



AGENDA

Climate Action Committee Meeting

Tuesday, May 27, 2025, 6:00 p.m.
Council Chambers, 400 Centre Road, Lions Bay
And Via Zoom Video Conference

Zoom Invite Link: <https://us02web.zoom.us/j/2780145720?omn=85977680093>
To join via phone, dial 778-907-2071 | Meeting ID: 278 014 5720

We are privileged to be meeting and doing work on behalf of the residents of Lions Bay on the traditional unceded territory of the Squamish and Musqueam Nations.

	Pages
1. Call to Order	
2. Adoption of Agenda	
Recommendation: THAT the Agenda of The Climate Action Committee of May 27, 2025, be adopted.	
3. Public Participation	
4. Delegations	
4.1 Grant Application and Shoreline Resiliency and Kelp Sea-forestation Project Proposal	3
Grant Application and Shoreline Resiliency and Kelp Sea-forestation Project Proposal to be presented by Greg Banta and in conjunction with committee member John Robb (not in attendance).	
<i>- for discussion and direction</i>	
5. Approval of Minutes of Prior Meetings	
5.1 Climate Action Committee Meeting- April 22, 2025	30
Recommendation: THAT the Climate Action Committee Meeting minutes of April 22, 2025 be approved.	
6. Business Arising from the Minutes	
7. Reports	
<i>- none</i>	
8. Resolutions	
<i>- none</i>	
9. Unfinished Business	
9.1 Mini Recycling Depot Update	

Verbal update on the Recycling Depot project from committee member Andrew Wray.

- for information

9.2 Furnace Infrastructure Replacement Environmental Upgrade (FIREUP) Project Update

Verbal update on the FIREUP project from Director of Operations K Buhr or Chair N Abbott.

- for information

9.3 Annual Climate Action Committee Reports

Committee member N Barmeier to author Climate Action Committee reports for 2023 & 2024.

reports due June 1, 2025

- for information and discussion

10. New Business

10.1 Fuel Spending 2023 & 2024

Report from Financial Officer J Chirkoff on Village fuel consumption and spending.

- for information

10.2 Climate Action Committee Recommendations to Council

Request for direction report to Council by Chair N Abbott on the Recycling Depot and Budget and Spending.

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11. Public Questions and Comments

12. Adjournment

Recommendation:

THAT the Climate Action Committee Meeting be adjourned.

Grant Application and Shoreline Resiliency and Kelp Sea-forestation Project Proposal

Project Title: Nature-Based Shoreline Resiliency and Kelp Sea-forestation for Lions Bay and Brunswick Beach, BC

Applicant: Village of Lions Bay Climate Action Committee

Partner(s) (proposed): Squamish Nation, Ocean Wise, Pacific Salmon Foundation, Residents

Executive Summary

The Village of Lions Bay proposes a multi-year, nature-based initiative to address increasing coastal erosion and marine habitat degradation due to sea level rise and climate change. The project will combine shoreline log-sand restoration and offshore sugar kelp (*Saccharina latissima*) reforestation to attenuate wave energy and restore ecological function. The plan uses local natural materials, aligns with Green Shores® best practices, and includes habitat resilience strategies informed by recent global kelp restoration research.

Project Objectives

1. Prevent shoreline erosion through nature-based solutions (logs, sand, native vegetation).
 2. Restore kelp forests to reduce wave energy and support marine biodiversity.
 3. Adapt the shoreline to withstand sea-level rise and marine heatwaves.
 4. Engage local and Indigenous knowledge in project planning and stewardship.
 5. Educate local youth to nurture future generations of coastal and marine environmentally conscious volunteers.
 6. Contribute to regional and global efforts to restore marine ecosystems.
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Project Scope and Phases

Year 1 – Pilot Phase (Fall 2025 Start)

- Site assessment and permitting
- Pilot shoreline restoration (logs, sand, beach planting)
- Kelp hatchery setup and small-scale outplanting
- Community engagement and initial monitoring

Year 2 – Scale-Up Phase

- Expand shoreline restoration to additional beaches
- Large-scale kelp planting (~0.5 hectares)

- Ongoing monitoring and community participation

Year 3 – Full Implementation and Stewardship

- Final shoreline and kelp installations
- Reporting and knowledge sharing
- Establish long-term monitoring and maintenance plan

Methodology Highlights

- **Shoreline Design:** Strategic placement of driftwood logs and compatible sediment to stabilize beaches.
 - **Kelp Planting:** Use of "green gravel" or other emerging methods (e.g., agar gel) of direct seeding to restore sugar kelp beds.
 - **Seasonal Planning:** Align construction and planting windows with ecological and weather constraints.
 - **Heat Stress Mitigation:** Deploy kelp in cooler seasons, select local genotypes, and trial pre-treated sporophytes.
 - **Monitoring:** Bathymetric surveys, kelp density and survival metrics, shoreline profile measurements.
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Budget Summary (Years 1–3)

Total Estimated Budget: CAD \$180,000–\$200,000

Breakdown by activity and year is provided in the attached Excel file.

Project Year	Activity	Estimated Cost (CAD)
Year 1	Shoreline works (pilot)	20000
Year 1	Kelp pilot cultivation and deployment	15000
Year 1	Design and monitoring (consultants, surveys)	15000
Year 2	Shoreline works (expansion)	60000
Year 2	Kelp scale-up (nursery, dives)	20000
Year 2	Monitoring and project management	10000
Year 2	Community engagement and outreach	5000
Year 3	Final shoreline and kelp installations	20000
Year 3	Interpretive signage and final report	5000
Year 3	Ongoing monitoring and data portal	5000
	Total	175000

Timeline Overview Lions_Bay_Kelp_Project_Timeline

Start Date: September 2025

Duration: 3 Years (2025–2028)



Expected Outcomes

- Stabilized shoreline and reduced erosion risk for Lions Bay and Brunswick Beach
- Restored sugar kelp canopy covering up to 1 hectare of nearshore habitat
- Enhanced biodiversity and carbon sequestration in the marine ecosystem
- Increased climate resilience for community assets and natural infrastructure
- Stronger partnerships with Indigenous and research communities

Funding Request

The Village of Lions Bay respectfully seeks full or cost-shared funding of CAD \$200,000 through eligible sources such as:

- BC Salmon Restoration and Innovation Fund (BCSRIF)
 - Green Municipal Fund (FCM)
 - UBCM Community Emergency Preparedness Fund (CEPF)
 - Oceans Protection Plan – Aquatic Ecosystems Restoration Fund
 - Pacific Salmon Foundation Community Salmon Program
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Attachments

- Detailed Project Timeline (see Gantt Chart)
 - Project Budget (see above Excel sheet)
 - Letters of Support (i.e., from Squamish Nation, Ocean Wise, DFO, relevant Ministry(s))
 - Preliminary Site Maps (to be added after marine surveys)
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Contact Information

Grant Lead: [Name], Chair, Lions Bay Climate Action Committee

Email: climateaction@lionsbay.ca

Phone: 604-xxx-xxxx

Mailing Address: Village of Lions Bay, 400 Centre Road, Lions Bay, BC V0N 2E0

Nature-Based Shoreline Resiliency and Kelp Seaforestation Framework for Lions Bay & Brunswick Beach, BC

Introduction and Project Objectives

Lions Bay and Brunswick Beach lie along the eastern shores of Howe Sound (Átl'ka7tsem) in the Salish Sea, facing increasing coastal erosion pressures and marine habitat loss. This multi-year project aims to **prevent shoreline erosion** and **restore kelp forests** using nature-based solutions. Key objectives include:

- **Enhancing Shoreline Resiliency:** Stabilize beaches and bluffs using local materials (logs, sand, gravel, rock) instead of hard infrastructure, in line with Green Shores® principles.
- **Kelp Seaforestation:** Establish beds of **sugar kelp (*Saccharina latissima*)** offshore to attenuate wave energy and protect the coast, while providing habitat and carbon sequestration.
- **Climate Adaptation:** Account for seasonal constraints (storm seasons, kelp life cycle) and future climate impacts like marine heat waves, ensuring the project's long-term success.
- **Data-Driven Planning:** Utilize publicly available shoreline and bathymetric data to guide site selection and design.
- **Community and Research Integration:** Align with regional initiatives (e.g. Green Shores, local restoration projects) and global best practices shared at recent kelp restoration conferences.

By combining **natural shoreline defences** with **kelp forest restoration**, the project seeks to create a model of coastal resiliency that protects property, supports biodiversity, and educates the community on sustainable shoreline management.

Site Assessment and Data Utilization

A thorough **site assessment** of Lions Bay's foreshore and nearshore will precede any interventions. This includes mapping **underwater topography (bathymetry)**, substrate type, and environmental factors:

- **Bathymetric Mapping:** Existing multibeam sonar surveys show that the seabed off Lions Bay includes steep drop-offs with some submerged rocky outcrops researchgate.net. These in-situ bedrock "hills" could serve as natural reefs to anchor kelp if they rise into the photic zone. Depth data (e.g., from Canadian Hydrographic Service charts and LiDAR surveys) will identify **shallow benches (approx. 5–15 m deep)** optimal for kelp attachment. Public resources like the Howe Sound Marine

Reference Guide provide interactive maps with hundreds of data layers on the local aquatic environment howesoundguide.ca, which will be used to locate suitable kelp installation zones and to avoid navigation hazards.

- **Shoreline Characteristics:** The project will profile the **beach slopes, sediment sizes, and log drift patterns** at Lions Bay Beach and Brunswick Beach. Historical erosion rates and high-tide line changes (from aerial photos or municipal records) will help target the most vulnerable stretches. Beach substrate is a mix of coarse sand, gravel, and cobble typical of Howe Sound's fjord shores; this offers a foundation for augmentation with imported sediment if needed for nourishment.
- **Creek Outflows:** Magnesia/Magenta Creek and other small streams entering the bay create localized freshwater influence. Water quality and salinity will be measured at creek mouths. Note that **surface waters have lower salinity due to mountain runoff** in Howe Sound geochem.nrcan.gc.ca. Sugar kelp thrives in salinities of 23–31 PSU, with growth dropping off below ~16 PSU frontiersin.org. Therefore, kelp beds will be sited at least 50–100 m away from creek outflows or in areas with sufficient mixing to maintain stable salinity. Fine sediments from creek outflow can smother young kelp, so areas with heavy sediment deposition will be avoided or mitigated (e.g., by positioning kelp on the up-current side of a rocky point away from direct silt plumes).
- **Environmental Baseline Surveys:** Prior to construction, diver surveys and drone imaging will document existing nearshore habitats (eelgrass, mussel beds, etc.), and sensitive species (like forage fish spawning sites) so the project can avoid or minimize impacts. These baseline data also form the reference for post-project monitoring of ecological changes.

