

Appendix 17. Maritime and coastal activities to environmental factors matrix (March 2001 version)**Terms and definitions**

Aquaculture - The cultivation of aquatic organisms by human effort for commercial purposes. For the cultivation of marine organisms in seawater, the term 'mariculture' is also used. (Based on Baretta-Bekker *et al.*, 1992.).

- **Fin-fish** for example, Atlantic salmon, rainbow trout, turbot, halibut, and grey mullet.
- **Macro-algae** - for example, kelps (Laminarians), laver (*Porphyra* spp.), *Gracilaria* sp., dulse (*Palmaria palmata*), and carrageen (*Chondrus crispus*).
- **Shellfish** for example, mussels, oysters (native, Pacific and American), scallops, queen scallops, Manila clams and American clams.
- **Predator control**: control of predators for conservation or to protect fish farms. Gulls may be controlled around tern colonies. Fish farms may introduce control methods for heron, shag, cormorant, mink, otter, common and grey seals. Seals may also conflict with fishermen using inshore fixed nets.

Climate Change - natural and anthropogenic change in the climate. The climate of an area refers to the totality of weather conditions at a certain location for a certain period (conventionally 30 years).

- **Current change** - potential perturbation of the ocean currents due to global warming.
- **Sea level change** - increase in the average sea level over time, currently thought to be about 50cm by the year 2100, resulting in an increased potential flood risk and 'coastal squeeze'.
- **Temperature change** - general increase in air, seawater surface, and sea water temperature over time.
- **Weather pattern change** - changes in the patterns of season and rainfall, for example, it is thought that global warming will increase rainfall and general storminess in the temperate regions of the Northern Hemisphere.

Coastal defence: includes both sea defence and flood defence in coastal areas against inundation of land by seawater or fresh water. Defence measures vary from engineering solutions such as sea walls, breakwaters and revetments, beach re-charge to 'managed retreat'.

- **Barrages** - impermeable barriers built across estuaries or embayments. Amenity barrages are usually built to create artificial lakes for water sports or aesthetic property development (e.g. Cardiff Barrage). Storm surge barrages may be built across estuaries in built up areas to reduce the risk of flooding due to surge tides and are usually open to allow water flow (e.g. Thames Barrier). Tidal barrages are constructed across estuaries with strong currents and large tidal ranges to generate tidal energy (e.g. St Malo, France).
- **Beach replenishment** - addition of beach material (shingle, pebbles, or sand) from another location to combat erosion.
- **Groynes** - a wall or jetty built out from a riverbank or seashore to combat the effects of longshore drift and control erosion.
- **Sea walls** - for example, breakwaters, curved sea-walls, revetments, and rip-rap.

Collecting: includes commercial harvesting of living resources and collection of marine organisms for personal use or consumption but excludes fishing.

- **Bait digging** - collection of marine invertebrates (annelids, molluscs) for use as bait by anglers by digging on mud and muddy sand shores. In extreme cases, JCBs have been known to be used by commercial bait collectors.
- **Bird eggs** - collection of sea bird eggs e.g. gulls eggs (herring, lesser black-backed and greater black-backed and black headed gulls).

- **Curios** - collection of species as souvenirs, either for personal use by divers or for the curio (souvenir) trade. Species collected include, the common sea urchin (*Echinus esculentus*), sea fans (e.g. *Eunicella verrucosa* and occasionally *Swiftia pallida*), and 'white weed' (*Sertularia* spp.).
- **Higher plants** - e.g. collection of samphire (*Salicornia* spp.), rock samphire, sea-spinach and spear-leaved orache and sea-kale for human consumption; the cutting of turfs from saltmarsh; reeds (*Phragmites australis*) for thatching and various other plants such as seagrass, sea holly and the sea-pea.
- **Kelp & wrack harvesting** - commercial harvesting of kelp species, e.g. *Laminaria hyperborea* and wrack (fucoid) species, e.g. *Ascophyllum nodosum*.
- **Macro-algae** - includes the local collection of drift seaweed as a soil conditioner or fertiliser and collection for human consumption e.g. laver (*Porphyra* sp.) and carrageen (*Chondrus crispus*). This category excludes kelp and wrack (fucoid) species (see below).
- **Peelers (boulder turning)** - primarily directed at the collection of crabs. In some cases roofing tiles are laid on flats to attract peeler crabs (*Carcinus maenas* just before moulting) e.g. Teign Estuary.
- **Shellfish** - collection of shellfish such as razor shells, mussels, limpets, cockles, whelks, winkles, and mussels for consumption or use as bait (see above).

Development - property, industrial or other commercial development of coastal land or below the mean low water mark. Coastal land may be arbitrarily defined as land adjacent to the sea or areas of sea water influence such as estuaries and lagoons or areas whose climate is influenced by its proximity to the sea.

