Empowering Leaders Around the World to Collaborate, Negotiate, and Resolve Conflict

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Massachusetts Fisheries Working Group Survey Results

Pat Field and Nate Lash

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Survey Respondents

- 29 responses
  - 8 commercial fishing
  - 1 council or commission
  - 1 environmental NGO
  - 2 federal agency
  - 7 developers
  - 2 recreational fishing
  - 2 state agency
  - 6 other (academic, consultant, local government)

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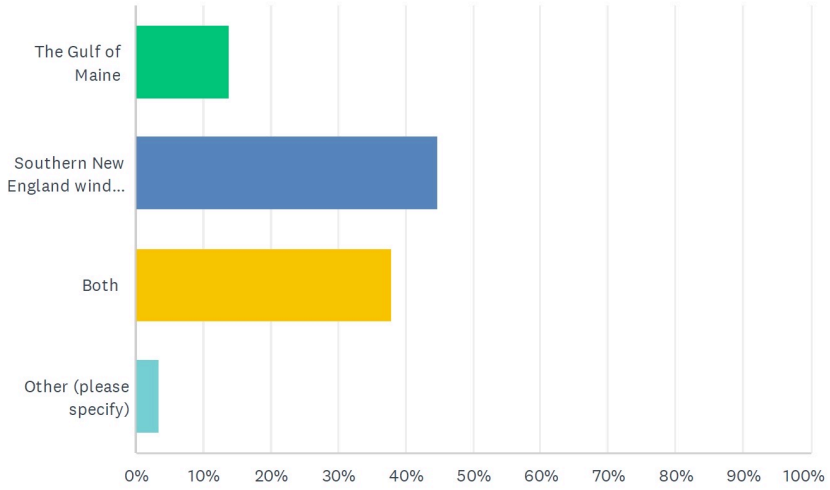
Survey Respondents

Q3 Where do you primarily work?

Answered: 29 Skipped: 0



ANSWER CHOICES	RESPONSES	
The Gulf of Maine	13.79%	4
Southern New England wind energy areas and surrounds	44.83%	13
Both	37.93%	11
Other (please specify)	3.45%	1
TOTAL		29

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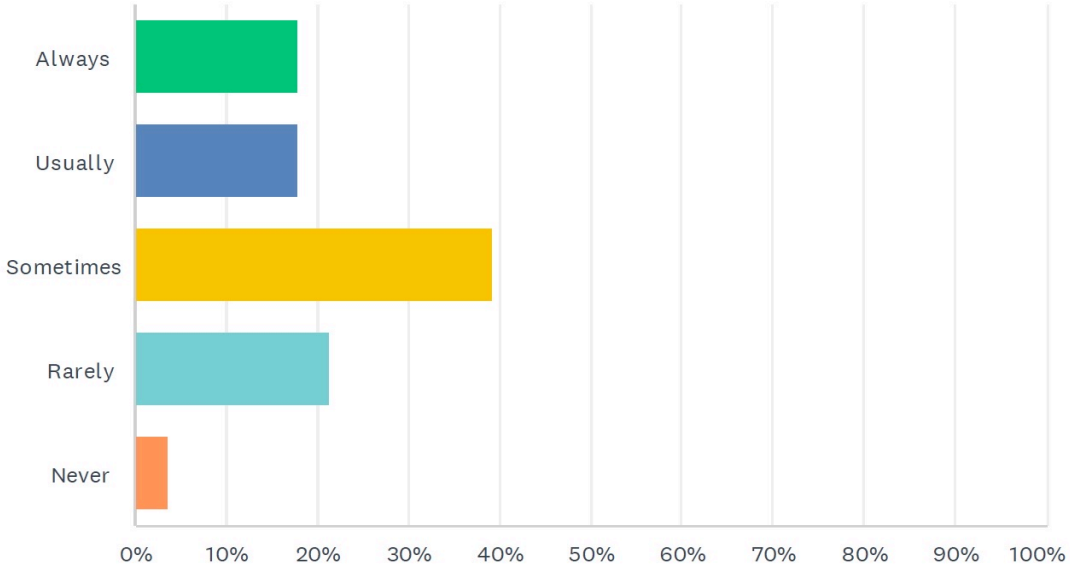
Meeting Materials

Q6 How often have you referenced meeting materials after a FWG meeting?

Answered: 28 Skipped: 1



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What do you find valuable about your participation in the FWG?

- Learn about OSW and fishing concerns
- Get updates on projects, studies, and related efforts
- Keeping in touch with different sectors

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Is there anything you do not find valuable about the FWG? If yes, please describe.

- Lack of dialogue around issues before decisions are made
- Lack of in-depth discussions
- Too much presenting and not enough listening, learning, and discussing
- Role of out-of-state participants
- Remote participation

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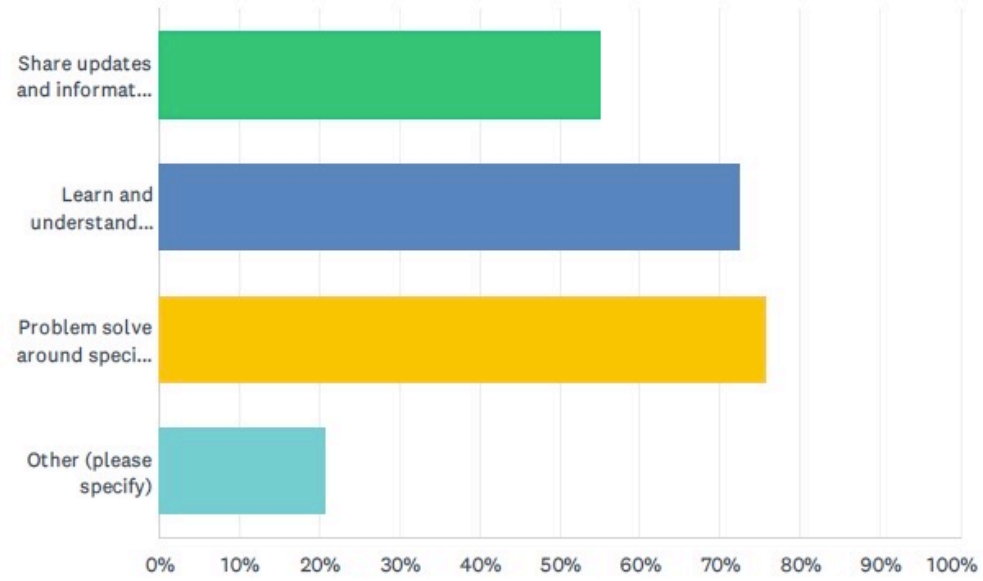
Purpose

Q10 What do you think the primary purpose of FWG meetings should be? Select one or more.

Answered: 29 Skipped: 0



ANSWER CHOICES	RESPONSES	
Share updates and information about all that is going on on OSW	55.17%	16
Learn and understand better together about specific OSW topics and issues	72.41%	21
Problem solve around specific OSW science or operational topics	75.86%	22
Other (please specify)	20.69%	6
Total Respondents: 29		

Do you have any feedback about the groups and perspectives represented?

- More coordination with other states and regional efforts
- Massachusetts focused on Massachusetts fishermen
- Clarify who is a member: both in and out-of-state or just in-state?
- Identify an actual working group but allow wider participation
- Tribes
- Private recreational interests
- Better balance between fishermen & developers
- Social scientists

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If there was one improvement you could make to the FWG, what would it be?

- Focused, specific issue work through subcommittees or subgroups
  - Say cross-cutting issue like HMS acoustic telemetry
  - Issue of high conflict to try and identify solutions
  - Specific mitigation plans or pre-construction survey plans
- More interdisciplinary work to better engage one another
- Connecting more to multi-state efforts/groups
- Discussion issues and options before they are decided

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What topics or questions do you think are important for this group to discuss?

- Regional scale, monitoring, data and impacts
- Fisheries mitigation, including compensatory mitigation
- Fishing inside a wind farm
- Search and rescue and general safety
- Gear conflicts
- Radar interference and its fixes
- Floating wind technology and impacts
- Gulf of Maine planning, impacts, resources, and sequencing of development

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What topics are particularly ripe for joint problem solving as a group?