By leveraging these datasets and field surveys, the team will produce suitability maps for both **shoreline treatments** (where logs/sand can be placed effectively) and **kelp installations** (areas of adequate depth, light, and substrate). All designs will then be validated by coastal engineers or geomorphologists familiar with local conditions (e.g., steep fjord walls, wave climate, seasonal winds).

Shoreline Resiliency Design (Logs, Sand, and Rock)

To strengthen the coast against erosion, the project will implement **nature-based shoreline defences** that work with local materials and coastal processes. In contrast to seawalls or riprap alone, this approach mimics the way natural beaches dissipate wave energy. Best practices drawn from Green Shores® guidelines include:

- **Large Woody Debris (Log) Placement:** Naturally fallen driftwood logs are common along BC shores and act as wave breaks. We will strategically reposition or anchor locally sourced logs and root wads along the upper beach. Placing logs parallel to the shoreline at the high-tide line helps **disperse wave energy and trap sand**, building up the beach berm stewardshipcentrebc.ca. The logs also provide habitat complexity and aesthetic value. Where possible, logs will be partially buried to half their diameter to prevent movement and mimic stable drift log accumulation. Using a mix of log sizes (including some very large pieces or boulders to “pin” them) ensures stability during winter storms. According to shore restoration experts, **log placement projects are**

typically low-cost and provide natural erosion protection, while also creating food and shelter for shoreline wildlife. This makes them ideal for community-led sites like Lions Bay Beach.

- **Beach Nourishment (Sand/Gravel):** In spots where chronic erosion has narrowed the beach, we will add compatible sediment (coarse sand and pea gravel) to rebuild a protective beach profile. Augmenting the beach width increases its capacity to absorb wave energy before it reaches the backshore. In Puget Sound, nourished gravels have even supported surf smelt spawning – a bonus ecological benefit wdfw.wa.gov; salishsearestoration.org. The imported sediment will match the native grain size to ensure it stays in place; a too-fine sand would wash away, while too-coarse rock might not interlock well. Nourishment often works hand-in-hand with log placement: **logs help hold added beach material in place** and prevent it from being rapidly eroded. We will schedule nourishment for late summer (when weather is calmest and after forage fish spawning season) so that fall storms can naturally settle the new material into a stable configuration.
- **Rocky Reefs and Headland Enhancement:** At Brunswick Beach (a more exposed site), the plan may include placing some **cobble or small boulders** to create artificial “headland” features at the ends of the beach. These rocky mounds can reduce longshore erosion by pinning the beach in place, while also providing hard substrate for kelp or shellfish. Care will be taken that any rock placement is modest and simulates natural rocky outcrops, to avoid creating a seawall effect. If existing riprap is present and failing, we will re-use those rocks in a more habitat-friendly configuration (lower slope angle, gaps for habitat, interplanted with beach grasses above).
- **Native Vegetation and Setbacks:** Above the high tide line, disturbed dunes or bank areas will be revegetated with salt-tolerant native plants (beach rye, dune grass, willow, etc.). Vegetation helps bind the soil and further dissipates wind and wave energy. We will encourage coastal homeowners to maintain a setback for landscaping, allowing a “buffer” of natural shore between lawns and the ocean. This not only reduces erosion but filters runoff and enhances habitat.

Design Rationale: These approaches align with the Green Shores philosophy that “**nature-based practices use a combination of plantings, gravel, sand, logs, stones, setbacks, and slope modifications**” to protect against erosion while maintaining ecological functions www2.gov.bc.ca. Instead of sacrificing habitat for erosion control, we aim to **restore habitat as a form of erosion control**. The local driftwood, beach sediment, and vegetation become self-adjusting defence mechanisms: logs and gravels will shift slightly during storms, dissipating energy, but remain on site to be reincorporated into the beach profile. This dynamic stability is more resilient in the long term than rigid structures. Additionally, these natural features will preserve the beach’s recreational value (safe access, aesthetics) and support wildlife (spawning fish, shorebirds, invertebrates) www2.gov.bc.ca.

During implementation, the project team will follow provincial best practices for working near water (adhering to the BC **nature-based shoreline project** guidelines and any required permits www2.gov.bc.ca). Heavy machinery access will be limited to avoid unnecessary disturbance, and work will likely occur during the summer fisheries window (typically late August to early fall in this region, when fewer sensitive species are in the intertidal zone). Community volunteers can

assist with tasks like planting beach grasses or placing smaller driftwood pieces, creating local stewardship of the enhanced shoreline.

Kelp Seeforestation Methodology (Sugar Kelp Beds)

Offshore, the project will cultivate **sugar kelp forests** as a living offshore breakwater to reduce wave action and erosion on the coastline. Sugar kelp (*Saccharina latissima*) is a native brown alga that forms broad undersea fronds. When established in sufficient density, kelp can significantly **dampen waves and currents**, protecting coasts: field measurements on the West Coast show that kelp forests slow currents and “*decrease wave action onshore,*” thereby *reducing coastal erosion* [fisheries.noaa.gov](https://www.fisheries.noaa.gov). Our plan for kelp seeforestation involves several steps:

Juvenile sugar kelp sporophyte attached to a small stone (“green gravel”) ready for outplanting. Innovative methods like seeding kelp on gravel allow easy dispersal of kelp propagules on the seabed, protecting them from drift and grazing during early growth.

1. **Hatchery Seed Cultivation:** In Year 1, we will partner with a local marine lab or the Ocean Wise Kelp Nursery to produce sugar kelp seedlings. Wild kelp sorus tissue (containing spores) will be collected from healthy donor kelp in the region in late summer. Under controlled conditions, we induce the spores to settle on twine, small stones, or shell substrates and grow into tiny kelp sporophytes a few centimeters in length. Ocean Wise recently reported success in cultivating sugar kelp in-house and transplanting it for restoration ocean.org. Having a **nursery stage** ensures we have hardy juvenile kelp ready for deployment at the optimal time. We will select parent kelp from stock that appears locally adapted (e.g., individuals that withstood the recent warm summers), to potentially enhance survival.
2. **Substrate and Outplanting Technique:** Several deployment methods will be tested in pilot plots to determine what works best at Lions Bay’s sites:
 - *Green Gravel:* This novel technique involves seeding kelp onto small stones or gravel in the lab, then scattering these “seeded” stones onto the seabed. Because the young kelp are already attached to a weight, they sink and remain at the target location. International trials of green gravel have shown promise as a low-cost, scalable restoration method globalseafood.org. In a Burrard Inlet pilot, Ocean Wise found that kelp on green gravel placed inside mesh cages grew rapidly and reached 7 feet (~2 m) within two months ocean.org. We will replicate this by deploying *kelp-seeded gravel* in protected frames or crates initially (to prevent them from washing away or being buried by sediment) until the kelp anchors more firmly.
 - *Direct Attachment to Rocks/Seafloor:* Where natural bedrock or large boulders are present in the target depth range (approximately –1 m to –6 m at low tide, where light is sufficient), divers will manually attach kelp propagules. This can be done by wrapping spore-seeded twine around rocks or using biodegradable clips to secure young kelp onto rocky reef surfaces. This technique relies on finding suitable hard substrate (the bedrock outcrops identified in bathymetry). **Kelp**

- holdfasts require hard surfaces** to attach [fisheries.noaa.gov](https://www.fisheries.noaa.gov), so where soft bottom prevails, we will instead use the gravel or anchored structure methods.
- **Anchored Arrays:** In deeper areas (6–15 m) with soft sediment, we may install a limited number of anchored kelp lines or “kelp rafts.” These would consist of floats or a horizontal rope near the surface (to maximize light) with kelp seeded onto it, anchored to the seabed by weights. While common in kelp aquaculture, anchored farms can be expensive to maintain and could conflict with boat traffic in this busy fjord. Thus, we intend to emphasize natural seabed planting and use anchored structures only on a trial basis to evaluate their wave attenuation benefit (possibly as seasonal installations each winter).
 - **Urchin Exclosures:** If green sea urchins (*Strongylocentrotus droebachiensis*) are present and grazing pressure is high (a known issue in parts of Howe Sound due to past sea star die-offs [squamishchief.com](https://www.squamishchief.com)), we will protect young kelp by using mesh enclosures or by culling urchins in the plot areas (subject to permits). Ocean Wise’s Burrard Inlet project **trialed modified crab traps filled with seeded gravel and shells to guard kelp from urchins** while they established, which proved “highly effective” ocean.org. We will use similar small cages or fences in the pilot phase to ensure at least some sporophytes survive to adulthood. In the long term, a healthy kelp forest can outcompete urchins by reducing their food access; also predators like sea otters or sunflower stars may return to control urchins naturally.
3. **Optimal Timing for Planting:** Based on sugar kelp’s life cycle, **outplanting will occur in the fall to early winter** of each project year. Sugar kelp sporophytes thrive in the colder months – they typically **grow through fall and winter and release spores in spring** depts.washington.edu. We plan initial deployments around **October–November** when seawater temperatures have dropped (below ~15°C) and winter nutrients are high, giving the young kelp a full cool season to establish. By starting in fall of Year 1 (after the first summer’s planning and hatchery rearing), the pilot kelp patches can grow over winter and be evaluated in spring of Year 2. Any second-round outplanting or scale-up will follow the same seasonal pattern (prep in summer, deploy in fall).
 4. **Spatial Arrangement:** To maximize wave dampening, kelp patches will be arranged in multiple rows roughly parallel to shore, akin to submerged “hedgerows.” We intend to create a **kelp fringe** at roughly 5–10 m depth extending along a segment of the coastline (e.g., 100 m length in pilot, scaling to 300+ m in later phases). The density goal is on the order of 10–15 kelp plants per square meter, which should form a semi-continuous canopy at maturity. Research has shown that even modest kelp canopies can reduce wave energy flux – one study observed that giant kelp beds reduced incoming wave height by a detectable amount, though less than rigid structures pubmed.ncbi.nlm.nih.gov; coastalscience.noaa.gov. We anticipate a moderate buffer effect: kelp won’t stop large storm waves completely, but it can “*attenuate wave energy and – albeit to a lesser extent – reduce coastal erosion*” coastalscience.noaa.gov, complementing the shoreline improvements.
 5. **Monitoring and Maintenance:** Divers and snorkelers will monitor kelp plots monthly in the first year to track survival, growth, and any issues (grazing, storm damage, etc.). If we find kelp dislodging, we may reinforce attachments or adjust methods (e.g., increase

weight on green gravel, or thin out kelp if they are overcrowded and shading each other). In the spring, before the kelp become reproductive, some thinning might be done to prevent excessive drift algae washing up on beaches (though moderate wrack deposition is beneficial for beach ecosystems). Long-term, the kelp forests should become self-sustaining by natural recruitment if conditions remain favorable. The project will also consider establishing a local volunteer “kelp guardian” group (perhaps Lions Bay School or a dive club) to help with ongoing monitoring and potentially harvest any invasive species (such as detecting if other seaweeds or tunicates overgrow the kelp).

