

Final Report on Pilot Scale Cultivation of *Macrocystis* in Alaska

Macrocystis pyrifera | WildBlue Mariculture

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Simpson Bay, Prince William Sound, Alaska

Cultivation season 2025–2026

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Project overview

WildBlue Mariculture conducted a pilot cultivation trial of giant kelp (*Macrocystis pyrifera*) at its commercial kelp farm in Simpson Bay. The trial demonstrated successful establishment and continued growth across four cultivation arrays. These results provide preliminary evidence that giant kelp can be cultivated at this protected Prince William Sound site, while leaving commercial yield, optimal spacing, and harvest timing unresolved.

WildBlue Mariculture was the first kelp farm in the State of Alaska to outplant *Macrocystis pyrifera*. This pilot project documents the establishment and cultivation of the species at WildBlue’s commercial farm site in Simpson Bay.

The project deployed approximately 2,000 feet of seeded growline on November 5, 2025, following sorus tissue collection on September 5, 2025. Monthly farm checks continued through July 2026. All four arrays showed moderate to good growth and excellent coverage. Through May, Array 2 performed best, followed by Arrays 3, 4, and 1. By the final July check, Array 3 was in the best condition among the remaining arrays. Array 4 was harvested on May 14, 2026, and yielded 1,163 pounds of wet kelp from 600 feet of growline.

Scope and documentation status

This report summarizes cultivation activities, monthly farm-check observations, photographic documentation, water-temperature observations, and the wet-weight harvest total. Measurements include blade lengths recorded on March 18 and April 21, harvest-day length measurements from Array 4 on May 14, and stipe and blade lengths from the three remaining arrays on July 11. Measurements were not collected during the June farm check because herring spawn on the kelp restricted handling. Farm and array-location maps are provided in Appendix A.

Farm site and cultivation system

WildBlue operates a 22-acre kelp farm approximately 7 nautical miles southwest of Cordova, Alaska, in Simpson Bay within Prince William Sound. Four experimental cultivation arrays were installed across the farm to examine growth under different levels of exposure, ranging from the most protected to the most exposed locations.

The arrays used aluminum stretcher-bar longline systems. Two arrays had 10-foot stretcher-bar spacing and supported two 200-foot seeded growlines each. Two arrays had 5-foot stretcher-bar spacing and supported three 200-foot seeded growlines each.

At outplanting, the growlines on all four arrays were suspended at approximately 5 feet. Before April, the observed plants consisted of holdfasts and blades. By the April 21, 2026 farm check, noticeable stipes had begun to develop and the first gas bladders were observed. The growlines were then lowered to approximately 10 feet, and about 20 pounds of additional weight was added to each stretcher bar to help keep the developing *Macrocystis* below the water surface.

Configuration	Arrays	Growlines per array	Total growline
10-foot spacing	2, 3	2 × 200 feet	800 feet
5-foot spacing	1, 4	3 × 200 feet	1,200 feet
Total	1–4	10 growlines	2,000 feet

Arrays 1 and 4 each used three 200-foot growlines at 5-foot spacing (600 feet per array). Arrays 2 and 3 each used two 200-foot growlines at 10-foot spacing (400 feet per array).

Farm and array-location maps are provided in Appendix A.

Cultivation methods and timeline

Date or period	Activity and recorded outcome
November 5, 2025	Approximately 2,000 feet of seeded growline outplanted across four arrays at a depth of approximately 5 feet. Water temperature: 46°F.
September 5, 2025	Sorus tissue collected from mature giant kelp.
December 2025	Water temperature: 47.03°F.
January 11, 2026	First noticeable continuous growth observed during the monthly farm check. Water temperature: 40.26°F.
February 1, 2026	More continuous growth observed across the growlines. Water temperature: 41.32°F.
March 18, 2026	Continued improvement observed on all arrays. Arrays 1–3 were very dense across all lines; Array 4 was less dense. Water temperature: 40.39°F.
April 21, 2026	Noticeable stipes beginning to develop and first gas bladders observed; previously, plants consisted of holdfasts and blades. Growlines lowered from approximately 5 feet to 10 feet, and about 20 pounds of additional weight was added to each stretcher bar. Water temperature: 42.68°F.
May 14, 2026	Array 4 harvested from 600 feet of growline, yielding 1,163 pounds wet weight. The kelp was weighed later in the day, so some water loss had likely occurred before weighing. Water temperature: 47.42°F.
June 19, 2026	Herring spawn observed on the remaining kelp. Measurements were not collected because handling was restricted.