- Regional monitoring, assessment, and reporting plan for the southern New England WEA
- Improving participatory processes
- Review two mitigation plans to date and offer lessons learned for future plans
- Non-monetary compensation
- Community investment mechanisms
- Spacing of turbines, transit, array design
- Gear modifications for co-existence
- Safety
- Mitigation

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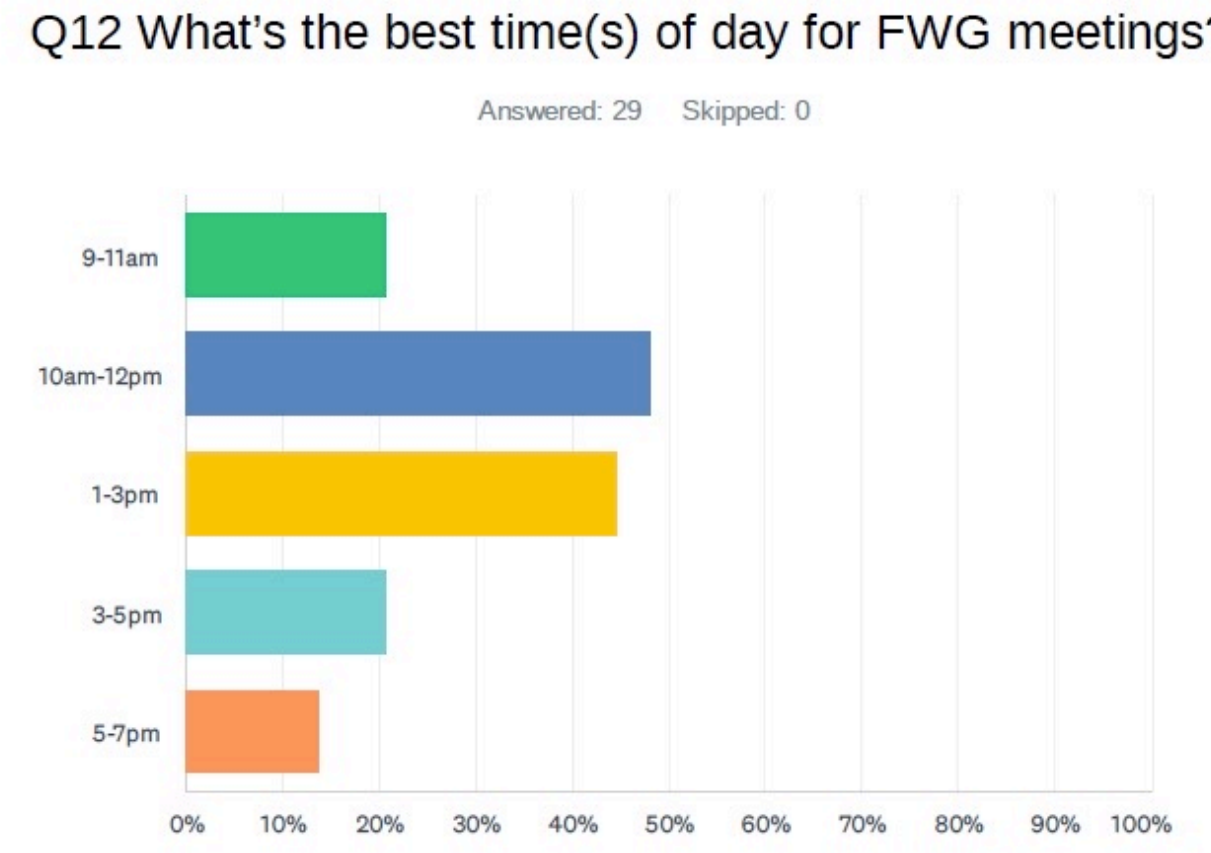
Time of Day



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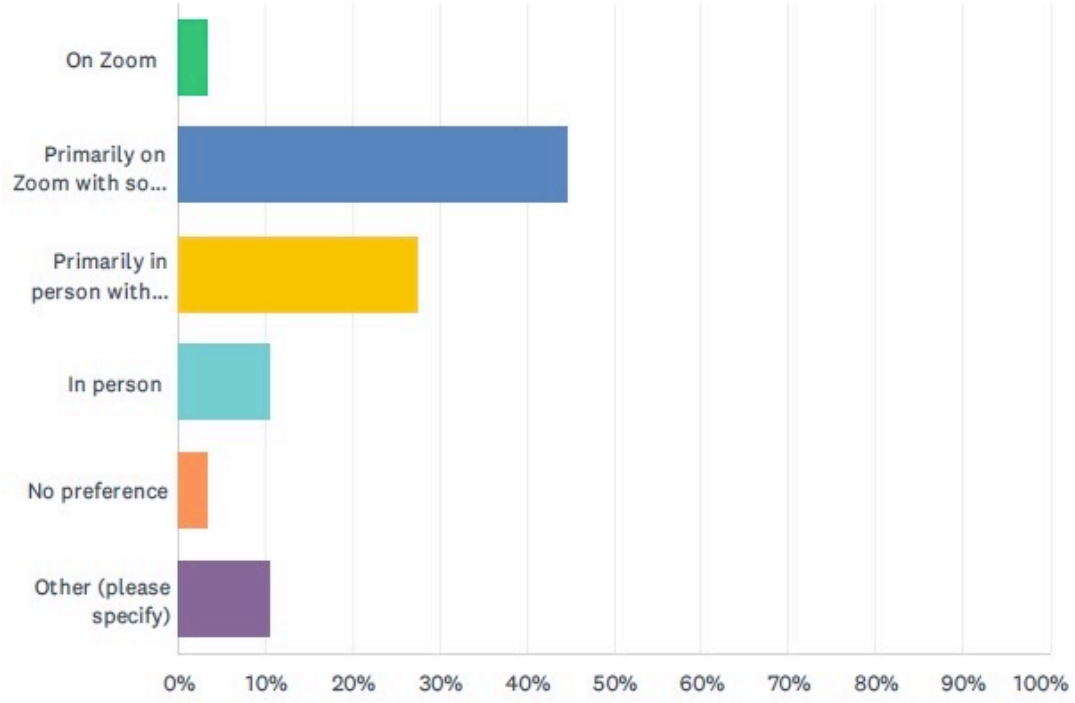
Virtual or In-Person

Q13 Would you prefer meeting on Zoom, in person, or some combination?

Answered: 29 Skipped: 0



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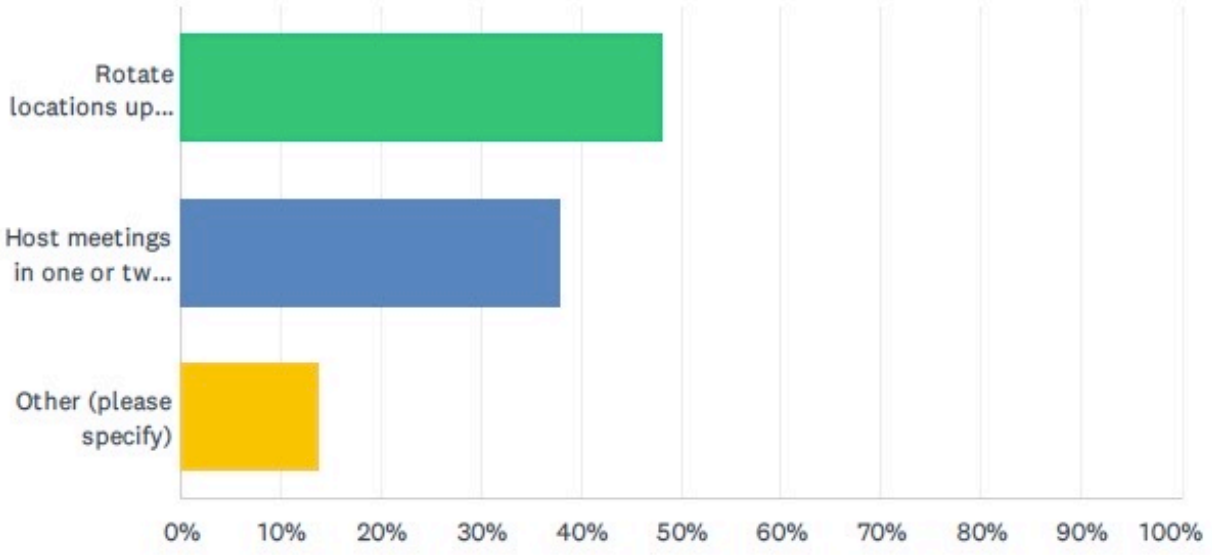
Meeting Location

Q14 If we meet in person, should we rotate locations up and down the coast or have them in a central location?

Answered: 29 Skipped: 0



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To think about for next meeting?

- What are 1 or 2 issues the FWG could “sink” its teeth into in the next 6 months -- focused on a deep dive, deliberation, and developing recommendations?
- How can we balance updates -- of which there are many -- with more focused topics for discussion, not presentation, while keeping everyone informed of all that is happening?
- What if we formalize membership more, while still being a forum where many can at least listen in?
- What tools do you want to use to increase active participation in meetings?

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QUESTIONS?

