3.7 Marine Vegetation

Supplemental Environmental Impact Statement/ Overseas Environmental Impact Statement Northwest Training and Testing

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3.7 Marine Vegetation

3.7.1 Affected Environment

For purposes of this Supplemental Environmental Impact Statement/Overseas Environmental Impact Statement (EIS/OEIS) (Supplemental), the region of influence for marine vegetation remains the same as that identified in the 2015 Northwest Training and Testing (NWTT) Final EIS/OEIS.

3.7.1.1 General Threats

Following a review of recent literature, the existing conditions of marine habitats in the Study Area as listed in the 2015 NWTT Final EIS/OEIS have not appreciably changed. As such, the information presented in the 2015 NWTT Final EIS/OEIS remains valid.

3.7.1.2 Marine Vegetation Groups and Distribution

A literature review found that the information on marine vegetation groups in the Study Area have not substantially changed from what is shown in the 2015 NWTT Final EIS/OEIS. As such, the information presented in the 2015 NWTT Final EIS/OEIS remains valid for the following marine vegetation groups: phylum Dinophyta [dinoflagellates], phylum Cyanobacteria [blue-green algae], phylum Chlorophyta [green algae], phylum Heterokontophyta [brown algae], phylum Rhodophyta [red algae], diatoms, and phylum Spermatophyta [seagrasses and cordgrasses]).

Some of the vegetated habitats, such as eelgrass beds, are Essential Fish Habitat (EFH) and protected under the Magnuson-Stevens Fishery Conservation and Management Act, which was reauthorized and amended by the Sustainable Fisheries Act in 1996.

3.7.2 Environmental Consequences

In the Proposed Action for this Supplemental, some modifications have been made to the quantity and type of explosive stressors under the two action alternatives. New activities being proposed; high-energy lasers (Energy stressor), as described in Section 3.0.3.3.2.2 (High-Energy Lasers); and biodegradable polymer (Entanglement stressor), as described in Section 3.0.3.5.3 (Biodegradable Polymer) would not impact marine vegetation and therefore do not change the stressors analyzed or the results of the analyses presented in the 2015 NWTT Final EIS/OEIS.

The 2015 NWTT Final EIS/OEIS considered training and testing activities proposed to occur in the Study Area that may have the potential to impact marine vegetation. The stressors applicable to marine vegetation in the Study Area include the same stressors considered in the 2015 NWTT Final EIS/OEIS:

- **Explosive** (in-air explosions, in-water explosions)
- **Physical disturbance and strike** (vessels and in-water devices, military expended materials, seafloor devices)
- **Secondary** (impacts associated with sediments and water quality)

This section evaluates how and to what degree potential impacts on marine vegetation from stressors described in Section 3.0 (Introduction) may have changed since the analysis presented in the 2015 NWTT Final EIS/OEIS was completed. Proposed training and testing activities, the number of times each activity would be conducted annually, and the locations within the Study Area where the activity would typically occur under each alternative are presented in Tables 2.5-1, 2.5-2, and 2.5-3 in Chapter 2 (Description of Proposed Action and Alternatives). The tables also present the same information for

activities described in the 2015 NWTT Final EIS/OEIS so that the proposed levels of training and testing under this Supplemental can be easily compared.

The analysis presented in this section also considers standard operating procedures described in Section 2.3.3 (Standard Operating Procedures) and mitigation measures that are described in Chapter 5 (Mitigation) and analyzed in Appendix K (Geographic Mitigation Assessment). These procedures and measures include the use of lookouts or observers to observe for additional biological resources, such as floating vegetation. The term "floating vegetation" refers specifically to floating concentrations of detached kelp paddies and *Sargassum*. The Navy observes for these additional biological resources to protect Endangered Species Act-listed species or to offer an additional layer of protection for marine mammals and sea turtles. The Navy would implement these measures to avoid potential impacts on marine vegetation from stressors associated with the proposed training and testing activities.