Seasonal Constraints and Considerations

Seasonality is a critical factor in planning both the shoreline works and kelp restoration, due to weather, biological windows, and oceanographic conditions:

- **Wave Climate and Tides:** The most intense storms in Howe Sound typically occur in the fall and winter, when wind-driven waves and king tides coincide. All heavy shoreline construction (log placement, nourishment) will be scheduled for **late spring to summer (May–August)** when the weather and seas are calmer. Summer also offers extended periods of daytime low tides, providing ample working time on the foreshore. By completing beach enhancements by early fall, the new features (logs, added sand) can stabilize before facing winter storms. Conversely, winter is when we want the kelp in the water, because they help with wave attenuation during storms. Kelp outplanting in late fall (Nov/Dec) ensures the kelp are present and growing during the winter storm season, when their wave dampening service is most needed. We will avoid outplanting kelp in summer, as warm water and long daylight can lead to kelp stress and biofouling by epiphytes, as well as minimal wave action to justify it.
- **Biological Windows:** The project must comply with regulatory timing windows to protect species. For example, work below the high-water line often has a “**fish window**” (in this region often mid-August to mid-September) to avoid disturbing spawning fish or migratory salmon. We will plan excavation or machine work accordingly. Kelp spore collection will be done in late summer when local sugar kelp have mature sori – this timing also avoids impacting spring/summer reproductive cycles of other species. Furthermore, if forage fish spawning (surf smelt or sand lance) is known to occur on these beaches (data can be obtained from surveys or the Marine Reference Guide), nourishment will be timed to avoid egg incubation periods (often fall/winter). Planting of dune vegetation is best in early fall when rains return, so we may schedule that for September.
- **Kelp Growth Cycle:** As noted, sugar kelp’s growth peaks in the cold season. It generally **prefers water 10–15°C and can perish if water exceeds ~20°C** for long depts.washington.edu. In Lions Bay, surface temperatures can reach 18–20°C in late summer, especially during a warm year, which would stress kelp. However, below about 5 m depth the temperatures stay cooler. By planting in fall, we avoid the worst of the heat. Also, sugar kelp releases its spores in spring depts.washington.edu; thus any kelp that matures in our plots by spring will contribute to natural seeding of the area, possibly yielding new recruits by the next fall. Seasonality also affects light: winter days are short, but water clarity in Howe Sound is often better in winter (less plankton bloom and less

river sediment than in spring freshet), so kelp still get enough light at depth. We will choose the most light-favorable sites (e.g., ones not shaded by cliffs and ideally north of creek outflows that bring turbidity).

- **Debris and Driftwood Movement:** Winter storms can move very large logs and debris onshore. This can be both a challenge and a benefit. We design the placed logs to be heavy/anchored enough to resist typical storm waves, but acknowledge some repositioning might occur. Actually, a dynamic shoreline is expected – storm surges may push logs higher up and deposit fresh driftwood from elsewhere. The project will allow for *adaptive maintenance*: each spring, any dislodged or mis-positioned logs will be relocated back to their intended configuration. Similarly, nourishment sand may shift seasonally (eroding in winter, accreting in summer); we anticipate a natural cycle and will only add more material if a deficit persists beyond one season.
- **Freshwater Seasonality:** Lions Bay experiences strong winter rainfall and spring snowmelt, meaning **peak creek flows in Nov–Jan and May–June**. During these periods, nearshore salinity can drop and sediment plumes increase, which are harsh for young kelp. Our fall kelp outplanting will wait until after the first autumn rains have passed and freshwater input stabilizes. If a major rainstorm is forecast right after planting, we might delay a few days to avoid subjecting new kelp to low salinity shock (recall sugar kelp growth drops sharply below salinity 16 PSU frontiersin.org). Also, any silt from Magnesia Creek could cover kelp if they're too near the delta outflow, so part of site selection is to ensure kelp plots are in areas where currents disperse creek sediment rather than accumulate it.

By anticipating these seasonal factors, the project can **schedule activities for optimal conditions** and design features that work with natural seasonal changes (for instance, expecting winter storms to help intermix added gravel, or expecting kelp die-back in late summer and planning clean-up of detached fronds if needed). This seasonal planning will be clearly laid out in the project timeline.

Climate Change Impact Mitigation (Rising Temperatures and Kelp Resilience)

Climate change, particularly **rising ocean temperatures**, poses a significant long-term risk to both shoreline stability and kelp forest health. The plan incorporates strategies to mitigate these impacts to the extent possible:

- **Rising Water Temperatures:** Warming trends and extreme heat events (like the 2021 “heat dome”) have already caused mass mortalities of marine life in the Salish Sea thenarwhal.ca. Kelp forests are especially vulnerable – they require cold water and *elevated seawater temperatures from global warming are a major threat to kelp forest survival* fisheries.noaa.gov. This is evident from events like “The Blob” marine heatwave (2014–2016) which devastated kelp in some areas capitaldaily.ca. In our project, **thermal resilience** is a priority in kelp restoration. We will mitigate temperature stress by: 1) selecting planting depths that are a bit deeper (e.g. 6–8 m) where water stays cooler in summer, 2) sourcing kelp gametophytes from individuals that survived recent

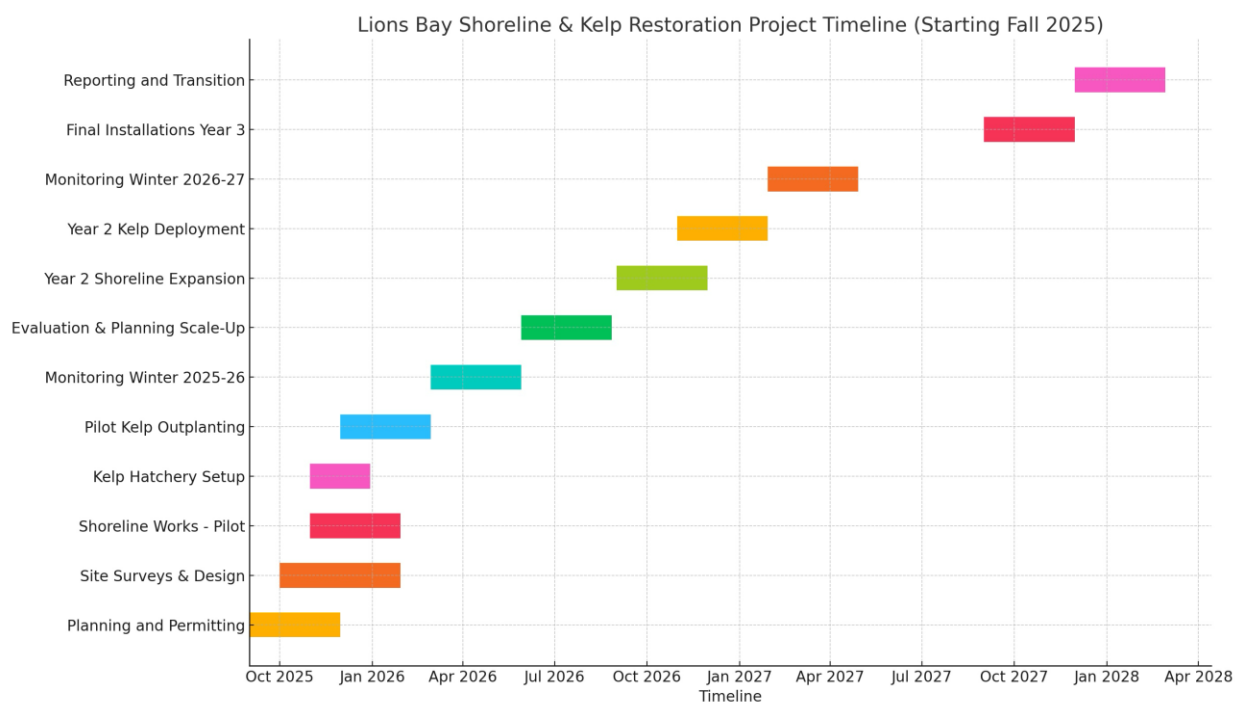
warm summers (hoping they carry more heat tolerance), and 3) timing plantings to establish during cool seasons so they are as robust as possible by the time the next summer arrives. We recognize some summers may exceed sugar kelp's tolerance (upper survival ~23°C frontiersin.org), so part of the strategy is also **continuous re-seeding** if needed – essentially treating kelp restoration as an ongoing agriculture effort, not one-time, in the face of climate change.

