

Adamus surveys

Preface Along with Koren Bosworth—then Zimmerman—I was hired by Paul Adamus to conduct the City's first wetland surveys in early summer, 1986. I moved into the valley from Eagle Beach and house-sat for Matt Kirchhoff on Auke Street off Windfall Ave.

From Paul's perspective, the surveys were about data-form-filling, simultaneously recording vegetation cover along walking transects while listening for birds. This required an unusual combination of skills, and I'd otherwise have been passed over for a shorter-haired, less disreputable observer.

For me, unimpressed by number-crunching, the surveys offered an unprecedented opportunity to collect traditional naturalist's daily journals—neatly written up each evening with rapidograph on 8x11 paper (not my traditional micrographic RinR notes).

Some of these notes, for the western valley have already been typed and 'sidebarred' into the place journal for Kaxdigoowu Héén, but segregated into landforms and wildlife sections. Here, they're re-integrated, so that each day's adventure preserves its original flow. Elsewhere, I've gone back to the original handwritten notes.

I'm transcribing these by reading them to my phone, chunked into ~3-paragraph emails to myself. Lots of typos to correct by this method, but definitely faster than secretarial typing direct from journal to this indesign page.

Valley residence also put me in regular contact with Rich Gordon & Dan Bishop, best possible mentors for a newbie to the world of professional birding-&-boggling.

Introduction: On 0528, prior to official employment in the Adamus work, I visited the slope bog (wetland 125k) just west of the new pistol range with Koren, Don & Paul. ¹ Several comments on birds here are in order since they're unlikely to be relocated on 'official' transects. We discovered a nesting **greater yellowlegs** who had sat quietly on 4 eggs during more than an hour of coring, about 10 yards away! She refused to flush until I made a sudden movement later. This is unusual behavior.

I returned the next day with Bob Armstrong, who had never had an opportunity to photograph a greater yellowlegs on the nest.—only numerous hours being attacked and deafened. Most of the serious birders in Juneau eventually visited this unfortunate bird.

By 0602 the eggs were hatched, and both parents were present together for the first time. Bob got fantastic photos of one parent (♀?) with young. On my return visits 0529 and 0530, several **olive-sided flycatchers** were singing in the bog and at least one **Townsend's solitaire** who was silent. The birds I saw on the 29th and 30th appeared to have different colored outer tail feathers one was buffy rather than white

Olive-siders are rare as nesters, and no nesting is known locally for solitaire. Rich Gordon does

¹ Not Adamus but Paul **Glasser**, colleague of Don **Siegel**: 2 reports to CBJ in 1987 for JWMP, on recharge-discharge function of wetlands 78 pp., and groundwater analyses. 81 pp.

have a summer observation from Berners Bay. Also there was a **northern three-toed woodpecker**, considered less common than sapsuckers and hairy's locally.

19860604 Flycatcher Carr ²

Koren and I ran E-W transects across the large wetland between Mword Creek & Mword River, beginning at the end of River Road. This went slowly at first as we worked out methods and classifications. By June 5 we were gaining efficiency. In 2 days we covered about a third of this wetland.

On 0604, I returned to several locations on our transect with Rich Gordon to solve problems of unidentified songs. One song Rich explained as a **yellowthroat**, heard on 2 different transects. But the other remains unknown. Rich says this area has fair numbers of yellowthroat and **alder flycatcher**, but singing for these species is late this year.

This also appears to be a poor year for birdsong in general. Rich just completed his 3rd Breeding Bird Survey for Fish and Wildlife Service. For 1986 the average number of birds per station, singing calling or observed, was 2/3 that of 1985, in 1985 it was 2/3 that of 1984!

² On 20230511, Koren, Dan Hysell (SEALT) and I visited, flew and mapped a 9-acre burn centered in this wetland. SEALT calls this the Montana Creek Wetlands, but on page 2 of my journal (*F:\2023\05\20230511sealtburn*) I proposed 4 more place-based alternate names. Flycatcher Carr is currently my favorite.

Similar BBS census 10 days later by Frank Glass on a different route indicates the same thing; low song intensity. The southern part of this large wetland remains unsampled as of 0616, as we felt we should move on to other areas.

The origins of this wetland are interesting. At the north end it's bounded by the steep face of the terminal moraine of M-word Glacier, which began to recede about 1765. Dan Bishop feels this area was a quiet backwater during the Little Ice Age. Fine sediments were thus deposited, forming a drainage impediment and retarding tree growth.

It might therefore be considered a 'proto bog.' *Sphagnum* is certainly present, but not dominant. This interpretation is supported by Don & Paul's core from a buckbean pond near our southernmost transect, which revealed shallow peat over a bed of clay, which in turn overlaid sand deposits. *Ledum* is notably abundant in many parts of this wetland, forming much denser cover than it normally attains in *Sphagnum* bogs

The most consistent singing bird is probably **orange-crowned warbler**.

Rich Gordon encouraged us to record our impressions of the general intensity of birdsong throughout the morning as we walk these transects. He feels that morning birdsong intensity is less reliable in Juneau than anywhere else he has birded. Not only the enthusiasm but the timing of

the peak is quite variable. We settled on a rating system of 0 to 4, zero being absolutely no sound, and 4 being constant noise, with overlapping songs of many species.

These impressions are subjective, but probably suffice to detect peaks of intensity and define trends. [A level is recorded for each hour of birding](#). As of 0616, our findings support Rich's feeling that birds of Áak'w Aaní³ are unpredictable, casting doubt on validity of single visit sampling.

A further note on uniqueness of this wetland. Only a few mainland valleys in Southeast Alaska experienced significant glacial advance during the Little Ice Age. Proto bogs now forming on lake and pond beds associated with this advance and retreat are uncommon. They're easier to traverse than most other local wetland types and are ideally suited for recreational hiking. They also shed light on early stages of bog succession.

19860611 Jordan headwaters

The area designated number 81 on air photos is primarily upland conifer forest. Since tracing each of the small tributary channels to Jordan Creek would have taken too much time, I walked 4 E-W transects, roughly perpendicular to them, and

³ For the most part I'm transcribing these notes word for word. However, I see no utility in preserving colonial place names, so what I called "Juneau" in 1986 will be Áak'w &-or T'aakú Aaní, etc. I may also reduce Mendenhall to M-word, etc.

stopped each time I came to an active or intermittent stream. On my fourth and southernmost transect most of the tributary's had converged into a single main channel.