- **Construction phase** - includes the construction phase of coastal and offshore structures such as coastal defences, barrages, breakwaters, quays and terminals.
- **Artificial reefs** - any intertidal or subtidal man-made structure that offers new hard substrata for colonisation by marine organisms may be considered as artificial reefs. Barrages, marinas, docks, coastal defence structures, jetties, piers, breakwaters, outfalls, and artificial islands may incidentally act as artificial reefs. The use of deliberately constructed artificial reefs to attract or improve fisheries or reef communities is growing in popularity.
- **Communication cables** - underwater telecommunication cables for example telephone cables.
- **Culverting lagoons** - the building of culverts to divert, drain or otherwise change the water supply of coastal lagoons.
- **Dock/port facilities** - facilities and structures required for safe navigation of shipping, their maintenance, safe loading and unloading of cargo, including passengers and livestock. For example, quays, terminals (petroleum products, containers, general cargo, Ro-Ro), cranes, floating docks, dry dock, locks, berths for vessels.
- **Land claim** - reclamation of land from the sea or more often estuarine waters by the construction of dykes and in-fill of the area. For example, land may be reclaimed for the construction of new port terminals, disposal of dredged spoil or agriculture.
- **Marina** - specific areas for the berthing or mooring of pleasure craft together with waste reception facilities and other visitor support infrastructure (e.g. shops, toilets).
- **Oil / gas platforms** - extraction of oil and gas from undersea deposits usually by oil or gas drilling rigs. This activity includes subsequent transportation of oil / gas by pipeline together with disposal of drilling muds, accidental spills, and burn-off of waste gases.
- **Urban** - construction of housing and industrial estates on coastal land either through new developments or continued urban sprawl.

Dredging - removal of material from the seabed.

- **Capital dredging** - refers to the major works that include removal of material for construction of, for example, quays or new terminal facilities.
- **Maintenance dredging** - maintenance dredging refers to regular dredging to maintain navigation channels for shipping.

Energy generation - industrial plants for the generation of energy in the form of heat or primarily electricity.

- **Nuclear power stations** - electrical power generation from the heat liberated by nuclear fission.
- **Power stations** - power generation from the burning of non-renewable fossil fuels such as coal, oils, or gas.
- **Renewable (wind/tide/wave)** - developments to extract energy from renewable resources. For example coastal and offshore wind farms, underwater turbines, tidal barrages (see above), and wave power generation plants or pontoons.

Extraction - physical removal of non-renewable resources from marine or coastal resources.

- **Maerl** - dredging of calcareous maerl deposits (living or dead) for use as a soil conditioner, filtration media or in the pharmaceutical or cosmetic industry.
- **Sand/gravel** - coastal sand mining (e.g. from dunes) and aggregate dredging. Aggregate dredging of sand or gravel for the building industry from licensed offshore deposits.
- **Rock/minerals** - this includes coastal quarrying and dredging of metalliferous deposits on the seabed. Coastal quarries for granite, slate or coal along the coast.
- **Water resources:** activities that affect the water table, riverine flow and supply of freshwater into the marine environment, for example river water and groundwater abstraction for consumption and industry.

Fisheries / Shellfisheries - human activities directed towards the capture of fish or shellfish. The method used depends on the type of fish or shellfish sought.

- **Benthic trawls** - towing a net or 'dredge' (e.g. scallop dredge) along the seabed (bottom trawls) for example, the beam and otter trawls for demersal fish, shrimp and lobster and scallop dredge for scallops, oysters, clams and mussels. Trawls may be used in inshore waters (e.g. lochs and estuaries) as well as offshore.
- **Netting** - use of fixed nets (e.g. gill, tangle and trammel) or seine netting inshore or in estuaries.
- **Pelagic trawls** - towing a net through the water for example, pair and mid-water trawls for demersal cod and whiting and pelagic mackerel and herring. Trawls may be used in inshore waters (e.g. lochs and estuaries) as well as offshore.
- **Potting / creeling** - use of standard traps (pots or creels) attached to lines and left on the seabed for periods to catch shellfish, primarily lobsters, crawfish, and crabs but including spider crabs, velvet swimming crabs, shore crabs, squat lobsters and whelks.
- **Suction (hydraulic) dredging** - uses water jets to loosen sediment and the organisms are then 'sucked' up with the sediment slurry to the dredger. This method is often used to exploit bivalve beds such as, cockles, razor shells, and lugworms.

Recreation - Any pursuit in the maritime area designed for pleasure, amenity or tourism and includes diverse activities such as bathing, water-skiing, power boating, jet-skis, surfing, horse-riding, dog-walking and sailing.

- **Angling** - capture of fish by rod and line, usually on an individual basis, for example, bass, cod, whiting, sole, mackerel, mullet, eel, skate, flounder, pollack, sea bream, and blue shark. Spear fishing is also included in this category.

