



Ageya Wilderness Education

Homer, Alaska

Ageya supports adventure-based educational programs extending out into a variety of wilderness settings based from its 80 acre site in Homer, Alaska. Ageya also hosts retreats and events on-site for groups ranging between 20 and 50 people, and is a year-round home for several individuals and families.

Ageya maintains connections with the nearby Wynn Nature Center, which includes 140 acres of land set aside as a wildlife refuge, with five miles of nature trails and environmental education programs. Ageya also holds first rights of refusal on adjacent parcels which it would like to purchase in order to protect scenic and environmental values, and to retain Ageya's semi-wilderness experience and peaceful setting over the long term.



AWE's Mission

To provide programs and experiences that excite and inspire through the vehicle of the natural world.

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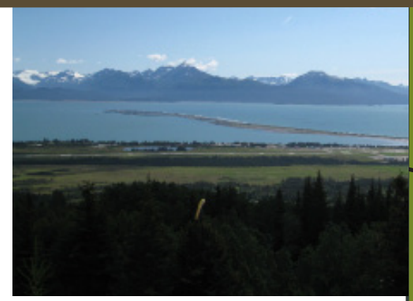
Ageya Site Vision

Rising 1200 feet up from Homer's spectacular Kachemak Bay, one arrives at Ageya atop Diamond Ridge and enters a successional sub-alpine zone of meadows and native plant communities punctuated by newly emerging and spreading spruce forests. Ageya's site is largely natural open space with protected scenic views and limited development that supports focused learning, group events, and year-round living with an emphasis on traditions of self-sufficiency and respect for natural systems.

Straddling an east-west ridgeline, most of Ageya's site gently slopes toward Bridge Creek, except along the northernmost edge, which drains and slopes into Twitter Creek. Water that enters the site as rain and snow, flows through intact vegetation and drainage catchment systems that are integrated into buildings and the landscape to slow, sink, and spread water on-site. This helps to recharge the property's natural springs and wells, supporting living gardens and lawn areas, filling a pond for wildlife and human use, and also recharging the Bridge Creek Reservoir, a surface catchment system that provides fresh drinking water for Homer.

Ageya is at the end of a small dirt road three miles from Homer. The journey to the site creates a sense of anticipation as visitors travel up to Diamond Ridge, with its spectacular views, and turn off onto small dirt roads. Although off the beaten path, Ageya is easy to find as aesthetic wayfinding signs direct vehicles onto the site and into well-defined parking and delivery areas. Visual cues upon arrival welcome and orient first time visitors to the building's entrances and nearby activity zones. Motorized access and deliveries are focused near the parcels' western edge to maintain a quiet, natural setting in the interior of the parcel, and limit eastward access to on-foot and ski travel connecting up with the Wynn Nature Center trails.


Skyline Drive, Easy Street Turn-Off


Water Catchment Pond at Sauna


Sunset from the Classroom Window


Gravel Access Road to Ageya

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Macro Level Vision Statement

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Ageya Site Vision

The integrity of Ageya's peaceful wilderness setting is preserved even as functional use areas and facilities are improved and developed to support large group and event uses. The limited number of permanent buildings at Ageya are aesthetic, well-integrated into the natural landscape, and are designed to capture scenic views and sun, with vegetation strategically located to provide privacy and shelter from harsh winds that funnel along the ridgeline, especially from the Southeast and Alaska's Gulf Coast.

A site wayfinding system orients visitors by integrating visual directional clues and interpretive elements at arrival points and dispersed along interconnected footpaths and access routes. Besides directing users, aesthetic wayfinding elements also help deepen users' connection with the natural environment and surroundings.

Ageya's main facility is a welcoming activity hub that includes a kitchen, shared meal gathering area, classroom space, and support spaces (bathing, laundry, communications, and office). Indoor spaces of the facility connect with the outdoors both visually and materially as the landscape includes native and cultivated plants that feed guests and residents, reinforce cultural ties, and add beauty to events and special gatherings. Respect for Ageya's wild inhabitants ensures that food and waste are stored and processed to minimize wildlife conflicts, particularly with bears.

Ageya's permanent dwellings are offset from the main activity hub to allow privacy, but with strong functional and visual connections to support caretaking of facilities. Over time, new opportunities for capturing waste, using renewable energy sources, and growing food are integrated into homesites for a more self-sufficient lifestyle.

Seasonal dwellings are spread across the site allowing guests and residents to be in closer touch with nature's scenic beauty, and providing a safe base for healing, growing, and learning through the vehicle of the natural world. Yurts and tents are linked with gathering spaces by footpaths that flow through the site, providing connectivity, places for walking and contemplation, and encountering wildlife at a safe viewing distance.

