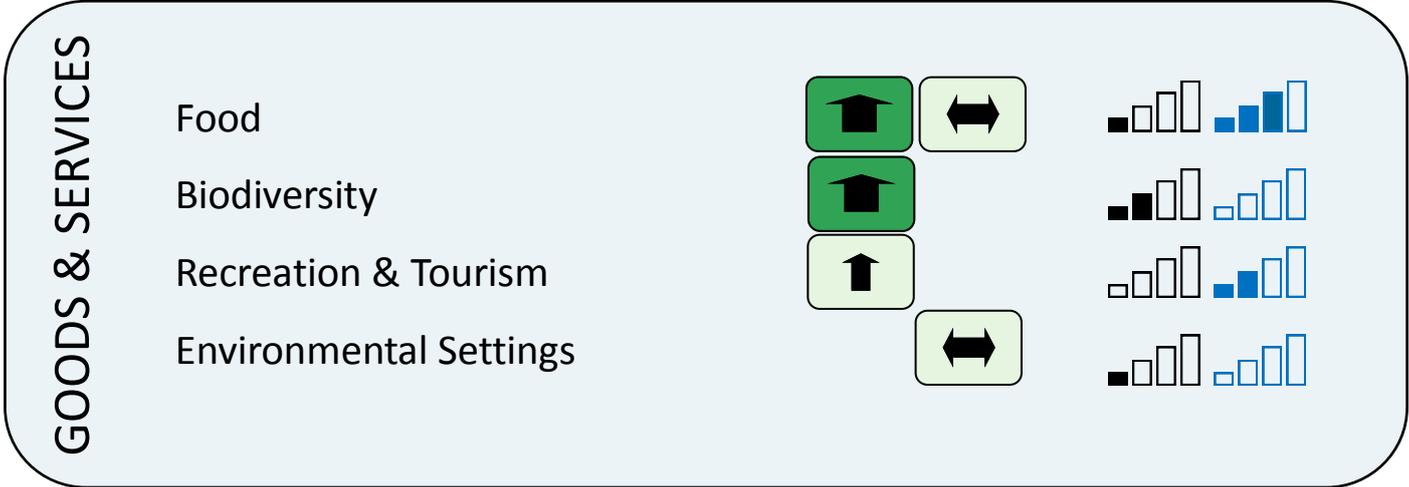


Establish areas where certain types of fisheries are prohibited or restricted

MANAGING ECOSYSTEM SERVICES

COASTAL & MARINE

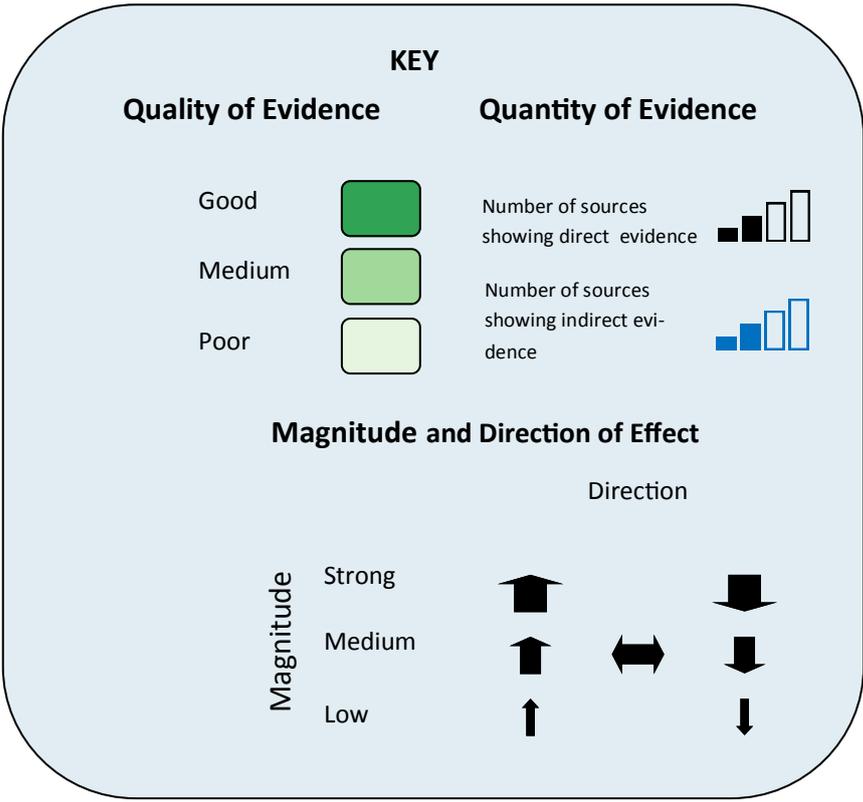
IMPLEMENT MARINE NO-TAKE ZONES



These pages represent a review of the available evidence linking management of habitats with the ecosystem services they provide. It is a review of the published peer-reviewed literature and does not include grey literature or expert opinion. There may be significant gaps in the data if no published work within the selection criteria or geographical range exists. These pages do not provide advice, only review the outcome of what has been studied.

Full data are available in electronic form from the [Evidence Spreadsheet](#).

Data are correct to March 2015.



MANAGING ECOSYSTEM SERVICES

COASTAL & MARINE

IMPLEMENT MARINE NO-TAKE ZONES

Provisioning Services—providing goods that people can use.