There's delightful plant diversity in this area. It's one of the richest forest walks I've ever taken. Every station was different in character and in species composition. Nettle (*Urtica lyallii*) was common. This plant has rather spotty distribution locally, and is an indicator of rich soils. *Carex macrochaeta* was the dominant sedge in channels. Coltsfoot (*Petasites hyperboreas*) was frequent, more typical of subalpine seeps. The moss *Drepanocladus* was often 100% cover in intermittent channels and in active but slowly moving ones. In another wet pocket I found a 20 inch diameter patch of *Fissidens*, a first for me in Áak'w Aaní. Another riparian moss I don't often find locally was *Leucolepis*.⁴

Bryophytes can be more useful than vasculars as indicators, because with exception of a few ubiquitous species like *Hylocomium*, they're less tolerant of environmental extremes. Bryologist Jan Janssens, a colleague of Paul's from Minnesota, will be spending the month of August with me, and we

⁴ PS June 21. Subsequent stream walks turned this up frequently, sometimes as a dominant. I've since learned that it gravitates to the same niche as the northern-Southeast endemic *Pleuroziopsis*, and gradually replaces it moving southeastward toward islands like Taan, sea lion (POW)

hope to collect throughout Áak'w Aani. Hopefully I can pass along some of his experience with bryophytes as wetland indicators.

Some of my stations were essentially upland in character because conifers overhung the channel and deciduous fringe was lacking. Others had wide deciduous riparian zones. Jordan Creek obviously carried a great deal more water during the late Neoglacial, probably including proglacial melt waters, since it heads up in alluvial fans very near the intersection of termino-lateral moraine with the base of thunder Mountain. This is likely the reason for the braided character of channels east of Thunder Mountain trailer park. Large cobbles and boulders are still exposed in these channels, too big for present flows to move.

Wilson's warbler was the characteristic singer in this habitat as opposed to orange-crowned in wetland 18.2. ⁵ The edge of coniferous upland forest almost always fell within the hundred foot radius plots. **Blue grouse** and **varied thrush** were heard constantly, along with other typical forest birds like **winter wren**, **pacific slope flycatcher**,

and **Townsend's warbler**.

Rich Gordon says to expect **McGillvray's warblers** in brush choked ravines at the base of thunder Mountain. It's possible I missed these as I didn't know their song. Total of the hourly song intensity ratings was 11.5, higher than the average of 9.9 for the period 0604-0621

19860612 Middle Jordan

Wetlands 58.3, 58.2, 58.7, 58H, and 58F. Middle reaches of Jordan Creek

Beginning in the small *Carex* meadows just east of Jordan Creek behind Glacier Valley school, Koren worked down (south) the Jordan Creek drainage. I worked upstream (north). Bottom of the channel has sand and silt and in many places *Carex* grows right in the main channel.

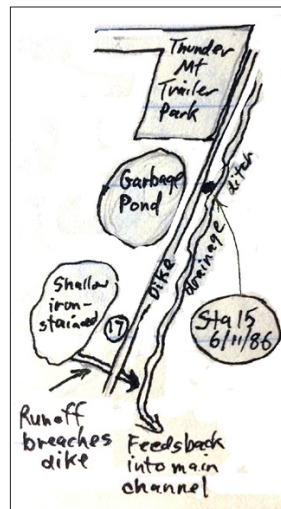
Northward from Coho Condominiums, more cobbles show in the bed. Considering close proximity of houses throughout these middle reaches, Jordan riparian zone has a fairly pristine feeling, and in many sections bushwacking was tedious.

Total song intensity for the period from 4 to 9 AM was only 7, compared to an average of 9.9 for mornings 0604-0621. Many birds heard in and outside of plots were upland species. Dominant singers from deciduous fringes were **Wilson** and **orange-crowned warblers**.

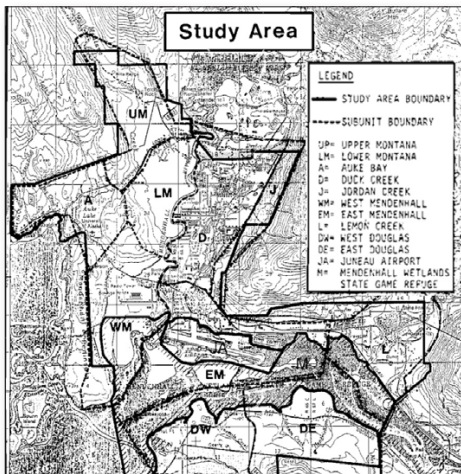
The area southward from Thunder Mountain

trailer park is quite disgusting, even in the flush of spring blooming. Dan Bishop says that in winter with the forgiving vegetation wilted back, the whole place smells like **dog shit**. South from the garbage pond, station 15 (0611), a new area has been bulldozed, and runoff from this delightful spot breaches a dike, feeding into a drainage ditch, which I assume is intended to be isolated from the garbage by the dike, which in turn feeds back into Jordan Creek mainstem.

At station 8 there's a **sapsucker** nest in a broken topped 18-inch diameter snag. Young were calling nonstop. As the adult landed I noticed scuff marks from its feet had worn away the gray weathered surface and left a brownish patch below the entry hole—good sign of an active hole, as all unused holes in snags here weather gray again.



⁵ **PS 2023:** These informal (and unsolicited :) journals include 2 types of spatial labels:, some of which made it into the handful of accompanying sketch maps: **1)** My station numbers, arrayed along walking transects and mapped only god knows how. And **2)** Paul's prefield wetland unit numbers, probably outlined on air photos, directing us to the wetlands he needed to sample. I have no maps of those polygons either. Final units were apparently renumbered, merged, and organized by sub-project areas as shown on next page.



At station 17 in the recently bulldozed area a pair of **killdeer** are nesting. They were agitated by my presence and both did broken wing displays only 20 feet from me. I didn't search for eggs. Rich says a few pair usually nest near the Lemon Creek dump, and occasionally near Mword lake at the visitor center. Otherwise they're not common here in summer.