Date or period	Activity and recorded outcome
July 11, 2026	All observed herring spawn had hatched. Substantial kelp deterioration and slowed growth led to the end of project monitoring; Array 3 was in the best condition among the remaining arrays.

Water-temperature observations were available for November, December, January, February, March, April, and May; readings were not available for June or July.

Observed growth performance

All four arrays displayed moderate to good growth with excellent growline coverage. Through May, WildBlue's qualitative ranking was Array 2, followed by Arrays 3, 4, and 1. By the July 11 final farm check, Array 3 was in the best condition among the remaining arrays and was the most exposed array in the test. Measurements recorded on March 18, April 21, May 14, and July 11, 2026 are provided in Appendix B. Arrays 1–3 were very dense across all lines on March 18, while Array 4 was less dense. The measurements are limited snapshots and do not, by themselves, establish comparative growth rates.

Array	Relative performance	Recorded observation
2	Best through May	Strongest growth through May; not the most exposed location.
3	Best at final July check	Most exposed array; in the best condition among the remaining arrays despite substantial deterioration.
4	Harvested May 14	Less dense than Arrays 1–3 in March; harvested at 1,163 pounds wet weight from 600 feet.
1	Least growth	Most protected location; less growth throughout the project, but better than WildBlue expected.

Array 2's performance suggests that the highest exposure did not necessarily correspond to the best growth at this farm.

Harvest yield and interpretation

Array 4 was fully harvested on May 14, 2026, yielding 1,163 pounds of wet biomass from 600 feet of growline, or approximately 1.94 pounds per foot. The biomass was weighed later in the day, after some water loss had likely occurred, so the recorded total may be lower than the immediate post-harvest wet weight. Three blade measurements collected from Array 4 at harvest were 24, 34, and 46 inches, with an average blade length of approximately 34.7 inches.

WildBlue considered this yield below its desired production level. Possible factors identified during the project include site compatibility, insufficient time for the kelp to reach maturity, and dense continuous growth along the seedline that may have restricted development. These remain working hypotheses rather than demonstrated causes. Because only Array 4 was harvested, the result should be treated as preliminary and does not establish the commercial yield potential of giant kelp at the site.

June herring spawn observation

During a farm visit on June 19, 2026, WildBlue observed a light to moderate coating of herring spawn across all kelp remaining in the water. This included 1,400 feet of giant kelp growline and 600 feet of split kelp.

WildBlue photographed the spawn and reported following the applicable no-touch guidance during the visit. This report records that farm practice without interpreting regulatory requirements. The giant kelp appeared healthiest and showed further growth in June, according to the farm observations.

Photographs from June 19, 2026 document giant kelp condition and herring spawn during the farm visit.

July monitoring and continued farm observations

The July 11, 2026 farm check showed that all observed herring spawn had hatched. The kelp showed signs of deterioration and slowed growth. These observations led WildBlue to conclude project monitoring in July, the final month of monitoring for this pilot.

Outside the scope of this project, WildBlue is retaining Arrays 1 and 2 in the water for continued observation and potential sale to Prince William Sound kelp pounders. WildBlue hopes that the healthy, well-established holdfasts will support blade growth suitable for sale in March, when blades are needed by PWS kelp pounders. Sale will depend on the kelp meeting buyers' specific requirements for blade size, density, and color. Suitability and sale remain to be determined through continued observation.

Challenges and lessons learned

The project established giant kelp across the farm but did not resolve the conditions needed for reliable commercial production. Strong coverage did not necessarily translate into the desired harvest weight. The apparent improvement in June, after Array 4's May 14 harvest, supports testing later harvest dates, although it does not establish that a later harvest would have increased Array 4's yield.

