PROPOSED SURVEY METHODOLOGIES AND EQUIPMENT TO BE USED FOR EACH ECOLOGICAL SURVEY TYPE:

Fish and Shellfish	Fish and shellfish surveys will be undertaken using drop down video and diving survey techniques. Grab samples may be used to verify sightings. Exact survey methodologies and locations will be agreed with the consultant engaged to undertake the work. Surveys will be carried out seasonally over a two year period.
Ornithology	Land based visual surveys from selected vantage points will be carried out seasonally over an approximate 24 month period on the nearshore sites depending on appropriate weather conditions. The surveys could be completed using theodolite stations. The vantage point watch locations and methodology will be discussed and agreed with the National Parks and Wildlife Service (NPWS). Seasonal surveys over an approximate 24 month period will be undertaken using either boat based surveys or fixed wing aircraft depending on weather/availability. The offshore sites will be surveyed using standard transect survey methods. The exact methodology will be agreed with the consultant engaged to undertake the work. It is proposed that a methodology based on the seabirds at sea monitoring programme will be employed. Survey methods will be discussed with the NPWS. The surveys will most likely be carried out in conjunction with the marine mammal surveys. The surveys will be carried out by qualified observers.
Marine Mammal Surveys – Visual Surveys	Seasonal surveys over an approximate 24 month period will be undertaken using either boat based survey or fixed wing aircraft methods, depending on weather/availability. The surveys will most likely be carried out in conjunction with the ornithological surveys. The offshore sites will be surveyed using a standard transect survey methodology and monitoring could include towed hydrophonic acoustic array for marine habitat identification, classification and mapping. The exact methodology will be agreed with the consultant engaged to undertake the work. It is proposed that a methodology based on the seabirds at sea monitoring programme will be employed to survey for cetaceans in combination with seabird surveys.

	The surveys will be carried out by qualified observers.
Marine Mammal Surveys – Static Acoustic Monitoring	C-pods will be deployed in locations within the survey area, one located beside each wind lidar buoy. They will provide supplementary information to the visual surveys with regard to cetaceans. The devices will be deployed on the seabed using anchor or weights and weighted groundlines. The C-PODs will be recovered, serviced (including removing any biofouling, changing the memory card and replacing the batteries), and re-deployed approximately every four months, given an expected maximum battery life of 4 months. The surveys will have a small footprint and will have negligible impact on other foreshore users. The c-pods will record the echolocation clicks of porpoise and other cetaceans in the survey area.
Benthic – Drop-Down Video	Drop-down video survey techniques will be used to map the seafloor where depths are considered too deep to dive. Diving will only be permitted in water depths < 30m. High quality photographs will be taken of the general fauna in the survey area and their locations will be recorded by GPS. A number of sites will be surveyed within the survey area and this will be agreed with the consultant in advance. Samples for water quality will be taken at all benthic survey locations.
Benthic – Soft-Bottom Survey	A grab sampler will be used to survey soft sediment areas for fauna and sediment. The grab sampling will be carried out from a suitable vessel. Standard methods and procedures will be followed. The grab gear will be deployed after the drop-down video equipment has been recovered and where possible all drop-down video stations will most likely be sampled using the grab. Various weights can be added to the grab depending on the sediment type. The location of each sampling site will be recorded using DGPS. Samples will be sieved, analysed, recorded and stored in solution and photographs will be taken of each sample. Sediment samples will undergo grain size analysis.
Benthic – Hard-Bottom Survey	A vessel which can access shallow water depths will be used for hard-bottom surveys. If water depths allow (<30m), the hard – bottomed reef areas may be surveyed by diving.

	A portable derrick and winch will be present on the vessel to allow for the deployment and recovery of equipment. Major taxa and general abundances will be recorded to accepted JNCC or equivalent standards. High quality still photographs will be taken of the general fauna.
Intertidal and Shore Surveys	Intertidal Habitats will be surveyed using replicate core samples across transects of the area. Cores will be analysed for in-faunal species.

The surveys including final location of equipment would be agreed in advance with the relevant authorities.