- **Heat-Dome “Pre-treatments” and Assisted Evolution:** A cutting-edge concept discussed in the kelp restoration community is pre-conditioning or selectively breeding kelp to withstand higher temperatures. Experienced researchers (e.g., at the 2025 Kelp Summit in Victoria) have noted the need for “*solutions taking root*” even as big challenges loom with warming missionblue.org. In practice, this could involve laboratory experiments to identify warm-tolerant kelp strains. For example, in Tasmania, scientists developed a “**super kelp**” strain of giant kelp by finding individuals naturally tolerant of warm water and breeding them – these strains survived summer heat far better than wild type, growing 4+ m in 9 months abc.net.au. Inspired by this, our project will collaborate with academic partners on a small research component: exposing some sugar kelp gametophytes to elevated temperatures (“heat stress trials”) in the lab, to see if any survive and can be propagated. If promising, future phases could deploy these pre-conditioned kelp in the wild, giving the kelp forest a better chance through events like another heat dome. This form of **assisted evolution** is still experimental, but it represents a potential “insurance policy” for our restoration.
- **Ocean Acidification and Nutrient Shifts:** While temperature is the focus, we also note that climate change may alter Howe Sound's nutrient cycles and pH. Kelp actually benefit from higher CO₂ (they are photosynthetic and can uptake carbon), so moderate ocean acidification is not seen as a critical threat to kelp – in fact, kelp forests locally ameliorate pH for other organisms. However, if climate change leads to more stratification (and thus nutrient-poor surface water in summer), kelp growth could be nutrient-limited. Our monitoring will include checking summer nitrate/phosphate levels; if low nutrients seem to stunt the kelp, one could explore kelp species or techniques that target cooler nutrient-rich periods (e.g., potentially adding more perennial kelp species or encouraging upwelling).
- **Sea Level Rise:** Over the multi-decade horizon, rising mean sea level will shift the intertidal and subtidal zones upward. The project's nature-based shoreline design inherently **accounts for sea level rise** by not locking the shoreline in place. A wider, gently sloping beach with mobile logs and sediment can naturally migrate landward, maintaining protection even as water levels change www2.gov.bc.ca. We will also site community assets (trails, etc.) farther back during any upgrades (consistent with Green Shores credit recommendations) to allow room for this migration. For kelp, a higher sea level means current depths may get deeper (relative to light penetration). To counter this, our plan includes **periodic depth-adjustment of kelp substrates**: for instance, if sea level rises notably in 10–20 years, we might need to establish new kelp slightly closer to shore or on higher relief substrate to stay in the optimal light zone. Using bathymetric data, we can predict where the kelp zone will move and protect those areas from future shoreline development.

In summary, the project embraces an **adaptive management** approach under climate uncertainty. We will monitor environmental parameters (temp, salinity, etc.) and kelp performance closely. If extreme conditions cause kelp losses, that data will inform adjustments (e.g., switching to more heat-tolerant species like bull kelp in certain years, or focusing efforts during cooler La Niña periods). By integrating insights from global kelp science – such as Dr. Karen Filbee-Dexter’s work on kelp in a warming ocean (shared at ISS25) – we remain up-to-date on resilience measures missionblue.org. The ultimate goal is to cultivate a *climate-resilient* shoreline system: one that not only survives warmer waters and higher seas but continues to provide its protective functions despite those changes.

Project Phasing and Timeline

This initiative will roll out in **phases over multiple years**, allowing for learning and expansion over time. Below is a proposed timeline with seasonal detail for each phase:



Year 1 – Pilot Implementation: *(Focus: small-scale trials and groundwork)*

- **Winter (Jan–Feb, Year 1):** Project planning and permitting. Secure any required approvals (DFO/Provincial permits for habitat work, local government support). Engage consultants for detailed design. Start community outreach and First Nations consultation (Squamish Nation, in whose territory Howe Sound lies, will be consulted for traditional ecological knowledge and project consent).
- **Spring (Mar–May, Year 1):** Site surveys and preparation. Conduct baseline ecological studies (intertidal flora/fauna inventory, kelp/frond algae survey to find donor kelp). Design pilot layouts for one site in Lions Bay (e.g., near the marina or beach park) and one in Brunswick Beach. Coordinate log sourcing – identify drift logs on-site or arrange

to import logs if needed from nearby beach cleanups or forest operations (with proper salt curing).

- **Summer (Jun–Aug, Year 1): Install pilot shoreline enhancements** during summer low-tide windows. For example, in July a crew with an excavator and hand labor will place 5–10 large logs along ~30 m of beach at Lions Bay, anchored with rebar or boulders as needed. Add ~100 cubic meters of mixed gravel/sand to widen the beach by a few meters. At Brunswick, perhaps 3–5 logs and some cobble berm enhancement is done. All work is timed for calm weather and within fisheries work windows. By August, these pilot beaches are completed. Concurrently, set up the kelp nursery process: collect sugar kelp fertile tissue in late August, start spore culture in tanks. If partnering with a facility like the **PSF (Pacific Salmon Foundation) pilot kelp lab or Ocean Wise**, ensure sporophytes on twine or gravel are growing by end of summer.
- **Fall (Sep–Nov, Year 1): Begin pilot kelp outplanting.** In September, as water cools, divers deploy kelp seeded materials in two small test plots (~100 m² each): e.g., one at Lions Bay at ~6 m depth in front of the newly nourished beach, and one at Brunswick Beach at similar depth. Use two methods (e.g., green gravel in one, direct tie-down in the other) to compare. Each plot is marked with surface buoys for monitoring. Also plant dune grasses or shrubs at any disturbed shoreline areas from construction, ideally in October for fall rains. By November, ensure all kelp plots are in place and check initial attachment.
- **Winter (Dec Year 1 – Feb Year 2):** Monitor pilot sites through winter storms. Use GoPro cameras or wave loggers if possible to see how waves behave with/without kelp and how logs hold up. Any logs that moved excessively in early storms are re-positioned during winter low tides. Kelp plots are checked for survival after major storm events. A brief Year-1 report is prepared in February summarizing lessons learned.

Year 2 – Monitoring and Scaling Up: *(Focus: evaluate pilot, expand to larger area)*

- **Spring (Mar–May, Year 2):** Assess the pilot results as spring arrives. Diver surveys measure kelp growth (frond length, density) and note any grazing or mortality. Shore surveys measure beach profiles to see if erosion was reduced behind the kelp area vs an uncontrolled area. If pilot is successful (e.g., kelp survival >50%, beach showing stable or accreting), plan the **scale-up for Year 2 summer/fall**. If there were failures, adapt the methods (for instance, if green gravel worked better than twine, we'll use that going forward, or if kelp died in one site, perhaps pick a cooler or less fresh-water influenced site next). Engage stakeholders with a progress meeting – show data and get input. For scale-up, finalize which additional shoreline segments to treat (maybe extend logs along the full Lions Bay beach length, ~100 m, and do a new 50 m section at Brunswick). Identify needs for more materials (logs, sand) and order by late spring.
- **Summer (Jun–Aug, Year 2): Implement expanded shoreline works.** Building on Year 1, extend log and gravel placement to new sections: e.g., add another 20+ logs along Brunswick Beach's length and nourish as needed, and possibly a small rock headland feature as designed. At Lions Bay, reinforce and extend the previous year's work if needed (perhaps adding more sand if some eroded, or adding an anchored root wad for habitat complexity). The work is likely less “experimental” now and more of a straightforward application, but crews will incorporate any refinements learned (e.g.,

optimal log burial depth, or protective fencing around planted vegetation to keep beachgoers from disturbing it). During this time, **nursery cultivation of kelp for scale-up** is in full swing: collect more spores (or use remaining lab cultures from Year 1 that can be kept going – kelp gametophytes can be maintained vegetatively in labs for long periods kelpforestalliance.com). We target raising enough sporophytes to plant **approximately 0.5 hectare of kelp forest** in the fall.

- **Fall (Sep–Nov, Year 2): Scale-up kelp deployment.** Based on pilot outcomes, deploy a larger kelp forest section. For instance, plant a contiguous kelp bed of ~2000 m² (0.2 ha) off Lions Bay using the best-performing method (say, green gravel without cages if urchins were not an issue, or with partial cages if needed). Do the same for Brunswick if that site proved suitable, or pick an alternate nearby site if Brunswick pilot failed (flexibility to move to a better cove or depth). We also deploy any **complementary measures** identified: e.g., if pilot showed urchin grazing was a problem, organize a community urchin removal dive in September (perhaps turning removed urchins over to local First Nations for use or to researchers). By November, Year 2 kelp forests are in place, covering a significantly larger area than Year 1.
- **Winter (Dec Year 2 – Feb Year 3):** Again monitor through winter storms. By now we should start to see the **combined effect**: logs onshore and kelp offshore working together. We will measure wave attenuation more rigorously (perhaps deploying a wave gauge landward of the kelp forest vs an area without kelp). Any damages are fixed (e.g., replace any logs washed away in extreme events). If a particularly warm winter occurs (e.g., El Niño leading to warmer water), check kelp health – some sporophytes may die off; plan to reseed in spring if necessary to maintain coverage.

Year 3 – Full Implementation and Long-Term Plan: (*Focus: refine, extend to full scale, establish long-term maintenance*)

- **Spring (Mar–May, Year 3):** By spring of Year 3, we should have about 6+ months of data from the expanded kelp forests. Analyze results: Has beach erosion measurably slowed? (Compare shoreline profiles and perhaps property owner observations from before vs after). Are kelp patches sustaining themselves? Are there natural recruits? Host a community open house or presentation, possibly with participation in the **Green Shores or coastal restoration forums**, to share progress. Use the feedback to finalize any **remaining gaps to address in Year 3 summer**. For example, maybe one last segment of shoreline needs logs (e.g., a stretch in front of a certain property), or maybe we want to connect the Lions Bay and Brunswick kelp beds into one continuous forest by planting the in-between area. Prepare for those final installations. Also consider **institutionalizing the project**: talk to the municipality about integrating these nature-based solutions into their development plans or hazard mitigation strategies so they remain supported beyond the project's active phase.
- **Summer (Jun–Aug, Year 3): Finalize installations.** This could include any additional log placements (perhaps smaller scale or touch-ups). By now, most heavy lifting is done, so summer Year 3 might focus on **maintenance**: e.g., adding a fresh layer of beach gravel if needed, doing a big invasive plant removal in the backshore (to ensure native plantings thrive), repairing any public access paths disturbed, etc. If kelp needs re-seeding or filling in bare patches, prepare for one more round of nursery culture.