Continuous seedline coverage may have produced crowding that limited individual plant development. WildBlue recommends testing seedline spacing. Any future trial should define the spacing treatment clearly, distinguishing gaps or planting intervals along a growline from the distance between adjacent growlines.

The unexpected performance of Array 2 shows the value of testing several farm locations. Exposure alone is insufficient to explain the observed ranking.

Recommendations for future cultivation and market evaluation

- Test defined seedline planting intervals against the continuous seeding approach used in this pilot, while holding other conditions as consistent as practical.
- Repeat exposure and spacing treatments across multiple arrays or seasons to distinguish treatment effects from location and year effects.
- Include moderately exposed locations in future trials. Although Array 2 performed best through May, Array 3—the most exposed array—was in the best condition at the final July check. This result suggests that highly protected farm sites may not provide ideal growing conditions for *Macrocystis* throughout the full cultivation season; exposure effects should be confirmed across additional sites and seasons.
- Record dated plant measurements, growline coverage, survival or losses, and environmental observations using a consistent sampling method.

- Confirm blade size, density, and color requirements with PWS kelp pounders and assess whether Arrays 1 and 2 meet those requirements in March. Document usable yield, handling requirements, and costs before drawing conclusions about commercial viability.

Photographic documentation and collected data

The following appendices summarize the available system, measurement, harvest, and monitoring records. Photographic documentation is presented by month after the conclusion. Captions identify the date and subject and retain the original photograph numbers.

Appendix A Farm map and system records

The following maps show the farm's location within Simpson Bay, the farm-site area, the positions of Arrays 1-4, and examples of the three-growline and two-growline configurations.

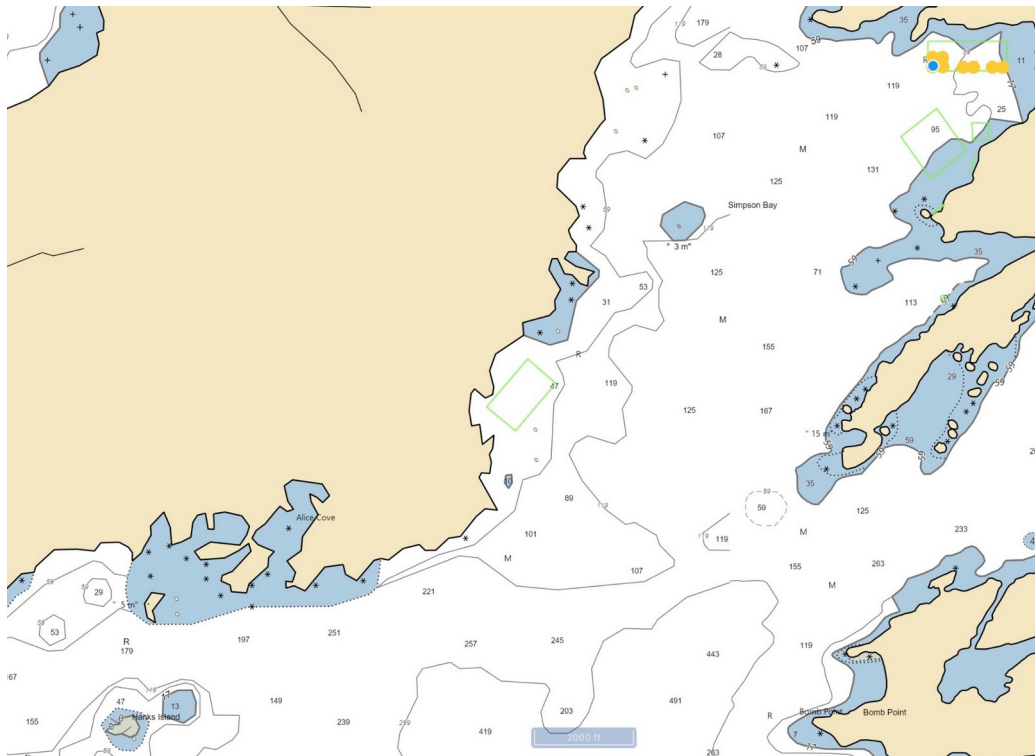


Figure A1. WildBlue Mariculture farm location within Simpson Bay.



