

Discoveries

News & views from Discovery Southeast

Spring 2005

RC preface, 2020: Kathy Hocker wrote this *Discoveries* feature midway through our *Repeat photography* project that ran from 2004 to 2006. On completion, we produced final reports, posters and a slideshow with more complete analysis of before-&-after photo-pairs. In fact, 2 of the historicals (at Sitka & Haines) that Kathy selected for this piece had not yet been retaken. But I love the more personal and 'Sherlockian' flavor of this *Spring, 2005* report—well worth preserving in *Discoveries'* digital archives. The only things I've added are those 2 retakes, from trips we eventually made to Harbor Mountain and Chilkat River.

Then and now

Repeat photography as a naturalist's tool

Kathy Hocker

I've been intrigued by the photo ever since I first saw it. Labeled "Perseverance Division, 9-18-14," it shows at least a dozen large buildings—some up to 5 stories high—stairstepping up the sides of 2 rock outcrops. Walkways, trams, railroad tracks, and smokestacks are packed among them, and more structures crowd the banks of the creek below. An enormous gray slope of waste rock spills down on the left side of the photo. It's a mining camp, home to hundreds of men. When this photo was taken, 90 years ago, the camp's noise, activity, and impacts dominated the upper end of Perseverance Basin, just a couple of miles from downtown Juneau.

I know that place—it's at the end of Perseverance Trail. I've been there scores of times. But like many other Juneau hikers, I know it not as a small, noisy city but as a sweep of bright green deciduous brush, threaded through with creeks and cascades. In early summer, layers of kinglet, thrush, and warbler song tremble through the treetops. Except for the occasional jet



Perseverance Mine Camp, 1914. Taken from a rock buttress at the head of Perseverance Valley, this photo shows bunkhouses, administrative buildings, a mill, equipment shops, and a tramway. Smooth gray mound on left is waste rock, pulled out of mine tunnels and dumped on surface. This camp was used until around 1920, then maintained, to some extent, until the 1930s.

Notice heavy disturbance of the valley floor, where Gold Creek flowed in braided channels. Both rock outcrops on which the camp is built have been cut over. Notice also the distant mountainside (north face of Gold Ridge), scarred by placer and open-pit operations. If you're a frequent hiker in Silverbow Basin, you won't recognize that slope, because it's gone—sucked down into the Glory Hole in the 1920s and 1930s.

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overhead, it's a quiet retreat from the noise and jostle of downtown. But quiet as it is now, the clues to Perseverance's busy past are there: rock walls; piles of weathered boards; rotting cement foundations and rusting machinery; eerie reddish barrens covered with thin mats of black moss. But even standing among those relics, your vision is hemmed in by the riotous alder and willow brush. It's hard to grasp the scale of mining development in Perseverance Basin, or to evaluate how that past has affected the natural communities there today. We need some way to compare the past and the present directly, to see and evaluate the changes.

Last summer, I hiked up Perseverance Trail in search of the site from which that 1914 mine camp photo was taken. My goal was to take the picture again—to capture that same view so old and new could be compared as directly as possible. The expedition was part of a 2-year repeat photography project I've been working on with fellow DSE naturalist Richard Carstensen. Funded by the US Forest Service—State and Private Forestry, and administered by Discovery Southeast's sister organization, SEAWEAD, the project is designed to find, collect, and re-take historical photos throughout Southeast.

Repeat photography (RP) is a proven scientific tool. Re-takes of historic photos show how vegetation responds to very specific changes in landscape and climate. RP has been used to document the creep of brush into the Arctic tundra, vegetation change in the high mountains of Oregon, and shrub invasion into western deserts.

Since the 1880s, generations of cameras have witnessed the landscape of Southeast Alaska, capturing both human impacts (logging, mining, towns, canneries, agriculture and other developments) and natural disturbances (landslides, glaciers, fire, blow-down, uplift). Thousands of old photos, in private and public collections, are the pool of potential from which we're rechoosing images

