Republic of the Philippines
Department of Agriculture
BUREAU OF FISHERIES AND AQUATIC RESOURCES
Regional Fisheries Office No. 6
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Seagrass Damage Assessment of Nueva Valencia, Guimaras

I) Introduction

Seagrass beds are a discrete community dominated by flowering plants with roots and rhizomes (underground stems), thriving in slightly reducing sediments and normally exhibiting maximum biomass under conditions of complete submergence. In the Philippines, they grow best near estuaries and lagoons where they are often associated, physically and ecologically, with mangrove forests and coral reefs, often forming the ecotone between these two divergent ecosystems (PNSC, 2004).

The oil spill in Guimaras last August 11, 2006 has affected the fragile marine ecosystems of the Municipalities of Sibunag, San Lorenzo and Nueva Valencia. The main purpose of the assessment was to determine the nature and extent of damage on seagrass beds in the affected coastal areas as basis for the formulation of a comprehensive rehabilitation plan.

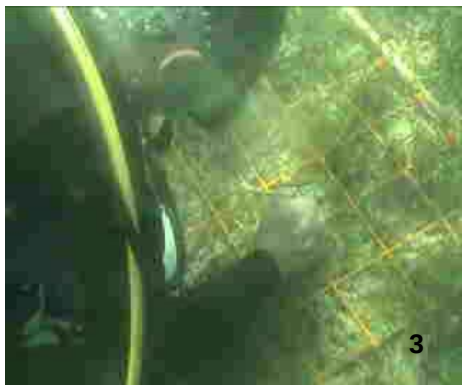
II) Methodology

1. The field survey of the seagrass beds was carried out last September 7-9, 2006 using the standard line transect and quadrat methods patterned after Australian Institute of Marine Science (English et. Al, 1994) to gather baseline information regarding the status of the seagrass beds.
2. The following parameters were gathered:
    - seagrass percentage cover
    - shoot density
    - blade density
    - biomass
    - species composition
    - ocular observation of direct impact by the oil spill.
3. A 100 meter transect line was laid perpendicular to the shore starting from the low water mark and up to a maximum of 100 meters seaward.
4. A 50 cm x 50 cm quadrat divided into 25 equal squares was used to determine the cover and the density of the seagrasses. For this method, percentage of seagrass is determined by the amount of substratum covered using the Saito and Atobe's class intervals for assessment of seagrasses (English et al, 1994). Percentage cover in each square per row was determined using the following scale:

Class	Amount of Substratum Covered	% Substratum Covered	Mid-Point %
0	0	0	0
1	0 – 1/16	< 6.25	3.13
2	1/16 – 1/8	6.25 – 12.5	9.36
3	1/16 – 1/8	12.5 – 25	18.75
4	¼ - ½	25 – 50	37.5
5	> ½	50 - 100	75

Table 1. Class interval for assessment of seagrass cover using a gridded quadrat by Saito and Atobe (1970).

5. As for the shoot density, the number of shoots found within one of the four quadrats was counted. While for the blade density, seagrass samples were harvested within 3 10 cm x 10 cm squares. The blades were counted and their wet weights (biomass) were determined at the laboratory.
6. As for the impact of the oil spill to the seagrass beds, this was determined by the presence or absence of oil slick smothering the seagrass beds.
7. The macro benthic fauna such as echinoderms and mollusks found within the belt transect were also listed down.



Figures 1 and 2. Assessment of the seagrass beds using the line quadrat method

III) Surveyed areas

The assessment covered the coastal areas that were heavily affected by the oil spill specifically in Brgy. Igdarapdap, Sitio Tamsik, Unisan Island, Panobolon and Yeto Islets.

IV) Gaps

1. Due to limited logistics, time constraint and health hazard to prolonged exposure to the bunker fuel, only one sample transect was carried out in every site.
2. There are no secondary data on the sites covered.

V) Present Intervention

Spill booms were deployed in some of the coastal areas to prevent the bunker oil from reaching the shore where mangroves and seagrasses thrive. However, the deployed spill booms were not enough to cover the whole coastal area.

VI) Result and Discussion

From initial field survey results covering all sites, there were no apparent direct impacts of the spill to the seagrass beds such as the presence of oil coatings or smothering observed. No direct evidence of mortality of seagrasses due to oil cover or asphyxiation. Most of the oil spills were observed along the mangrove areas and shoreline at the high tide levels. It was also observed that the sea grass beds tend to start almost 20 meters from the highest tide mark extending seaward. From interviews with the local community members, it was reported that the oil spill reached their shores during high tide level which spared the seagrass beds from being covered by the oil spill.

The results of the percentage cover or shoot density did not show a drastic changes as compared to the survey done by the SMISLE Program last July 14-26, 1995 in other areas in Guimaras. Since there is no available baseline information in the 5 survey sites, it is not also conclusive that any changes of its composition, cover and density are attributed to the recent oil spill.

However, upon inspection of the shoreline, it was observed that the bunker oil has seeped into the sediments almost 30 cm deep such areas in Tamsik, Panobolon Island and Unisan Island. This may cause changes to the environmental conditions which may affect the growth of seagrass beds in the intertidal areas. Other possible long term effects of oil is the incorporation of sublethal amounts of petroleum components into the plant tissues which may lower the plant's tolerance to natural or man made stresses.

Figure 3. Bunker oil seeped almost 30 cm into the sediments on the intertidal zone.

Figure 4. Bunker oil on the rocks.

V) Recommendation

From the results of the field survey, it is highly recommended the following:

1. Conduct regular monitoring of sea grass beds in terms of its cover, density and species composition which may be attributed to long term effects of the oil spill.

This may be conducted at 3 months intervals minimum of 1 year. This will cover the different monsoon seasons that may affect the growth of the sea grass beds.

2. Established monitoring stations in heavily affected areas as well as areas that have not been affected by the spill which will serve as comparison (control site).
3. Fish composition and macro invertebrate surveys should be incorporated in the monitoring in order to determine if there are changes in the sea grass fauna population, taking note of indicator species such as the echinoderms and mollusks.
4. Meiofaunal studies must also be undertaken to determine if there are peripheral effects of the oil seeping into the substrates.
5. Increase the number of sampling sites and the number of transects per area.

VI) Team Members

The seagrass survey team members are the following:

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VII) References

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