Figure A2. Farm-site overview within Simpson Bay.

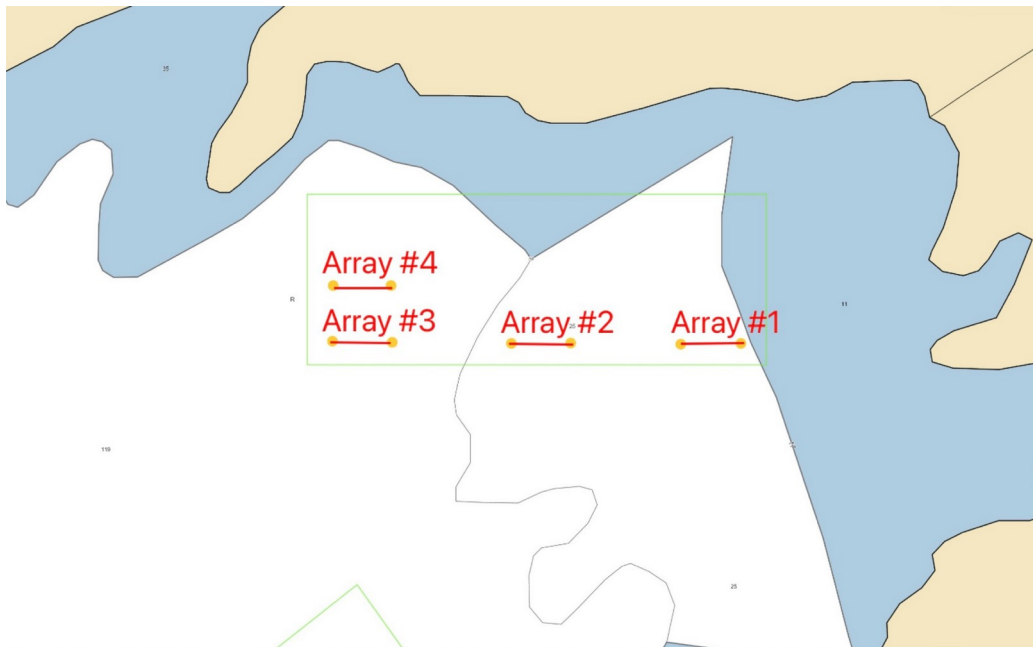


Figure A3. Locations of experimental Arrays 1-4 within the farm site.

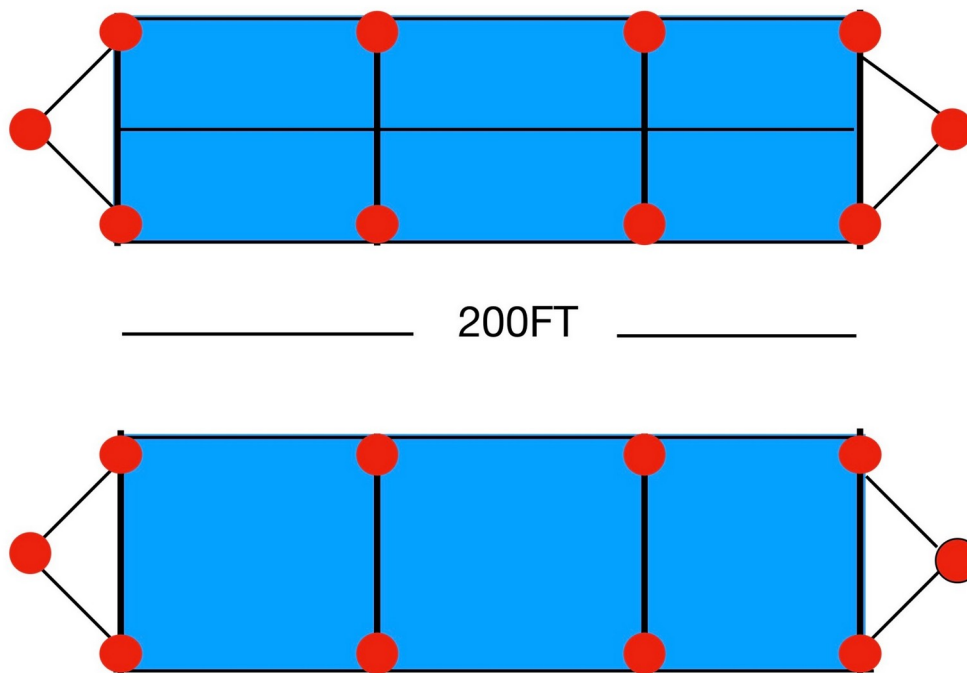


Figure A4. Examples of the three-growline and two-growline 200-foot array configurations.