Outdoor activity zones are integrated across the site and support programmatic learning (boat building and fish processing), team-work (ropes course), logistical staging and trip preparation, as well as informal play, relaxation (sauna!) and social gatherings. Raised gardens, edible forests and native plants are interspersed into the network of activity spaces to provide beauty, learning, and food. Visitors to Ageya leave with a sense of appreciation, wonder, connectedness, and peace.


Main Facility, Dining Hall/Classroom


Permanent Residence


Seasonal Dwelling


Outdoor Activity Area

Permaculture student's site vision incorporating sun, wind, and natural site elements.

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Site Level Vision Statement

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Site Analysis ~ Scale of Permanence

This site analysis on the next two pages describes site elements that are integral to good design. Elements are presented generally in order of their permanence, and/or difficulty to change and/or amend (e.g. climate and landform are the most difficult elements to change on a site.

Climate/Exposure:

Ageya is located in Southcentral Alaska at 59° latitude, in a temperate climate influenced by the North Pacific Ocean (Cook Inlet, Kachemak Bay) and lower Kenai Peninsula's mountain ranges and glaciers. The area has an average annual temperature of 37° with records reaching to +80°F and -20°F. There are more than 186 days per year when minimum temperatures are below freezing.

Annual rainfall is ≈ 25 inches, with a total snowfall of ≈57 inches typically arriving between December and March. Although freeze/thaw cycles are a regular occurrence in Homer, Diamond Ridge's elevation (≈ 1200 feet) creates more stable cold conditions, and Ageya's site has more dependable snowcover which enables cross country skiing on site, and provides insulation for plants and wildlife. Prevailing site winds are from the southeast, including cold Winds from the Southeast (Gulf of Alaska and glaciers) that scour the ridge in the Winter and pile up snow in tall drifts.

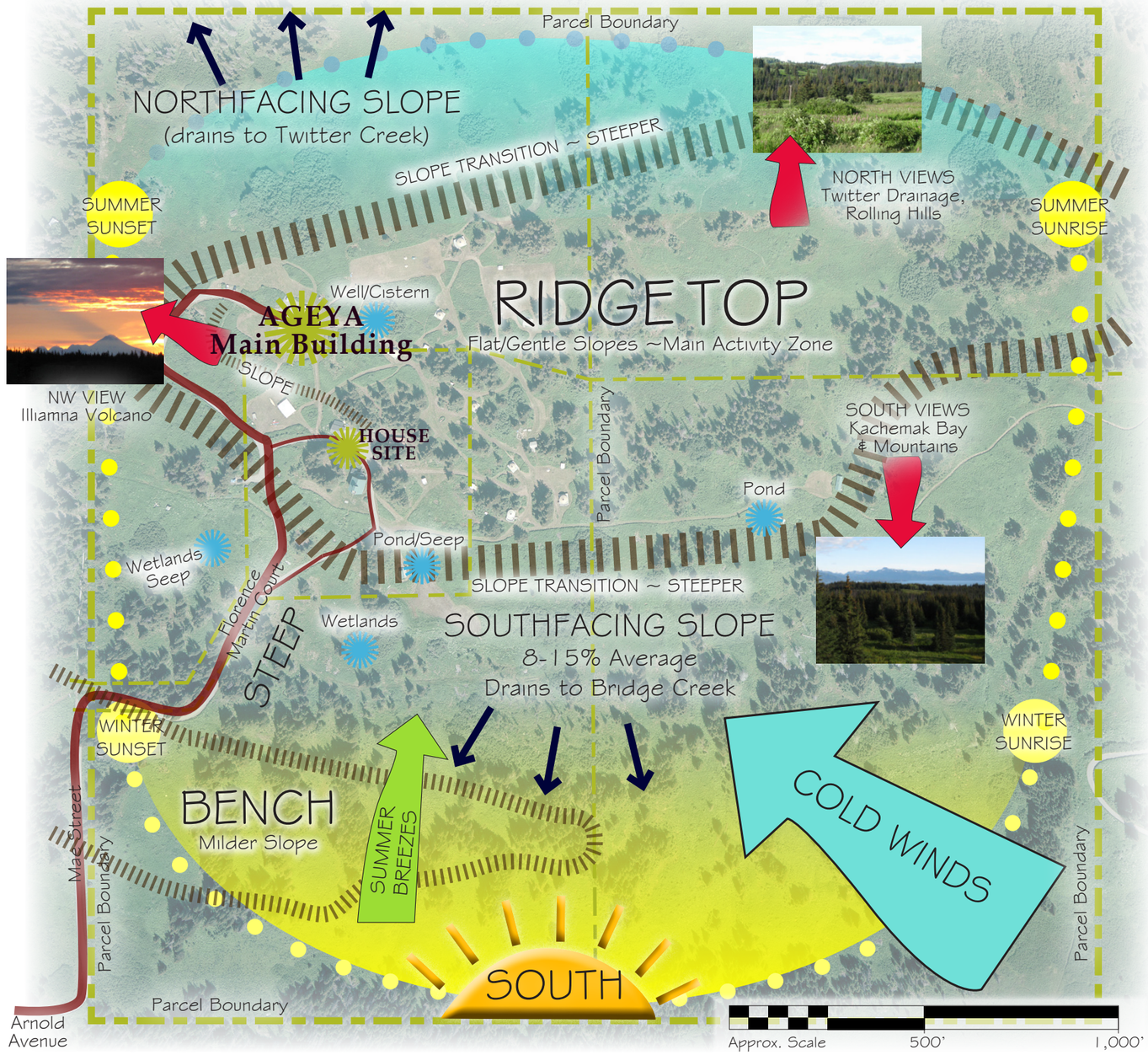
Most of Ageya's site is sloped southward with a sun elevation angle ranging from 7° to 54° with resulting extremes in daylight (≈ 9 hours at winter solstice, ≈ 19 hours summer solstice) and seasonal sun intensity. A few protected sunny spots exist with microclimates where plant hardiness could be extended beyond the area's USDA plant hardiness Zone 4. The site's average last frost date is May 30, with a frost safe date of June 12 (≈ 110 frost free days). Winter soil freeze levels extend on average 2 feet underground.