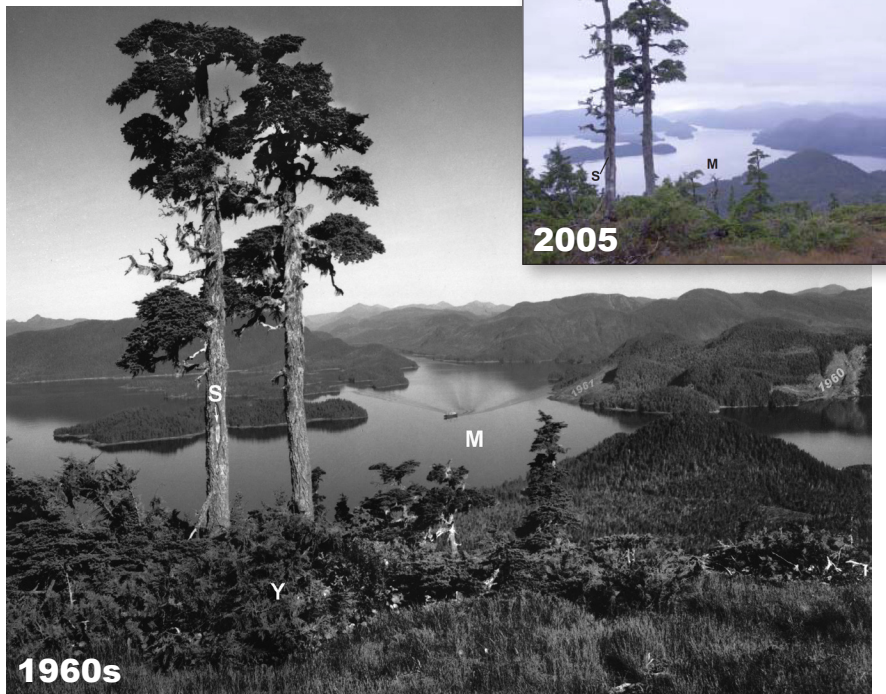
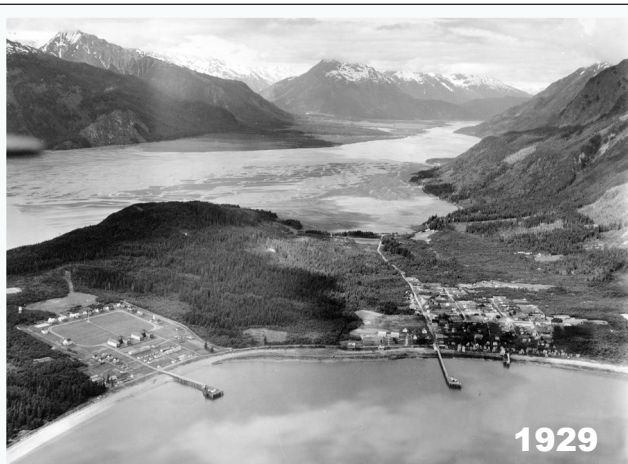


Photo taken from Harbor Mountain, in Sitka, in the early 1960s. It's a nice scenic shot, but there's more to be learned: what's going on today in the foreground meadow? How have the foreground mountain hemlocks changed? What about the clearcuts visible at right center? ● **RC PS, 2020:** Inset is from a visit Kathy later made to Sitka. For her full before-&-after analysis, see the 2013 second edition of our final report *Documenting change through repeat photography*, page 23. http://juneanature.discoverysoutheast.org/content_item/documenting-change-through-repeat-photography-in-southeast-alaska/



1929



2013

Aerial view of Haines, taken by the US Navy in 1929 as part of a large-scale aerial survey of Southeast Alaska. Downtown is just right of center, Ft. Seward is at left center. While the foreground may not be as useful for studying vegetation change (development has obscured or removed much of the vegetation), the changes in the Chilkat River estuary should be very exciting to see and interpret. • **RC PS, 2020:** Lower photo is from a visit I later made to Haines for the Southeast Alaska Land Trust. For this pair and other aerial oblique retakes on the Áak'w-to-Jilkáat flight, see my 2013 Mud Bay survey report to SEAL Trust, pages 51-61, downloadable from their website or JuneauNature: http://juneaunature.discoverysoutheast.org/content_item/mud-bay-survey-for-seal-trust/

for this project.

What makes a good photo for re-taking? We've found that an ideal prospect:

1. Has clearly identifiable vegetation
2. Has not had the original scene destroyed by human development or had the original scene obscured by intervening vegetation
3. Has a complex mountain backdrop for triangulation of the photopoint
4. Is accompanied by documentation of photopoint, date, photographer, and notes.

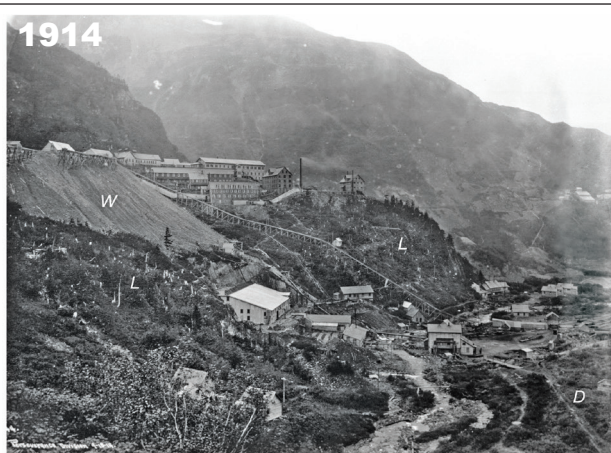
Of course it's rare to find a photo that meets all of these criteria! But many come close. And even if the photo is not

impeccably documented, or if the photopoint may be difficult to relocate, it can be useful.