3.7.2.1 Explosive Stressors

3.7.2.1.1 Impacts from Explosives

As stated in the 2015 NWTT Final EIS/OEIS, the potential for an explosion to injure or destroy marine vegetation would depend on the amount of vegetation present, the number of munitions used, and their net explosive weight. In areas where marine vegetation and locations for explosions overlap, marine vegetation on the surface of the water, in the water column, or rooted in the seafloor may be impacted. Seafloor macroalgae and single-celled algae may overlap with underwater and sea surface explosion locations. If these vegetation types are near an explosion, only a small number of them are likely to be impacted relative to their total population level. Also, some seafloor macroalgae are resilient to high levels of wave action (Mach et al., 2007), which may aid in their ability to withstand underwater explosions that occur near them. Underwater explosions also may temporarily increase the turbidity (sediment suspended in the water) in nearby waters, incrementally reducing the amount of light available to marine vegetation. Reducing light availability temporarily decreases the photosynthetic ability of marine vegetation.

3.7.2.1.1.1 Impacts from Explosives Under Alternative 1

Impacts from Explosives Under Alternative 1 for Training Activities

As shown in Table 3.0-7, the number of explosions would increase for E1, E2, and E5 explosives, but decreases for E12 explosives compared to levels presented in the 2015 NWTT Final EIS/OEIS. The activities would occur in the same locations and in a similar manner as were analyzed previously, with underwater detonations typically occurring in waters greater than 200 ft. in depth and greater than 50 nautical miles (NM) from shore, with the exception of mine countermeasure and neutralization testing proposed in the Offshore Area, and existing mine warfare areas in Inland Waters (e.g., Crescent Harbor and Hood Canal Explosive Ordnance Disposal Training Ranges).Therefore, the impacts to marine vegetation would be the same. As stated in the 2015 NWTT Final EIS/OEIS, underwater and surface explosions conducted for training activities are not expected to cause population-level impacts on seagrasses because (1) the impact area of underwater explosions is very small (localized) relative to seagrass distribution; (2) the training would occur in previously disturbed areas; (3) the low number of charges reduces the potential for impacts; and (4) disturbance would be temporary and dependent upon the level of sediment redistributed, the amount of time it takes the sediment to settle, and the amount of light that reaches the disturbed area. Based on these factors, potential impacts on marine algae and vegetation from underwater and surface explosions are not expected to result in detectable changes to growth, survival, or propagation that would result in population-level impacts.

Pursuant to the EFH requirements of the Magnuson-Stevens Fishery Conservation and Management Act and implementing regulations, the use of explosives during training activities under Alternative 1 may have an adverse effect on EFH by reducing the quality and quantity of marine vegetation that constitutes EFH or Habitat Areas of Particular Concern (HAPC). Impacts on attached macroalgae is determined to be minimal and temporary to long term throughout the Study Area and minimal and long term (stressor duration or recovery in more than 3 years but less than 20 years) on submerged rooted vegetation beds.

Impacts from Explosives Under Alternative 1 for Testing Activities

As shown in Table 3.0-7, the number of explosions would increase for E1, E7, E8, and E11 explosives, but decreases for E4 explosives compared to levels presented in the 2015 NWTT Final EIS/OEIS. The activities that use explosive munitions would occur in the same general locations and in a similar manner as previously analyzed in the 2015 NWTT Final EIS/OEIS, with one exception. A new mine countermeasure and neutralization testing activity would occur in the Offshore Area approximately two times per year and would use explosives within the water column (see Chapter 2, Description of Proposed Action and Alternatives). This activity would occur closer to shore than other activities analyzed in the 2015 NWTT Final EIS/OEIS that involved the use of in-water explosives in the Offshore Area. Although this activity would occur closer to shore, it would typically occur in water depths greater than 100 feet (beyond the maximum extent of kelp beds). Therefore, the impacts would remain the same as stated in the 2015 NWTT Final EIS/OEIS. Underwater and surface explosions conducted for testing activities are not expected to cause population-level impacts on seagrasses because (1) the impact area of underwater explosions is very small (localized) relative to seagrass distribution; (2) the low number of charges reduces the potential for impacts; and (3) disturbance would be temporary and dependent upon the level of sediment redistributed, the amount of time it takes the sediment to settle, and the amount of light that reaches the disturbed area. Based on these factors, potential impacts on marine algae and vegetation from underwater and surface explosions are not expected to result in detectable changes to growth, survival, or propagation that would result in population-level impacts.

Pursuant to the EFH requirements of the Magnuson-Stevens Fishery Conservation and Management Act and implementing regulations, the use of explosives during testing activities under Alternative 1 may have an adverse effect on EFH by reducing the quality and quantity of marine vegetation that constitutes EFH or HAPC. Impacts on attached macroalgae is determined to be minimal and temporary to long term throughout the Study Area and minimal and long term (stressor duration or recovery in more than 3 years but less than 20 years) on submerged rooted vegetation beds.