Landform & Soils:

Ageya's sits atop a five mile long escarpment (Diamond Ridge) formed at about ≈1200 feet above a mostly deglaciated valley. Where the site is more exposed, scenic views exist to Kachemak Bay (south) and Iliamna Volcano (east). Ageya's moderately sloping site (8-15% average) was formed as glaciers left unconsolidated sediments over shallow bedrock. The substrata mainly consists of silty/clayey fine sand (creating at times hardpan at about ≈2 feet below the surface) topped by young and often saturated loamy soils, with some perched peatlands, springs and seeps. Within USDA NRDC soil classifications the site is largely Kachemak silt loam (about 8% clay, 6% organic matter, 37% sand, with high water saturation). Soils are extremely young and acidic (3.5 - 5.5 ph) and have a moderate infiltration rate when thoroughly wet.

Water:

Most of the water on-site enters as rain and snow, which flows as surface water southward into Bridge Creek. Some drainage also flows off the site northward into Twitter Creek. This surface drainage helps provide fresh drinking water for Homer, and eventually drains into the Bay's rich ecosystem where the water cycle begins anew. At least three springs are on site, in addition to two small ponds, one which has been amended for greater capacity. A decent well water supply is available onsite. A cistern was installed in 2010 to meet federal health and safety regulations.



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Ageya Site Analysis Summary

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Legal:

Several different parcels are used by Ageya under different ownership parameters. Property lines are identified, right. Future considerations include purchase of adjacent private parcels; section lines, legal access and shared driveway issues; subsurface/mineral and water rights. The land is outside the City of Homer and is governed under the Kenai Peninsula Borough land development code. It is also subject to Homer's Bridge Creek Watershed Protection District regulations limiting the percentage of impervious surface on a parcel (gravel/paved driveways, parking pads, roads, decks, and roofs are included). Mitigation plans with rainwater catchment systems can potentially allow increased development, which may become an issue if a greenhouse or other new structure is added on the smaller homesite parcel.

Access and Circulation:

Auto access is concentrated on the west edge of the site, with parking areas concentrated around the main building and house site. Finding the site and deciding where the "front door" of Ageya is presents a challenge for first time visitors given the number of small turn-offs and lack of visual cues. A connected system of on-site circulation paths support foot traffic, skiing, and ATV use, and connect the site to the Carl E. Wynn Nature Center trails on a nearby 140 acre parcel.