The Perseverance photo I was re-taking is a very good candidate for repeating. Part of the Winter and Pond collection at the Alaska State Historical Library, it's clearly labeled with location and date. It shows several different types of human-related disturbance: clearcut logging, waste rock disposal, buildings. The landscape features are distinctive and relatively easy to relocate. And vegetation is fairly identifiable.

At Gold Falls, I dropped down into the creekbed to work my way toward the buttress that I calculated to be the photo site. We've developed several ways of relocating historic photo points, including use of ArcGIS software (sidebar). But sometimes just careful estimation, familiarity with the area, and patient groundwork are enough. A sweaty scramble up through puckerbrush brought me to the top, where I peered downvalley through the foliage.

I pulled out my copy of the original photo. Not quite, but close. I threaded twisted trunks of alder, waded gingerly through a salmonberry thicket, and came out on a blessedly brush-free rock outcrop. Another photo check revealed that I was very close. Since this outcrop seemed to offer the only



Perseverance mine camp then (1914) and now (2004): Logged slopes have come back in dense mountain hemlock. Similar, unlogged outcrops at this elevation have more Sitka spruce. Did understory hemlocks spring up when overstory spruce were cut? A similar pattern of regrowth is common at lower elevations, with western hemlock in place of mountain hemlock.

On the building sites, alder/ willow scrub (with devil's club, salmonberry, and goatsbeard, and some cottonwood) predominates, but the waste rock pile shows a much more uniform canopy of young Sitka alder. Why? Soil instability and rapid drainage may explain the slow regeneration.

RC PS, 2020: Lettered annotations on these before-&-after images are from a sidebar in *Natural history of Juneau trails, 2013, titled Succession in a teacup watershed, page 24:*

S = slide vegetation; **G** = glory hole; **L** = logged; **D** = deciduous regrowth; **W** = waste rock; **M** = mountain hemlock regrowth; **B** = building sites

The trail guide is sold in Juneau bookstores, including Discovery's shop at Glacier Visitor Center.

Background on JuneauNature: http://juneaunature.discoverysoutheast.org/content_item/natural-history-of-juneau-trails-a-watershed-approach/

unobstructed view, I unpacked the camera and took the photo.

Since the beginning of our project, we've collected scores of potential repeats. Our discoveries vary in provenance—from surveyor William Ogilvie's gorgeous glass-plate early-1890s photos of the Mendenhall Valley, to beautiful 1929 oblique aerial photos shot by the US Navy in 1929. They vary, as well, in disturbance-type—from the whaling station at Port Armstrong on Baranof Island to clearcuts on Chickamin River.

After focusing on Juneau-area photos last summer, we'll be expanding to other areas of Southeast in 2005. Eventually, we'll make the collection of potential photos, and our selected repeats, available for education and research purposes. Look for more from the repeat photo project in the next year. And let us know if you have a photo (from the 1950s or before) that we might want to add to our collection!

Although in-depth interpretation would wait until I could compare Perseverance photos side by side, preliminary comparisons were obvious from this vantage above the old mining site. Clearcut rock buttresses are now covered with dense mountain hemlock forest. Scattered cottonwoods rise above a rumpled blanket of alder and willow where the buildings were. The great gray waste rock pile is covered with a smooth coating of Sitka alder. A quick check revealed young even-aged trees, nearly all with pronounced snowcreek.

Back home, I downloaded the repeat photo to my



computer and imported it into Photoshop as a layer on top of the historic photo. By manipulating opacity to see both photos at once, I aligned and scaled my retake to match as closely as possible the historic photo underneath. I moved the opacity slider back and forth, watching ghosts of mine camp buildings emerge and disappear, looking for patterns of change.

