

RESTORING CADBORO BAY'S URBAN FOREST

Part 2

Presentation to Native Plant Study Group

Victoria BC

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E.B. Peterson and N.M. Peterson,

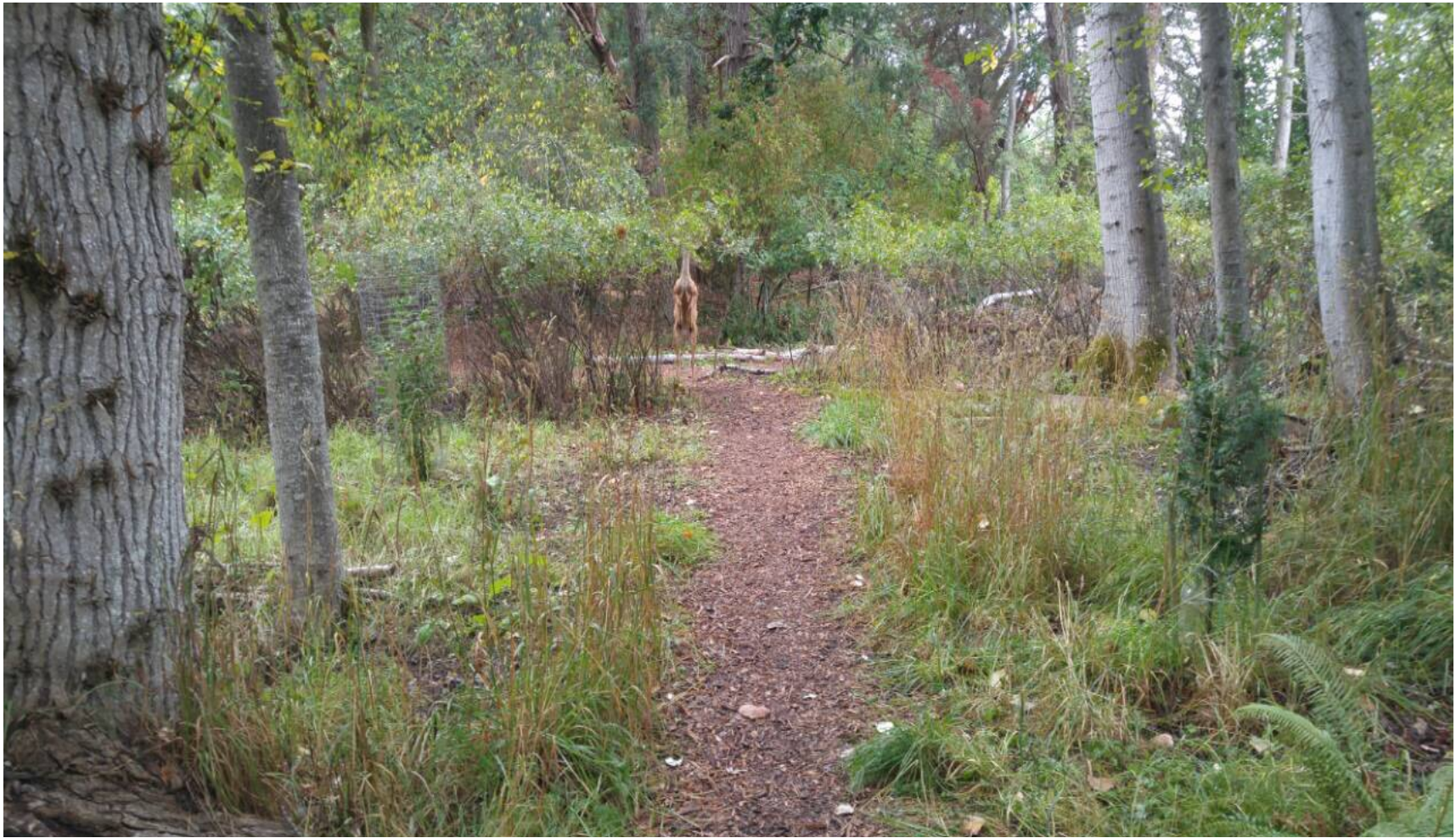
Stewards, Goward Woodland,

westeco@shaw.ca

Deer in Goward Woodland



Deer die there



And deer feed there, in this case on leaves and berries of snowberry
(*Symphoricarpos albus*).



Deer-feeding trim-line is evident on red-osier dogwood.
For scale, wire rings are each 54 inches tall.



Deer browsing trimline on arbutus leaves.