3.7.2.1.1.2 Impacts from Explosives Under Alternative 2

Impacts from Explosives Under Alternative 2 for Training Activities

The quantity of explosives used during training activities under Alternative 2 would increase compared to levels presented above for Alternative 1 (Table 3.0-7) and levels presented in the 2015 NWTT Final EIS/OEIS. The activities would occur in the same locations and in a similar manner as were analyzed previously, with underwater detonations typically occurring in waters greater than 200 ft. in depth and greater than 50 NM from shore, with the exception of mine countermeasure and neutralization testing proposed in the Offshore Area, and existing mine warfare areas in Inland Waters (e.g., Crescent Harbor and Hood Canal Explosive Ordnance Disposal Training Ranges). Therefore, the impacts to marine vegetation would be the same as described above under Alternative 1 and in the 2015 NWTT Final EIS/OEIS. Impacts of explosions that exceed natural disturbance intensities may uproot plants and damage substrates, which would delay recovery; however, the Navy reduces impacts on overall

vegetation communities by using previously disturbed areas for training. Therefore, potential impacts on marine algae and vegetation from underwater and surface explosions are not expected to result in detectable changes to growth, survival, or propagation that would result in population-level impacts.

Pursuant to the EFH requirements of the Magnuson-Stevens Fishery Conservation and Management Act and implementing regulations, the use of explosives during training activities under Alternative 2 may have an adverse effect on EFH by reducing the quality and quantity of marine vegetation that constitutes EFH or HAPC. Impacts on attached macroalgae is determined to be minimal and temporary to long term throughout the Study Area and minimal and long term (stressor duration or recovery in more than 3 years but less than 20 years) on submerged rooted vegetation beds.

Impacts from Explosives Under Alternative 2 for Testing Activities

The quantity of explosives used during testing activities under Alternative 2 would be the same as Alternative 1 (Table 3.0-7), but would decrease from 148 to 129 explosives compared to levels presented in the 2015 NWTT Final EIS/OEIS. The activities that use explosive munitions would occur in the same general locations and in a similar manner as previously analyzed in the 2015 NWTT Final EIS/OEIS, with one exception. A new mine countermeasure and neutralization testing activity would occur in the Offshore Area approximately two times per year and would use explosives within the water column (see Chapter 2, Description of Proposed Action and Alternatives). This activity would occur closer to shore than other activities analyzed in the 2015 NWTT Final EIS/OEIS that involved the use of in-water explosives in the Offshore Area. Although this activity would occur closer to shore, it would typically occur in water depths greater than 100 feet. Therefore, the impacts to marine vegetation under Alternative 2 would be the same as those described above under Alternative 1 and in the 2015 NWTT Final EIS/OEIS.

Pursuant to the EFH requirements of the Magnuson-Stevens Fishery Conservation and Management Act and implementing regulations, the use of explosives during testing activities under Alternative 2 may have an adverse effect on EFH by reducing the quality and quantity of marine vegetation that constitutes EFH or HAPC. Impacts on attached macroalgae is determined to be minimal and temporary to long term throughout the Study Area and minimal and long term (stressor duration or recovery in more than 3 years but less than 20 years) on submerged rooted vegetation beds.

3.7.2.1.1.3 Impacts from Explosives Under the No Action Alternative

Under the No Action Alternative, proposed training and testing activities would not occur. Explosive stressors, as listed above, would not be introduced into the marine environment. Therefore, existing environmental conditions would either remain unchanged or would improve slightly after cessation of ongoing training and testing activities.

Discontinuing the training and testing activities would result in fewer explosive stressors within the marine environment where training and testing activities have historically been conducted. Therefore, discontinuing training and testing activities under the No Action Alternative would lessen the potential impacts from explosive stressors on marine vegetation, but would not measurably improve growth, survival, or status of marine vegetation populations.

3.7.2.2 Physical Disturbance and Strike Stressors

This section analyzes the potential impacts on marine vegetation of the various types of physical disturbance and strike stressors during training and testing activities within the Study Area. Three types

of physical disturbance and strike stressors are evaluated for their impacts on marine vegetation, including (1) vessels and in-water devices, (2) military expended materials, and (3) seafloor devices.