However, if Year 2 kelp is successful, new outplanting might be minimal, focusing instead on *monitoring and fostering natural growth*.

- **Fall (Sep–Nov, Year 3): Adaptive re-planting and completion.** Any kelp areas that didn't take or got damaged are replanted. This could be a smaller effort than previous years, essentially topping up the kelp forest to desired density. We will also implement any **new knowledge** gained from the latest research or conferences – for instance, if by 2025 a new kelp restoration technique (like semi-floating “kelp curtains” for wave reduction) has emerged and is suitable, we could pilot a small version. As this is the last planned heavy field season, ensure all components are as robust as possible going into winter. Conduct a thorough evaluation of **Green Shores credits** achieved (the project likely fulfills points for shoreline habitat restoration, erosion control, public education, etc.) – this could be submitted for a Green Shores certification for Lions Bay's beach park as a showcase.
- **Winter (Dec Year 3 onwards): Transition to long-term monitoring and maintenance mode.** By end of Year 3, the project delivers a comprehensive report and a maintenance manual to the Village of Lions Bay and partners. It will outline how to maintain log structures (e.g., replace or reposition logs every 5–10 years as needed), and how to steward the kelp forests (e.g., possibly establishing a yearly late-summer survey to check for declines, and a plan to reseed kelp every few years to boost genetic diversity and numbers). Long-term monitoring (Years 4–5 and beyond) should include annual beach profile surveys, kelp density surveys, and water quality measurements to track ecosystem health. Funding or responsibility for this could be handed over to a local stewardship group or municipality, potentially with external support from programs like **DFO's Coastal Restoration Fund or community science grants**.

Throughout all phases, **community engagement** is woven in. Each year could feature volunteer planting days, workshops (such as teaching residents about rain gardens and runoff to complement shoreline work), and school field trips to learn about kelp ecosystems. By Year 3, we aim to have local champions trained to continue certain tasks (for example, a “kelp keeper” dive team in Howe Sound). The phased approach ensures we **learn and adapt each year**, scaling up what works best and not over-committing to any approach until proven on site.

Cost Estimates and Funding Strategy

Estimating costs for a project of this scope requires considering each phase's activities and using analogies from similar projects in the region. Below is a rough cost breakdown by phase, with references to comparable efforts:

- **Year 1 Pilot Costs:** *Shoreline works:* The pilot involves minor regrading, logs, and ~100 m³ of gravel. Using local contractor rates, we expect around **\$20,000** for equipment and materials (e.g., an excavator for a few days, gravel purchase and trucking). Log placement itself is low-cost since the “materials” (drift logs) can often be obtained for free, so costs are mainly labor and machine time. *Kelp pilot:* Hatchery setup and diver time are significant. Partnering with an existing hatchery (in-kind support) could reduce costs, but if budgeted, allocate ~**\$15,000** for the pilot kelp effort – this covers lab materials, tanks, power, and a few weeks of a technician's time, plus several dive days to

outplant and monitor. *Design and monitoring:* Professional consulting (coastal engineer or biologist to guide design, plus baseline surveys) might be **\$15,000** in Year 1. **Total Year 1:** on the order of **\$50,000**. This is modest, as much of the work is pilot-scale and leveraging volunteer help. (Notably, a small riprap project at nearby Furry Creek had an original budget of \$20k squamishchief.com, so \$50k for a pilot integrating habitat elements is reasonable).

- **Year 2 Scale-Up Costs:** With proof of concept, Year 2 scales both beach and kelp efforts roughly by a factor of 3–5. *Shoreline:* Expanding log and nourishment to a few hundred meters of shore could cost **\$50,000–\$80,000**. This includes more materials (perhaps 500 m³ of gravel, multiple days of machine work, crew labor) and possibly some rock structures. For reference, Green Shores-type restorations have been shown to **cost significantly less per linear meter** than traditional seawalls [m.facebook.com](https://www.facebook.com/greenshores), and often a few tens of thousands can restore an entire small beach. *Kelp:* Rearing enough kelp for ~0.5 ha might require scaling the hatchery effort; we estimate **\$20,000** (more tanks, more dive days for a larger area, possibly equipment like protective cages or anchors). *Monitoring and project management:* Year 2 involves extensive evaluation; allocate **\$10,000** for scientific monitoring (diver surveys, wave instruments rental, etc.) and **\$5,000** for community workshops and outreach events. **Total Year 2:** approximately **\$85,000–\$115,000**. We will seek cost efficiencies (for example, using volunteer divers for some monitoring, or obtaining government gravel stockpiles at low cost).
- **Year 3 Full Implementation Costs:** By Year 3, most one-time expenses (like initial hatchery setup, design) are done. Spending shifts to maintenance and final augmentation. *Shoreline:* Mostly minor top-ups – perhaps **\$10,000–\$20,000** for additional materials or fixes. *Kelp:* Continued cultivation on a smaller scale, say **\$10,000** for any replanting needed. *Long-term setup:* We might invest **\$5,000** in things like interpretive signage (explaining the project to the public at Lions Bay Beach), and **\$5,000** to produce the final report and an online data portal for results. **Total Year 3:** roughly **\$30,000–\$40,000**.

Summing these, the **multi-year project total** could be in the range of **\$180,000 – \$200,000**. This aligns with costs reported for holistic coastal restoration projects of similar scale. For example, the Squamish River Watershed Society’s coastal restoration efforts (though estuarine) secured a few million dollars for large habitat projects westcoastnow.ca, but our targeted approach is much smaller. On a per-hectare basis, kelp restoration globally averages about **\$80k–\$160k per hectare** [researchgate.net](https://www.researchgate.net) (marine restoration is costly), but our plan leverages natural recruitment and volunteer contributions to lower that. We are initially focusing on <1 ha of kelp, keeping costs manageable. Additionally, simpler kelp restoration methods like urchin culling can be as low as **\$1k–\$40k per hectare** [researchgate.net](https://www.researchgate.net), which is encouraging if we incorporate community urchin removals as part of our strategy.

Table 1: Projected Budget

Year 1	Shoreline works (pilot)	\$20,000
Year 1	Kelp pilot cultivation and deployment	\$15,000
Year 1	Design and monitoring (consultants, surveys)	\$15,000
Year 2	Shoreline works (expansion)	\$60,000
Year 2	Kelp scale-up (nursery, dives)	\$20,000
Year 2	Monitoring and project management	\$10,000
Year 2	Community engagement and outreach	\$5,000
Year 3	Final shoreline and kelp installations	\$20,000
Year 3	Interpretive signage and final report	\$5,000
Year 3	Ongoing monitoring and data portal	\$5,000
Total		\$175,000

Funding Strategy: We will pursue a mix of funding sources:

- *Government Grants:* The Canadian Coast Restoration Fund (part of the Oceans Protection Plan) has previously funded Salish Sea habitat projects – a grant could cover a significant portion. Likewise, provincial climate adaptation funding or the federal Natural Infrastructure Fund might support our nature-based solution.
- *Partnerships:* Collaboration with NGOs like Ocean Wise, Pacific Salmon Foundation (PSF), or the Howe Sound Biosphere Region Initiative can bring both expertise and financial support (PSF’s Coastal Restoration program, for instance, could fund kelp and eelgrass work). The Green Shores program itself sometimes offers cost-share or rebates for nature-based projects [m.facebook.com](https://www.facebook.com/greenshores); Lions Bay could apply for such a pilot grant.
- *Community and In-Kind:* The municipality might contribute some budget (especially for portions that protect public infrastructure, e.g., the Lions Bay Beach Park shoreline). Local residents might donate to a dedicated fund, especially if it protects their property. In-kind contributions from volunteers, donated materials (e.g., a local arborist providing logs), or academic partners (providing lab space or monitoring equipment) will effectively lower the needed cash.

We will also plan for **maintenance funding**. Even though nature-based designs are cheaper to upkeep than seawalls, some maintenance is inevitable (replenishing gravel after an unusually large storm, etc.). Setting aside a small annual budget (perhaps \$5k per year) with municipal or community backing would ensure the project’s benefits are sustained indefinitely. The cost-benefit here is favorable: a traditional seawall for the same stretch could cost many hundreds of thousands to build and still require repairs, whereas our approach not only buffers waves but also enhances habitat and aesthetics, providing value that is hard to quantify in dollars. In the long run, preventing erosion and storm damage will save money by avoiding emergency fixes and protecting real estate – a point we will articulate when justifying the costs.

Alignment with Green Shores and Kelp Restoration Initiatives

This project is designed in concert with current best practices and initiatives at the regional and global level, ensuring we leverage the latest knowledge:

- **Green Shores Certification:** The project methodology follows the *Stewardship Centre for BC's Green Shores*® guidelines for nature-based shoreline design. By avoiding hard armoring and instead using logs, native vegetation, and beach restoration, we are aligning with the Green Shores goal of “*protecting waterfront properties while also protecting and restoring habitats*” www2.gov.bc.ca. We will document our project for Green Shores credits – for example, the restoration of shoreline sediment processes and the improvement of habitat complexity should meet several credit criteria. Lions Bay’s effort could become a **Green Shores demonstration site**, showcasing to other coastal communities how to build resilience naturally. We’ll engage Green Shores experts in our planning (they offer training workshops which project staff can attend) and possibly host a field tour for participants of Green Shores courses. This integration ensures our design is not only ecologically sound but also meets recognized standards that could ease regulatory approvals (the BC government even has an expedited permit process for projects following Green Shores nature-based practices www2.gov.bc.ca).
- **Knowledge Sharing from Conferences:** We will incorporate insights from recent symposia and summits. Notably, the **2025 International Kelp Summit in Victoria (ISS25)** provided a wealth of information: the Kelp Forest Alliance launched an ambitious challenge calling for restoration of 4 million hectares of kelp forests by 2040 missionblue.org. Our project, though local, contributes to this global mission. One takeaway from the summit is the importance of scaling up efforts and learning from international successes and failures. We have made connections with leading kelp researchers (e.g., Aaron Eger of Kelp Forest Alliance, and Salome Buglass who studies kelp resilience missionblue.org) to stay informed on techniques like reef analogues or remote sensing for monitoring. This network can provide technical advice and maybe cross-collaboration (for instance, trialing the “green gravel” method which has gained international attention as a promising technique globalseafood.org, already part of our plan). The summit also emphasized that *though kelp forests are declining globally, they have not received enough attention or funding in a warming ocean* missionblue.org – a statement that reinforces the significance of our Lions Bay initiative.
- **Local and Indigenous Knowledge:** We plan to integrate knowledge from local environmental groups and Indigenous observers. The Squamish Nation has traditional knowledge of the Howe Sound marine environment (for example, historical presence of kelp forests or shellfish beds that could guide restoration to the right places). We will invite a Nation representative or knowledge keeper to advise on site selection and share any cultural insights (such as traditional uses of kelp or known ancient fish traps in the area that we should be mindful of). This not only builds relationships but can improve project outcomes by aligning with the natural patterns long known to the original stewards of this land and sea.