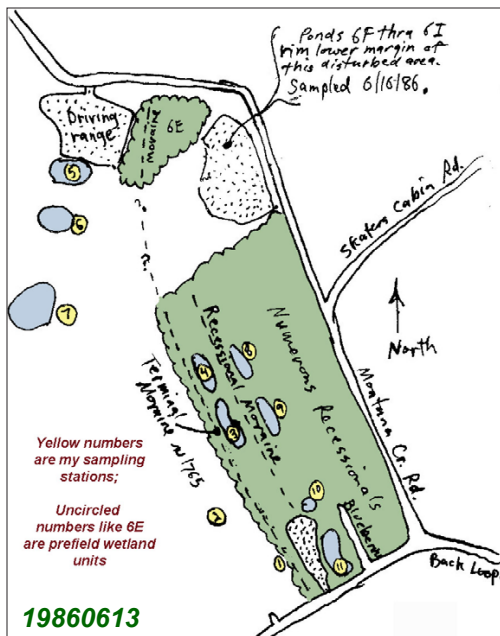
Boundaries of the 1986 Adamus wetland units as ultimately consolidated. No resemblance to Paul's decimated draft-unit numbers reported in these journal entries. I worked mostly in sub-areas ML (lower Montana), UM (upper Montana), J (Jordan), and A (Auke Bay). Koren did most of the others.

19860613 Terminal moraine

Wetlands 6A through 10. Moraine-dammed ponds near the Terminal.

Today I toured the terminal and recessional moraines downvalley from Montana Creek Road, and some ponds, 6A and 6D, in a proglacial outwash area that was forested in the 1962 photography but has since been logged and rearranged. Stations 1&2 are tiny kettle ponds. These are slightly down valley from the terminal moraine, but could have been formed by ice blocks tumbling away from the ice face at its neoglacial maximum position. Ponds behind the moraines are shallow and elongated parallel to the ridges, and are probably not icemelt kettles but simply formed in the inter-morainal depressions where enough fines accumulated to seal them. Stations 3&4 just behind the terminal, are at ponds about 200 years old. Stations 8,9,10&11 are on younger ponds, with more remaining scrub alder on their margins.

Wetland #8 on the air photos is now dry, and I didn't bother with a station there. The forest surrounding the moraine-dammed ponds is young spruce dominated dry upland, with dense *Vaccinium* brush on the older moraines, and more open understory on the younger. Thus the most consistent singer was **Townsend warbler**. However there was enough alder on pond fringes for occasional **Wilsons** and **orange-crowns**.



Even to a non-bryologist, zonation of *Sphagna* on margins of these ponds is apparent, with a submerged species, a floating-leaved species, and a carpet-forming species on upper edges. *Menyanthes* is rapidly invading. A **mallard** is probably nesting at station 3 or 4, reluctant to fly. Ponds labeled 6A & 6D on arials are somewhat puzzling.

The area is proglacial outwash, restructured since by bulldozers, with cobbles to 4 inches and coarse sand.

Other younger outwash flats in upper Mword Valley are excessively drained, and even where kettle pits have formed from icemelt, their bottoms are dry. This is also the case with most pits in area 6H visited on 0616. Water table is high right now, but will drop. The dominant in pond 6D has *Equisetum arvense*, tolerant of a wide range of moisture. This pond may go dry at times.

A **mallard** with 8 young was swimming in pond 6A, occasionally hiding in emergent sedges. During my entire stay in the vicinity of 6A&6D I was rushed by a pair of **greater yellowlegs**. This isn't typical of their nesting habitat, and Bob Armstrong later suggested they might be the 125K nesters, whose young hatched by 0602 are old enough to have made the trip down from pistol range bog.

An old dirt road leads south from the SE corner of the newly bulldozed prospective driving range. This road has become an intermittent drainage, and now conducts 2 to 5 inches of rapidly flowing water. Alders hang completely over it.

Following this road, I did one station in wetland 6L (0619 map station #7). This is wonderful bird habitat. Class III snags indicate **beaver**-kill about 20 to 30 years ago. Many are soft enough for

At east and west margins of Mword Valley, where terminal and early recessional moraines converge with laterals leading up to the valley walls, ice face fluctuations were less pronounced than in center valley. Associated longer still-stands have resulted in greater morainal relief. My 1948 stereopair show the 1880 recessional-lateral area is not only raised above the more southeasterly portions of the same moraine, but quite a bit higher than the older recessional moraine (since largely plowed down) just downvalley from Montana Creek Road before its sharp E-W turn.

This relief has produced an outwash fan that erased any intervening moraine ridges and replaced them with sorted alluvium. I originally thought this fan sliced all the way SW through the terminal, but have since noticed moraine ridges in 1948&62 aerials in lower portions, and now think the shrub cover in 1948 must have followed an early clearcut.

Don Lawrence's tree cores show this moraine was formed in about 1810. That's why it was first to be clearcut; trees were larger here than on younger moraines. Opening 6F has been heavily reworked by machinery, and is covered with an unidentified lichen resembling a cross between *Peltigera* and *Fucus*. Pond 6I has the alga *Chara*, or stonewort.

Wetland 4.2 survived as a pond until 1948

photos but has since succumbed. Little is left of the original wetland flora. This is headwaters of a small drainage parallel to but separated from system 4.1, 5.3 & 5.2, by ridges formed in about 1880, judging from Lawrence core dates of 1883 near pond 4.1 and by Miller of 1889 just upvalley from present Terrace Place. The 4.2 drainage is not marked on the 1984 air photos but was mapped by Air Photo Tech for USFS. * It should be traced as it lies on CBJ lands.

I've only walked the 5.2-5.3 system SE of Skater's Cabin Road. Creek 4.1 should also be walked to the rec area boundary. Pond 5.3 is in a backyard. It's beautiful near the outlet, rimmed with buckbean, cotton sedge, and occasional bog orchids.

Apparently though, it's a liability to basements, because system 5.2 has been deepened with a backhoe down to Arctic Circle Road. And bottom sediments, coarse outwash materials, are piled alongside. A 24-inch culvert attempts to pass 5.2 under newly built Arctic Circle Road. It is clogged by sand & cobbles within inches of the top, and emits sickly iron stained nearly stagnant water with a yummy surface froth. Below the road things slowly get better, and within 50 yards, one has repeated the experience, so common in Mword Valley, of stepping from obscurity into grandeur.

The large pond 37 is shallow with an angular

erratic in the center and a good sized patch of mareastail near the inlet stream. It's a century younger than those sampled near terminal and early recessional moraines on 0613, and lacks their well defined marginal *Spagna* zonation. Surface age is about 100 years.