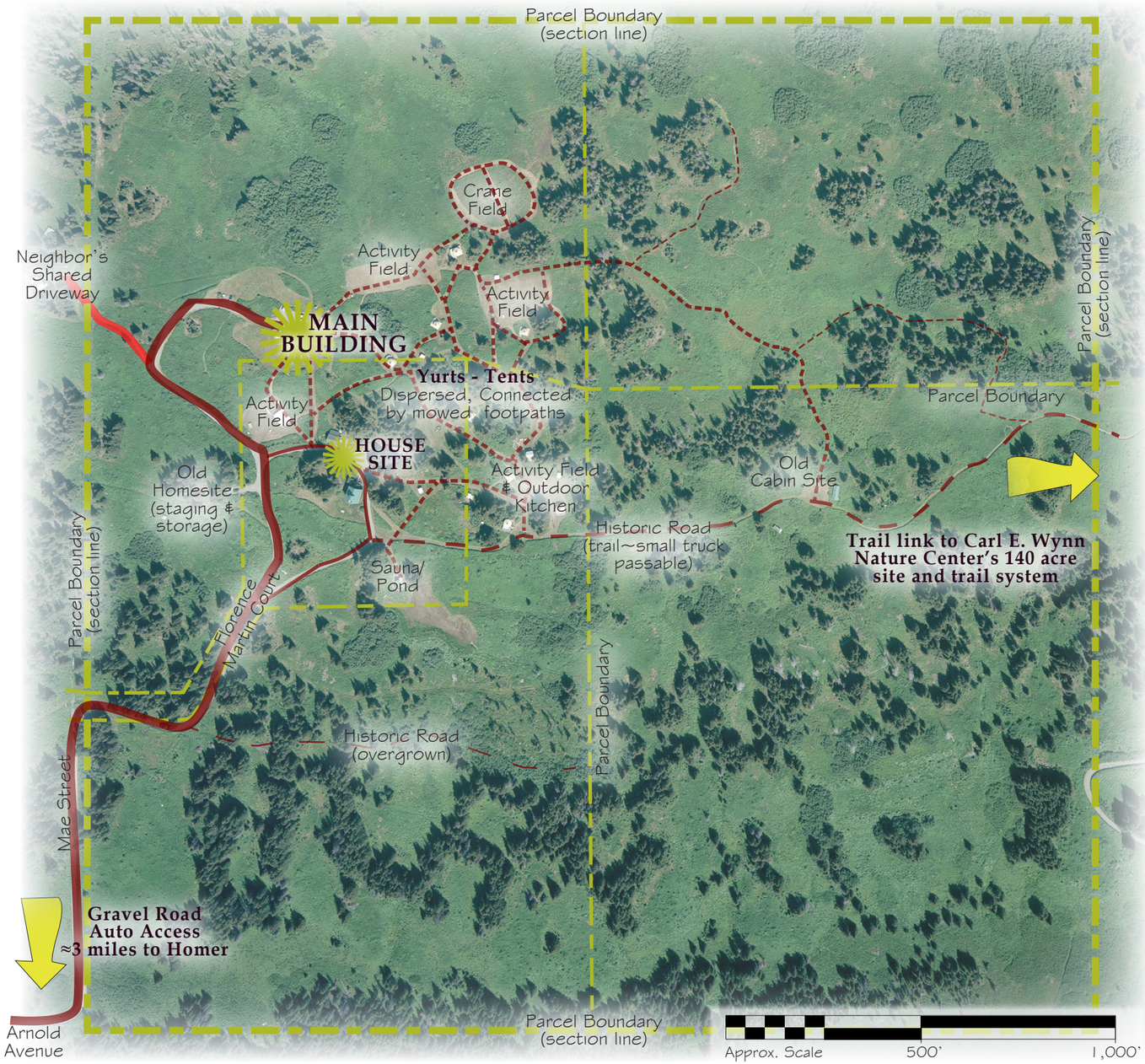
On site circulation paths are necessary for servicing yurts and tents with water and propane. These trails are generally mowed ≈ 8 foot wide swaths, which can become muddy with heavy use and rains. Moreover, although the main building and housesite have good visibility one to another, many of the pathways meander through spruce forest and at times, tall fireweed stands which limit views. Although maintaining the wilderness feel and privacy of yurt/camp sites and trails is a goal, it adds some wayfinding challenges for first-time users. Additionally, a number of game trails also support foot traffic.

Buildings and Infrastructure:

Only two sizable buildings are onsite, the new Main Building, and House. Support buildings include a workshop, sauna, and cistern building. Several screened connexes provide additional storage. Other structures include an outdoor kitchen/gazebo, a number of yurts with permanent decks, and wall tents with wooden frames. The site has electricity, communications, and septic infrastructure on-site in addition to wells and a cistern, concentrated near and between the main building and housesite. Fuel tanks are located north of the main building and homesite and are serviced by truck, as is garbage removal.