- **Lessons from Furry Creek and Squamish:** Just north of Lions Bay, the community of Furry Creek and the Squamish area have attempted shoreline and kelp projects. For instance, the Oliver’s Landing spit in Furry Creek underwent erosion mitigation with added riprap squamishchief.com, and there have been experimental kelp and eelgrass transplants in Squamish’s estuary funded by restoration programs. We are gathering reports from those projects to avoid repeating mistakes. One lesson noted in the Squamish area is that **sea urchin overpopulation** (after sea star declines) led to kelp losses squamishchief.com – hence our proactive stance on urchin control. Another lesson is the need for maintenance: the Furry Creek project required additional funds to extend and reinforce the initial work soon after it began squamishchief.com, highlighting that following up is crucial. Our phased approach explicitly includes follow-up actions for that reason. We will also use cost data from those projects to refine our budget (for example, Furry Creek’s ~\$45k expenditure to protect a small spit squamishchief.com suggests our estimates are in the right order of magnitude for comprehensive restoration of a longer shoreline).
- **Global Best Practices and Publications:** The project team will continuously consult the latest literature – such as the *“Kelp Restoration Guidebook: Lessons Learned Around the World”* (a 2022 publication by The Nature Conservancy and Kelp Forest Alliance) which compiles global case studies decadeonrestoration.org. Some key principles from such resources that we are applying include: *start small and adapt, ensure local community support, address the root cause of kelp loss (e.g., urchins or pollution), and monitor rigorously to document benefits*. From the scientific side, researchers like Dr. Maycira Costa (UVic) and others working on BC kelp resilience have pointed out that some kelp populations can bounce back after heat waves capitaldaily.ca – indicating it’s worth trying restoration even after stress events, as refugia may exist. We also heed cautions from experts like Dr. Filbee-Dexter that not all high-tech schemes (e.g., open-ocean kelp farms for carbon sequestration) are viable missionblue.org; thus, we focus on proven ecological restoration in situ rather than speculative climate fixes.

By aligning with these initiatives and knowledge sources, our project stands on the shoulders of a broad community of practice. We are not operating in isolation; rather, Lions Bay and Brunswick Beach will serve as a **living laboratory** that contributes to and draws from the wider movement of **“living shorelines” and kelp forest restoration**. We will share our results at forums like the Salish Sea Ecosystem Conference or Green Shores webinars, further reinforcing our commitment to science-based, community-driven coastal management.

Conclusion and Next Steps

In conclusion, this multi-year framework presents a comprehensive approach to safeguarding the Lions Bay–Brunswick Beach coastline through **nature-based engineering and ecological restoration**. By marrying onshore measures (logs, sand, rocks, and vegetation) with offshore kelp seaforestation, the project creates a synergistic defense against erosion – one that is flexible, habitat-enhancing, and resilient to future changes. The phased implementation allows for learning and adaptation, increasing the likelihood of success and efficient use of resources.

As we move from planning to action, the next steps will be to secure funding, finalize engineering designs with input from coastal specialists, and continue consultations with the community and First Nations to ensure local values are reflected. Early actions like establishing a kelp nursery partnership and sourcing materials can begin promptly upon approval. Given the urgency signaled by climate trends and the global decline of kelp, timing is opportune to launch this project. In doing so, Lions Bay can become a leader in the region – a practical example of how coastal communities can **build climate resilience** not by fighting nature with concrete, but by working with nature’s own tools: living forests of seaweed, dynamic driftwood, and the power of natural processes www2.gov.bc.ca.

By the end of Year 3, we envision a transformed shoreline: wider beaches dotted with stabilizing logs and native plants, and just offshore, waving canopies of kelp visible at low tide. These kelp forests will not only calm the waves, but also enrich the marine ecosystem – inviting back fish, crabs, and maybe even sea otters. The air will smell of salt and seaweed, and residents will have the peace of mind that their shoreline is healthier and more secure. And as part of a larger network of restoration efforts, this project will add a small yet meaningful patch to the quilt of recovering kelp forests along the Salish Sea, contributing to the broader goal of restoring these vital habitats for future generations missionblue.org.

The success of this initiative will be measured not just in meters of beach saved or kelp planted, but in the knowledge gained and shared. A detailed monitoring program and the final project report will disseminate our findings (successful techniques, cost-effectiveness, ecological outcomes) to help inform similar projects in other coastal communities. In this way, Lions Bay’s shoreline resiliency project is both a local solution and a piece of a global puzzle – demonstrating how we can tackle the twin challenges of coastal erosion and biodiversity loss through innovation, collaboration, and respect for the natural world.

Bibliography

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2. **“Your Marine Waterfront” Homeowners Guide** – *Stewardship Centre for BC* (2019). Provides best practices for log placement and beach nourishment; notes that logs disperse wave energy, trap sand, and are low-cost natural protection stewardshipcentrebc.ca.
3. **NOAA Fisheries – Kelp Forest Habitat (West Coast)** – Explains kelp’s ecological role and benefits. Notes that kelp forests slow currents and reduce wave action, thereby lessening coastal erosion fisheries.noaa.gov, and warns that warming seas threaten kelp survival fisheries.noaa.gov. (NOAA, updated 2024)
4. **Ocean Wise Burrard Inlet Kelp Restoration** – Web article on a local kelp restoration project. Describes innovative methods like green gravel and using oyster shells in modified traps to protect young kelp from urchins, which led to kelp reaching 7 feet in 2 months ocean.org. (Ocean Wise, 2024)
5. **Marine Botany – Sugar Kelp Life Cycle** – University of Washington page detailing *Saccharina latissima*’s biology. Confirms sugar kelp sporophytes grow in fall/winter and

release spores in spring depts.washington.edu, and cannot survive sustained water >15–20°C depts.washington.edu.

6. **Frontiers in Marine Science (2023) – Sugar Kelp Salinity Tolerance** – Research finding that sugar kelp grows best at salinity 23–31 PSU, with sharp decline below 16 PSU frontiersin.org. Highlights need to avoid low-salinity areas near river outflows for kelp planting.
7. **Mission Blue Blog – “Hope Beneath the Waves: Global Kelp Community in Victoria”** – Coverage of the May 2025 Kelp Summit in Victoria, BC. Emphasizes that kelp forests (30% of world’s coasts) are globally declining and need more restoration effort in a warming ocean missionblue.org. Notes the Kelp Forest Alliance’s goal to restore 4 million hectares of kelp by 2040 missionblue.org, situating Lions Bay’s project in the broader context.
8. **ABC News – “‘Super’ Heat Tolerant Kelp Restores Hope”** – News article on Tasmanian giant kelp restoration (June 23, 2021). Describes how researchers identified and bred warm-water-tolerant kelp and successfully outplanted “super kelp” that withstood summer heat better than wild kelp [abc.net.au](https://abc.net.au/abc.net.au). Illustrates a potential strategy for mitigating rising temperature impacts.
9. **Squamish Chief – “Riprap added to shore up Oliver’s Landing”** – Local news (Dec 22, 2016) on an erosion control project at Furry Creek, BC. Provides cost context: initial shoreline armoring budget ~\$20k, later expanded with an additional \$17k and community contribution squamishchief.com. Though a different approach (riprap), it underscores maintenance needs and costs in the same region.
10. **Átl’ka7tsem/Howe Sound Marine Reference Guide** – An interactive mapping tool (2022) with data layers for Howe Sound’s marine environment howesoundguide.ca. Used for site selection (bathymetry, habitat maps) and ensuring project decisions are based on

Open Grant Opportunities for Coastal Erosion, Marine Restoration & Kelp Projects (Lions Bay, B.C.)

Federal Funding Programs

BC Salmon Restoration and Innovation Fund (BCSRIF) – A major federal–provincial fund (\$285.7 million over 7 years) supporting projects that protect and restore wild Pacific salmon and other BC fish stocks communityclimatefunding.gov.bc.ca; dfo-mpo.gc.ca. **Funding Amount:** No set cap per project; past awards range from under \$100k to multi-million dollars. **Current Status/Timeline:** The second intake of BCSRIF projects was announced in 2024, and future application opportunities are expected before the fund ends in March 2026 dfo-mpo.gc.ca. **Eligibility:** Wide-ranging – Indigenous communities, local governments, non-profits, academic institutions, industry groups, and others involved in fisheries or habitat stewardship in B.C. communityclimatefunding.gov.bc.ca. **Match Requirements:** No strict municipal matching required (for non-commercial applicants, up to 100% funding is possible). **Why it Fits Lions Bay:** BCSRIF prioritizes projects enhancing *salmon ecosystems and habitats*, including those addressing climate change impacts on salmon dfo-mpo.gc.ca. A Lions Bay initiative to mitigate coastal erosion or restore kelp forests would benefit salmon habitat and align with BCSRIF’s focus on wild fish stock sustainability and ecosystem restoration. *Example:* BCSRIF has funded kelp, eelgrass, and estuary restoration tools in the Salish Sea via the Pacific Salmon Foundation canada.ca, indicating kelp reforestation projects are within scope.