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Revolution Wind

A Joint Venture of Ørsted and Eversource

January 20, 2023

MA Fisheries Working Group

Revolution Wind | Powered by Ørsted & Eversource

Agenda

1. Introductions
2. Overview of Technical Feasibility for Revolution Wind
3. Revolution Wind Layout Update
4. Next Steps

Technical Construction Feasibility

Geologic Environment

- Surface and subsurface boulders
- Jack-up related issues (e.g. punch through)
- Hard soils resulting in more remedial works

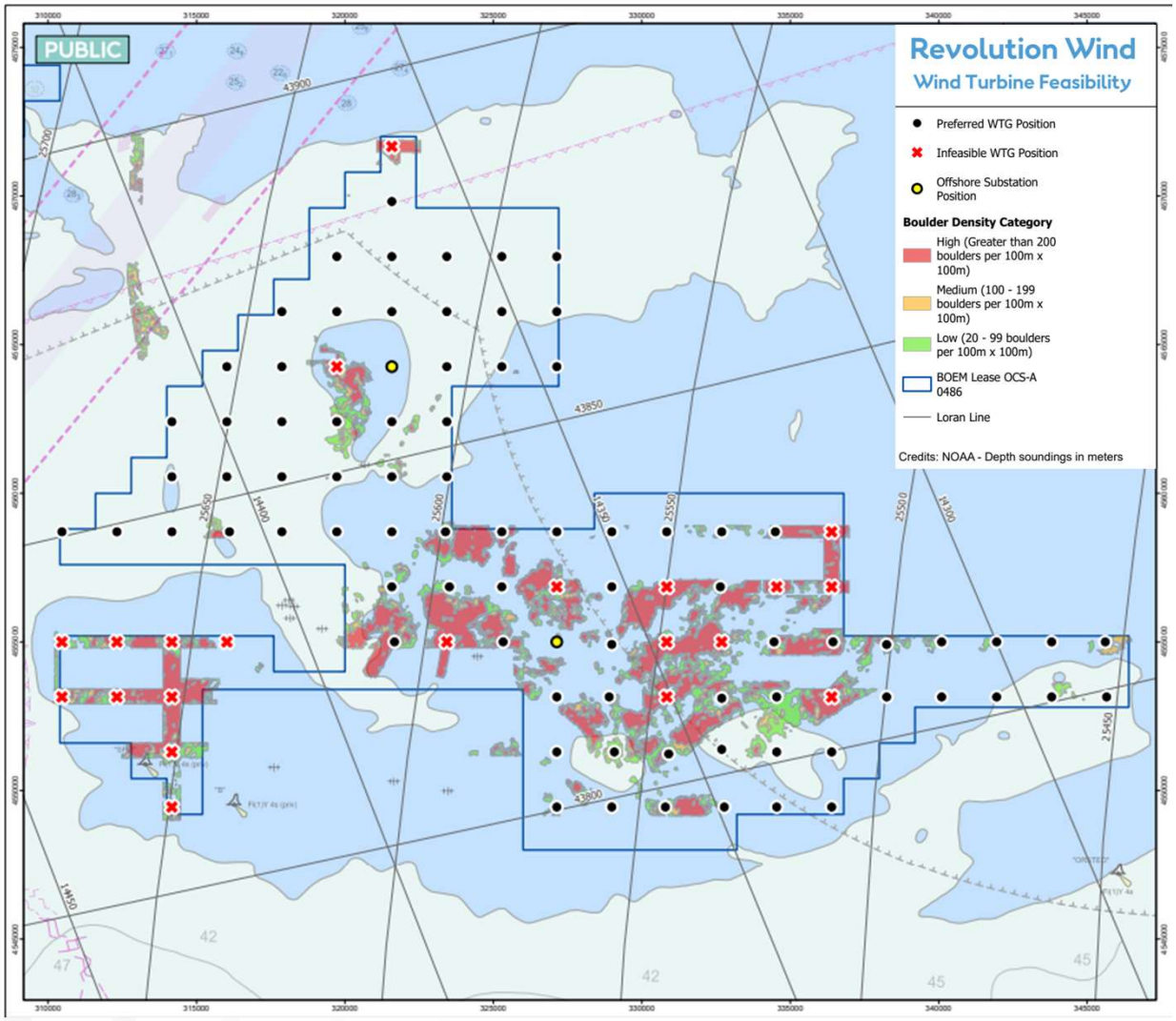
Navigation - 1x1 nm grid

Construction Issues That Will Be Avoided or Resolved:

- Boulder Relocation
- Cable Installation
- Pile Driving
- Jack-Up Operations

Available Turbine Locations for Revolution Wind

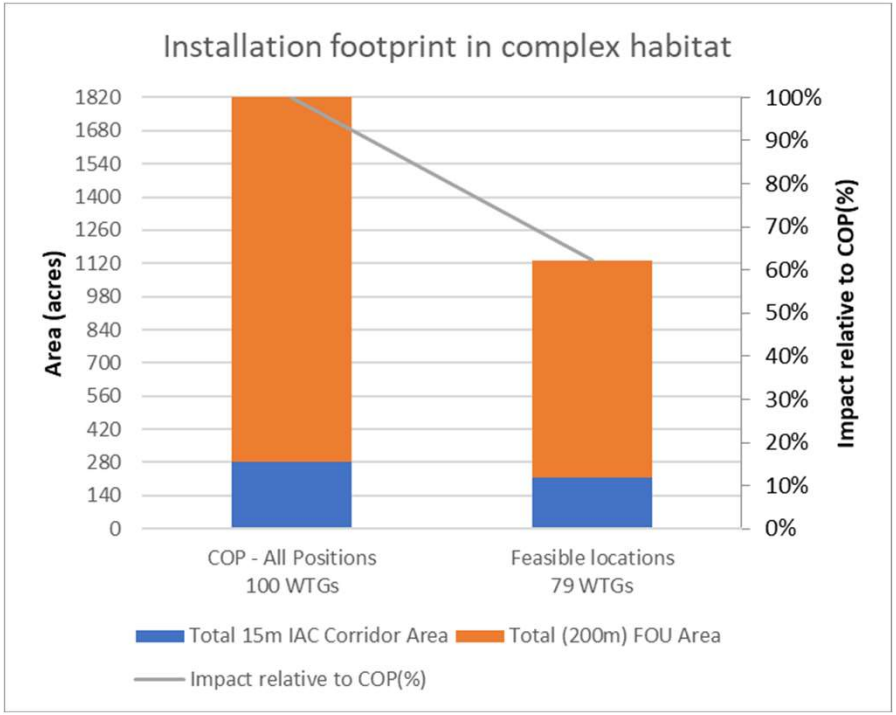
- 79 available positions due to technical feasibility
- Need to further consider electrical design limitations
  - Proximity to shore
  - Equal number of turbines per substation
  - Preferred to have six WTGs per string
  - Balancing of the collection and export infrastructure
- Need to consider other resources
  - Cultural resources
  - Visual impacts
  - Benthic habitat and EFH



Habitat Impact Reduction

Habitat delineations

- Project footprint in Complex Habitat
  1. Heterogenous Complex
  2. Large Grained Complex
  3. Complex
- Infeasibility of the 21 positions in dense boulder areas in the site significantly reduces the footprint of the project in complex habitat.



QUESTIONS?

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Revolution Wind Fisheries Exposure Analysis - Massachusetts

Hauke Kite-Powell, Di Jin, and Michael Weir
Marine Policy Center, Woods Hole Oceanographic Institution

January 2023

Revolution Wind Fisheries Exposure Analysis

What is the value to Massachusetts from commercial and charter fishing around the Rev Wind lease area and the federal waters portion of the export cable route, and how will this change as a result of Rev Wind development?

