



4.12 Invasive Species

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4.12.1 Tanker Traffic

In 1998, the Smithsonian Environmental Research Center coordinated a study to assess the invasion of nonindigenous species associated with oil tanker traffic (particularly management of water ballast) in Prince William Sound (Hines and Ruiz, 2000). Tankers in Port Valdez released 17,000,000 m³ of segregated (non-oily) ballast water in 1998 — the third largest volume in any U.S. port. Most of the segregated ballast water (96 percent) released in Valdez comes from domestic ports. Of the domestic arrivals, 82.7 percent were from the ports of Puget Sound, San Francisco and Long Beach. Domestic tankers offload their ballast directly into Prince William Sound, whereas foreign tankers replace their coastal ballast water with an open-ocean exchange before they arrive.

On average, the total density of organisms was greater (10 and 100 times greater) in segregated ballast water from domestic ports compared to foreign arrivals. Total density of organisms in the ballast water decreased with increased travel duration. Fourteen nonindigenous species were identified in segregated ballast water in oil tankers arriving in Port Valdez. However, this is probably an underestimate because only a subset of the plankton can be identified to species and only the largest planktonic organisms were included in the analysis. All of the identified nonindigenous species were in ballast water from San Francisco Bay and Long Beach. These organisms have a high potential of initial survival in the seasonal cycles of salinity and temperature in Port Valdez.

A total of 15 nonindigenous species have been recorded in Prince William Sound. The majority of the species appear to be associated with boat harbors and aquaculture activities. Although several nonindigenous species are found in ballast water arriving in Port Valdez, none is clearly associated with ballast water of oil tankers as a primary means of introduction. Other means of transport were

recognized in the study. Some tanker hulls carried fouling organisms and bottom dwellers that were introduced with sediment drawn into the hold during ballasting.

4.12.2 Revegetation

Commercial grasses used for revegetation will introduce new or exotic species. This direct effect of revegetation almost always occurs and will very likely follow any seeding conducted to reduce the potential for erosion. The introduction of exotic plants with seed application, however, has been reduced as greater quality-control measures have been developed for producing seed mixtures for construction sites in arctic and subarctic environments. The result of introducing exotics on the North Slope and along the TAPS ROW has usually been benign and has not led to large-scale replacement of indigenous plant species.

Studies of the presence and distribution of introduced weed species along the TAPS ROW are discussed in detail in Section 4.3.2.2. As discussed there, most exotic species found were seeded grasses, with broad-leaved weeds (forbs) more common in the Interior south of TAPS MP 250. The numbers of exotic species were higher near human settlement, suggesting that introductions on the ROW were related to various human activities in the area and not just to revegetation.

Seeding the ROW with grasses — and other disturbances — may interfere with the recovery of natural vegetation on such sites. Generally, invasion by native plants was greater in locations where seeded grasses did not persist. Seeded indigenous gramminoids can also dominate open ground and prevent other species from recolonizing. Ideally, species used in revegetation to control erosion will establish easily but will be short-lived or poorly adapted to the environment and thus not compete with indigenous species.