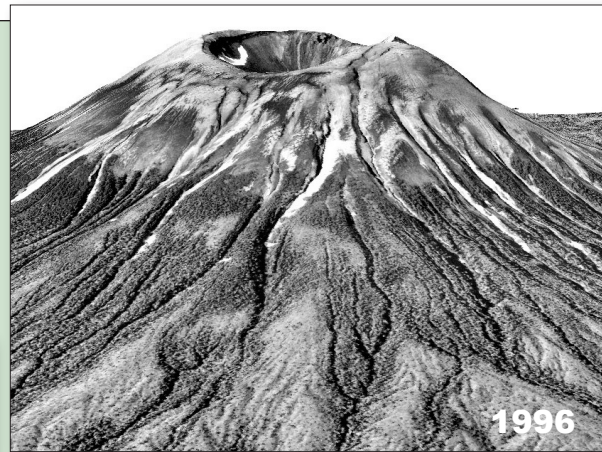
Mt. Roberts, just below 'the Cross' In subalpine bowls too low for Little Ice Age glaciers are meadow communities where persistent summer-long snowpack pre-empted woody vegetation. As climate warms and snowpack melts earlier, lush meadow—deer & bear habitat—is replaced by woody vegetation. Three photos document this change. Original (top) was by Donald B. Lawrence, pioneering ecologist of postglacial succession in Glacier Bay and Juneau. While exploring lowland post-glacial trends, Lawrence was sidetracked into puzzles of subalpine change. • **RC PS, 2020:** More complete discussion of successional change for this and other photo-pairs on Mt Roberts is in *Natural history of Juneau trails*, page 53. *Gunalchéesh* to our 'models' on these visits: Elizabeth Lawrence, '49; Catherine Pohl, '89; Robert Armstrong '04.



Old photos meet new technology

The ArcGIS system of computer-assisted mapping has helped immensely in our repeat photo project. All of our potentials and repeats are stored in an Arc View database, hyper/inked to a map of Southeast Alaska. Click on an arrow that represents a photo, and the computer will bring up the ID number, bearing, date, type of disturbance shown, and notes. Shift to hyperlink mode and click to see the original photo plus any repeats that we've done.

ArcGIS has also allowed us to narrow our search for photopoints. In ArcScene, we can create a digital elevation model (DEM) of the general area of a historic photo. This model can be tilted and rotated, and thus viewed from any point on the landscape. We drape an orthophoto (direct overhead photo taken from a high-flying airplane) over this DEM and manipulate the resulting 'virtual' landscape until the view in the computer matches that in the historic photo, giving us the general area of our photopoint. This streamlines our fieldwork quite a bit: Finally, we can use the DEM technique to create 'virtual' repeat photos. Using an aerial oblique



historic photo as a basis—such as one of the many beautiful shots taken by the US Navy in 1929—we create a DEM with a modern orthophoto, then position the DEM to match the 1929 view.

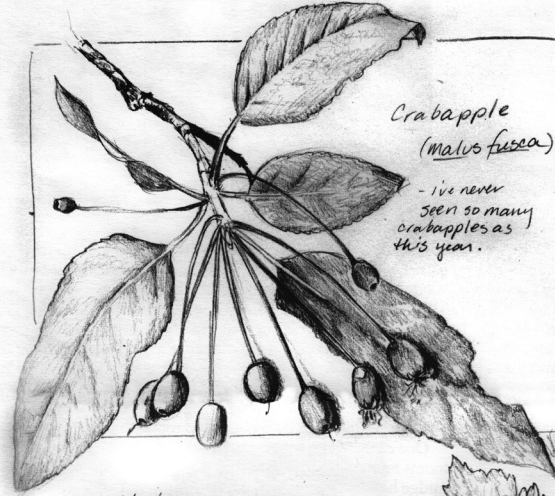
Here's an example of this technique: a 1929 view of Mt. Edgecumbe on left, and above, our 'virtual' repeat using a 1996 orthophoto. Notice that little change in vegetation is detectable between historic and modern photos.

RC PS, 2020: As noted in my preface to this Discoveries feature article by Kathy, we were only mid-way through the Repeat photography project when this was written. Subsequently we created many interpretive documents and programs, including a Fireside Talk at the glacier visitor center in winter, 2005. I still have the gigantic powerpoint file from that presentation, along with audio files that we recorded for a stand-alone pptx. Still on my to-do list, 15 years later, is to convert that program for upload to Discovery's vimeo site. Stay tuned!

Sketches from a field notebook

Kathy Hocker

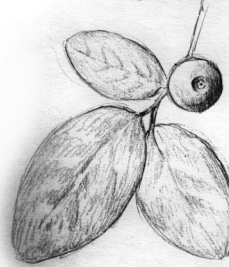
An early berry bowl this year.



Crabapple
(*Malus fusca*)

- I've never
seen so many
crabapples as
this year.

Early blueberry
(*Vaccinium ovalifolium*)



Alaska blueberry
(*V. alaskense*) has
more pointed leaves,
longer bud scales. It's not ripe.



Salmonberry not
ripe yet, but blueberry
is unusual at my
house!