Vegetation and Wildlife:

Plant communities on the site are in a state of flux. At the macro scale, a sub-alpine early succession of fireweed meadows are currently being replaced by spruce forest, although this is also transitional, as the area is on an edge between coastal and boreal forests. At the micro level, a patch mosaic of several plant communities are spread across the site: mowed paths, lawns and fields; fireweed, cow parsnip and spiraea meadows; spruce forest with moss understory; willow, alder, woody scrub; and wetland/pond plant communities. Only a few young birch are on site. The site's vegetation provides habitat for various wildlife populations. Many animals live on the site, large and small. Moose, porcupine, bear, and small mammals are common. The site also supports migrating wildlife, including crane. Wildlife offers valuable educational and viewing opportunities, although it also poses safety concerns along trails and requires that humans take care with waste and foods that can create conflicts.



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Larger Community



USERS:

- Guests using the site for educational activities, special events, and leadership retreat purposes
- Visitors enjoying the site's trails and attending community events

NEEDS:

- ✓ Wayfinding to access the site
- ✓ Parking and defined entrances
- ✓ Intensive, short-term food, water, energy, and waste processing needs
- ✓ Welcoming, aesthetic environment that supports large group functions
- ✓ Flexible use of indoor/outdoor spaces in changing weather conditions
- ✓ Clear boundaries and rules of conduct

Youth / Students



USERS:

- 20 + day residence camps for Native Alaskan high school students from across Alaska
- Special environmental education programming and family overnights

NEEDS:

- ✓ Direct experiences of wonder, connectedness and peace through the vehicle of the natural world
- ✓ Fun outdoor activity and play areas
- ✓ Spaces that support skill building and learning
- ✓ Welcoming and well-functioning facilities (kitchen, classroom, laundry)
- ✓ Seasonal food, water, energy and waste needs
- ✓ Comfortable "homelike" shared living that provides a safe base for healing and growing
- ✓ Clear boundaries and rules of conduct

Staff/Mentors



USERS:

- Seasonal and permanent staff supporting youth camps (counselors, teachers, cook, etc.)
- Visiting mentors and teachers

NEEDS:

- ✓ Rich opportunities to teach and lead exploration of the natural world on site
- ✓ Outdoor activity areas with basic logistical support (e.g., access, tools, storage, shelter)
- ✓ Group learning, socializing and skill development areas.
- ✓ Comfortable temporary housing with private areas for bathing, relaxation, and rest
- ✓ Seasonal food, water, energy and waste needs
- ✓ Common spaces and tools in support of lesson planning, logistics, communications and safety

Residents



USERS:

- Permanent residents and site caretakers
- Guests of residents

NEEDS:

- ✓ Welcoming and nurturing home environment and surroundings
- ✓ Clearly visible entrances for guests
- ✓ Screened outdoor areas for private use
- ✓ Sunny sheltered areas for play and relaxation, ideally with scenic views
- ✓ Year round food, water, energy and waste processing needs
- ✓ Year round access, parking, and storage needs
- ✓ Views and access to facilities when not in use for caretaking purposes
- ✓ Areas supportive of projects and gardening

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Site Users ~ Needs

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User Outputs

Visitors, guests, and residents of Ageya, and the site development (roads, facilities, etc.) that supports them creates resources and outputs that can be re-directed and used on-site:



Water Runoff

Sources:

- Roofs, parking areas, lawns, roadways

Values:

- Fresh water can be captured during rain events to supply water for bathing and garden uses
- Water from parking areas, lawns and roadways can be directed to water trees and gardens, fill ponds, and slowly infiltrate and recharge ground water and the Bridge Creek reservoir
- Directing and capturing runoff can limit erosion and reduce mud on roads and trails

Technologies:

- "Key Line" drainage infiltration channels
- Roof gutters, "rain chains" and cisterns/barrels for capturing and storing rainwater
- 1:3 sloped ditches on gentle slopes (1' drop over 200') will slow spread and sink water
- Rain gardens, water harvest basins, fish scale swales, etc.