Baseline value from NOAA data on landings and landed value

Baseline for-hire charter fishing revenue from 2022 charter captain survey

Indirect and induced impacts in Massachusetts estimated via multipliers

Exposure of fisheries values estimated based on likely effects on fishing during

- Construction
- Operations
- Decommissioning

Rev Wind project areas

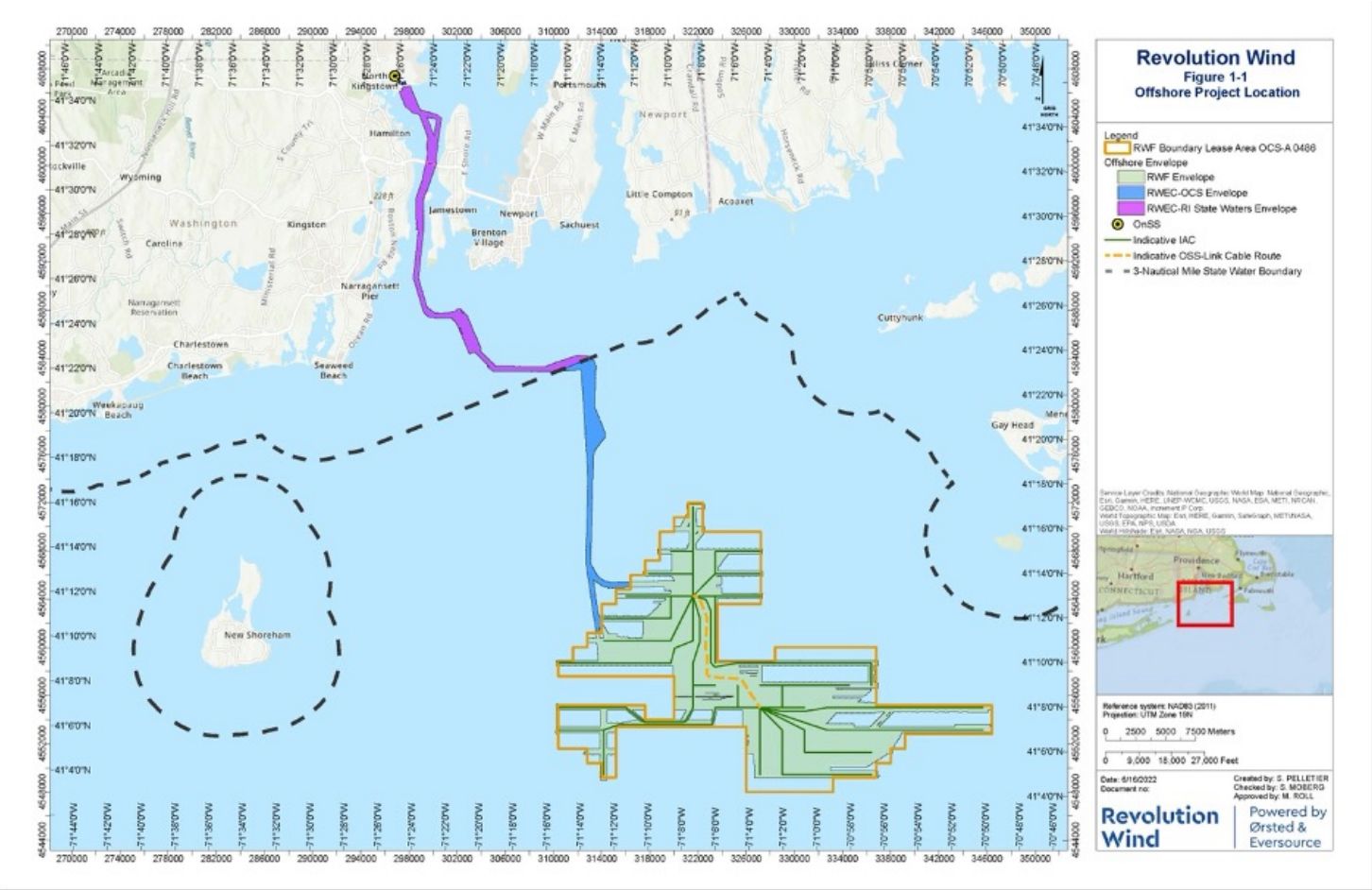


Figure 1. Revolution Wind project area and export cable route. Source: Revolution Wind.

NOAA baseline data, adjusted for WTGA

Average of 11 years of NOAA data (2008-2019) on commercial landings from the Wind Lease Area (WLA) and Export Cable Corridor (ECC), defined as two 180m lanes

Landed value (2020$) from MA commercial fishing:

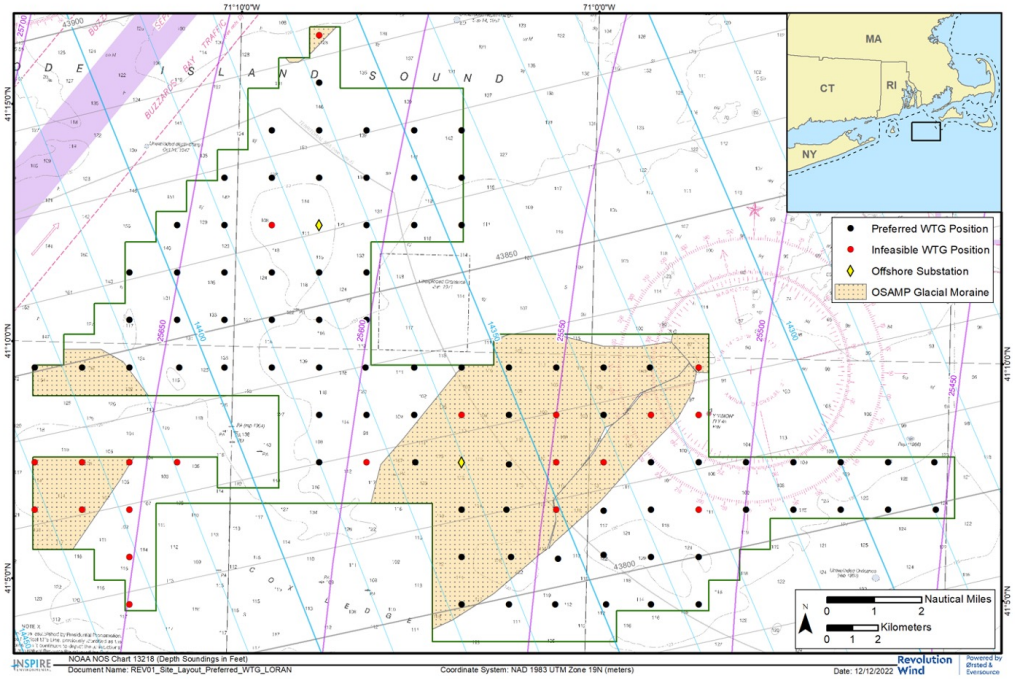
$575,000/year in WTGA
$20,000/year in ECC

$1.31 million/year in total, including indirect and induced effects

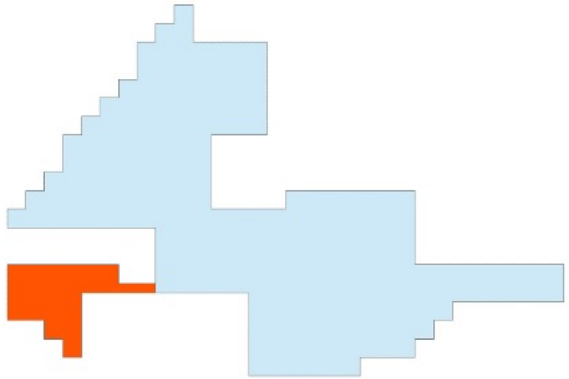
Estimated annual economic impact in Massachusetts (all values in 2020$)

Area	State	Average value of landings/year: NOAA VTR data only	Average value of landings/year: with lobster & Jonah crab adjustment	Average value of landings/year: with dockside sales adjustment (15% premium on RI lobster & JC landings)	Total impact/year: dockside sales column multiplied by upstream & downstream multipliers, except RI lobster & JC
Revolution WLA	total	1,111,520	1,463,527	1,510,461	3,206,170
Rev. WTGA	total	1,020,709	1,343,957	1,387,056	2,944,226
Revolution ECC	total	94,506	122,415	128,015	267,483
Revolution WLA	MA	475,849	626,545	626,545	1,381,332
Rev. WTGA	MA	436,972	575,356	575,356	1,268,661
Revolution ECC	MA	15,508	20,088	20,088	44,293

Adjustment for “infeasible” WTG positions



WTGA = portion of WLA that encompasses WTGs that will actually be built



WTGA = WLA minus SW “rudder”

WTGA footprint = 91.8% of WLA

Baseline landed values (2020$) used for exposure calculations.

	WTGA	WTGA+5km	1.6km ECC WA	2x180m ECC
Total landed value:	**1,387,056**		**568,956**	**128,015**
Lobster & Jonah crab	581,846		231,621	52,115
Other crabs	2,249		1,575	354
Scallops	148,585		12,670	2,851
Other shellfish	7,871		8,139	1,831
Finfish/mobile species	646,506	1,900,561	314,950	70,864
MA landed value:	**575,357**		**89,279**	**20,088**
Lobster & Jonah crab	230,641		33,924	7,633
Other crabs	963		674	152
Scallops	63,610		5,424	1,220
Other shellfish	3,370		3,485	784
Finfish/mobile species	276,774	831,643	134,832	30,337

For-hire charter fishing survey (2022)

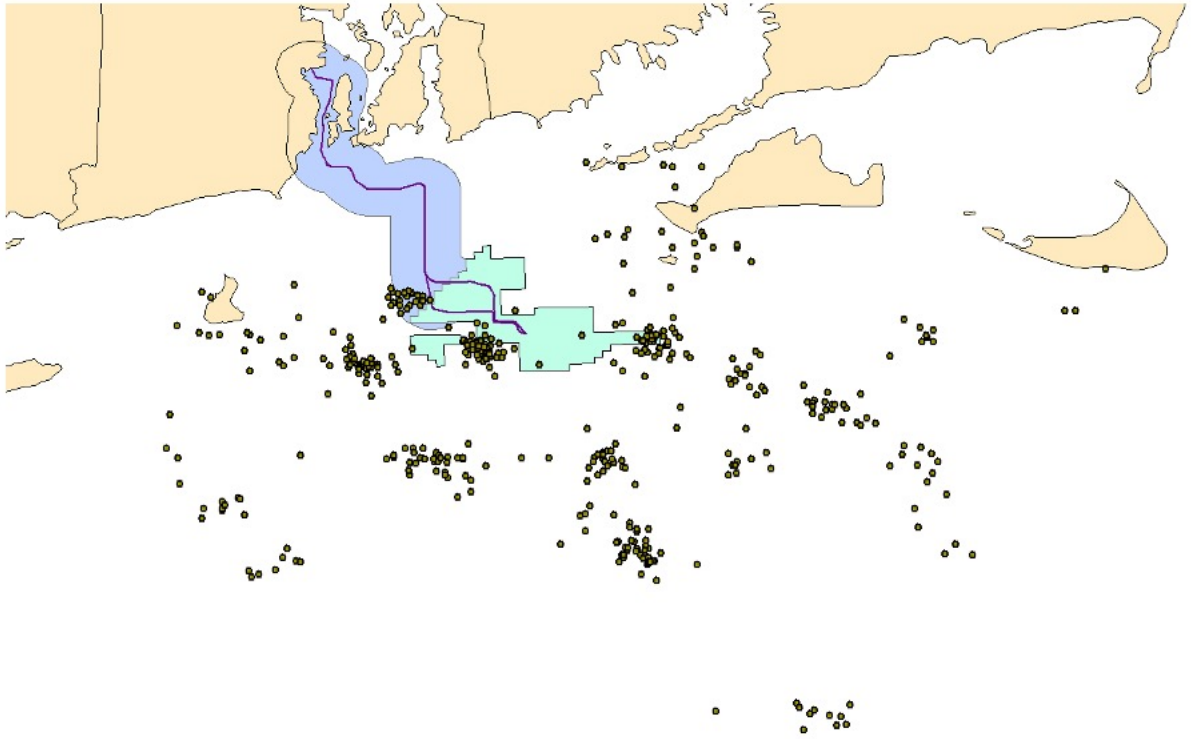


Figure 4. Charter fishing locations, 2017-2021, identified in survey responses.