Green Municipal Fund – Local Leadership for Climate Adaptation (FCM) – A newly expanded federal-municipal program to help communities plan and implement climate adaptation solutions. **Funding Amount:** *Planning grants* up to ~\$70k for climate risk assessments or adaptation plans, *feasibility studies* up to \$70k, and *capital project grants* up to \$1 million (covering 60% of costs) for implementing adaptation projects greenmunicipalfund.ca. Notably, additional incentives (+10% each) are available for projects that involve Indigenous partnership, serve small/rural communities, advance equity, or use nature-based solutions – potentially allowing up to 100% funding. **Deadline: Imminent** – this adaptation program’s application portal is scheduled to open by *spring/summer 2025*. (Municipalities can subscribe for updates as the exact launch date is announced.) **Eligibility:** Canadian municipal governments (and partners such as municipally owned or non-profit organizations, or Indigenous communities). Lions Bay can apply directly or in partnership (e.g., with Squamish Nation or a non-profit). **Why it Fits Lions Bay:** This program specifically targets *climate adaptation projects* that reduce risks from climate hazards. Projects enhancing coastal resilience – for example, “nature-positive” measures like living shorelines or kelp beds to buffer waves – are emphasized and even incentivized. Lions Bay could seek funding to design and build coastal erosion defences or restore marine ecosystems as natural infrastructure. The program’s scale (up to \$1M) suits larger capital works or multi-year initiatives, and Lions Bay’s small size and potential First Nation partnership would maximize grant coverage.

Aquatic Ecosystems Restoration Fund (AERF) – A federal fund under Canada’s Oceans Protection Plan supporting marine and coastal habitat restoration. **Funding Amount:** Typically large multi-year contributions (e.g. ~\$2.5 million over 3 years to certain BC projects

[canada.ca](#)). **Deadline: Currently closed**, with the latest BC recipients announced March 2025 [canada.ca](#). (Future intakes are unconfirmed; Lions Bay should monitor for any new calls.) **Eligibility:** Federal agencies partner with Indigenous governments, communities, and conservation organizations on projects addressing root causes of coastal ecosystem degradation. Municipalities may participate via partnerships. **Why it Fits Lions Bay:** The AERF funds projects like kelp and eelgrass restoration to enhance coastal resilience. For example, \$2.24 million was granted to develop tools for kelp forest and tidal marsh restoration in the Salish Sea. If re-opened, Lions Bay (especially in partnership with Squamish Nation or a marine NGO) could pursue AERF support for kelp reforestation or shoreline habitat enhancement to combat sea-level rise impacts.

B.C. Provincial Programs

Disaster Resilience and Innovation Funding (DRIF) – *New in 2024*, this B.C. program provides \$40 million over two years to help local governments and First Nations reduce climate-driven hazard risks [ubcm.ca](#). **Funding Amount:** Not explicitly capped per project; in 2025 the DRIF supported projects up to ~\$1 million each for high-priority regional partnerships [news.gov.bc.ca](#). **Deadline: Open now** – expressions of interest (EOI) are accepted on a rolling basis, with an annual cutoff (June 27, 2025 for this year’s cycle) [www2.gov.bc.ca](#); [ubcm.ca](#). Selected EOIs will be invited to submit full proposals. **Eligibility:** B.C. municipalities and First Nations (independently or jointly) for new projects or new phases of projects addressing hazards like *erosion, floods, sea-level rise, storms, tsunamis*, etc. [ubcm.ca](#); [www2.gov.bc.ca](#). **Why it Fits Lions Bay:** DRIF specifically supports *community resilience and disaster risk reduction* projects, including both planning and construction of adaptation works [www2.gov.bc.ca](#). Lions Bay could use DRIF for coastal hazard mapping, developing a sea-level rise adaptation plan, or constructing small-scale natural breakwaters. Importantly, DRIF encourages innovative and locally led solutions to threats like shoreline erosion and coastal storms [ubcm.ca](#). **Example:** In 2025, DRIF (with CEPF) funded numerous projects on the BC coast – e.g., a \$400k **Sea-Level Rise Management Plan** for City of Nanaimo [news.gov.bc.ca](#) and a nearly \$1 million **North Shore Disaster Risk Reduction plan** co-led by North Vancouver municipalities and Squamish Nation [news.gov.bc.ca](#) – showing the program’s relevance to Lions Bay’s coastal climate challenges.

Community Emergency Preparedness Fund – Disaster Risk Reduction/Climate Adaptation (CEPF DRR-CA) – A longstanding B.C. grant (administered by UBCM) to help communities assess hazards, plan mitigation, and implement small-scale risk reduction. **Funding Amount:** Up to ~\$150k–\$300k for risk assessments and planning projects, and up to ~\$500k+ for certain implementation projects (in recent intake, many grants were in the \$300–\$400k range [news.gov.bc.ca](#)). **Deadline:** Intakes are typically annual; the **2024/25 round closed** last fall with ~\$20 million awarded in spring 2025. The next intake is expected in late 2025 (watch for UBCM announcements). **Eligibility:** B.C. local governments and First Nations. No strict matching funds required. Projects can include disaster risk mapping, climate adaptation plans, updates to bylaws/policies, and “*small-scale structural projects*” that are non-structural or nature-based [ubcm.ca](#). **Why it Fits Lions Bay:** CEPF’s DRR-Climate Adaptation stream explicitly supports planning for hazards like flooding, coastal erosion, and extreme weather. Lions Bay could seek funding to develop coastal flood maps, a shoreline resilience plan, or pilot a nature-based erosion

control project. The program has a track record of funding sea-level rise planning (e.g., Nanaimo’s \$400k plan to manage future sea-level rise news.gov.bc.ca) and cross-jurisdictional climate risk projects (e.g., North Shore/Squamish Nation risk reduction action plan) that mirror Lions Bay’s needs. CEF grants can also complement larger DRIF projects by covering early-stage planning or innovative smaller interventions news.gov.bc.ca.

Infrastructure Planning Grant (IPG) – A B.C. Ministry of Municipal Affairs program offering small grants for community infrastructure planning. **Funding Amount:** Up to \$10,000 per project ubcm.ca (municipal contribution required for any costs beyond \$10k). **Deadline:** Ongoing, with quarterly processing – **next review is June 11, 2025** ubcm.ca. **Eligibility:** All municipalities and regional districts in B.C. (year-round application). Funds can be used to develop or update plans related to *asset management, integrated stormwater management, flood protection, wastewater, etc.*, ubcm.ca. **Why it Fits Lions Bay:** Although modest in size, IPG could help Lions Bay create foundational plans needed for larger grants – for example, a *coastal hazard mitigation plan* or preliminary engineering study for shoreline erosion control. This grant could cover consulting or design work for sustainable marine infrastructure (perhaps a living breakwater or improved drainage to address sea-level rise) ubcm.ca. Completing such a plan with IPG funds would strengthen Lions Bay’s applications to bigger funding programs.

Regional/Municipal Sources

Union of BC Municipalities – Canada Community-Building Fund (Gas Tax) – Strategic Priorities Fund – (Note: No new intakes in Metro Vancouver in 2025; Lions Bay receives gas tax funding via regional allocation). Lions Bay’s major “regional” funding for capital projects comes through the federal Gas Tax (Community-Building) Fund. In 2025, a Strategic Priorities Fund intake (for large infrastructure or capacity-building projects) is open to many BC municipalities with a **May 23, 2025 deadline** ubcm.ca, but Metro Vancouver members like Lions Bay typically access these funds through Metro Vancouver’s regional budgeting. While there isn’t a Metro Vancouver-specific environmental grant competition, Lions Bay can work with the Metro Vancouver Regional District on regionally significant resilience projects. For instance, Metro Vancouver itself is funding a regional hazard mapping and risk analysis initiative metrovancover.org, and Lions Bay could potentially partner or benefit from such regional efforts (data, expertise, or inclusion in larger projects). In summary, **no direct Metro Vancouver grant program** is currently open for coastal restoration, but regional collaboration (e.g., joining a North Shore resilience consortium as was done in 2025 news.gov.bc.ca) can enhance Lions Bay’s access to federal/provincial funds.

Foundation and Corporate Grant Programs

Intact Municipal Climate Resiliency Grants – A corporate-sponsored climate adaptation grant program by Intact Financial Corporation. **Funding Amount:** Typically around \$100k per project (Intact has committed \$2 million over 2024–25, aiming to fund ~10 municipalities or partners per year) intactpublicentities.ca. **Deadline:** Annual – last call opened Sept 9, 2024 for 2024 grants. We anticipate a 2025 intake likely in fall 2025 (Intact doubled the program for two

years). **Eligibility:** Municipal governments, registered charities, and Indigenous communities across Canada. Projects must *assess or reduce climate risks (flood, wildfire, extreme weather)* and actively involve the community. **Why it Fits Lions Bay:** This grant is tailored for practical climate adaptation solutions at the local level – exactly Lions Bay’s focus on coastal flooding and erosion. Intact looks for projects protecting vulnerable communities from climate impacts with measurable outcomes. Lions Bay could seek funding for something like a **shoreline stabilization pilot** (e.g. using natural materials or reef installations to reduce storm surge damage) coupled with public education for residents. The grant does not require matching funds (it’s philanthropic), making it attractive for a small municipality. *Note:* 2024 recipients will be announced in early 2025 and provide examples of funded projects (useful models for Lions Bay).

Pacific Salmon Foundation – Community Salmon Program – A public foundation grant supporting community-driven habitat restoration and stewardship projects in B.C. **Funding Amount:** Small grants; *Standard* grants typically range from ~\$5,000 up to \$25,000 (and require 50% matching in-kind or cash), while micro-grants (\$2,500 or less) are available for minor purchases. **Deadline:** Semi-annual intakes. The **fall intake opens early September** with applications due by **October 15**; the **spring intake opens January** with deadline **February 15** psf.ca. (The Spring 2025 round just closed on Feb 15, 2025.) **Eligibility:** Local stewardship groups, volunteer organizations, and First Nations are the primary applicants. Municipalities can participate by partnering with a community group or First Nation on a project. **Why it Fits Lions Bay:** While modest in scale, these grants are ideal to support kelp forest and marine shoreline restoration at a community level. Projects that engage volunteers and educate the public get priority psf.ca. Lions Bay could, for example, collaborate with a local conservation society or the Squamish Nation on a kelp reforestation pilot or beach habitat enhancement, using Community Salmon Program funds to cover materials and monitoring. This program would raise local awareness and prepare Lions Bay for larger grants by demonstrating community support. (*Note: Lions Bay must ensure a 50% contribution, which can be in-kind labor or donations* psf.ca.)

