysis (that are far more

landscape / habitat size

- biodiversity conservation objectives: The comparative areas of GOE habitat units, fragments, isolates and matrices have tremendous implications for desirability of protection and long-term viability of associated biodiversity. Larger areas with smaller edge / area ratios, with isolation factors that are more biophysical than social, are preferable over small and highly fragmented areas. Along with
 - **area** are factors related to
 - **shape**,
 - **edge** (and edge / area ratio), and
 - **comparative isolation & connectivity** (with some unique processes and both negative and positive factors associated with each).
- data fields:
 - Total area of a mosaic of GOEs can be the **combined hectares of sites with specific GOEs elements and indicators** have been confirmed. However, is a rather onerous process that requires extensive use of aerial photos and ground-truthing. Such an approach is justifiable, and often cost-effective, where land is expensive and where species at risk are possibly present.

Some information needed for making a list of priority areas with currently unprotected Garry oak ecosystems warranting immediate protection

- Another for of setting area is more viable, in the shorter-term and with more limited budgets. A smaller number of indicators can be used, centred on aerial and field confirmation of the presence of Garry oak and associated grassland and dry Douglas fir woodland. Around canopy indicators, an exterior margin can be drawn (such as of 100 meters) and possibly non-GOE communities and elements can be just added into the broader **dynamic mosaic**.
- The **edge / area ratio** can be confirmed through aerial photos and field visits.
- Various measures of **connectivity** and **isolation** can involve measures in kilometres.
- Ways to analyze the data could include:
 - comparison of hectares with actual GOE elements;
 - comparison of hectares of dynamic mosaics;
 - comparison of edge / area ratios (of both actual area with GOE elements and of the dynamic mosaics); and
 - comparison of relative isolation and connectivity of canopy, successional conditions (such as species at risk, old-growth, snags, fire-influenced vegetation and areas under threat of or with the presence of invasive species).

biological richness

- biodiversity conservation objectives:
 - The number of plant associations present (GOEs or otherwise), in a particular dynamic mosaic, is a relatively easy way to have some sense of landscape-level diversity.
 - There are purely landscape-level indicators of richness (fragments, edges, matrices) but they are usually linked to indicator species.
- Some data fields can be the following:
 - landscape level, successional diversity (combined with sufficient areas of individual habitat units for viability); and
 - presence of indicator species or habitat attributes.
- Ways to analyze the data include the following:
 - comparison of number of groups of species;
 - comparison of presence and numbers of indicator species;
 - comparison of presence and associated spatial relationships of successional factors and, in particular, fragments, interiors, edges, matrices, flow and corridors.
- Evidence of cultural factors in the landscape particularly related to Salish land use involve an additional set of ‘diversity’ factors and could include the following:
 - partial list suggesting any presence of food, medicinal and technology species;
 - partial list suggesting any presence of gathering and preparation (such as camas pits);
 - partial list suggesting any areas with indications of frequent burning; and
 - partial list suggesting any village sites.

Some information needed for making a list of priority areas with currently unprotected Garry oak ecosystems warranting immediate protectionintegrity and present ecosystem condition

- Some biodiversity conservation objectives could include:
 - presence of late successional phases;
 - presence of a range of successional conditions (and indicators);
 - presence of detritus food webs such as snags;
 - indications of historic or recent fire (and presence of low fuel levels that would allow reintroduction of fire);
 - lack of (particularly) invasive species;
 - relative isolation from source points for further invasions; and
 - prospects for eradication of invasive species.
- Some data fields could include:
 - comparative areas (and indices) of certain and combinations of successional phases;
 - numbers of particular successional and habitat attributes such as snags of certain species (and age classes);
 - presence and extent of indicator species of certain successional phases; and
 - various indicators and classes (as in interval data) of presence or absence of invasive species and potentials for subsequent invasions.
- There are ways to analyze the data:
 - comparison of areas,
 - numbers of species and landscape indicators, and
 - indices related to areas as portions of mosaics.
- The presence of cultural factors related Salish land use could include the following:
 - partial list suggesting any historical indications of aboriginal use
 - partial list suggesting any presence of species still utilized by aboriginals; and
 - partial list suggesting any indications of aboriginal settlements and land stewardship.

geographical stratification and representativeness

- The biodiversity conservation objectives here could include:
 - even spatial distribution across the historic range of GOEs in British Columbia;
 - even distribution across basic ecosystem types including
 1. mainland,
 2. Vancouver Island (matrix),
 3. Vancouver Island (isolates),
 4. larger Gulf Islands, and
 5. smaller islands (perhaps islands dominated by GOEs 20 hectares or less);
 - even distribution across regional districts;
 - distribution in regional districts based on historic occurrence within particular regional districts;
 - even distribution across biogeographic (or biotic) districts as based on:
 1. watersheds on Vancouver Island,

Some information needed for making a list of priority areas with currently unprotected Garry oak ecosystems warranting immediate protection

2. larger Gulf Islands,
 3. smaller islands, and
 4. sub-watersheds on the mainland.
- Some relevant data fields include:
 - maps and
 - spatialized boundaries determined as based on landscapes, climates, soils, and species.
 - Ways to analyze this data include
 - maps and distances between GOE locations and
 - representation within zones and biogeographical districts.

degree of threat

- The biodiversity conservation objectives for this kind of threat (see above for biological invasions) is related to impending and projected human activities that would destroy, degrade, and / or fragment GOE habitat.
- Data fields could include:
 - the threat rating from the Conservation Data Centre
 - land ownership;
 - documents, dossiers and interviews involving owners, neighbours, and government personnel;
 - economic projections; and
 - applications.
- Ways to analyze the data could include the following:
 - development of a 4 or 10 interval rating system for degree of threat or
 - development of a cumulative formula producing a number such as 0 to 1.0 or 1 to 10.

species and communities at risk

- These biodiversity conservation objectives relate directly to the ecosystems and species defined at risk through SERA, the Blue and Red Lists, GOERT and any expanded federal or provincial legal frameworks that might one day be in place.
- Data fields could include the following:
 - CDC data on presence of any species at risk;
 - CDC data on the number of species at risk; and
 - CDC data on assessment of the extent of species occurrences and the strategic role of particular sites and landscapes.
- Ways to analyze the data could include the following:
 - the number of presence of any species at risk;
 - indices of the viability of a particular site for the local persistence of a species at risk; and
 - indices of the extent of species occurrences and the strategic role of particular sites and landscapes.

Discussion paper for the

Conservation Planning & Site Protection Recovery Action Group

Some information needed for making a list of priority areas with currently unprotected Garry oak ecosystems warranting immediate protection

4. Creation of documentation protocols to enhance defensibility and to create a historical record

By the end of Meeting #10, a set of documentation protocols will be proposed by the RAG technical group, will be discussed and will be devised for the following aspects of the work of the RAG:

1. inclusion of locations for consideration (as in the 1 2002 Lidstone List);
2. choice of sub-set of locations for ongoing investigation;
3. development of an dossier format for locations of interest;
4. complete notes on analyses, determinations and major aspects of all decisions leading to priorities;
5. revisions of information; and
6. revisions of decisions.

5. Possible time lines for development of the first list of priorities

The RAG could decide between at least two strategies and modes to carrying out its mission.

ALTERNATIVE 1

MOVING FAST WITH POORLY DEFENSIBLE DATA

ALTERNATIVE 2

POLISHING THE LIDSTONE LIST & DEFERRING SETTING A 'TOP TEN' UNTIL 2003

There are positive and negative implications of both possibilities and the choice may be most about what kind of human resources are available to the RAG in the coming three months.