The evaluation of the impacts of physical disturbance stressors on marine vegetation focuses on proposed activities that may cause vegetation to be damaged by an object that is moving through the water (e.g., vessels and in-water devices), or dropped to the seafloor (e.g., military expended materials), or dropped to the seafloor and recovered (e.g., seafloor devices such as anchors). Not all activities are proposed to occur throughout the entire Study Area. Wherever appropriate, specific geographic areas of potential impact are identified within the Study Area boundaries.

3.7.2.2.1 Impacts from Vessels and In-Water Devices

As described in the 2015 NWTT Final EIS/OEIS, the potential impacts of Navy vessels used during training and testing activities on marine vegetation are based on the vertical distribution of the vegetation, and vessel disturbance of marine vegetation would be limited to floating marine algae. Vessel movements may disperse or injure algal mats. Training and testing activities would be on a small spatial scale, and because algal distribution is patchy, mats may re-form. Navy training and testing activities involving vessel movement would not impact the general health of marine algae; the impact would be minimal relative to their total population level.

3.7.2.2.1.1 Impacts from Vessels and In-Water Devices Under Alternative 1

Impacts from Vessels and In-Water Devices Under Alternative 1 for Training Activities

Under Alternative 1, the combined number of proposed training activities involving the movement of vessels and the use of in-water devices would increase (Table 3.0-12 and Table 3.0-13) compared to those proposed in the 2015 NWTT Final EIS/OEIS. The activities would occur in the same locations and in a similar manner as were analyzed previously. Vessel movement would decrease slightly in the Offshore Area (from 1,156 to 1,144 annual activities) and in the Inland Waters (from 368 to 327), so there would still be a net decrease in the Study Area. There is an overall increase in the use of in-water devices (Table 3.0-13), all of which are associated with small, slow-moving unmanned underwater vehicles. The proposed increase of approximately 104 in-water devices would not change the conclusion presented in the 2015 NWTT Final EIS/OEIS.

As stated in the 2015 NWTT Final EIS/OEIS, the impact of vessels and in-water devices on marine vegetation would remain inconsequential because impacts are expected to be short term and temporary, based on (1) the quick recovery of most vegetation types; (2) the short-term nature of most vessel movements and local disturbances of the surface water, with some temporary increase in suspended sediment in shallow areas; (3) the deployment of in-water devices at depths where they would not likely come in contact with marine vegetation; and (4) the implementation of Navy protective measures. Based on these factors, potential impacts on marine algae and vegetation from physical disturbance and strike are not expected to result in detectable changes to growth, survival, or propagation that would result in population-level impacts.

Pursuant to the EFH requirements of the Magnuson-Stevens Fishery Conservation and Management Act and implementing regulations, the use of vessels and in-water devices during training activities under Alternative 1 would have no impact on attached macroalgae or submerged rooted vegetation that constitutes EFH or HAPC.

Impacts from Vessels and In-Water Devices Under Alternative 1 for Testing Activities

Under Alternative 1, the combined number of proposed testing activities involving the movement of vessels and the use of in-water devices (Table 3.0-12 and Table 3.0-13) would increase compared to those proposed in the 2015 NWTT Final EIS/OEIS. Vessel movement would increase in the Offshore Area (from 181 to 283 annual activities), and increase slightly in the Inland Waters (from 916 to 918) and in the Western Behm Canal (60 to 63).

There is also an overall increase in the use of in-water devices during testing activities in the Study Area (Table 3.0-13), all of which are associated with small, slow-moving, and unmanned underwater vehicles. The number of testing activities increases in the Offshore Areas (156 to 215), Inland Waters (576 to 664), and in the western Behm Canal (8 to 19). The proposed increase of in-water devices would not change the conclusion presented in the 2015 NWTT Final EIS/OEIS. The activities would occur in the same locations and in a similar manner as were analyzed previously. In spite of these increases, and as described in the 2015 NWTT Final EIS/OEIS, these vessel and in-water device activities remain unlikely to impact marine vegetation. The proposed net increase of vessel and in-water device activities combined would not change that conclusion. As stated in the 2015 NWTT Final EIS/OEIS, the impact of vessels and in-water devices on marine vegetation would be inconsequential for the same reasons presented above for training activities. Based on these factors, potential impacts on marine algae and vegetation from physical disturbance and strike are not expected to result in detectable changes to growth, survival, or propagation that would result in population-level impacts.