TD Friends of the Environment Foundation (TD FEF) – A national corporate philanthropy program that funds small grassroots environmental projects. **Funding Amount:** Typical grants range from **\$2,000 to \$10,000** (varies by project scope and region). **Deadline:** Quarterly intakes (e.g., mid-January, April, July, and October each year) instagram.com. For instance, a mid-year intake in **July 2025** is expected. **Eligibility:** Registered non-profits, Indigenous communities, schools and in some cases municipalities (often municipalities apply in partnership with local environmental committees or charities) td.com. **Why it Fits Lions Bay:** If Lions Bay undertakes a kelp planting initiative or coastal clean-up/restoration project, a TD FEF grant could offset costs for supplies, native plants/kelp propagules, and community engagement. Although relatively small, this funding is accessible and can be used to kickstart on-the-ground actions (such as a kelp nursery project or shoreline tree planting to prevent erosion). It can complement larger grants by covering community outreach or volunteer coordination aspects of Lions Bay’s coastal resilience efforts.

Sources:

1. British Columbia Salmon Restoration & Innovation Fund – *DFO Program Overview*[dfo-mpo.gc.ca](https://dfo-mpo.gc.ca/dfo-mpo.gc.ca)
2. BCSRIF Funding Details – *Community Climate Funding BC (joint Fed/BC)*[communityclimatefunding.gov.bc.ca](https://communityclimatefunding.gov.bc.ca/dfo-mpo.gc.ca)
3. FCM Green Municipal Fund – *Adaptation Implementation (Grant Preview)*[greenmunicipalfund.ca](https://greenmunicipalfund.ca/greenmunicipalfund.ca)
4. FCM GMF Incentives for Partnerships/Nature – *Adaptation Funding Guidelines*greenmunicipalfund.ca
5. Disaster Resilience and Innovation Fund (B.C.) – *UBCM News Release*[ubcm.ca](https://ubcm.ca/www2.gov.bc.ca)
6. DRIF Program Details – *Province of B.C. EMCR*[www2.gov.bc.ca](https://www2.gov.bc.ca/ubcm.ca)
7. CEPF Project Examples (Sea-Level Rise & Risk Plans) – *B.C. Government News*[news.gov.bc.ca](https://news.gov.bc.ca/news.gov.bc.ca)
8. CEPF Structural vs Non-Structural Funding – *UBCM Program Update*[ubcm.ca](https://ubcm.ca/ubcm.ca)
9. Infrastructure Planning Grant – *UBCM Funding Update (Apr 2025)*ubcm.ca
10. Intact Municipal Resiliency Grants – *Intact Public Entities News*[intactpublicentities.ca](https://intactpublicentities.ca/intactpublicentities.ca)
11. Pacific Salmon Foundation – *Community Salmon Program (Deadlines & Match)*psf.ca
12. Pacific Salmon Foundation – *Community Salmon Program (Purpose)*psf.ca
13. TD Friends of the Environment – *Foundation Info (Social Media/News)*instagram.com



**CLIMATE ACTION COMMITTEE MEETING
OF THE VILLAGE OF LIONS BAY
HELD ON TUESDAY, APRIL 22, 2025, AT 6:00 PM
COUNCIL CHAMBERS, 400 CENTRE ROAD, LIONS BAY
AND VIA ZOOM VIDEO CONFERENCE**

MINUTES

In Attendance: Councillor Neville Abbott
Committee Member Andrew Wray
Committee Member John Robb
Committee Member Norm Barmeier
Committee Member Clara George
Committee Member Greg Weary

Absent with regret: Councillor Reuters

Staff: N/A (Recorder)

1. Call to Order

The meeting was called to order at 18:02 PM

2. Approval of the Agenda

Moved/Seconded

THAT the agenda of Apr 22/25, Climate Action Committee be adopted as amended:

CARRIED

3. Public Questions & Comments

Public participation by Ron McLaughlin thanking the committee for all their great work.

4. Approval of Minutes

Moved/Seconded

THAT the minutes of Dec 9, 2024 and Oct 28, 2024 Climate Action Committee meetings be adopted as presented:

CARRIED

5. Business Arising from the Minutes:

None

6. Unfinished Business

A. Recycle BC

Recycling Depot approved by Council. Container is on order, and the staffing agreement is being negotiated. Preliminary education materials presented by Andrew Wray at the Bird Friendly Event (5/10/25). Goal is to launch by the end of May.

Action Items: Obtain signage from WBS. Create LB CAC/ Recycling Depot branded High Vis vests for staff. Signage with hours of operation. Look into adding a donation box (possibly Big Brother)

B. Hall Upgrade / FIRE UP (Furnace Replacement Environmental Upgrade Project)

Budget approved, PO approved, completed by end of 2025.

Action Item: NA to do a report for the council, including suggestion for a project manager if needed to ensure project completion by the end of 2025.

C. Budget and Spending

Councillor Abbot to update council on LGCAP spending and projections, goal is to eliminate fuel emissions in Lions Bay

Councillor Abbott to request fuel spending in 2023 and 2024 to update emission profile of Lions Bay, and to request invoices for confirmation of % of Renewable Diesel bought.

D. Natural Asset Register / Nature Based Solutions

Committee agreed on next steps to create a register of natural assets.

Committee agreed to look into the possibility of creating Kelp Beds to protect shoreline and whether they are natural to Howe Sound.

E. Nature Based Solutions

7. New Business

ACTION item: Norm B to author 2 annual reports for the CAC 2023 and 2024 reports due June 1, 2025.

ACTION item: Committee members to listen to recording of Michelle Lewis Presentation video to CAC

8. Recommendation to Council

CAC recommendation:

Allow Committee to review the future water metering bylaw and metering rates.

CAC Recommendation:

All future vehicles purchased by the Village should be EVs.

CAC would make up the cost difference from the LGCAP funding for the Bylaw Enforcement Officer vehicle and L2 EV charger installation at the works yard.

9. Correspondence

A. None

10. Public Questions & Comments

A. None

11. Adjournment

Moved/Seconded

THAT the Climate Action Committee meeting be adjourned. Next meeting Tuesday, May 27th at 6pm.

CARRIED

Meeting adjourned at 7.45 pm

Chair

Corporate Officer

Date Adopted by Committee:	
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Type	CAC Committee Recommendation		
Title	Actions form April 22 CAC meeting		
Author	Neville Abbott	Reviewed By:	
Date	May 13, 2025	Version	
Issued for	RCM May 20, 2025		

Recommendation:

THAT Council provide direction to staff with respect to the Climate Action Committee (CAC) recommendations and requests as documented in attached CAC Meeting Minutes form April 22, 2025 as follows:

1. 6. - A. Recycle BC

- a. Action Items: Obtain signage from Waste Control Services (WCS). Create LB CAC/ Recycling Depot branded High Vis vests for staff. Signage with hours of operation. Look into adding a donation box (possibly Big Brother).

2. C. Budget and Spending

- a. Councillor Abbott to update council on LGCAP spending and projections, goal is to eliminate fuel emissions in Lions Bay
- b. Councillor Abbott to request fuel spending in 2023 and 2024 to update emission profile of Lions Bay, and to request invoices for confirmation of % of Renewable Diesel bought.

THAT Council provide direction to staff with respect to the additional funding available through the LGCAP program.

THAT Council approve a joint meeting between Staff, CAC Chair and GICB Grant Authority with respect to the delayed response to the GICB grant and it's impact on the LGCAP spending.

Key Information:

1. 6. - A. Recycle BC

- See attached proposed logos in response to request from Public Works. *(page 69)*



- The logo for the Community Recycling Depot. It is the circular shaped logo and will be used on official notifications, signage etc. Note the official name for the depot **“Community Recycling Depot”**.
- The second is for the back of the work jackets.
- The last is a typical name badge for the front of the jacket. Title for these people is **“Recycling Specialist”**.

3. C. Budget and Spending

The 2024 budget included the allocation of \$102,000 (LGCAP funding for 2022-2023) to the hall heating upgrade. There was a concern that the budget was insufficient based on the anticipated electrical upgrade requirements given the lack of clarity as to scope and estimate.

LGCAP funding required the Village to commit the \$102,000 (2022-2023) LGCAP allocation by March 2025 and complete installation by “summer 2025”.

Staff advised the province had allocated 3 years (2024-2026) of LGCAP funds to be spent by March 2028.

In October 2024 the CAC became aware of the Green & Inclusive Community Building (GICB) grant. This stackable grant would allow the full original scope as envisioned by the CAC to be completed within the available from the LGCAP program. The CAC with Staff support submitted an application for the GICB grant. The outcomes and timing of this application remains unknown.

With a total of \$250,000 available over two phases Staff proceeded commit the purchase of equipment through the procure bid process. Through the contractor involvement it became known that the electrical upgrade was not required after all.

With the outcome of the GICB grant application pending we need to decide what to do as our grant application outcome may come too late for it to be used with the LGCAP monies. We no longer have time to reassess the scope depending on if the grant is successful or not.

4. Item 8. From draft minutes future recommendations from CAC



Recommendation to Council

CAC recommendation:

Allow Committee to review the future water metering bylaw and metering rates.

CAC Recommendation:

All future vehicles purchased by the Village should be EVs.

CAC would make up the cost difference from the LGCAP funding for the Bylaw Enforcement Officer vehicle and L2 EV charger installation at the works yard.

ATTACHMENTS

Previous Minutes from CAC

1. Approved in December 09, 2024 Meeting
 - A. Climate Action Committee Meeting Minutes – October 3, 2024 *(page 72)*
 - B. Climate Action Committee Meeting Minutes – October 28, 2024 *(page 75)*
2. Approved in April 22, 2025 Meeting
 - C. Climate Action Committee Meetings Minutes - December 9, 2024 *(page 78)*
3. Included for information draft minutes for April 22, 2025 Meeting *(page 66)*
4. Community Recycle Centre Depot logos. *(page 69)*