Grey Water

Sources:

- Sinks, dishwasher and laundry facilities

Values:

- Waste water from bathing and washing can be redirected to trees and fruit crops (except acid loving crops like blueberries)

Technologies:

- Use non-toxic soaps (NO salts, boron, or phosphates).
- 3-way valve for shifting drainage out of dwellings via hoses or "grey water emitters"
- Do not store or allow direct human/animal contact, or drain onto root crops or tender leafed crops eaten raw (e.g., lettuce)
- Filter grey water through mulch at the base of woody plants and trees
- Mushrooms and fungi can help break down organics in the water


Kitchen Area

Sources:

- Cardboard and waste paper (napkins, etc.)
- Vegetable, fruit, egg shells and decomposable food scraps, including salmon bones/waste
- Wood stove ashes, wood chips, saw dust, lawn clippings, straw, other cellulose

Values:

- Significantly improve soils and creation of garden quality soils and beds

Technologies:

- "Vermiculture" red worm compost system (indoors where it won't attract wildlife)
- Three bin compost system (outdoors)
- "Sheet mulching" incorporates various waste products to create a garden bed (finished compost as an inoculator, cardboard/paper products, compost/manure, topped by straw or wood chips and left for one season)


Human Waste

Sources:

- Urine - liquid waste
- Solid waste

Values:

- Urine separated from solid waste can safely supply major fertilizing needs for vegetable gardens (Nitrogen, Phosphorus, Potassium) when diluted with 10 parts fresh water.
- Human excrement, if handled properly and after a sufficient curing time can create compost suitable for gardening and improving soils. Given students' familiarity with honey buckets, demonstrating technologies that turn this waste product into an inert resource could impact health and rural life across Alaska.

Technologies:

- Use a urine separator and apply diluted fresh urine directly to plant beds (do not let urine age - it changes the chemical composition)
- Composting toilets all depend on aerobic decomposition (liquid must be removed, and heat source is required). A number of systems are available which use vermiculture (worms) which eat the bacteria that cause smell and disease conditions. Other compost toilet options use waste sawdust. Simple bucket options with urine diverters are also available.

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Renewable Resources

Although many of the site guests and residents rely on resources from off-site to meet basic energy, food, and material needs, the Ageya site has significant potential for meeting many of its needs onsite. Several opportunities are described below.

Wind

Wind is a major site challenge. Strong seasonal winds dominate from the southeast, particularly during the fall and winter months.

Values:

- Wind could provide electricity to power site appliances and lights during the high demand season when winds are strong.

Technologies:

- Because the peaceful atmosphere of the Ageya site, newer wind technologies that include an "outer diffuser" ring to cut the noise level to 35 decibels and reduce vibrations (40 decibels is a human whisper, a normal conversation is at 60 decibels).

Solar

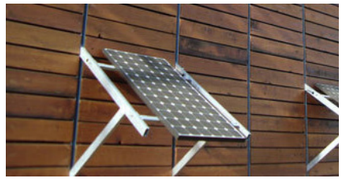
Solar gain is an important source of energy on Ageya's site, particularly during the summer months when peak visitation occurs.

Values:

- Solar energy supports biomass growth on Ageya's 80 acre site including plants, timber, and potential food crops
- Solar panels could be used to generate electricity for main buildings in the summer and shoulder seasons
- A small sturdy system could provide educational value for rural Alaskan students who experience very high energy costs

Technologies:

- Solar panels should be scaled for 3 season use demands, with the option of selling power back to Homer Electric.
- Solar infrastructure should be integrated into the site in an aesthetic manner with sturdy frames that can withstand strong Southeast winter winds.



Plants

Ageya's site grows diverse plant resources which can support a broad range of needs.

Values:

- Cultivated and native wild plants support food, aesthetic, and cultural values
- Spruce and alder can supply heating fuel
- Willow is fast growing and contains 70% of the fuel value of coal while also providing food and habitat for many animal species and helping as a windbreak
- A number of plant species can be grown to enhance soil fertility. Nitrogen fixing plants include Alder, Lupine, Dogwood, Russian Olive, Silver Berry, Soap Berry, Wolf Willow, Sea Buckthrorn and Eskimo Potato
- Some plants can bring up nutrients from underground for better cycling (Dandelion and Nettles) and fungi can speed decomposition and nutrient availability. Other "insectary" plants support fertilization of crops (Cow Parsnip, Bee Balm).

Technologies:

- Greenhouses can expand the growing season
- Forest gardens are a re-discovered method for growing polycultures of woody of plants for food. See *Edible Forest Gardens* by David Jacke
- Small woody material can support outdoor cooking on rocket stoves (Stovetec)

Animals

Ageya's plant life and intact habitat areas can support diverse wild and domestic animal populations that are an important site resource.