My station 8 is not on a designated wetland but I thought it deserved recording. This rapidly filling pond is probably not connected to drainage 5.2, and receives only little surface flow. *Sphagnum* is common already in this young but stagnant pond.

At turn of century, glacial recession speeded up, and instead of narrow, clearly delineated recessional moraine ridges, it began to leave broad indistinct hills and unpatterned ground moraine. Ponds 5.5 & 5.6 occur on such terrain. Surface age is about 90 years. *Equisetum fluviatile* is the dominant emergent, with no *Sphagnum* yet on margins

Between the 1765 terminal and the broad 1900 recessional, most small drainages occupy intermorainal depressions, paralleling moraines until they can breach them, or enter a transverse channel like the river. Thus, entire drainages tend to be the same surface age, offering an opportunity for study of riparian succession. Unfortunately, all parts of the Valley in 1765-to-1910 age bracket have been developed, except for this area along lower Montana Creek Road.

Totalled hourly song intensity was low on 0616:

6 M-Rec blue lines from Pat Thrasher, 1972 photography

7.5 compared to average of 9.9. Most characteristic in-plot singer was **orange-crowned warbler**.

19860617 Kax mainstem & tribs

Today I covered a good deal of the drainage below Kax's emergence from canyon onto alluvium. I was so impressed with stations 2&3 at confluence of 6.5,6&7 that I returned with Rich Gordon at 9:15am and discovered 2 species who hadn't been singing earlier.

Creek 6.5 is irony, with *Scirpus*. Creek 6.4 is clear, with steeper gradient, more filamentous green algae on the bottom, and abundant **coho** fry. Above its junction with 6.4, Creek 6.5 is irony. It can be traced under the road at foot of the steep grade (double 48-inch culverts) and all the way back to Kaxdigoowu Héen mainstem.

The uppermost reach before this junction is presently dry, but can be considered a Kax overflow channel. Between overflow junction and road is clear. Thick reddish sludge seeps from a point source below steep road banks into the stream, discolored from there on down. Six spruces on the road berm near the seep have been killed. Class I, dead less than 5 years.

Stations 11-13 on Kaxdigoowu Héen mainstem are almost completely dominated by barclay willow. A rise in water level of only one foot from present elevation floods much of the riparian zone,

and alder cannot apparently tolerate frequent siltation. Large snags, ranging from decay class I to IV, were killed over a wide time span. Dan Bishop says active channel migrations are causing property disputes. I can't figure out how the spruces got established in the first place. Apparently this reach has become more dynamic during the past half century. Few young recruits are coming in to replace the killed spruces.

Kax mainstem & tributaries below the canyon [PS: "little Appalachia area"]

Snags are riddled with **sapsucker** holes, and several were observed. Willow is prime habitat for **yellow warbler**, first of my transects, but they aren't common. (Currently dominant singers on Steep Creek).

Roadside between stations 2 & 13, where irony creek 6.5 crosses back under to meet 6.6&6.7 is probably the best bird-listening spot in Mword valley. **Mallard** prints in mud at junction. All 5 common SE warblers were heard, plus **water-thrush**. PSFL sing from conifer edge, and **alder flycatchers** from brush. SOSP are common; these have only colonized freshwater marshes in the 20 years since Rich Gordon came to Juneau.

Five thrushes sing here: AMRO, VATH, HETH, SWTH and **grey-cheeked**. Other species include: CBCH, RUHU, SASP, STJA, BASW, **Vaux's swift**, **dipper**. At 4:30, station 2. I heard and

sketched a probable **cowbird**. RG was unable to relocate it, but a transient later showed up at the King's bird ranch at Sunny Point. So far cowbirds are only known here in migration.

At station 5, near junction of creeks 6.4 and 6.5, I heard a probable **western tanager**. RG gets about one per year in the Juneau area. A resident here reported a small "white-faced owl" to Rich, probably a **sawwhet**.

Totalled song intensity was above average. 11.0 compared to 9.9.

19860618 Kax down from 0617

Wetlands 125B thru 126K, & 15G thru 15D. Rifle range bogs & upper V-bottom sections of Kax.

Started with bogs closest to the range so as to finish before shooting began. These are fairly similar slope bogs to my eye, though a palynologist might disagree. Seigel & Glasser have a core from my station 9, presumably representative of depths and profiles locally. Cal Heusser (1960) did pollen analysis from 2 bogs in this area.

At least for birds the bogs were uniform, and largely mute. Totalled song intensity was 5.5, compared to 9.9 average—quietest morning between 0604 and 0621. Commonest bog-fringe singer was **juncow**. Saw several 3-bird chases by RUHU. I was glad for my earlier visits, which

correct the general impression of low intensity gathered today.

At station 10, just upslope from our 0528 yellowlegs nest, I heard a 2-second burst of unidentified thrushlike song, somewhere between robin and hermit in character. Remembering the **solitaires**, possibly paired, from 0529&30, I wondered if they'd stayed to nest. I later listened to Rich's recordings and felt they were close enough to merit his investigation. He returned on the following 2 mornings, once from 0400 to 0700! Never heard a thing. Except, to my horror, a single phrase of very thrushlike **jay** song. This is the second wildgoose chase I've sent Rich on this year; first was a 4 mile hike after a "western kingbird." The "solitaire" at least had been singing from a gorgeous patch of crabapple in full flower, which compensated Rich somewhat.

In the canyon, commonest singer in plots was PSFL. VATH usually at greater distance. Stream-walking twice required ascents of 100 to 200 feet to get around slate buttresses [*PS 2009, I seem not to have known about the higher trail—or perhaps was instructed to follow the creek? See journal notes from 20090921.*]

At station 20 I flushed a **spotted sandpiper** at only 5 feet on a cobble bar with 3 to 8-inch seedlings of willow and alder. She immediately went into a broken wing display so I froze and

scanned until I found the nest with 4 eggs. On 0619 I returned to this site with Bob & Rich, so Bob could photograph the nest. We saw **Vaux's swifts** high over the canyon, and a **dipper** flying back and forth, probably to a nest nearby.

19860619 Kax unit 6.2

Kaxdigoowu Héen wetlands 6.8, 6.2, 6M, 15c, 6L Tribes down from 0617 sampling.

The section of Kax marked 6.8 is only one of several main channels running through this meadow. It's wider than the other braids, with presently exposed gravel/cobble bars, and shows most clearly on 1984 photography. Another braid at station 2 is narrower but deeper, and possibly of equal volume.

