**Qualitative network models in support of ecosystem approaches to bivalve aquaculture**

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**Supplementary Materials**

**Table S1**. Description of linkages in the South Puget Sound qualitative network model. Linkage types denoted by an asterisk indicate interactions that are uncertain (represented as dashed lines in Fig. 1). For brevity, predator-prey relationships are noted in terms of the effect of predators on prey only, unless either the effect of prey on predators or predators on prey is uncertain.

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| **Effect of** | **Effect on** | **Type** | **Comments and references** |
| Scoters | Manila clam | predator-prey (predator) | Scoters prey on manila clams, reducing clam densities (DeFrancesco and Murray 2010; Lewis et al. 2007). |
| Manila clam | Scoters | predator-prey (prey\*) | Unclear to what extent scoter populations are driven by Manila clam aquaculture (Žydelis et al. 2006). |
| Small fish | Manila clam | predator-prey\* | Unclear if clam loss due to siphon nipping from flatfish and sculpin occurs; unknown if cultured manila clams are important to small fish populations (e.g., Armstrong et al. 1995; Meyer and Byers 2005; Peterson and Quammen 1982). |
| Small fish | Structure invertebrates | predator-prey | Benthic invertebrates are important prey; English sole (Buechner et al. 1981); sculpin (Armstrong et al. 1995; Dinnel et al. 1990; Williams 1994); shiner perch (Troiano et al. 2013). |
| Small fish | Nonstructure invertebrates | predator-prey | Benthic invertebrates are important prey for: English sole (Buechner et al. 1981); sculpin (Armstrong et al. 1995; Dinnel et al. 1990; Williams 1994); shiner perch (Troiano et al. 2013). |
| Graceful crab | Manila clam | predator-prey | Manila clam loss due to predation by graceful crab (DeFrancesco and Murray 2010). |
| Graceful crab | Structure invertebrates | predator-prey | Graceful crab are likely generalist predators, similar to red rock crab (Knudsen 1964). Common in areas with and without aquaculture structure (Brown and Thuesen 2011; McDonald et al. 2015). |
| Graceful crab | Nonstructure invertebrates | predator-prey | Graceful crab are likely generalist predators, similar to red rock crab (Knudsen 1964). Common in areas with and without aquaculture structure (Brown and Thuesen 2011; McDonald et al. 2015). |
| Red rock crab | Structure invertebrates | predator-prey | Generalist predator, may occur in mud habitats (Knudsen 1964; Robles et al. 1989). |
| Red rock crab | Pacific oyster | predator-prey | Red rock crab prey on Pacific oyster (Grason and Miner 2012) and prefer oyster bed habitat (Holsman et al. 2006). |
| Red rock crab | Moon snail/sea star | predator-prey | Moon snail and sea stars are preyed upon by red rock crab (P. S. McDonald, personal communication). |
| Red rock crab | Manila clam | predator-prey | Red rock crab are predators to cultured Manila clams (Anderson et al. 1982; Boulding and Hay 1984; Chew 1989; Toba et al. 1992). |
| Chinook salmon | Structure invertebrates | predator-prey | Predator to benthic invertebrates (Buechner et al. 1981). |
| Chinook salmon | Zooplankton | predator-prey | Zooplankton common in Chinook salmon diet (e.g., Duffy et al. 2010; Troiano et al. 2013). |
| Moon snail/sea star | Manila clam | predator-prey\* | Known predator of clams (Kozloff 1983; Toba et al. 1992), but unclear if moon snail significantly reduces commercial Manila clam productivity (Cook and Bendell-Young 2010). |
| Moon snail/sea star | Structure Invertebrates | predator-prey | Generalist predators of small sedentary invertebrates (Kozloff 1983). |
| Moon snail/sea star | Nonstructure invertebrates | predator-prey | Moon snail and sea stars both feed on infaunal, bivalves (Kozloff 1983). |
| Moon snail/sea star | Pacific oyster | predator-prey | Known predator of Pacific oyster (DeFrancesco and Murray 2010). |
| Moon snail/sea star | Geoduck | predator-prey (predator) | Sea stars are predators to geoduck (Mauzey et al. 1968; Sloan and Robinson 1983; Van Veldhuizen and Phillips 1978), though moon snail predation has not been directly observed (Straus et al. 2013) |
| Geoduck | Moon snail/sea star | predator-prey (prey\*) | Unclear if cultured geoduck are important to Moon snail/sea star productivity. |
| Pacific oyster | Structure invertebrates | positive | Pacific oyster addition increases epibenthic invertebrate abundance (Dumbauld et al. 2001). |
| Pacific oyster | Phytoplankton | negative | Pacific oysters are filter feeders (Wheat and Ruesink 2013). |
| *Z. marina* | Structure invertebrates | positive | Increase in plant density likely to increase benthic invertebrate abundance (e.g., Attrill et al. 2000). |
| *Z. marina* | Chinook salmon | positive\* | *Z. marina* serves as a refuge for Chinook salmon (Semmens 2008), but they are found in other habitats and association does not appear to be tied to foraging (Dumbauld et al. *Accepted*; Hosack et al. 2006). |
| *Z. marina* | Small fish | positive\* | Increase in eelgrass may potentially increase small fish abundance (e.g., Kelly et al. 2008), but is uncertain |
| Geoduck | Structure invertebrates | positive | Increased invertebrate abundance with geoduck farm structures (McDonald et al. 2015). |
| Geoduck | Phytoplankton | negative | Geoduck filter feed, consume phytoplankton (Goodwin and Pease 1989). |
| Structure invertebrates | Phytoplankton | predator-prey | Structure invertebrates include deposit and filter feeders. |
| Nonstructure invertebrates | Phytoplankton | predator-prey | Nonstructure invertebrates include deposit and filter feeders. |
| Zooplankton | Phytoplankton | predator-prey | Zooplankton include filter feeders |
| Phytoplankton | *Z. marina* | negative | *Z. marina* likely light limited at lower end of its distribution (Britton-Simmons et al. 2010; Thom and Albright 1990; Thom et al. 2008). |

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