Values:

- Educational (animal tracking and study, wildlife viewing)
- Selective hunting and wild game foods (moose, bear, grouse) to support healthy populations and reinforce subsistence traditions for Native Alaskan students
- Domestic animals can also be brought to Ageya to provide additional food, soil amendments, and waste processing, although the "burden of the intervener" and a host of new site needs and responsibilities.
  - Ducks feed on garden slugs and provide meat and eggs
  - Chickens eat kitchen scraps and provide manure and eggs
  - Goats and ruminants eat plant biomass and convert it into food (milk, butter, cheese)
  - Pigs can help with site clearing and grubbing, process waste, and provide meat

Technologies:

- Chicken tractors can be designed to move around a site and help with weeding, pest insects, and loosening soil.

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Site Resources

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Site Intensity of Use Zones

Ageya's site breaks into five zones which respond to the intensity of uses as follows:




Zone 1 - Intensive Use Zones

This zone incudes the immediate vicinity of the house, classroom, and seasonally, yurt and tent dwelling sites where people spend time intensively. Major uses and issues in this zone include:

- Balance privacy needs with social needs
- Blend structures into the natural setting by capturing scenic views and retaining trees and vegetation
- Design for maximum solar gain, wind protection (microclimates), and fire defense
- Combine efficiency, functionality and aesthetics in meeting day-to-day needs (e.g. access, utilities, storage, staging, defined entryways, etc.)
- Minimize input flows from off-site (energy - fuel, food, water, materials)
- Re-use waste outputs (roofline/road drainage, grey water, kitchen scraps, solid/liquid human waste)
- Locate high maintenance gardens and systems like greenhouses, solar panels, and root cellars in zone 1
- Concentrate "high impact" design elements (flower gardens, outdoor furniture, etc.) in this zone both to visually define the private living space and to support regular use and enjoyment

Zone 2 - Everyday Travel Zones

Extending beyond the immediate home site, this zone includes areas surrounding zone 1, and well used travel paths or access points. Key issues are:

- Place gardens and systems in this zone that need daily or regular maintenance, or that benefit from proximity to the home (e.g., compost bins, chickens and animals subject to predators)
- Concentrate vegetable gardens, orchards, and ornamental trees in this zone for enjoyment, ease of gathering, and maintenance
- Screen storage, utility, and waste processing areas
- Develop access paths, parking areas and roads to anticipate soil compaction, drainage, and erosion issues associated with heavy use

Zone 3 - Activity/Production Zones

This zone supports more land intensive activities, projects and systems that benefit from homesite proximity and road access, but have smell, noise, and space needs less compatible with the immediate home/intensive use environment. Key uses are:

- Land intensive activity zones (play areas, ropes course, bonfire sites) and project areas (kayak building, salmon smoking, trip staging, etc.)
- Larger scale gardens requiring less maintenance (potatoes, grains, forest gardens, silviculture)
- Windbreaks
- Energy production elements (windmill, firewood processing, hay meadows)

Zone 4 - Semi-Wild Zone

This zone includes land uses which support the needs of the site, but which are self regulating and maintaining (native intact landscape or perennial polyculture). Key uses/activities include:

- Sustainable timber and forest product harvest
- Maintain the native vegetation with minor interventions (windblocks, vegetative screening, clearing to enhance scenic views, add tree and understory species with food and material value)
- Trails, wildlife viewing and interpretive areas

Zone 5 - Wild Zone

Along the site's perimeter and away from the main activity and travel ways, protect a contiguous wild zone that achieves multiple objectives.

- Provides a wild landscape with a diversity of species for visiting, learning and reflection
- Maintains wildlife habitat and sustainable game harvest opportunities (moose, bear, grouse, etc.)
- Native species nursery
- Creates windbreaks and screens adjacent land uses from views
- Supports clean water, air, and other health and ecosystem values for the bioregion



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Ageya Site Use Intensity Zones