Between stations 1&3 I had to cross 3 channels too deep to wade on log bridges. The reunion of these channels is at station 3, where there are pools up to 5 feet deep. Meadows between these incised channels are more mature in character than the annually flooded willow riparian strip between 0617 stations 11 and 13. *Heracleum* indicates long-stabilized channels.

Wetland 6.2 (my stations 5 and 6) is a large swamp with many class III snags >18. Navigating here was difficult with only 14-inch boots. It was selectively logged a few decades ago; *Cornus* and spruce seedlings grow on the stumps. Bob says

cutting was done in winter on frozen surfaces. F&G has records of the date of logging, and info on the mill.

Wetland 6M (station 7) is a mature *Carex/Sphagnum* bog rimmed with *Viburnum*, unaffected by recent migrations of Kaxdigoowu Héen, or by logging.

My sketch map on next page was traced from the 1984 wetlands boundary photography, with my stations (and 0613 stations 5-7), and reconstructions of the former main channel. The abandoned road to 0613 station 7 is now a runoff channel carrying water from the driving range disturbed area down into the former 1962 channel. This creek (stations 11-13) is sedate and irony, but betrays its ancestry by the firm bed of sorted 3-to-4-inch cobbles.

In 1948, closed coniferous forest covered the entire area of this map, excepting a recently clear-cut block in the upper right corner that extended just beyond pond 6D. Between 1948 and 1962, much of the large-tree spruce forest was cut. Remnant trees, now snags, were alive in 1962 aerials. Probably they were bypassed as defective or under-sized. At some time since 1962, the main channel jumped westward to its current position. Residual flows in the 1962 channel were then dammed by **beaver** at several locations, raising water level and killing residual spruces. The

0613 station 7 swamp⁷ has an odd assortment of species, some of which don't 'belong' in a young, post-glacial marsh; most notably skunk cabbage. These plants can live up to 70 years, and are certainly remnants from the former forest understory. At station 14 a dam is still intact, but no evidence was found of recent activity.

In wetland 6.2, the biggest, broken-topped snag had 8 **sapsucker** holes in one side and an active nest near the top, visited once by the parent during my 20-minute stay. As with the 0602 Jordan Creek nest, the active hole had a worn, brownish area just below, from removal of the grey weathering on trunk exterior.

Other snags are also class III and presumably killed by

⁷ The term "swamp" should be technically reserved for wetlands with trees. In SE AK there are few genuine swamps with *living* trees, conifer or deciduous. About the only habitats to which I apply the term "swamp" are these early-phase **beaver** workings with drowned spruces. My impression is that they last for about 40 years before most have fallen, at which point they become "marshes."

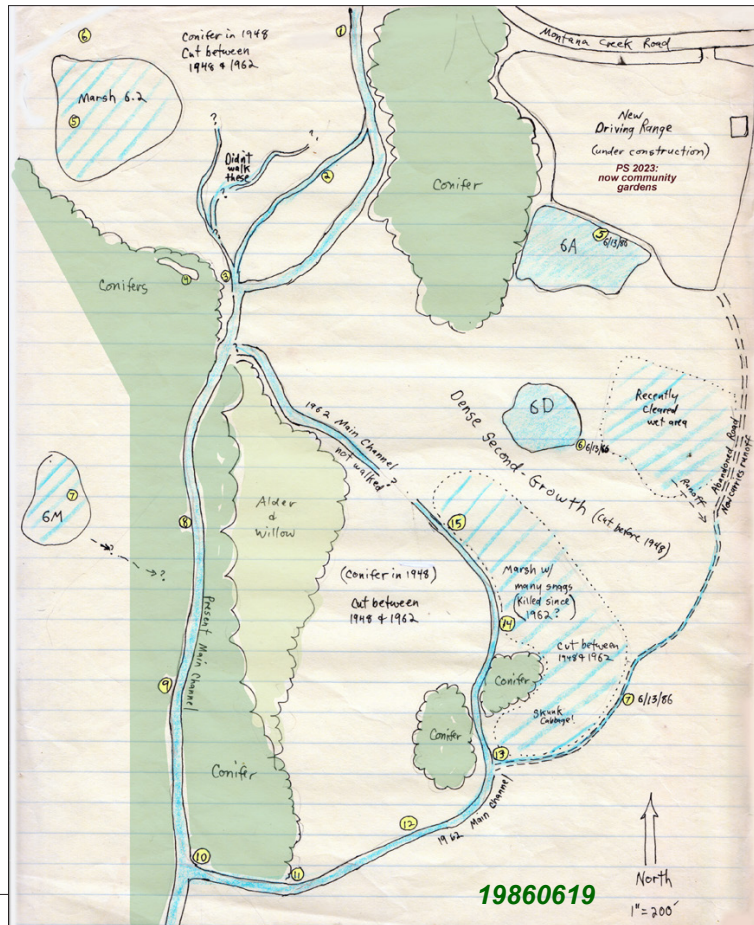
the same water-level changes, but not so riddled with holes. Maybe collapse of the crown hastened decomposition, encouraging excavators

On 0613, with a single stop at station 7, I was unable to decipher the recent developments in this area that have created such great bird habitat. Today's hike and study of the photographic sequence have made a little more sense of the problem.

Totalled hourly song intensity was 14, highest for any morning from 0604 to 0621. Birds from 0613 station 7 marsh are [listed in those notes](#). In this dynamic and puzzling drainage, early post logging succession has unquestionably increased bird diversity.

At 3 AM, preparing to leave our house on Windfall Avenue near Lake Creek Bridge, I heard a **great horned owl** call several times

Tracing from 1984 wetland boundaries photography, with my stations 1 thru 15 and 0613 stations 5, 6 & 7. Reconstruction of former main channel until at least 1962, with extent of coniferous upland forest that disappeared between 1948 & 1962. The abandoned road that gives access to 0613 station 7 was probably a logging road. It is now a runoff channel carrying water from the driving range disturbed area down into the former 1962 main channel. This creek, stations 11-12-13, is sedate and iron stained, but betrays its ancestry by the firm bed of shorted 3 to 4 inch cobbles



19860621 Mword River

Wetlands 18.6, 18.2 & banks of Wooch

Eel'óox'u héen.