Appendix B Array measurements and photographs

March 18, 2026 — Blade lengths were: Array 1, 6, 8, and 14 inches; Array 2, 14, 18, and 19 inches; Array 3, 9, 13, and 16 inches; and Array 4, 11, 14, and 16 inches. Arrays 1–3 were very dense across all lines, while Array 4 was less dense.

April 21, 2026 — Blade lengths were: Array 1, 25, 18, and 22 inches; Array 2, 34, 26, and 19 inches; Array 3, 19, 22, and 25 inches; and Array 4, 18, 25, and 29 inches. Before April, the observed plants consisted of holdfasts and blades. By April 21, noticeable stipes had begun to develop and the first gas bladders were observed.

May 14, 2026 — Array 4 harvest-day blade lengths were 24, 34, and 46 inches. After the growlines were lowered and approximately 20 pounds of weight was added to each stretcher bar in April, length measurements were collected only from Array 4 at harvest. Array 4 was harvested on May 14 and was not measured in July.

June 19, 2026 — Measurements were not collected because herring spawn on the kelp restricted handling.

July 11, 2026 — Array 1 had a 24-inch stipe and blade lengths of 20, 24, and 19 inches. Array 2 had a 35-inch stipe and blade lengths of 8, 21, and 12 inches. Array 3 had a 36-inch stipe and blade lengths of 27, 26, and 21 inches. Substantial deterioration was observed across the remaining arrays. Despite the deterioration, Array 3 was in the best condition and was the most exposed array in the test.

Appendix C Harvest and monitoring records

Array 4 was harvested on May 14, 2026. The 600-foot array yielded 1,163 pounds of wet kelp. The weight was recorded later in the day after harvest, so some water loss had likely occurred before weighing. June measurements were not collected because herring spawn on the kelp restricted handling. During the July 11 final farm check, the remaining *Macrocystis* showed substantial deterioration and slowed growth; the July measurements are recorded in Appendix B.

The March 18 and April 21 observations provide blade-length measurements for all four arrays. May 14 measurements were collected only from Array 4 at harvest, and July 11 measurements were collected from the three remaining arrays during substantial deterioration.

Conclusion

The 2025–2026 pilot demonstrated successful establishment and growth of giant kelp at WildBlue’s Simpson Bay farm. All four arrays developed substantial coverage. Through May, Array 2 showed the best qualitative performance; by the final July check, Array 3 was in the best condition among the remaining arrays. Array 4 produced 1,163 pounds of wet kelp from 600 feet on May 14, 2026. Because the kelp was weighed later in the day, some water loss had likely occurred before weighing. The trial provides a basis for further cultivation work, particularly controlled tests of seedline spacing, harvest timing, and site conditions. Commercial production potential remains to be determined. The *Macrocystis* grown during this trial was smaller, more delicate, and lighter in color than expected; these characteristics may have been influenced by the protected farm site, but additional trials are needed to confirm the cause. A two-year cultivation cycle may produce better results and should be evaluated in future trials.

January 11 2026 photographic documentation



January 11, 2026 - Giant kelp on the growline. Photograph IMG_1409.

February 1 2026 photographic documentation



February 1, 2026 — Giant kelp beside a measuring tape. Photograph IMG_2945. This original image replaces the previously supplied copy of the same photograph.

February 1 2026 growline photographs



February 1, 2026 — Giant kelp on the growline. Photograph IMG_2949.



February 1, 2026 — Giant kelp on the growline. Photograph IMG_2942.