Douglas-fir planted in 2016 was not ringed with wire within 24 hours and was immediately antler rubbed. This tree died in 2017.

Deer feeding habits were documented many decades ago.

Cowan, Ian McTaggart. 1945. The ecological relationships of the food of the Columbian black-tailed deer *Odocoileus hemionus columbianus* (Richardson), in the Coast Forest Region of southern Vancouver Island, British Columbia. Ecological Monographs 15: 109-139.

DEER AS FOREST ARCHITECTS

Of the 4 conifer tree species and 9 broadleaf tree species occurring naturally in Goward woodland, black cottonwood and grand fir are the two species most influenced by deer's role as architects shaping the future tree **structure of this urban forest.**



Naturally regenerated grand fir browsed by deer.



Naturally regenerated grand fir
protected from deer browsing.
Red and white pole is 2 m tall.



Black cottonwood suckers several weeks old.



Left, cottonwood sucker at end of first season growth in 2017; right, same sucker in second season, mid-2018

Integrate new plantings with areas of natural regeneration of native species.



Naturally regenerated Garry oak.



Nursery-produced Garry oak planted near natural oak in 2018.

In the preceding screen:

Adaptive methods to protect plantings are as invisible as possible:

- Clear plastic bottle for supplemental watering;
- Supporting stakes of natural earth-tone color.



Pleurococcus green biofilm on Douglas-fir bark is inspiration for color of supporting stakes.



Mixing formula for Benjamin Moore paint to match green biofilm produced by *Pleurococcus* green algae.



Naturally regenerated red alder seedling.



Red alder seedling of preceding screen 2 years after transplanting.



Rapid early growth of alder in first 3 years.

AIMING FOR MAXIMUM VISUAL IMPACT DURING THE TWO PHASES OF ECOLOGICAL RESTORATION

Phase 1 – Reduction of cover by main non-native woody-stemmed unwanted species;

Phase 2 – Encouragement and reintroduction of wanted native species



‘Before’ view in Phyllis Park.



'After' view in Phyllis Park.



Before blackberry clearing in Goward woodland.



Same view as preceding screen after
blackberry clearing and Phase 2 planting.

Limited role for surround fencing,
individual wire rings, and netting.



For small transplants, like ocean spray above, so many individuals are needed that a wire ring around each is impractical.



To protect an entire population, such as Oregon boxwood (*Paxistima myrsinites*) shown left, surround netting protects the population but limits public access, not amenable for public parks and natural areas.

REPEAT STEPS NEEDED IN ECOLOGICAL RESTORATION

For English ivy suppression

For Himalayan blackberry suppression

For removal of dumped garden biomass

For removal of large garbage

SUMMARY OF EXPERIENCES IN GOWARD WOODLAND

Report cards for:

Phase 1, reduction of non-native species

Phase 2, encouraging native species.

**REPORT CARD OF STEPS TO REDUCE NON-NATIVE
INVASIVE SPECIES, 2004-2018**

	% of visible population removed	Grade *
Ivy on tree trunks	100 %	A
Ivy as ground cover	85 %	A
Scotch broom ground cover	100 %	A
Daphne laurel ground cover	95-100 %	A
Blackberry, mature thickets	95-100 %	A
Blackberry, new current shoots	50 %	B
Blackberry, tubers	10 %	F
Orchard grass	1 %	F
Reed canary grass	50 %	B

