Influence of near bottom mariculture on intertidal diversity
Plans for expansion: based on a 1998 Western Economic Diversification report

Potential to create 1,100 new industry jobs over the next 10 years and generate $100 million annually in coastal communities
North of Repulse Point, Denman Island

- Predator netting
- Berms
- Vexar netting
- Equipment storage
- Vehicles on beach
Concerns related to possible impacts on the intertidal community
But also the possibility that nets could enhance three-dimensional structure of the intertidal thereby increasing habitat diversity (e.g., artificial reefs)
Objectives

(1) to assess how shellfish aquaculture practices of applying antipredator netting in combination with seeding influenced intertidal diversity of both macroflora and fauna;

(2) to determine whether an increase in the three dimensional structure of the intertidal as afforded by the presence of antipredator netting enhances habitat as measured by increased abundance of macroinvertebrate species.
Figure 1. Locations of the three regions and sites within regions; A Baynes Sound, B Desolation Sound, C Barkley Sound.

* notes the approximate location of Yuculta Rapids where the temperature differential of 5 °C has been reported to prevent further invasion of the Manila clam northward (Bourne 1982). See also Figure 4a.
Farmed beaches; includes the use of predator netting and seeding
Recorded Variables

Macrofauna > 6mm; 
# individuals m/2

% Plant cover
I. Net and intertidal community with farming
II. Intertidal community with farming
III. Reference (no farming)
Macroflora

- Endocladia mucicata
- Enteromorpha sp
- Fucus gardneri
- Gastroclonium sp
- Leathesia difformis
- Mastocarpus papilatus
- Sargassum muticum
- Ulva sp
- Zostera marina

% coverage quadrat⁻¹

- Farmed with net community included
- Farmed with net community excluded
- Reference

Macroflora vs. % coverage quadrat⁻¹
Mean Difference (reference-farm) ± S.E.
More individuals on reference Mid-tide with significantly greater amounts present when net community excluded.
Two reasons:

- anaerobic conditions underneath nets (mid-tide)
- predation by small fish and invertebrates (mid and low-tide)
1) Physical barrier; increases in organic matter/silt plus biofouling leading to anoxia
2) Predation by small fish and invertebrates
MDS ordination of 15 of 16 sites based on the abundance similarity matrix including individuals on nets (a, stress = 0.12) and results of the same analysis, with the net community excluded (b, stress = 0.11). Open circles are reference sites, solid are farmed sites.

**Farmed sites more similar than reference sites**
Conclusions

On the northwest coast of BC antipredator nets in combination with seeding:

1) reduced # individuals at mid-tide
2) increase macroinvertebrate similarity across regions.