Table 17. For-hire charter fishing survey summary statistics.

Description	Number
Fished in the area and responded to the survey	66
Provided vessel names	62
of which based in Massachusetts	37.5
Provided annual vessel trip numbers	31
Observations with vessel trips reported (2017-2021)	142
Total trips per year	1 – 235
Average total trips per year	47.30
Passengers per vessel trip	2 – 25
Average passengers per vessel trip	5.41
Identified fishing locations on maps	29
of which based in Massachusetts	18.5

Charter fishing baseline

Number of MA-based vessel trips and anglers by year, Revolution Wind areas.

Year	WLA		WTGA + 5km buffer	
	Vessel Trips	Anglers	Vessel Trips	Anglers
2017	7	20	61.5	816
2018	6	24	69	965
2019	65	1,108	49	143
2020	7.5	35	37.5	169
2021	21	91	65	295
Average	***21.3***	***255.6***	***56.4***	***477.6***

Annual revenue and value generated from MA-based charter fishing in Revolution Wind areas.

Area	Annual anglers	Revenue per angler (2020$)	Scale factor	Annual revenue (2020$)	Economic multiplier	Annual value generated (2020$)
WLA	255.6	106.22	Low: 2.027	55,033	1.627	89,538
			High: 3.269	88,753	1.627	144,401
WTGA+5km buffer	477.6	106.22	Low: 2.027	102,831	1.627	167,306
			High: 3.269	165,839	1.627	269,819
ECRA	150.0	106.22	Low: 2.027	32,296	1.627	52,546
			High: 3.269	52,085	1.627	84,742

Summary of baseline economics in Massachusetts

Commercial fishing:

Massachusetts landings from WTGA and ECC:	$595,000/year
Massachusetts landings with multipliers:	$1,313,000/year

For-hire charter fishing:

Massachusetts revenue from WTGA and ECC:	$166,000/year
Massachusetts revenue with multipliers:	$270,000/year

Rev Wind development exposure assumptions

Assumptions for exposure of commercial fisheries to wind farm development.

Categories of Potential Exposure			Assumptions/Effects	Duration
Availability effects due to construction	WTGA+5km		100% of finfish leave area (a)	1 year
	WTGA		Lobster/crab landings reduced 10% (b) Other shellfish landings reduced 10% (c)	1 year 4 years
	ECRA	1.6km WA	All landings reduced 10% (d)	1 year
		180m ECCs	Lobster/crab landings reduced 25% (e) Other shellfish landings reduced 25% (f)	1 years 4 years
Construction constrained access	WTGA		No fishing in 50% of area (g)	1 year
	ECRA	1.6km WA	No fishing in 5% of area (h)	6 months
		180m ECCs	No fishing in 100% of area (i)	2 months
Effects during operations	WTGA		Landings reduced by 5% (j)	30 years
	ECRA	1.6km WA	None	
		180m ECCs	None	
Availability effects due to decommissioning	WTGA		None beyond constrained access	
	ECRA	1.6km WA	All landings reduced 5% (k)	1 year
		180m ECCs	Lobster/crab landings reduced 12.5% (l) Other shellfish landings reduced 12.5% (m)	1 year 4 years
Decommissioning constrained access	WTGA		No fishing in 50% of area (n)	1 year
	ECRA	1.6km WA	No fishing in 5% of area (o)	2 months
		180m ECCs	No fishing in 100% of area (p)	2 months

Exposure due to construction effects

Pile driving scheduled for < 9 months

Assume finfish leave when noise exceeds 160 dB: 5km buffer around WTGA

Assume shellfish mortality at 219 dB / 24 hours: 160m radius around 81 turbine towers ≅ 2% of WTGA

250 km of inter-array cables @ 40 m max disturbance ≅ 3% of WTGA

Availability effects due to construction	WTGA+5km		100% of finfish leave area (a)	1 year
	WTGA		Lobster/crab landings reduced 10% (b) Other shellfish landings reduced 10% (c)	1 year 4 years
	ECRA	1.6km WA	All landings reduced 10% (d)	1 year
		180m ECCs	Lobster/crab landings reduced 25% (e) Other shellfish landings reduced 25% (f)	1 years 4 years
Construction constrained access	WTGA		No fishing in 50% of area (g)	1 year
	ECRA	1.6km WA	No fishing in 5% of area (h)	6 months
		180m ECCs	No fishing in 100% of area (i)	2 months

Exposure during operations

Mobile gear (bottom trawl, scallop dredge) accounts for about half of landed value from WLA

100m radius around turbine towers < 1% of WTGA footprint

Effects during operations	WTGA		Landings reduced by 5% (j)	30 years
	ECRA	1.6km WA	None	
		180m ECCs	None	

Exposure due to decommissioning

Similar to construction but less severe (no pile driving)

Availability effects due to decommissioning	WTGA		None beyond constrained access	
	ECRA	1.6km WA	All landings reduced 5% (k)	1 year
		180m ECCs	Lobster/crab landings reduced 12.5% (l)	1 year
			Other shellfish landings reduced 12.5% (m)	4 years
Decommissioning constrained access	WTGA		No fishing in 50% of area (n)	1 year
	ECRA	1.6km WA	No fishing in 5% of area (o)	2 months
		180m ECCs	No fishing in 100% of area (p)	2 months

Potential exposure of Mass. fishing to Rev Wind

Categories of Potential Exposure		MA Direct Landed Value/Revenue (2020$)
Construction-related effects	WLA+	$832,000
	ECRA	$13,000
Effects during operations	WLA	$347,000
	ECRA	---
Decommissioning-related effects	WLA	$52,000
	ECRA	$1,000
Subtotal MA commercial direct effects		**$1,245,000**
MA for-hire charter fishing direct effects		$166,000
Total Massachusetts direct effects		**$1,411,000**

Categories of Potential Exposure	MA Total Impact with Multipliers (2020$)
Subtotal MA commercial fishing	$2,744,000
MA for-hire charter fishing	$271,000
Total Massachusetts impacts	**$3,015,000**

Sunrise Wind Fisheries Exposure Analysis - Massachusetts

Hauke Kite-Powell, Di Jin, and Michael Weir
Marine Policy Center, Woods Hole Oceanographic Institution

January 2023

Sunrise Wind Fisheries Exposure Analysis

What is the value to Massachusetts from commercial and charter fishing around the Sunrise Wind lease area and export cable route, and how will this change as a result of Sunrise Wind development?

Baseline value from NOAA data on landings and landed value

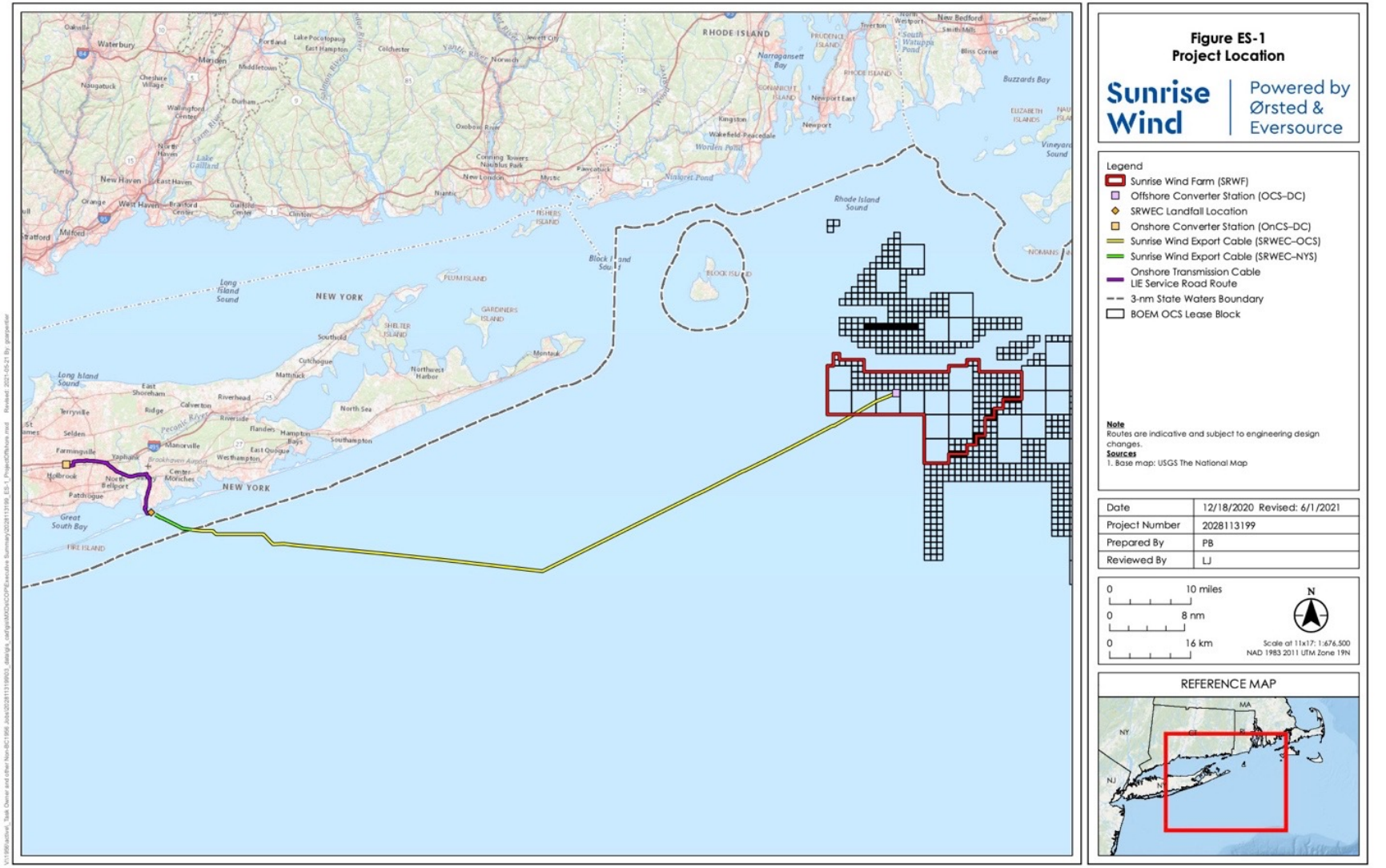
Baseline for-hire charter fishing revenue from 2022 charter captain survey