Picked up this morning where we left off on 0605, running 2 more long E-W transects through the proto bog between Mword Creek & Mword River [Flycatcher Carr]. For description of vegetation and interpretation of origins see 0604&05. On these transects I encountered slightly more willow thicket than on more northerly transects. Another difference was an area of **beaver**-drowned snags where the creek draining the central buckbean pond has been occasionally dammed. This accounts for presence of the most notable bird of the morning, a **western wood pewee** at station 24.

Hiking in to station 1, I flushed a **snipe**, feeding in a wet swale in dense alder thicket. Snipe are no longer winnowing or vocalizing on territory (*PS, not true, see notes for 0706*), and our sampling is probably missing some.

Lincoln's sparrows were abundant, but not singing as strongly as on 0604&05. However they're so easy to pish in that they were detected on almost every plot. **Orange-crowned warblers** were the most abundant, with **Wilson's warblers** heard at east and west margins but not central portions. To my surprise, **alder flycatcher** was actually the dominant singing bird in the central

portions. Several were always audible. These are furtive, and only one was seen.

By contrast, the **pewee**, seen at the last station, allowed many views from different angles, fortunate since the song was atypical. **Juncos** have almost ceased to sing, and were probably under-represented today.

Station 18, on a cobble-gravel bar in the bend of Mword River, no longer flooded very often, had many cryptogamic species typical of xeric post glacial outwash surfaces in upper Mword valley. Four **spotted sandpipers** were seen, 2 probably nesting. Song intensity of 10 was average for 0604-0621.

19860623. No sampling. Rain prevented sampling but I stayed up and recorded song intensity on the hour. Singing birds at this house near Windfall Ave are mostly forest species, but included some edge birds like **Wilson's warbler**. Rain increased steadily to a hard downpour, and birdsong decreased accordingly. This was the lowest total hourly song intensity. A 4.5, which makes me feel better about refusing to work in hard rain.

19860625 Moraine Way

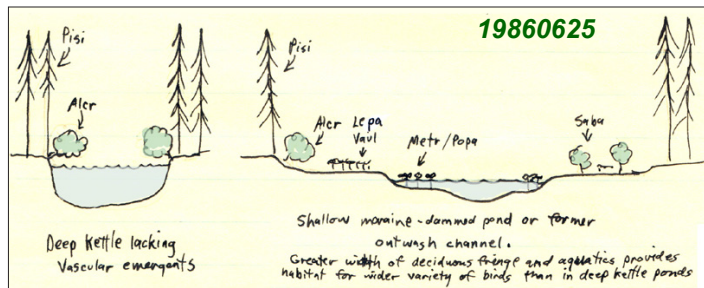
Kettles & moraine-dammed ponds near Moraine Way

Most of today's sampling was on ponds scattered

along a broad and ill-defined moraine formed in about 1890. Wetlands, and bird habitats are linked to pond formation processes, contrasted in cartoons on next page.

Forests of spruce on well-drained uplands immediately adjacent to the ponds are about a century old. Fringing alder and willows are luxurious around some, and nonexistent on others. The dominant vascular emergent is bog buckbean. Also common and are *Potentilla palustris* and *Equisetum fluviatile*; one collection later keyed to *palustre*. *Sphagnum* is just beginning to colonize, and lacks the distinct zonation of submerged, floating, and emergent species described 0613 for ponds roughly twice the age. *Ledum* and *Vaccinium uliginosum* dominate with sedges on invading margins of the shallower ponds, probably colonizing mats of old buckbean rhizomes.

Yellow warblers were common for the first time in my sampling, sharing dominance with **orangecrowns** and **myrtles**. Yellows are the most abundant warbler in willow riparian habitat at Steep Creek near the visitor Center. The other two commonest in-plot birds were **ruby-crowned kinglet**, and **varied thrush**. **White-winged cross-bills** constantly swirled overhead, occasionally descending into crowns to feed. Cones are not ripe yet, and I saw cottonwood used for feeding, though I don't know what was taken.



Kettle ponds are deep and steep sided with little aquatic vegetation. Intermorainal ponds offer much better wildlife habitat. Basically, the wider and marshier the better. these generalizations about ponds apply also to older moraines bracketing Montana Creek Road.

At my first station I found a nesting pair of **solitary sandpipers**. I have only 1 probable nesting observation for my 9 years in Juneau. Rich Gordon has 1 probable and 1 possible observation for 20 years. The pair is in an amazingly public spot for shorebirds of any kind.

Pond 22 has a robin nest. I saw the female with food and heard nestlings but didn't spot them

At station 13, a small undesignated pond at the intersection of Montana Creek Road and Back Loop, I stopped to check on a **yellowthroat** pair I'd previously discovered when driving by with windows down. The male wasn't singing today, but I called him in to 10 feet. Two singing **water-thrushes** were heard from wet cottonwood-alder-willow at station #14.

Five **red-throated loons** flew over together today, and when I mentioned it to Rich he said he'd never seen more than a pair together. This

group flight is more typical of **common loons**, but calls are not confusable. Only one nest site in the recreation area is known to local birders this year. As often as redthroats are heard during my work in the valley, they probably don't use any of the ponds in the study area, but nest by younger kettles up Valley. Ponds on 1930-to-1960 surface ages have 'aged-out' of prime loon-nesting status; they're too brushy for parents wanting better predator visibility.

Totalled hourly song intensity was 10.6

19860626 River Rd & Steelhead Willow & *Ledum* communities on fines near terminal moraine. Wetlands 35 to 40 & area 18.5

Although separated by only 1000 feet along the axis of ice movement, ponds sampled today vary in surface age by 100 years. The oldest, just behind

the terminal moraine, were exposed around 1780; the youngest in the 1880s. Recession was slow during the first century after 1780, so large differences in upland and wetland habitats are apparent over short distances. Moving from young to old sample stations, cottonwood overstory decreases, *Vaccinium* understory increases, and diversity of vascular and bryophyte aquatic species increases. Value of pond and pond-margin habitats to nesting birds probably depends on the amount of deciduous fringe (ALCR, SABA, POTR), which is greater in the younger ponds and inter-morainal drainages.

Four **warbler** species, 2 **thrushes**, and 2 **kinglet** species were heard from the first station, primarily singing from deciduous trees and shrubs.