- **Boating** - - this includes recreational boating, e.g. inshore dinghy, sailing and small pleasure vessels as well as sea going yachts and power boats.
- **Dive site** - specified areas regularly visited by divers, for example, wrecks and reefs
- **Public beach** - a beach area frequented by members of the public e.g. for walking, dog-walking, sunbathing, bathing and horse-riding.
- **Tourist Resort** - any urban or residential development designed to accommodate, entertain, and attract tourists in a coastal area.
- **Water sports** - any sporting or recreational activity based on water e.g. jet skiing, surfing, wind surfing, swimming, bathing, and canoeing.

Uses - other activities or uses that are dependent on a coastal or maritime location.

- **Animal sanctuaries** - areas where potentially damaging activities are prohibited or regulated to protect specific species (activity zoning), e.g. wildfowl, bottle-nose dolphin and cup corals.
- **Archaeology** - this activity includes examination of marine wrecks by marine archaeologists as well as prospecting / searching for historic wrecks by diver teams, remote cameras and salvers.
- **Coastal forestry** - Afforestation of coastal land and subsequent management of the forest, including felling and replanting.
- **Coastal farming** - farms on coastal land or adjacent to coastal land. This activity includes grazing of saltmarsh and drift seaweeds by sheep, cattle, or horses.
- **Education/interpretation** - the use of the maritime area for education or raising public awareness. For example, school and university field courses, public interpretation centres, and Eco-tourism.
- **Military** - the use of the maritime area for military installations (dockyards), training and firing ranges together with areas used in military landing and low-flying exercises.
- **Mooring/beaching/launching** - includes moorings for recreational vessels and launching of small boats or jet-skis from slip-ways.
- **Research** - marine environmental and oceanographic research but also includes sample collection for laboratory research by universities and pharmaceutical companies.
- **Shipping** - this includes commercial shipping such as cargo vessels, Ro-Ro and container vessels, livestock and car carriers, ferries (including hovercraft) and passenger liners as well as tanker vessels designed to carry liquid or gaseous products, for example; petroleum and petroleum products (crude or refined oils.); liquefied gases (e.g. liquefied natural gas (LNG) and liquefied petroleum gas (LPG)) and chemicals (e.g. alumina, acids, methanol and bitumen); and liquid bulk (e.g. edible oils, fruit juices, and wine).

Waste - waste is generally regarded as material that is no longer required or fit for its original purpose and that has no alternative use. For example special and controlled hazardous wastes, packaging, oils, sewage and garbage.

- **Fisheries & agricultural wastes** - includes discarded fish/shellfish material (e.g. fish entrails) from fish/shellfish processing onshore or in factory ships, or direct discard over the side of vessels (e.g. by-catch). Agricultural wastes include high BOD waste discharges from abattoirs, which may enter the marine environment via rivers.
- **Industrial effluent discharge** - discharge from industrial processes directly or indirectly (airborne discharges) into the marine environment. This includes thermal and hyper-saline discharges.
- **Inorganic mine and particulate wastes** - this includes colliery waste discharges (mine tailings) from the coal, tin, copper mining, or alumina production together with inert particulate wastes from potash mines or china clay quarries.

- **Industrial / urban emissions (air)** - includes air emissions from industrial, chemical and pharmaceutical plants, domestic and industrial vehicles, aircraft and shipping (e.g. ferries). Air emissions may enter the marine environment due to fumigation or precipitation.
- **Land /waterfront runoff** - rainfall washes particulates and other contaminants from soil, industrial and urban developments and road surfaces. Contaminants and particulates may enter the coastal environment as runoff from waterfront developments or, predominately, via rivers.
- **Litter and debris** - marine litter from a variety of sources including for example shipping garbage, wind blown litter from land, fly tipping of wastes, accidental spillage from ships and discarded fishing gear.
- **Nuclear effluent discharges** - includes radioactive discharges from nuclear waste reprocessing plants and contaminated nuclear power plant cooling water.
- **Shipping wastes** - include discharges of ballast and bilge waters, hull flushings, sewage and garbage.
- **Spoil dumping** - the dumping at sea or on land of spoil from excavation or construction works, capital or maintenance dredging.
- **Sewage discharges** - direct discharge of sewage effluents from water treatment plants and untreated sewage. Also includes the dumping of sewage sludge and sewage discharges from shipping at sea.
- **Thermal discharges (cooling water)** - includes discharges of water of higher or lower temperature than ambient. Predominately discharge of water used for cooling in industrial plants and power stations at higher than ambient temperatures although some industrial processes, e.g. liquid gas production, discharge cooler water.

Other: activities not addressed above.

- **Removal of substratum:** for example because of beach cleaning after oil spills or due to erosion of the foreshore (beach or cliff).