Indirect and induced impacts in Massachusetts estimated via multipliers

Exposure of fisheries values estimated based on likely effects on fishing during

- Construction
- Operations
- Decomissioning

Sunrise Wind project areas



NOAA baseline data

Average of 11 years of NOAA data (2008-2019) on commercial landings from the Wind Lease Area (WLA) and Export Cable Corridor (ECC; 180m)

Landed value (2020$) from MA commercial fishing:

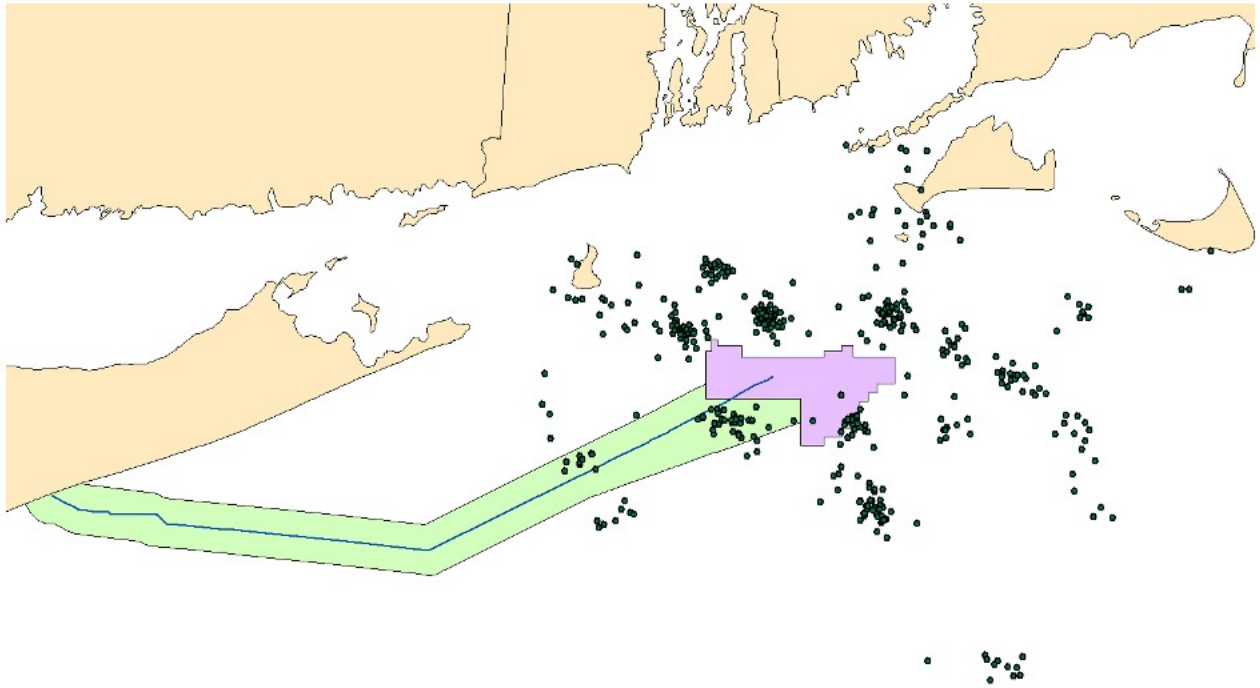
$1,097,000/year in WLA
$80,000/year in ECC

$2.60 million/year in total, including indirect and induced effects

Estimated annual economic impact in Massachusetts (all values in 2020$)

Area	State	Average value of landings/year: VTR data only (Table 11, row 1)	Average value of landings/year: with lobster & Jonah crab adjustment	Average value of landings/year: with dockside sales adjustment (15% premium on RI lobster & JC landings)	Total impact/year "dockside sales" column multiplied by upstream & downstream multipliers, except RI lobster & JC
Sunrise WLA	total	2,116,815	2,366,693	2,397,234	5,214,570
Sunrise ECC	total	146,040	150,723	150,901	332,878
Sunrise WLA	MA	981,567	1,097,435	1,097,435	2,419,845
Sunrise ECC	MA	77,401	79,883	79,883	176,142

For-hire charter fishing survey (2022)



Charter fishing locations, 2017-2021, identified in survey responses. WLA is shown in purple, and ECRA in green.

For-hire charter fishing survey summary statistics.

Description	Number
Fished in the area and responded to the survey	66
Provided vessel names	62
of which based in Massachusetts	37.5
Provided annual vessel trip numbers	31
Observations with vessel trips reported (2017-2021)	142
Total trips per year	1 – 235
Average total trips per year	47.30
Passengers per vessel trip	2 – 25
Average passengers per vessel trip	5.41
Identified fishing locations on maps	29
of which based in Massachusetts	18.5

Charter fishing baseline

Number of Massachusetts-based vessel trips and anglers by year, Sunrise WLA.

Year	WLA + 5km buffer		WTGA + 5km buffer	
	Vessel Trips	Anglers	Vessel Trips	Anglers
2017	16.5	75	62.5	355
2018	35.5	157	67.5	389
2019	51	1,032	21	120
2020	51	780	47	262
2021	55	795	51	287
Average	***41.8***	***567.8***	***21.7***	***282.6***

Annual revenue and economic impact from MA-based charter fishing in Sunrise Wind areas.

Area	Annual anglers	Revenue per angler (2020$)	Scale factor	Annual revenue (2020$)	Impact multiplier	Annual impact (2020$)
WLA+5km	567.8	106.15	Low: 2.027	122,171	1.627	198,773
			High: 3.269	197,029	1.627	320,566
WTGA+5km	202.6	106.15	Low: 2.027	43,593	1.627	70,925
			High: 3.269	70,303	1.627	114,383
ECRA	24.0	106.15	Low: 2.027	5,164	1.627	8,402
			High: 3.269	8,328	1.627	13,550

Summary of baseline economics in Massachusetts

Commercial fishing:

Massachusetts landings from WLA and ECC:	$1,177,000/year
Massachusetts landings with multipliers:	$2,596,000/year

For-hire charter fishing:

Massachusetts revenue from WLA and ECC:	$205,000/year
Massachusetts revenue with multipliers:	$334,000/year

Sunrise Wind development exposure assumptions

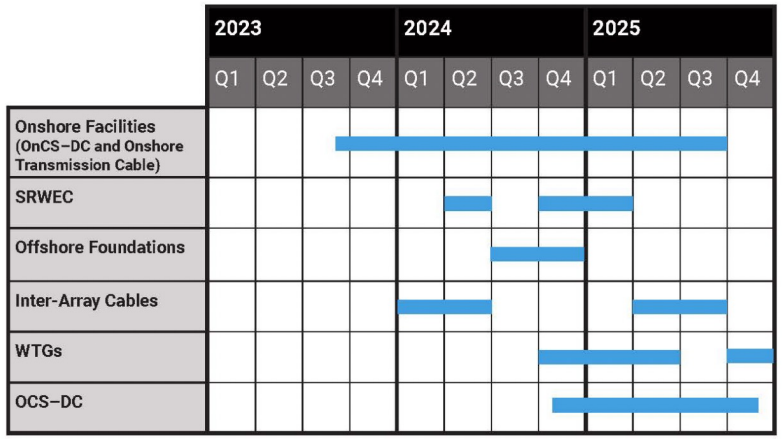


Figure 3.2.2-1 Indicative Project Construction Schedule

Assumptions for exposure of commercial fisheries to wind farm development.