Stations 2, 3 & 4 were not on designated wetlands. None are open ponds but are all important bird habitats, possibly the more so because they are filling in. Station 2 is almost completely covered with buckbean and surrounded by recently killed snags. Station 3 is on a sluggish iron-stained creek, with dense cottonwood overstory. This drainage should be walked from the culvert on Back Loop Road, 0625 station 14, to Mword River and added to wetland boundary maps. It probably contains the highest warbler diversity in the recently deglaciated part of the Valley. I have now heard 7 species here: WIWA OCWA, YEWA, YRWA, TOWA, NOWA, and yellowthroat.

Apparently drainage is poor in this broad inter-morainal depression. Former lake? Soggy roots allow persistence of early-seral cottonwood-alder-willow, and delay spruce colonization

Bushwacking south from Loop Road to pond 37, I traversed much of this ill-defined drainage with several small creeks, mostly iron-stained. Found skunk cabbage here, which is unusual upvalley from the terminal moraine.

At station 6, I watched a female **junco** calling repeatedly from a spruce leader. Very different from the male's metallic rattle. Softer whispery buzzy notes, in pairs: "— —, — —, — —, — —", with each of the pairs lasting about one second.

PS 0703, Rich Gordon says this is becoming a common vocalization.

The **Pacific slope flycatcher** heard here is also notable, a mostly old-growth breeder atypical of younger post-glacial spruce forest.⁸

Stations 10&11 were downvalley from the terminal moraine, on fine silt with only occasional open-grown spruce. Station 10 was in a closed willow thicket that graded into more open *Ledum* flats similar to those sampled 0604, 0605 & 0621.

Totalled song intensity was 8.0, slightly higher than average of 7.36 for the period 0623 to 0704

⁸ Fortunately, PSFL seems not to need old forest on its winter grounds. We see them hawking at head height from young scrub on [visits to highland Mexico](#).

19860627 Duck headwaters

Taku Blvd & rec area boundary ponds.

Wetlands 42, 43, 44, 55.1, 55.15, 47, 48, & 49.

Ponds 42 and 43 are the oldest in today's series. They lie just behind the terminal and early recessional moraines and are about 200 years old. The area has been intensively developed in the past decade. The oldest tree cored by Professor Lawrence during his moraine studies in the early 1950s was immediately down valley from pond 42, and dated to 1767-69. Hardly a single spruce survives in this vicinity.

Not much coniferous or deciduous cover is available for breeding birds. Lawns generally approach pond margins closely, replacing original shrub fringes, and even peripheral aquatic and emergent species are often lacking. In 1984 I helped an aquatic entomologist sample species in a residual buckbean patch on the north bank of Pond 42, and we discovered an impressive diversity. Apparently insects are more patient than birds. I think I still have the species list in my files somewhere.

Duck Creek occupies a channel that once carried much of the outwash from the glacier. Presently its headwater area is restricted to a small forested plot bounded by Taku Boulevard and Back Loop Road, identified as number 44 on wetland boundaries photos. At least 2 undesignated ponds lie within area 44, stations 7&8. These apparently provide

water to channel 15.1, which runs along the outer face of the terminal moraine. This water emerges into the channel at station 5 as a trickle, and by station 6 the stream is deeper and wider.

The other source channel is 15.15, which breaches the terminal and early recessional moraines, and probably carried outwash for nearly a century after the glacier began its retreat. Large angular erratics lie in the bed. 15.15 is clear, and 15.1 is iron-stained, as is Duck Creek below their confluence.

At station 88 I unintentionally treed a 200 pound **black bear** with very dark muzzle, who climbed only 10 feet and began to make rhythmic 2-syllable huffing noises. After finishing my notes I approached hoping to measure the forefoot width, but this annoyed the bear, who began to descend. I apologized and left. I now believe the bear's behavior indicated it was a mother with cub, probably higher in the tree, and that the huffing was a '*go-higher*' signal to her kid. Dogs in this area seemed rather highstrung.

Station 9 is on an undesignated pond, formerly of greater extent, now mostly bulldozed and filled. Abundant cottonwood on margins of this disturbed area probably hosts greater warbler diversity than sampling indicated. The pond shows on 1979 & 1962 photography, but not on in 1948.

High percent of fines in the recently plowed area makes me doubt that it originated from gravel

extraction. Apparently it resulted from damming of runoff by construction of Thunder Mountain Road, sometime between 1948 and 1962. The pond occurred just down valley from the terminal moraine. No natural ponding of any extent has taken place on outwash materials immediately below this moraine.

Totalled hourly song intensity was 10.5 for today, quite high for the period 0623 to 0704. Most singing was later in the morning at the younger ponds with more deciduous habitat. These ponds on the rec area boundary are undisturbed by development, at least from the point of view of birds.

19860628 West rec area

Intermorainal drainage SE from Brigadoon, loop west from intersection of Mword Creek & Skaters Cabin roads. 4.2 drainage, repeat sampling of 6H, 6C and northlobe area 14.

Today I followed my 0616 recommendation that the undesignated drainage originating in 4.2 be walked. This was formerly a high energy outwash channel, running toward the river between recessional moraines. Bed has cobbles and boulders to 18 inches. Stations 1 through 4, moving down drainage, showed it to be intermittent at first, gradually filling with clear water, not moving perceptively. The dominant bryophyte in the bed at station 3 was *Fissidens*, rare in Áak'w Aani. I've

never found extensive passive patches.

In the dense post logging deciduous scrub at 6H, **warblers** and **Lincolns sparrows** were abundant and easily called in. Song seems to be tapering off though. As I finished my sampling this morning I heard an **alder flycatcher** from area 6H, which makes this the third location where I know them to be present.

At station 7 in the *Equisetum*-dominated, intermittently flooded area between ponds 6A&D. I located a **yellowthroat** that earlier sampling missed.

Stations 8&9 are not designated wetlands but should be. Well dispersed spruce left from early logging rise above dense alder & willow scrub riddled with deep, clear, rapidly flowing creeks not discernible on aerial photography. Quantity of water is puzzling, more than the apparent contributing area would indicate. This is probably valuable **coho** rearing habitat.

Song sparrows, who nest only in wet areas here, appeared common. Snags and stressed spruce trees provided hawking habitat for a **wood pewee** at station 9—possibly one of the pair whose nest Rich located near my station 7 on 0613.

Station 10 was in a *Carex aquatilis*-*Calamagrostis* wet meadow, tussocky and chest high.

9 I think that's what Rich Gordon told me in the 1980s. Subsequently, they've begun to nest in a much broader range of early-seral habitats.

