

Chapter 9E. Re-Examination of Museum, Reference, and Voucher Specimens

Nora Foster, University of Alaska Museum, Fairbanks

9E1. Purpose

As a result of environmental assessment work in Port Valdez during the 1970's for construction of the Valdez Marine Terminal, and the Exxon Valdez oil spill (EVOS), a large ecological database exists for Prince William Sound. Through a careful scrutiny of both the species lists and specimens archived in museum, reference and voucher collections for the past work, this part of our study was intended to test the idea that this extensive prior work in Prince William Sound should have detected NIS. However, in spite of the amount of sampling done in Prince William Sound, some species lists were developed without input from taxonomic experts, so that the biota is still poorly known. Few prior surveys have focused on biogeography or taxonomy, and until this study, none has specifically looked for NIS.

9E2. Methods

Literature sources for Prince William Sound invertebrates include:

- Reports on marine fauna of the northeastern Gulf of Alaska, compiled as a result of the Outer Continental Shelf Environmental Assessment Project (OCSEAP);(Feder and Matheke, 1980; Feder and Jewett, 1988);
- Thesis by M. Hoberg (1986);
- Project reports on the Port Valdez environment (Cooney and Coyle, 1988; Feder et al., 1976; Feder and Bryson-Schwafel, 1988; Feder and Keiser, 1980; Jewett and Feder, 1977);
- Eyerdam's (1924) species lists;
- Haven (1971); and
- Several taxonomic references (Butler, 1980; Hart, 1982; Lambert, 1981; 1991; Behrens, 1991 and others) for additional distribution records in Alaskan waters.

A vast array of preserved biological samples from Prince William Sound and adjacent Gulf of Alaska are housed in the Aquatic Collection of the University of Alaska Museum (UAM). The major part of these are collections made as part of the OCSEAP projects in the mid-1970's, environmental monitoring of Port Valdez, and Max Hoberg's thesis material from three bays in the outer part of the Sound. Intertidal and benthic biota from the soft bottom communities of Prince William Sound are well represented in the collection. Species lists for this material were generated using the museum accession records.

EVOS Specimen Archives

The specimens collected as part environmental surveys after the 1989 Exxon Valdez oil spill supplement the UAM collection. Subtidal invertebrates in 1,154 lots have been transferred to the UAM from warehouse storage for examination. These represent sampling conducted during 1990, 1991, 1993, and 1995, from 15 selected unoiled sites. The collections provide samples of shallow subtidal fauna from silled fjords, eelgrass beds, and habitats dominated by *Laminaria*. With limited resources, each specimen from this large number of samples cannot be examined individually, so it has been necessary to select subset of specimens for careful re-examination.

The subset of reference and voucher specimens examined as part of this study was selected by first compiling a list of 88 invertebrate taxa by comparing the lists of known taxa from Prince William Sound (discussed above) with lists of known NIS from west coast source ports: Puget Sound, San Francisco Bay, southern California, and other localities (see Ruiz & Hines, 1997). This compilation of 88 species includes:

- species that may be confused with known NIS in Alaska;
- NIS known from western North America (especially those extending to higher latitudes);
- taxonomically difficult species and species complexes;
- biogeographic outliers; and
- range extensions.

For example, polychaete specimens of most *Boccardia* and *Polydora*, were removed for re-examination because for their resemblance to *Polydora ligni*. Similarly, capitellid and many syllid polychaetes were selected to check for the presence of *Barontolla americana*, *Capitella capitata*, and *Decamastus* spp. The gastropod slipper shell *Crepidula* was partitioned from the collections to check for *Crepidula fornicata* and *C. plana*. Specimens of the amphipod *Corophium* were selected to check for several NIS *Corophium* reported from Puget Sound. This original list was considered a working document and has been refined as the project has progressed (Table 9.E.1).