Pursuant to the EFH requirements of the Magnuson-Stevens Fishery Conservation and Management Act and implementing regulations, the use of vessels and in-water devices during testing activities under Alternative 1 would have no impact on attached macroalgae or submerged rooted vegetation that constitutes EFH or HAPC.

3.7.2.2.1.2 Impacts from Vessels and In-Water Devices Under Alternative 2

Impacts from Vessels and In-Water Devices Under Alternative 2 for Training Activities

Under Alternative 2, the combined number of proposed training activities involving the movement of vessels and the use of in-water devices would be slightly greater than Alternative 1 (Table 3.0-12 and Table 3.0-13) and greater than those proposed in the 2015 NWTT Final EIS/OEIS. Vessel movement would increase in the Study Area compared to Alternative 1 (1,471 for Alternative 1 compared to 1,658 for Alternative 2), and increases (1,524 to 1,658) compared to levels presented in the 2015 NWTT Final EIS/OEIS (Table 3.0-12).

There would also be a slight total increase in the use of in-water devices compared to Alternative 1 (600 for Alternative 1 compared to 620) and an increase from levels presented in the 2015 NWTT final EIS/OEIS (496 to 620) (Table 3.0-13). All of the increased in-water device activities are associated with small, slow-moving unmanned underwater vehicles. The proposed increase of in-water devices would not change the conclusion presented in the 2015 NWTT Final EIS/OEIS. As stated in the 2015 NWTT Final EIS/OEIS, the impact of vessels and in-water devices on marine vegetation would remain inconsequential because impacts are expected to be short term and temporary based on (1) the quick recovery of most vegetation types; (2) the short-term nature of most vessel movements and local disturbances of the surface water, with some temporary increases in suspended sediment in shallow areas; (3) the deployment of in-water devices at depths where they would not likely come in contact with marine vegetation; and (4) the implementation of Navy protective measures. Based on these factors, potential impacts on marine algae and vegetation from physical disturbance and strike are not

expected to result in detectable changes to growth, survival, or propagation that would result in population-level impacts.

Pursuant to the EFH requirements of the Magnuson-Stevens Fishery Conservation and Management Act and implementing regulations, the use of vessels and in-water devices during training activities under Alternative 2 would have no impact on attached macroalgae or submerged rooted vegetation that constitutes EFH or HAPC.

Impacts from Vessels and In-Water Devices Under Alternative 2 for Testing Activities

Under Alternative 2, the combined number of proposed testing activities involving the movement of vessels and the use of in-water devices would increase compared to Alternative 1 (Table 3.0-12 and Table 3.0-13) and those proposed in the 2015 NWTT Final EIS/OEIS. Vessel movement would increase slightly in the Offshore Area compared to Alternative 1 (from 283 to 295) and would increase compared to numbers presented in the 2015 NWTT Final EIS/OEIS (from 181 to 295). Vessel movements would increase in the Inland Waters compared to Alternative 1 (from 918 to 1,028) and would increase compared to numbers presented in the 2015 NWTT final EIS/OEIS (from 916 to 1,028). Similarly, vessel movement would increase in the Western Behm Canal (from 63 to 77) compared to Alternative 1 and would increase from 60 to 77 compared to the 2015 NWTT Final EIS/OEIS, resulting in a net increase in the Study Area.

There would also be a slight increase in the total use of in-water devices compared to Alternative 1 (898 for Alternative 1 compared to 932) and an increase from levels presented in the 2015 NWTT final EIS/OEIS (740 to 932) (Table 3.0-13). The activities would occur in the same locations and in a similar manner as were analyzed previously. In spite of these increases, and as described in the 2015 NWTT Final EIS/OEIS, impacts to marine vegetation during vessel and in-water device activities would be unlikely. The proposed increase of vessel and in-water device activities would not change that conclusion. As stated in the 2015 NWTT Final EIS/OEIS, the impact of vessels and in-water devices on marine vegetation would be inconsequential for the same reasons described above for training activities. Based on these factors, potential impacts on marine algae and vegetation from physical disturbance and strike are not expected to result in detectable changes to growth, survival, or propagation that would result in population-level impacts.