Categories of Potential Exposure			Assumptions/Effects	Duration
Availability effects due to construction	WTGA+5km		100% of finfish leave area (a)	1 year
	WLA		Lobster/crab landings reduced 10% (b)	2 years
			Other shellfish landings reduced 10% (c)	5 years
	ECRA	1.6km WA	All landings reduced 10% (d)	1 year
		180m ECC	Lobster/crab landings reduced 25% (e)	2 years
			Other shellfish landings reduced 25% (f)	5 years
Construction constrained access	WLA		No fishing in 50% of area (g)	2 years
	ECRA	1.6km WA	No fishing in 5% of area (h)	1 year
		180m ECC	No fishing in 100% of area (i)	9 months
Effects during operations	WLA		Landings reduced by 5% (j)	30 years
	ECRA	1.6km WA	None	
		180m ECC	None	
Availability effects due to decommissioning	WLA		None beyond constrained access	
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Decommissioning constrained access	WLA		No fishing in 50% of area (n)	1 year
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		180m ECC	No fishing in 100% of area (p)	2 months

Exposure due to construction effects

Pile driving scheduled for < 9 months

Assume finfish leave when noise exceeds 160 dB: 5km buffer around WTGA

Assume shellfish mortality at 219 dB / 24 hours: 160m radius around 102 turbine towers < 2% of WLA

290 km of inter-array cables @ 40 m max disturbance ≅ 2.7% of WLA

Availability effects due to construction	WTGA+5km		100% of finfish leave area (a)	1 year
	WLA		Lobster/crab landings reduced 10% (b)	2 years
			Other shellfish landings reduced 10% (c)	5 years
	ECRA	1.6km WA	All landings reduced 10% (d)	1 year
		180m ECC	Lobster/crab landings reduced 25% (e)	2 years
			Other shellfish landings reduced 25% (f)	5 years
Construction constrained access	WLA		No fishing in 50% of area (g)	2 years
	ECRA	1.6km WA	No fishing in 5% of area (h)	1 year
		180m ECC	No fishing in 100% of area (i)	9 months

Exposure during operations

Mobile gear (bottom trawl, scallop dredge) accounts for about half of landed value from WLA

100m radius around turbine towers < 1% of WTGA footprint

Effects during operations	WLA		Landings reduced by 5% (j)	30 years
	ECRA	1.6km WA	None	
		180m ECC	None	

Exposure due to decommissioning

Similar to construction but less severe (no pile driving)

Availability effects due to decommissioning	WLA		None beyond constrained access	
	ECRA	1.6km WA	All landings reduced 5% (k)	1 year
		180m ECC	Lobster/crab landings reduced 12.5% (l)	1 year
			Other shellfish landings reduced 12.5% (m)	4 years
Decommissioning constrained access	WLA		No fishing in 50% of area (n)	1 year
	ECRA	1.6km WA	No fishing in 5% of area (o)	2 months
		180m ECC	No fishing in 100% of area (p)	2 months

Potential exposure of Mass. fishing to Sunrise Wind

Categories of Potential Exposure		MA Direct Landed Value/Revenue (2020$)
Construction-related effects	WLA+	$1,339,000
	ECRA	$154,000
Effects during operations	WLA	$629,000
	ECRA	---
Decommissioning-related effects	WLA	$100,000
	ECRA	$12,000
Subtotal MA commercial direct effects		**$2,234,000**
MA for-hire charter fishing direct effects		$200,000
Total MA direct effects		**$2,434,000**

Categories of Potential Exposure	MA Total Impact with Multipliers (2020$)
Subtotal MA commercial fishing	**$4,926,000**
MA for-hire charter fishing	$326,000
Total Massachusetts impacts	**$5,252,000**

Seabed Preparation

Massachusetts Fisheries Working Group

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01.20. 2023

Introduction – Seabed Preparation

Seabed Preparation Activities

Prior to cable and foundation installation seabed preparation take place to make seabed ready for installation tools.

- Boulder Clearance
  - Boulder Grab
  - Boulder Plough
- Cable Crossings
- Pre Lay Grapnel Run (PLGR)

Seabed Preparation - Boulder Clearance

- Prior to cable installation and foundation installation, boulders will be cleared from the cable route and foundation where necessary.
- The cables and foundations will be sited around or between boulders to the extent feasible.
- Two types of boulder removal equipment may be used:

Boulder Plough – towed behind vessel, clears a linear area and cuts a trench for the cable to be laid into

Boulder Grab – remotely operated, picks up individual boulders

Boulder Clearance Vessel Examples

Sheila Bordelon – Boulder Grab, Boulder Skid ROV

Laney Chouest – Boulder Plough

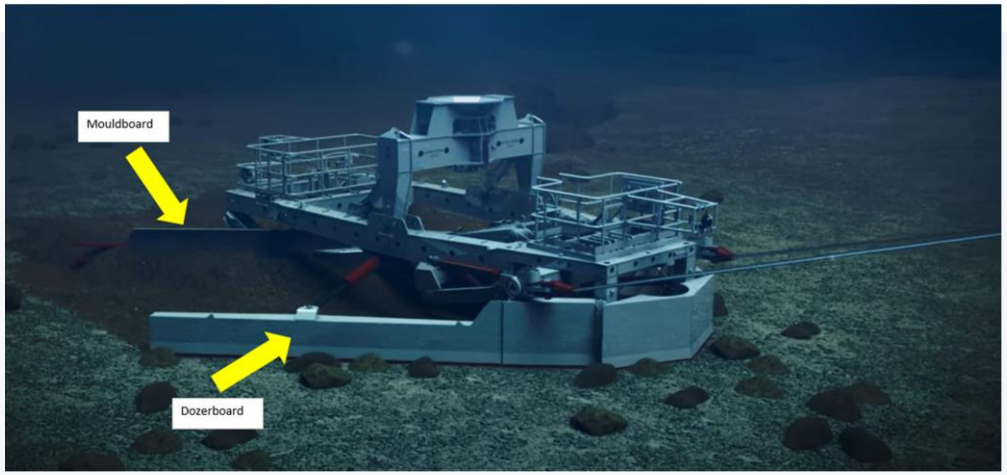
Boulder Clearance – Boulder Grab

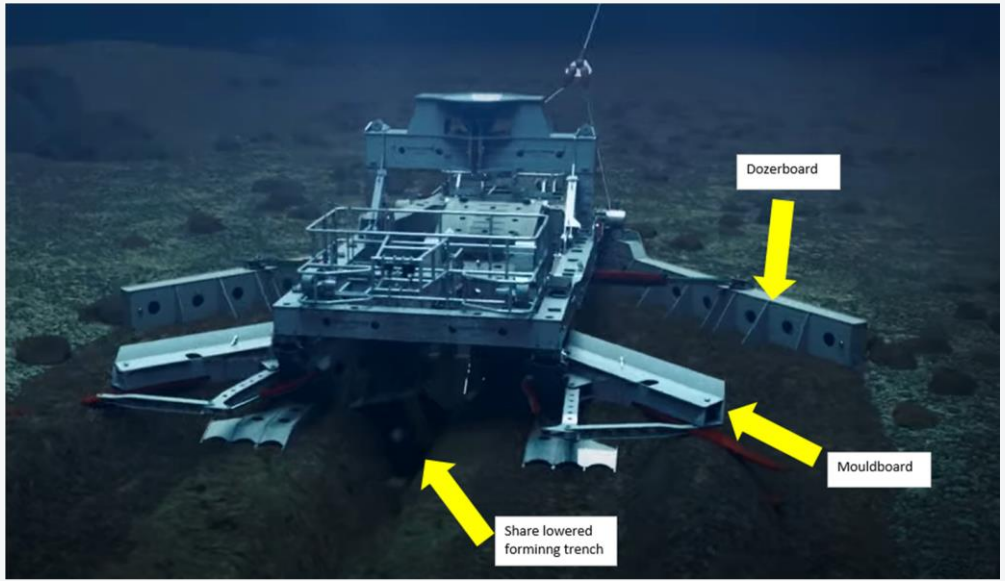
- For areas of low boulder density, a boulder grab will be used to displace specific boulders from designed cable routes and foundation locations.
- The reason for their relocation is to allow trenching equipment to pass along the centreline without boulders damaging the trencher or cable.
- Boulders picked by boulder grab will be relocating approximately 25-50 feet off centreline of route.
- Boulders that are picked are not grouped, they are displaced perpendicular to cable alignment.
- The maximum size boulder grab can handle is approximately 7 feet.
- The maximum distance a boulder would be moved at a foundation location is 600 ft

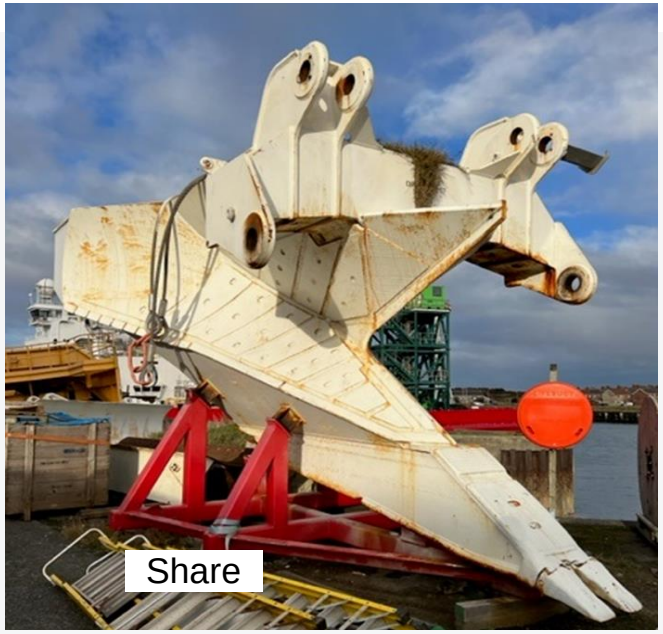
Boulder Clearance – Boulder Plough

- For areas of high boulder density, a boulder plough will be used to displace boulders from designed cable routes and foundation locations.
- The reason for boulder relocation is to allow trenching equipment to pass along the centreline without boulders damaging the trencher or cable.
- The plough will push boulders approximately 25 feet either side of the route and create a slot in the seabed to lay the cable into if required.
- The height of the material that is pushed aside will depend on the seabed profile and if the share of the plough is deployed.
- The height of the pushed material should not be higher than individual boulders themselves.
- The plough will be utilized to push the spoils back into the slot to cover the cable.
- The plough can move boulders up to 7 feet in size

Boulder Clearance – Boulder Plough







- Dozerboard – forward part of the plough that removes surface boulders and creates the outer edge.
- Mouldboard – bearing surface of the plough which moves sediment lifted by the share and creates the inner edge.
- Share – retractable portion of the plough that digs into the sediment to move hard substrates and sub-surface boulders and creates a slot for the cable.