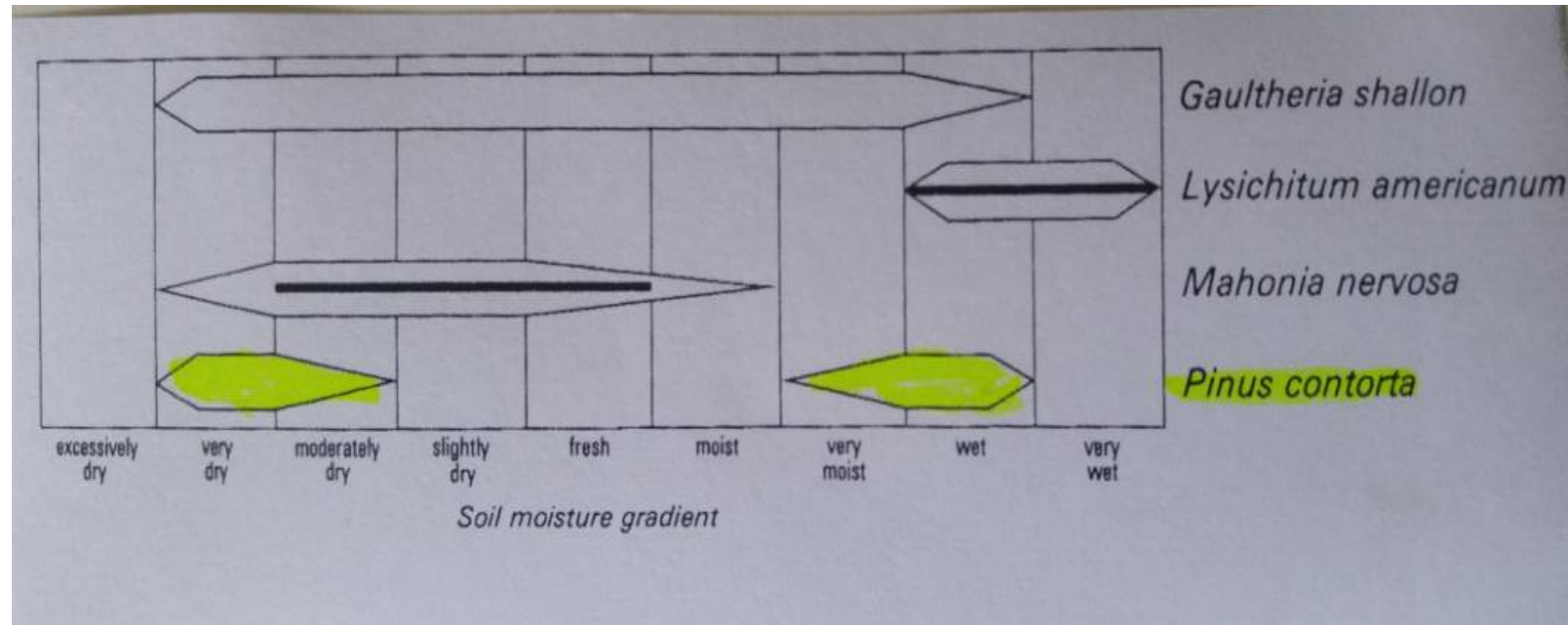
*** A – successful; B – partly successful; F – no significant progress**

REPORT CARD OF TRANSPLANT SUCCESS OF NATIVE HERBS AND SHRUBS

<i>Camassia quamash</i>	F *
<i>Dodecatheon pulchellum</i>	F
<i>Erythronium oreganum</i>	F
<i>Fritillaria lanceolata</i>	F
<i>Polypodium glycyrrhiza</i>	F
<i>Trillium ovatum</i>	F
<i>Gaultheria shallon</i>	B
<i>Holodiscus discolor</i>	B
<i>Mahonia nervosa</i>	B
<i>Ribes sanguineum</i>	B
<i>Carex obnupta</i>	A
<i>Polystichum munitum</i>	A

* A - all transplants successful; B - some transplants successful; F - no successful transplants

Shore pine, a forgotten restoration species



From: Klinka, Krajina, Ceska and Scagel. 1989.
Indicator plants of coastal British Columbia.



Nursery stock of shore pine, left;
same pine 3 years after planting, now 3 m tall, right.

MOST INSPIRING EXPERIENCES

During Phase 1:

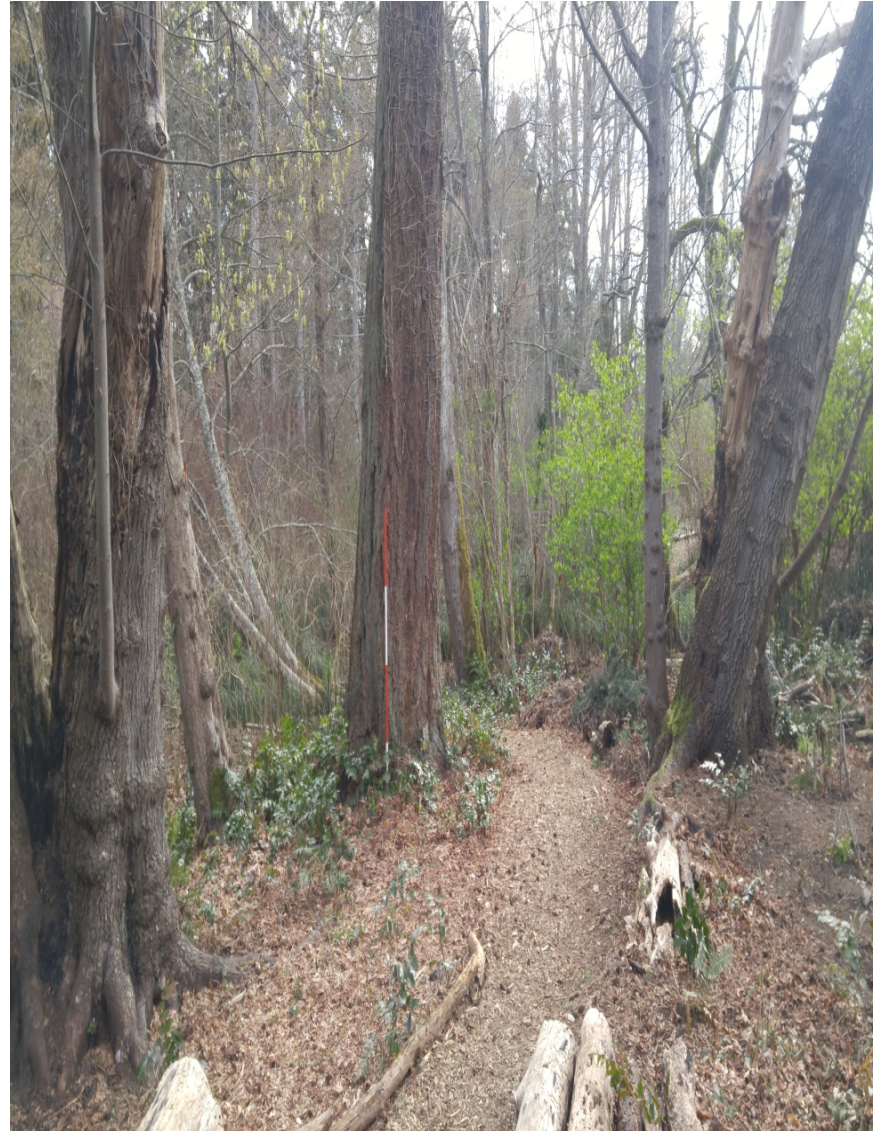
- near complete removal of ivy from site

During Phase 2:

- creation of areas of future new forest of diverse tree species



2009



2018



2018 view of new plantings of diverse tree species for future forest canopy.



The first new tree of the Goward woodland ecological restoration program was this Douglas-fir planted by Robert van den Driessche in autumn 2010. This fir is 7 metres tall in autumn 2018.

LEAST INSPIRING EXPERIENCE IN GOWARD WOODLAND

- Realization that none of the 13 tree species naturally present in Goward woodland have surviving young age classes to guarantee those species a presence there in the future.
- Black cottonwood is the species with the greatest capability of natural regeneration, yet it is an example of a species that has no young age classes surviving at present.



Three clusters of black cottonwood suckers emerged in May 2018. Right cluster was protected immediately. Two clusters on left remained unprotected and were nibbled by deer repeatedly.

No new suckers of cottonwood can develop in the presence of heavy browsing.



A cottonwood sucker protected from deer browsing can achieve a height of 3 m by the end of the second growing season in groundwater discharge areas of Goward woodland.



Mature cottonwood 1 m in diameter in Goward woodland. Note 2 m red/white pole for scale.

Cottonwoods Are At Risk

Magnificent cottonwoods in the preceding screen will some day topple from internal stem decay or from windstorms.

There will be no young cottonwoods to replace these giants as long as deer are preventing natural regrowth by new young cottonwood suckers.

The Choices

The choices we are presented with are between:

1. high density deer with no future cottonwoods or
2. future cottonwoods and Columbian black-tailed deer in a balanced population density.

To date, the choice of residents of Greater Victoria and the Cadboro Bay area is #1.

Our preference is #2.



Footpath system in Goward woodland welcomes visitors.

Biographic Notes

Everett Peterson is a forest ecologist and retired registered forest professional. His UBC graduate studies under the direction of Dr. Vladimir Krajina focussed on biogeoclimatic classification of the coastal mountain hemlock zone in southwestern B.C.

In latter years, as president of Western Ecological Services Ltd., he and Merle Peterson co-authored monographs for the ecology and management of aspen/balsam poplar in the prairie provinces and for Sitka spruce in British Columbia.

On behalf of the B.C. Ministry of Forests, they also co-authored managers' handbooks for aspen, black cottonwood, red alder, paper birch, and bigleaf maple.

Everett and Merle have focussed on volunteer ecological restoration of the Goward woodland since 2004.

End of Part 2