Pursuant to the EFH requirements of the Magnuson-Stevens Fishery Conservation and Management Act and implementing regulations, the use of vessels and in-water devices during testing activities under Alternative 2 would have no impact on attached macroalgae or submerged rooted vegetation that constitutes EFH or HAPC.

3.7.2.2.1.3 Impacts from Vessels and In-Water Devices Under the No Action Alternative

Under the No Action Alternative, proposed training and testing activities would not occur. Physical disturbance and strike stressors as listed above would not be introduced into the marine environment. Therefore, existing environmental conditions would either remain unchanged or would improve slightly after cessation of ongoing training and testing activities.

Discontinuing the training and testing activities would result in fewer physical disturbance and strike stressors within the marine environment where training and testing activities have historically been conducted. Therefore, discontinuing training and testing activities under the No Action Alternative would lessen the potential impacts from physical disturbance and strike stressors on marine vegetation, but would not measurably improve growth, survival, or status of marine vegetation populations.

3.7.2.2.2 Impacts from Military Expended Materials

Military expended materials that could impact marine vegetation includes non-explosive practice munitions (Table 3.0-14), other military materials that are expended or recovered (Table 3.0-15), and explosive munitions that may result in fragments (Table 3.0-16).

3.7.2.2.2.1 Impacts from Military Expended Materials Under Alternative 1

Impacts from Military Expended Materials Under Alternative 1 for Training Activities

Under Alternative 1, the number of military materials that would be expended during training activities is generally consistent with the number proposed for use in the 2015 NWTT Final EIS/OEIS. When the amount of military expended materials from Tables 3.0-14 through 3.0-16 is combined, the number of items proposed to be expended under Alternative 1 decreases compared to ongoing activities. The activities that expend military materials would occur in the same locations and in a similar manner as were analyzed previously. Therefore, the impacts to marine vegetation would be expected to be the same or marginally reduced, as stated in the 2015 NWTT Final EIS/OEIS, and would be inconsequential for the same reasons described above for vessels and in-water devices.

Pursuant to the EFH requirements of the Magnuson-Stevens Fishery Conservation and Management Act and implementing regulations, the use of military expended material during training activities under Alternative 1 may adversely affect EFH by reducing the quality and quantity of marine vegetation that constitutes EFH or HAPC. Any impacts of military expended materials on attached macroalgae or submerged rooted vegetation would be minimal and temporary..

Impacts from Military Expended Materials Under Alternative 1 for Testing Activities

Under Alternative 1, the number of military materials that would be expended during testing activities is generally consistent with the number proposed for use in the 2015 NWTT Final EIS/OEIS. When the amount of military expended materials from Tables 3.0-14 through 3.0-16 is combined, the number of items proposed to be expended under Alternative 1 increases compared to ongoing activities. Although there are a few new activities, such as mine countermeasure and neutralization testing and kinetic energy weapon testing, that would generate military expended materials, impacts to marine vegetation would be expected to be the same as those described above for training activities and would be inconsequential for the same reasons described above for vessels and in-water devices.

Pursuant to the EFH requirements of the Magnuson-Stevens Fishery Conservation and Management Act and implementing regulations, the use of military expended material during testing activities under Alternative 1 may adversely affect EFH by reducing the quality and quantity of marine vegetation that constitutes EFH or HAPC. Any impacts of military expended materials on attached macroalgae or submerged rooted vegetation would be minimal and temporary.

3.7.2.2.2.2 Impacts from Military Expended Materials Under Alternative 2

Impacts from Military Expended Materials Under Alternative 2 for Training Activities

Under Alternative 2, the number of military materials that would be expended during training activities is generally consistent with the number proposed for use in the 2015 NWTT Final EIS/OEIS. When the amount of military expended materials from Tables 3.0-14 through Table 3.0-16 are combined, the number of items proposed to be expended under Alternative 2 increase compared to both Alternative 1 and ongoing activities. The activities that expend military materials would occur in the same locations and in a similar manner as were analyzed previously. Therefore, the impacts to marine vegetation would be expected to be the same. As stated in the 2015 NWTT Final EIS/OEIS, the impact of military expended

materials on marine vegetation would be inconsequential for the same reasons described above for vessels and in-water devices.