Table 9.E.1. Museum and Reference Samples Selected for Re-Examination

Family	Genus	Species	Specimen Source
Amphitoidae	Amphitoe	sp.	Jewett samples
Amphitoidae	Amphitoe	simulans	Jewett samples
Corophidae	Corophium	sp.	Jewett samples
Corophidae	Corophium	brevis	Jewett samples
Gammaridae	Melita	sp.	UAM uncataloged
Gammaridae	Gammarus	sp.	Jewett samples
Gammaridae	Jassa	sp.	Jewett samples
Gammaridae	Melita	dentata	UAM uncataloged
Cardiidae	Clinocardium	fucanum	Jewett samples
Glycymeridae	Glycymeris	septentrionalis	Jewett samples
Kelliidae	Pseudopythina*	compressa	Jewett samples
Kelliidae	Pseudopythina*	rugifera*	Jewett samples
Mytilidae	Dacrydium	vitreum*	Jewett samples
Mytilidae	Dacrydium	pacificum*	UAM cataloged
Ungulinidae	Diplodonta	orbella	Port Valdez uncataloged
Ungulinidae	Diplodonta	impolita	UAM cataloged
	Adontorhina	sp.	Jewett samples
	Cryptosula	okaidai	Jewett samples
Atyidae	Haminoea	virescens	Little Green Island
Atyidae	Haminoea	vesicula	PWS 98 samples
Atyidae	Haminoea	sp.	Jewett samples
Calyptraeidae	Crepidula	dorsata*	Jewett samples
Calyptraeidae	Crepidula	sp.	Jewett samples
Calyptraeidae	Crepidula	grandis	Jewett samples
Calyptraeidae	Crepidula	sp.	Jewett samples
Diaphanidae	Diaphana	minuta*	Jewett samples

Table 9.E.1. Continued

Diaphanidae	Diaphana	brunnea	Jewett samples
Diaphanidae	Diaphana	sp.	UAM cataloged
Fissurellidae	Puncturella	cooperi*	Jewett samples
Lacunidae	Lacuna	sp.	UAM cataloged
Lacunidae	Lacuna	vincta*	Jewett samples
Lacunidae	Lacuna	variegata*	UAM cataloged
Lacunidae	Lacuna	marmorata*	UAM cataloged
Lamellariidae	Velutina	sp.	UAM cataloged
Rissoidae	Barleeia	acuta*	Jewett samples
Scaphandridae	Cylichna	alba	UAM cataloged
Scaphandridae	Cylichna	occulta	UAM cataloged
Scaphandridae	Cylichna	sp.	UAM cataloged
Scaphandridae	Cylichna	attonsa	Jewett samples
Scaphandridae	Cylichnella	culcitella	Jewett samples
Scaphandridae	Cylichnella	harpa	Jewett samples
Scaphandridae	Cylichnella	sp.	Jewett samples
Turridae	Kurtziella	plumbea	Jewett samples
Turridae	Taranis	strongi	Jewett samples
Limnoriidae	Limnoria	lignorum	Jewett samples
Limnoriidae	Limnoria ?		Jewett samples
Capitellidae	Barantolla	americana	Jewett samples
Capitellidae	Barantolla	sp.	Jewett samples
Capitellidae	Capitella	sp.	Jewett samples
Capitellidae	Capitella	capitata	Jewett samples
Capitellidae	Decamastus	sp.	Jewett samples
Capitellidae	Decamastus	sp.	Jewett samples
Capitellidae	Heteromastus	sp.	Jewett samples
Capitellidae	Heteromastus	filliformis	Jewett samples
Capitellidae	Mediomastus	sp.	Jewett samples
Capitellidae	Notomastus	sp.	Jewett samples
Nereidae	Platynereis	bicanaliculata	Jewett samples
Polynoidae	Harmothoe	imbricata	Jewett samples
Spionidae	Malacoceros	sp.	Jewett samples
Spionidae	Nerine	cirratulus	Jewett samples
Spionidae	Polydora	sp.	Jewett samples
Spionidae	Polydora	cf P.bracycephalata	Jewett samples
Spionidae	Polydora	socialis	Jewett samples
Spionidae	Prionospio	cirrifera	Jewett samples
Spionidae	Prionospio	sp.	Jewett samples
Spionidae	Prionospio	steenstrupi	Jewett samples
Spionidae	Prionospio	malmgreni	Jewett samples
Spionidae	Pygospio	sp.	Jewett samples
Spionidae	Pygospio	elegans	Jewett samples
Spionidae	Rhynchospio	glutaeus	Jewett samples
Spionidae	Scolecipis	sp.	Jewett samples
Spionidae	Scolecipis	squamata	Jewett samples
Spionidae	Spio	cirrifera	Jewett samples
Spionidae	Spio	fillicornis	Jewett samples
Spionidae	Spio	sp.	Jewett samples
Spionidae	Spiophanes	berkeleyorum	Jewett samples
Spionidae	Spiophanes	bombyx	Jewett samples
Spionidae	Spiophanes	sp.	Jewett samples