Seabed Preparation – Boulder Clearance Northeast Project Summary

Project Name	Wind Turbine Foundations	Export Cable Route	Inter-array Cable Route
Revolution Wind	Grab	Grab/Plough	Grab/Skid
Sunrise Wind	Grab	Grab	Grab
South Fork Wind	Grab	Grab/Plough	Grab/Plough

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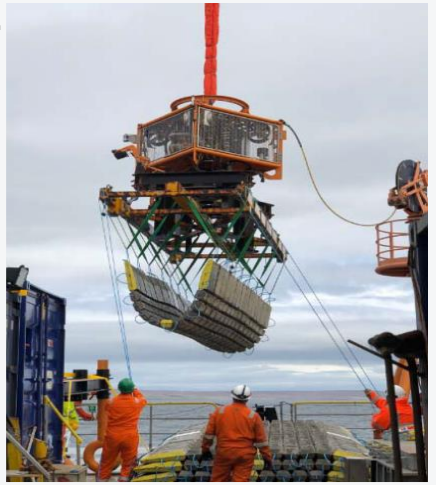
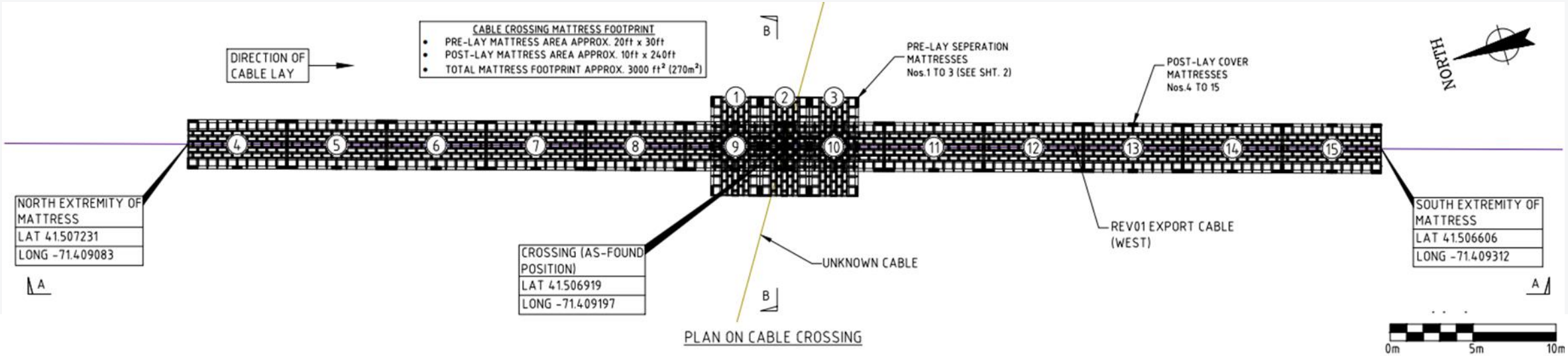
Seabed Preparation – Cable Crossing

- At cable crossing mattresses provide separation between existing infrastructure and cables.
- Each crossing will be individually designed.
- Mattresses have a tapered edge design.



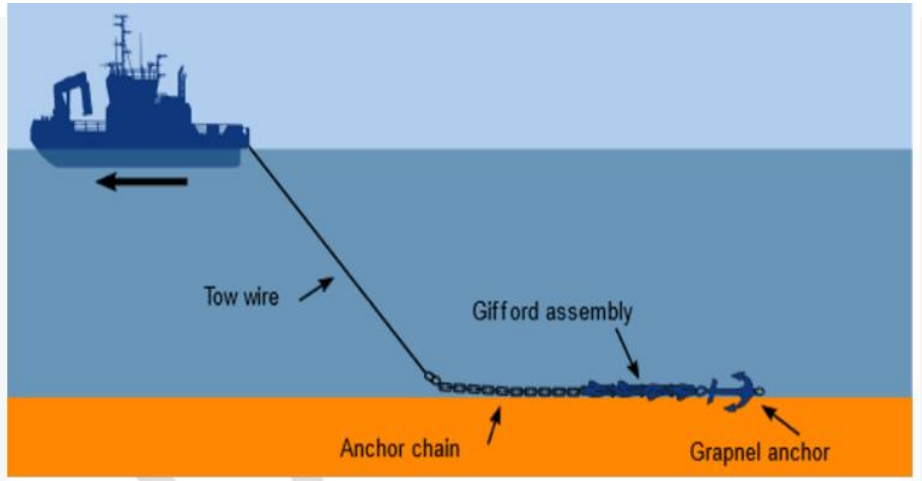


PLAN ON CABLE CROSSING

Indicative Cable Crossing Design

Seabed Preparation - Pre Lay Grapnel Run (PLGR)

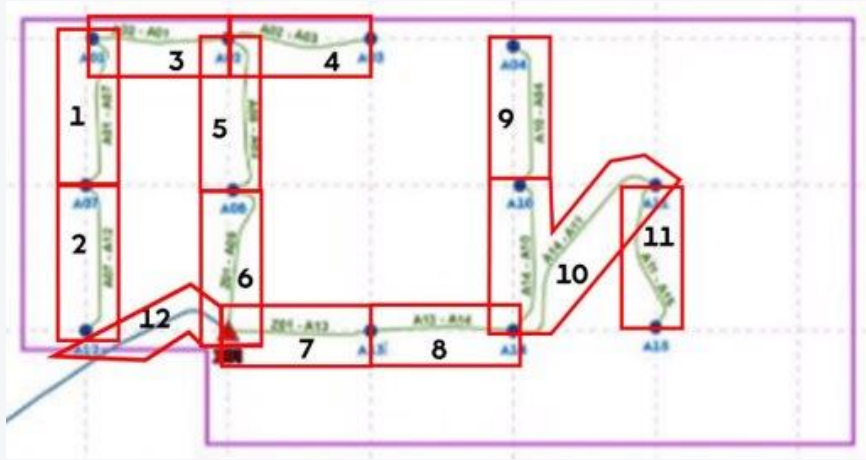
- A vessel will pull a grapnel train along the seabed to collect debris (e.g., wires, anchor chains, debris).
- PLGR will be performed along the entire cable route except for in the vicinity of cable crossings.
- More than one grapnel run may be required in areas with a high density of debris.
- Debris brought up to vessel and disposed of onshore.
- Average PLGR grapnel is approximately 3 feet wide will have a penetration depth approximately 1.7 feet.



Example Vessel – North Star Commander

South Fork Wind: Cod Spawning Mitigation

- South Fork Wind is implementing mitigation measures to avoid and minimize impacts to spawning cod during construction.
- Southern New England cod are known to spawn primarily between December through February.
- However, based on SFW COP condition 5.4.4 monitoring for spawning cod is required for any ground-disturbing activities from **November through March**.
- No pile driving of wind turbine foundations is set to occur during these months either.



Monitoring Zones

<u>Monitoring Plan</u>

- South Fork Wind will deploy a Slocum glider with Passive Acoustic Monitoring equipment for a two-week survey prior to ground-disturbing activities to listen for the grunts of spawning cod.
- Ground-disturbing activities can occur in a monitoring zone if the spawning cod detection threshold (two or more verified grunts in a monitoring zone in a 24-hr period) is not met during the survey.
- Ground-disturbing activities cannot occur in a monitoring zone if the detection threshold is met.
- Additional, directed PAM will occur in the monitoring zones where the detection threshold was met.
- Ground-disturbing activities in those survey zones cannot being until the detection threshold is not longer met.

South Fork Wind - Seabed and Cable Construction Activities 2023 Q1 – Q2

- Export Cable Seabed prep (plough): February through 2nd week of March, Laney Chouest
- Export Cable Seabed Prep (Pre Lay Grapnel Run): 2nd-4th week of February, North Star Commander
- Export Cable Installation - 2nd week of February through end of April, Living Stone

Laney Chouest – Boulder Plough

North Star Commander – Pre Lay Grapnel Run

Living Stone – Export Cable Installation

Questions?

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