Pursuant to the EFH requirements of the Magnuson-Stevens Fishery Conservation and Management Act and implementing regulations, the use of military expended material during training activities under Alternative 2 may adversely affect EFH by reducing the quality and quantity of marine vegetation that constitutes EFH or HAPC. Any impacts of military expended materials on attached macroalgae or submerged rooted vegetation would be minimal and temporary.

Impacts from Military Expended Materials Under Alternative 2 for Testing Activities

Under Alternative 2, the number of military materials that would be expended during testing activities is generally consistent with the number proposed for use in the 2015 NWTT Final EIS/OEIS. When the amount of military expended materials from Tables 3.0-14 through 3.0-16 are combined, the number of items proposed to be expended under Alternative 2 increases compared to Alternative 1 and ongoing activities. Although there are a few new activities, such as mine countermeasure and neutralization testing and kinetic energy weapon testing, that would generate military expended materials, impacts to marine invertebrates would be expected to be the same as those described above and would be inconsequential for the same reasons described above for vessels and in-water devices.

Pursuant to the EFH requirements of the Magnuson-Stevens Fishery Conservation and Management Act and implementing regulations, the use of military expended material during testing activities under Alternative 2 may adversely affect EFH by reducing the quality and quantity of marine vegetation that constitutes EFH or HAPC. Any impacts of military expended materials on attached macroalgae or submerged rooted vegetation would be minimal and temporary.

3.7.2.2.2.3 Impacts from Military Expended Materials Under the No Action Alternative

Under the No Action Alternative, proposed training and testing activities would not occur. Physical disturbance and strike stressors as listed above would not be introduced into the marine environment. Therefore, existing environmental conditions would either remain unchanged or would improve slightly after cessation of ongoing training and testing activities.

Discontinuing the training and testing activities would result in fewer physical disturbance and strike stressors within the marine environment where training and testing activities have historically been conducted. Therefore, discontinuing training and testing activities under the No Action Alternative would lessen the potential impacts from physical disturbance and strike stressors on marine vegetation, but would not measurably improve growth, survival, or status of marine vegetation populations.

3.7.2.2.3 Impacts from Seafloor Devices

Several training and testing activities include the use of seafloor devices—items that may contact the ocean bottom temporarily. The activities and the specific seafloor devices are (1) precision anchoring training, where anchors are lowered to the seafloor and recovered; (2) explosive ordnance disposal mine countermeasures training exercises, where some mine targets may be moored to the seafloor; (3) crawler unmanned underwater vehicle tests in which unmanned underwater vehicles "crawl" across the seafloor; and (4) various testing activities where small anchors are placed on the seafloor to hold instrumentation in place.

3.7.2.2.3.1 Impacts from Seafloor Devices Under Alternative 1

Impacts from Seafloor Devices Under Alternative 1 for Training Activities

Under Alternative 1, the number of training activities that include the use of all seafloor devices (anchors, bottom-placed mines, and mine shapes) would increase from 23 to 53 compared to ongoing activities, all of which would occur in the Inland Waters (Table 3.0-18). The activity is comprised of a vessel navigating to a precise, pre-determined location and releasing the ship's anchor to the bottom. The anchor is later recovered, and the activity is complete. Because of the nature of the activity, marine vegetation on the seafloor may be impacted by seafloor devices by physically removing vegetation (e.g., uprooting), crushing the vegetation, temporarily increasing the turbidity (sediment suspended in the water) of waters nearby, or shading seagrass, which may interfere with photosynthesis. However, the impact of seafloor devices on marine vegetation would be inconsequential because (1) the anchors will be deployed in previously disturbed areas; (2) most vegetation types will recover quickly; and (3) the implementation of Navy protective measures.

Pursuant to the EFH requirements of the Magnuson-Stevens Fishery Conservation and Management Act and implementing regulations, the use of seafloor devices during training activities under Alternative 1 may adversely affect EFH by reducing the quality and quantity of marine vegetation that constitutes EFH or HAPC.

Impacts from Seafloor Devices Under Alternative 1 for Testing Activities

Under Alternative 1, the number of testing activities that include the use of all seafloor devices (anchors, bottom-placed mines, and mine shapes) would increase slightly compared to ongoing activities (from 697 to 710) (Table 3.0-18). The majority of the activities involve the temporary placement of mine shapes in Inland Waters. Because of the nature of the activity, marine vegetation on the seafloor may be impacted by seafloor devices by physically removing vegetation (e.g., uprooting), crushing the vegetation, temporarily increasing the turbidity (sediment suspended in the water) of waters nearby, or shading seagrass, which may interfere with photosynthesis. However, the impact of seafloor devices on marine vegetation would be inconsequential for the same reasons given in the 2015 NWTT Final EIS/OEIS; that is, the size of the disturbed area would be small, and the activities would be short term and infrequent.