March 18 2026 farm check photographic documentation

March 18, 2026 blade measurements — Array 1: 6, 8, and 14 inches; Array 2: 14, 18, and 19 inches; Array 3: 9, 13, and 16 inches; Array 4: 11, 14, and 16 inches. Arrays 1–3 were very dense across all lines. Array 4 was less dense than Arrays 1–3.



March 18, 2026 farm check — Growline and farm setting. Photograph IMG_1514.



March 18, 2026 farm check — Closer view of kelp blades on the growline. Photograph IMG_1516.

April 21 2026 farm check photographic documentation

April 21, 2026 blade measurements — Array 1: 25, 18, and 22 inches; Array 2: 34, 26, and 19 inches; Array 3: 19, 22, and 25 inches; Array 4: 18, 25, and 29 inches. All measurements are blade length. Before April, the observed plants consisted of holdfasts and blades. By this farm check, noticeable stipes had begun to develop and the first gas bladders were observed.

During the April 21 farm check, noticeable stipes had begun to develop and the first gas bladders were observed. Before April, the observed plants consisted of holdfasts and blades. The growlines were lowered from approximately 5 feet to approximately 10 feet, and about 20 pounds of additional weight was added to each stretcher bar to help keep the developing kelp below the water surface.



April 21, 2026 farm check — Kelp blades on the growline. Photograph IMG_3426.

April 21 2026 farm check photographic documentation



April 21, 2026 farm check — Kelp coverage on the growline. Photograph IMG_3442.



April 21, 2026 farm check — First gas bladder and noticeable stipe development observed. Photograph IMG_3445.

May 8 2026 photographic documentation



May 8, 2026 - Close view of dense giant kelp growth along the growline. Photograph IMG_1896.



May 8, 2026 - Dense giant kelp growth viewed underwater. Photograph IMG_1899.

June 19 2026 herring spawn photographic documentation



June 19, 2026 — Herring spawn coating giant kelp blades. Photograph IMG_1882.



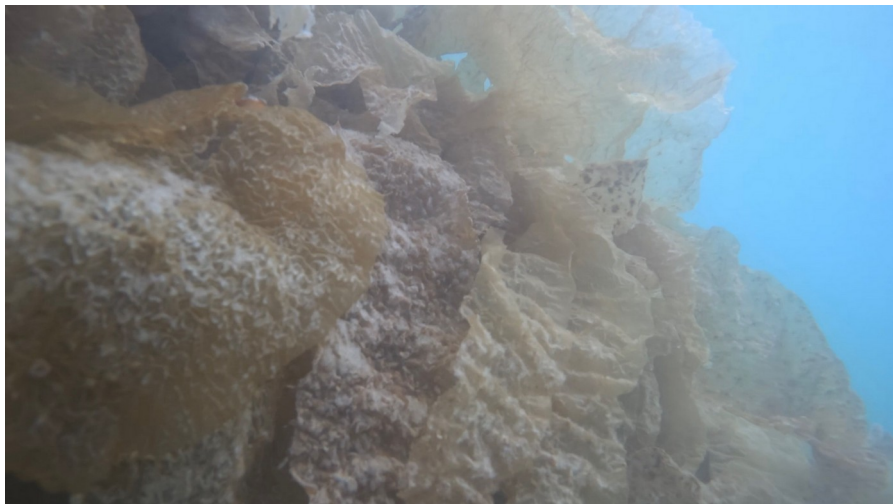
June 19, 2026 — Close view of herring spawn distributed across giant kelp blades. Photograph IMG_1883.



June 19, 2026 - Close view of herring spawn coating Macrocystis blades. Photograph IMG_1962.



June 19, 2026 - Herring spawn distributed across Macrocystis blades. Photograph IMG_1960.



June 19, 2026 - Additional underwater view of herring spawn on Macrocystis. Photograph IMG_1959.

July 11 2026 farm check photographic documentation



July 11, 2026 - More mature gas bladder development on Macrocytis. Photograph IMG_1905.



July 11, 2026 - Biofouled Macrocytis observed during the final farm check. Photograph IMG_1913.



July 11, 2026 - Additional view of biofouled Macrocytis. Photograph IMG_1912.



July 11, 2026 - Developed stipes and gas bladders visible on deteriorating Macrocytis. Photograph IMG_1885.