Cultural Services—contributing to health, wellbeing and happiness.

Regulating Services—maintaining a healthy, diverse and functioning environment.

PROVISIONING

Food: Strong Evidence:— A review of temporary or permanent closure of some areas to fisheries shows a generally positive outcome for fish stocks¹. However, the benefits are dependent on species distribution, migration and recruitment. In some cases, the complexity of trying to assess whether there is spill-over from a reserve into a fishery is too difficult to model properly². A model based on empirical data however shows that despite some short-term economic loss, benefits from no-take zones can be seen in as little as five years³. The exclusion of towed demersal fishing gear from Lyme Bay Marine Protected Area (MPA) resulted in increases in species richness and total abundance within three years, including a range of economically important species⁴. Within the Lundy no take zone (NTZ), there was a rapid increase in the abundance and sizes of lobsters which resulted in spill-over of sublegal sized lobsters into the adjacent fishery⁵. In the Mediterranean, tagged individuals of *Palinurus elephas* (the spiny lobster) were found up to 50 km from the centre of the marine reserve indicating good dispersion. The local catch is significantly enhanced by the presence of the NTZ⁶. Voluntary fishing agreements, such as the Inshore Potting Agreement (IPA) were analysed with respect to their effect on commercial fisheries⁷. The study found that where towed gear was prohibited and there was a use of static gear only, there was a significantly higher species richness and biomass of benthic communities. A historical review of the Firth of Clyde shows how closure of the fishery aided recovery, but re-opening it led to rapid decline in most commercial species⁸. Much of the North Sea is trawled too frequently to recover back to pristine levels of biomass and production, with recovery times estimated to be 2.5-6 years⁹. Short term to long term reduction of trawling in certain areas is recommended. Trawling affects some areas of the North Sea more than others. Habitat sensitivities varied widely, and a trawling frequency of 5 year⁻¹ in the least-sensitive habitat had the same ecological effect as a trawling frequency of 0.3 year⁻¹ in the most-sensitive habitat (based on production)¹⁰. A redirection of trawling effort from the most sensitive to the least sensitive areas would result in a reduced impact on biomass and production. This is supported by evidence that shows that repeated fishing of the same area has a reduced impact compared with fishing new areas and that patchiness of fishing is important for maintaining vulnerable species and habitats¹¹. For sedentary species such as the scallops, animals within protected areas were heavier and more abundant than adjacent fished areas¹². However, a different study found no difference between scallop density in fished and unfished areas, and suggested that natural disturbance was a greater driver of abundance¹³.

Biodiversity: Strong Evidence:- Following the exclusion of demersal fishing gear from a marine protected area in Lyme Bay, the protected reef was found to extend beyond the normal expected boundaries showing that 'reef' species assemblages could extend into bottom sediment areas with benefits for biodiversity of the site¹⁴. The exclusion area also had a highly positive effect on biodiversity with the net export of species to the adjacent fished area⁴. The creation of a no take zone North of Gotland in the Baltic Sea showed clear benefits for the flatfishes *Scophthalmus maximus* (Turbot) and *Platichthys flexus* (Flounder) within the NTZ, but there was no evidence to show that there was a net export into the commercially fished area¹⁵. Mobile fishing gear was excluded from a 2 km² area off the Isle of Man, previously used as a scallop fishery¹⁶. The closure of the site has allowed scallops to increase in size and numbers. Closures to mobile fishing gear are better studied than those on static gear, and a study from Lundy looked at the effect on benthic assemblages of a ban on all fishing¹⁷. It found that there was no net change in the benthic communities following the ban, and suggests that bans on static gear have no conservation benefits.

Recreation and Tourism: Strong Evidence:- A study on the monetary valuation of tourism in Lyme Bay shows a clear benefit for those areas with the potential for the creation of marine protected areas as they show higher levels of diversity for tourism. This could lead to a significant increase of economic value for the area¹⁸. The economic value of fisheries often dominates the decisions on marine management plans. One review however suggests that other non-extractive uses such as tourism (diving, kayaking, seabird watching) have the same potential value and should be considered as such when planning marine management¹⁹. A business model for marine reserves in tropical and temperate waters shows that the net benefits of marine reserve creation in terms of enhanced adjacent fisheries and tourism exceed the pre-reserve value and that economic benefits can be seen within five years²⁰. **Moderate Evidence:-** A study from Malta suggests that most fishermen feel they have not benefitted from a fisheries management zone, and that only the recreational fishery has benefitted²¹. **Weak Evidence:-** In a study of a large temperate towed fishing gear exclusion area, the size of trophy fish was found to have increased²². This could potentially benefit a sport fishing industry, but these fish would be vulnerable to declines.

Environmental Settings: Moderate Evidence:- In a study from Malta, local fishermen felt that the fisheries management zone did not support their livelihoods and had a negative impact on their income and wellbeing²¹. **Weak Evidence:-** In a willingness to pay survey, people's attitudes towards different marine taxa were analysed²³. Mammals and fish were highly valued in the Azores, while on the Isles of Scilly a low value was put on fish while a high value was put on algae and marine mammals. In Gdansk, Poland, the order of preference was marine mammals>fish>birds>invertebrates & algae.

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