Pursuant to the EFH requirements of the Magnuson-Stevens Fishery Conservation and Management Act and implementing regulations, the use of seafloor devices during testing activities under Alternative 1 may adversely affect EFH by reducing the quality and quantity of marine vegetation that constitutes EFH or HAPC.

3.7.2.2.3.2 Impacts from Seafloor Devices Under Alternative 2

Impacts from Seafloor Devices Under Alternative 2 for Training Activities

Under Alternative 2, the number of training activities that include the use of all seafloor devices (anchors, bottom-placed mines, and mine shapes) would be slightly greater than Alternative 1 (53 to 61) and ongoing activities (23 to 61) (Table 3.0-18). Because of the nature of the activity, marine vegetation on the seafloor may be impacted by seafloor devices by physically removing vegetation (e.g., uprooting), crushing the vegetation, temporarily increasing the turbidity (sediment suspended in the water) of waters nearby, or shading seagrass, which may temporarily interfere with photosynthesis. However, the impact of seafloor devices on marine vegetation would be inconsequential for the same reasons described above under Alternative 1.

Pursuant to the EFH requirements of the Magnuson-Stevens Fishery Conservation and Management Act and implementing regulations, the use of seafloor devices during training activities under Alternative 2 may adversely affect EFH by reducing the quality and quantity of marine vegetation that constitutes EFH or HAPC.

Impacts from Seafloor Devices Under Alternative 2 for Testing Activities

Under Alternative 2, the total number of testing activities that include the use of all seafloor devices (anchors, bottom-placed mines, and mine shapes) would increase compared to both Alternative 1 (710 to 735) and ongoing activities (697 to 735) (Table 3.0-18). The majority of the activities involve mine shapes. Because of the nature of the activity, marine vegetation on the seafloor may be impacted by seafloor devices by physically removing vegetation (e.g., uprooting); crushing the vegetation; temporarily increasing the turbidity (sediment suspended in the water) of waters nearby; or shading seagrass, which may temporarily interfere with photosynthesis. However, the impact of seafloor devices on marine vegetation would be inconsequential for the same reasons described above under Alternative 1.

Pursuant to the EFH requirements of the Magnuson-Stevens Fishery Conservation and Management Act and implementing regulations, the use of seafloor devices during testing activities under Alternative 2 may adversely affect EFH by reducing the quality and quantity of marine vegetation that constitutes EFH or HAPC.

3.7.2.2.3.3 Impacts from Seafloor Devices Under the No Action Alternative

Under the No Action Alternative, proposed training and testing activities would not occur. Physical disturbance and strike stressors, as listed above, would not be introduced into the marine environment. Therefore, existing environmental conditions would either remain unchanged or would improve slightly after cessation of ongoing training and testing activities.

Discontinuing the training and testing activities would result in fewer physical disturbance and strike stressors within the marine environment where training and testing activities have historically been conducted. Therefore, discontinuing training and testing activities under the No Action Alternative would lessen the potential impacts from physical disturbance and strike stressors on marine vegetation, but would not measurably improve growth, survival, or status of marine vegetation populations.

3.7.2.3 Secondary Stressors

As described in the 2015 NWTT Final EIS/OEIS, the Navy determined that neither state or federal standards or guidelines for sediments nor water quality would be violated by proposed training and testing activities. Because of these conditions, population-level impacts on marine vegetation are likely to be inconsequential and undetectable. Therefore, because these standards and guidelines are structured to protect human health and the environment, and the proposed activities do not violate them, no indirect impacts are anticipated on marine vegetation from the training and testing activities proposed by Alternative 1, or Alternative 2, or the No Action Alternative.

REFERENCES

Mach, K. J., B. B. Hale, M. W. Denny, and D. V. Nelson. (2007). Death by small forces: A fracture and fatigue analysis of wave-swept macroalgae. *The Journal of Experimental Biology, 210*(13), 2231–2243.