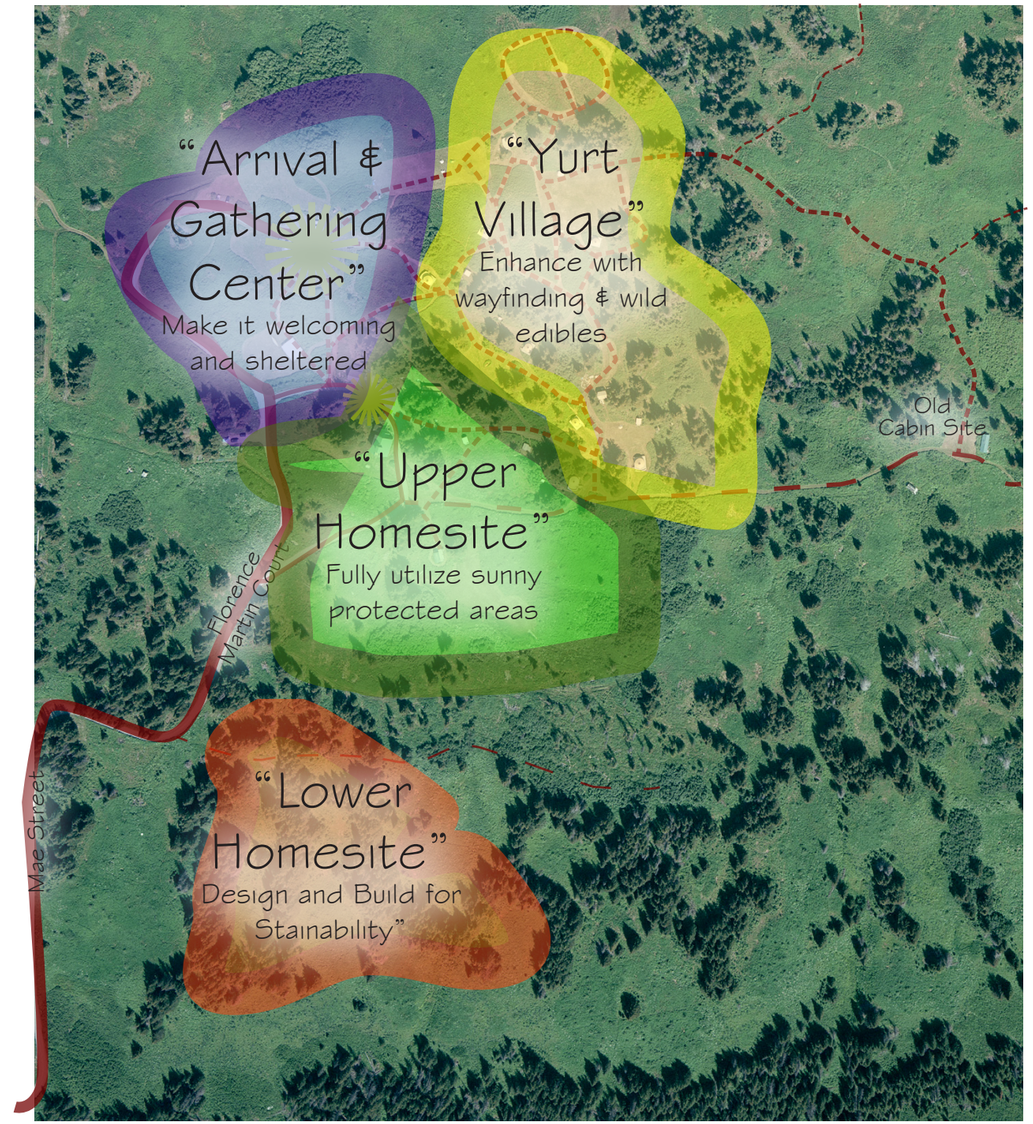




Site Design Concepts

Design and use the site in accordance with "use intensity zones" while also applying the permaculture principles below to four focused areas (diagram right).

- ✓ Catch & Store Energy
- ✓ Use & Value Renewable Resources and Services
- ✓ Produce No Waste (make value from outputs)
- ✓ Design From Patterns to Details
- ✓ Value Diversity and Use Edges
- ✓ Creatively Use and Respond to Change



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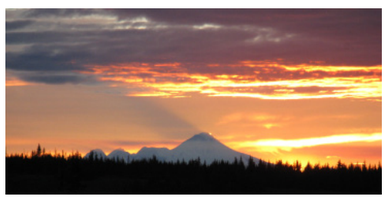
"Arrival & Gathering Center"

Make it welcoming and sheltered

Main Facility, Dining Hall and Classroom

Maintain Views to Volcanos



August Sunset from Kitchen Door

40% Permeable Wood Fence

~ Trap Snow Melt for Berries
~ Snow Fence to help keep driveway clear
~ Discourage Moose from browsing
~ Slow wind as it crosses the ridge

Create an interpretive wayfinding garden "map" of the site, highlighting the patterns and locations of the yurts using unique ethnobotanical plants from Alaska. Each yurt site has its own large, rotten spruce log planter (example right) tall enough to poke out of the snow. The log is hollowed out and planted with compost and one hardy plant (artemesia, etc.). Plant names are burned in the wood in different languages to provide a name for that specific yurt. The map garden includes a low ground cover between yurt name plants to maintain the map spacing between individuals (potential species include dogwood, nagoonberry, low ferns)

The map garden also provides opportunities for learning and supports a welcome sign and information board.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Permaculture Design Concept