Table 9.E.1. Continued

Spionidae	Sternopsis	scutata	Jewett samples
Syllidae	Typosyllis	armillaris	UAM uncataloged
Syllidae	Typosyllis	fasciata	Jewett samples
Syllidae	Typosyllis	harti	UAM uncataloged
Syllidae	Typosyllis	sp.	UAM uncataloged
			Jewett samples

Biological Technician Max Hoberg (UAF) used the suspect list to remove 1,154 specimens for screening: 154 crustaceans, 1081 polychaetes, 307 molluscs, 30 bryozoans. From these, specimens in the best condition were removed for further study. Thirty-five small crustacea were loaned to focal taxonomic expert J. Chapman (OSU), and similarly polychaete specimens were loaned to focal taxonomic expert J. Kudenov (UA Anchorage). Analyses of these specimens (presently on-going) will be reported in the 2000 final report for the University of Alaska Sea Grant.

9E3. Results

Mollusc Taxa, including One Known NIS

Most east Pacific records of the soft shell clam, *Mya arenaria*, are the result of its accidental introduction along with Atlantic oysters, starting in San Francisco Bay in 1869, and Puget Sound in 1888 or 1889. We found that the clam was abundant in mud sediments in Cordova. We also found it in Port Valdez, Tatitlek, Constantine Harbor, Homer and Seward. *Mya arenaria* is also documented in Alaska from Nunivak Island, Norton Sound, and Kodiak Island (UAM collection records) as well as southeastern Alaska.

Nora Foster examined mollusc specimens from both the EVOS specimens and cataloged and uncataloged specimens the UA Museum, selecting the following taxa for re-examination:

- small venerids and *Turtonia*, were examined as possibly misidentified specimens of potential NIS *Protamcorbicula amurensis*, *Veneropsis philipinarium*, or *Nuttalia obscurata*;
- small individuals of *Muscululus* spp. were reexamined as possibly misidentified specimens of the potential NIS *Musculista stehousei*;
- Cerithiidae were re-examined were reexamined as possibly misidentified specimens of the potential NIS *Battilaria*;
- *Ocenebrina* were reexamined as possibly misidentified specimens of the potential NIS *Urosalpinx cineria* and *Ocenebra inornata*, two introduced oyster drills; and
- *Crepidula* specimens were reexamined as possibly misidentified specimens of the potential NIS *Crepidula fornicata*.

None of these potential NIS taxa were found. However, to date it has been possible to examine carefully only a small subsample of the collections, and we are faced with the situation of there being too many samples and too little time.

University of Alaska Sea Grant funding for this analysis of existing museum and reference collections continues until June 30, 2000. The goals for this remaining time frame are to:

- Incorporate information from additional taxonomic experts and ecologists.

- Check database against additional grey literature sources (e.g., O'Clair & Zimmerman, 1987).
- Add to the database a biogeographical descriptor, indicating whether the PWS record represents a range extension, and a reference source for the animal's distribution.
- Publish with J. Goddard an analysis of our 1999 collections of opisthobranch molluscs of Prince William Sound (see also focal taxonomic subsection 9C8 Opisthobranch Molluscs, above).
- Incorporate of additional specimens collected as part of this assessment of EVOS collections into the UAM Aquatic Collection.

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