It should be distinguished on wetland boundary maps from the rest of area 14, which is brushier. It shows clearly as a peanut-shaped smooth patch on air photos viewed in stereo. Very similar to the sedge wet meadows east of Backloop north from Kaxdigoowu Héen bridge, westernmost stations on 0604&05. From station 10 to terminal moraine, sedge meadow grades into willow scrub, then upland conifer.

Song intensity was higher in the second half of today's sampling, in the wet deciduous scrub near and downvalley from the terminal moraine. Singing was minimal in the essentially coniferous habitat southeast from Brigadoon, due in part to general tapering off of birdsong. Coniferous birds begin nesting earlier and fledge sooner than deciduous birds. Some like **varied thrush** are early arrivals. Others, like **wren** and **chickadee**, are permanent residents and get a strong headstart. Onset of nesting in deciduous habitat is more dependent on spring leaving phenology.

19860629 Up from backloop

Montana Creek and adjacent meadow&scrub upstream from back loop bridge. Wetlands 18.3, .5, 15.1 thru .5, & southern 14.

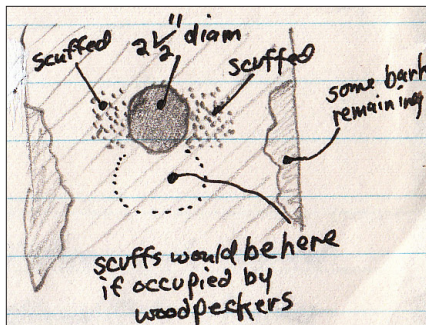
Stations 1-3 are similar to the nearby *Carex aquatilis* wet meadows forming the western part of the large "greenbelt" wetland [PS 2009: now

owned by JYS. I don't have a sketch map of my 0629 stations but I believe some of the first ones were later developed by Spruce Meadows trailer park.]. There are several small creeks here that should be mapped.

At station 5 on Kaxdigoowu Héén, I heard the robin-like chirpings of two **otters** thrashing in skunk cabbage on banks ahead of me. I stalked to within about 20 feet before they took alarm and dove in. I froze at the edge of their mashed playground as one reemerged only 10 feet away, staring at my legs but apparently not identifying me. It loped directly toward me, and at 5 feet I lost nerve and said *hello otter!* Which caused it to plunge back into the creek, probably somewhat embarrassed.

Station 6 was on a rapidly flowing stream with EQFL growing almost to the center, stems vibrating in the current. I've previously seen it only in quiet water. Above the emergent horsetails are sedge and bluejoint, then willow/alder scrub, then spruce, with many class II snags and one class II with recently excavated **sapsucker** holes. Other spruce are dying, indicating recently elevated water levels here.

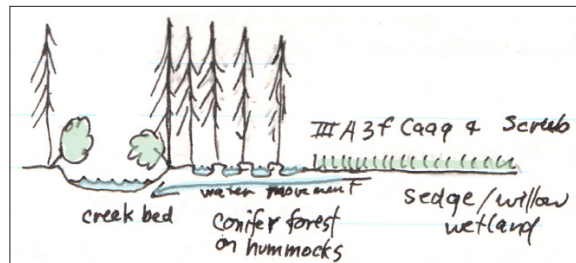
Station 7 has a **chickadee** nest in an abandoned woodpecker hole. It's 35 feet up in a broken-topped snag with incompletely sluffed bark, thus intermediate between decay classes II and III. An



adult entered the hole as I watched, landing first to the side of the entry. Corresponding scuff marks occur on either side of the hole, instead of just below it, as in the sapsucker nests found on Jordan and Kaxdigoowu Héén. Adult and young were silent, unlike the very obvious **sapsuckers**, and I would have missed this nest if I hadn't noticed the odd scuff marks. Maybe CBCH doesn't vocalize near the nest?

Wetlands 14 and 16B include some of the least travelled and best fish and wildlife habitat in the Valley.

Stations 9 and 10 are in fairly closed spruce forest but are definitely wetland. Station 9 has spruces about 100 years old on hummocks, with slowly flowing water in the depressions. Station 10 has



big, 36-inch spruce on hummocks, with most of the typical upland forest forbs and bryophytes, but deep standing water in between, actually overhung by the hummocks in many places. I have not seen wet forests like this before, but perhaps they are not uncommon as stringers separating channels from adjacent sedge wet meadows.

Beginning at station 11, I found an unmarked overflow channel that departs from Kaxdigoowu Héén at station 14, and swings out through stations 13 & 12. This is a sizable channel cut into silt, with clear water about 2 feet deep. Between this channel and Kax, just north from station 12, the forest has been cut. As with the logging described 0619, it took place sometime between 1948 & 1962.

Kaxdigoowu Héén and adjacent meadow&scrub upstream from back loop bridge. Stations 1-3 are similar to the nearby *Carex aquatilis* wet meadows forming the western part of the large "greenbelt" wetland. **Song sparrows** nest here, but not in the greenbelt wetland. Perhaps this is because standing water in the latter dries up by late June. Above the road, flowing and some standing water is

available throughout the nesting period.

19860702 Brotherhood Park

Uplifted beach meadows. Wetlands 65.1-2 & .3

Just as actual recent glaciation and/or proglacial ponding and outwash has affected wetland substrates in the upper valley, the Little Ice Age has had profound effects on coastal wet meadows, and must be considered in any interpretation or classification. Rate of glacial rebound is roughly .8 inches per year in this area (Hicks & Shofnos, 1963). On gently sloping salt marsh surfaces, this lifts a good deal of terrain into supratidal elevations each decade. Recent intertidal history of these transitional meadows can be read in substrate, in stranded drift logs, and in deeply incised former tidal sloughs. Many remnant halophytes are present.

Today's sampling revealed 2 basic uplifted beach meadow types, with fairly abrupt ecotones. I have characterized them as high and low. High types have coarse sand & gravel, with mesic flora often dominated by Umbelliferae, thus IIIB2c HelaAnge according to the V,D&B1986 revision. Low types have finer sand & silt, are poorly drained, and continue to support *Carex lyngbyei*, the dominant halophyte on fines at 15-to-17 feet on intertidal wetlands. A co-dominant on these uplifted sites is *Eriophorum russeolum*, and *Sphagnum* has been surprisingly quick to move in here, indicating that

the alkaline intertidal conditions do not persist long after uplift. It would be interesting to have soil and pond pH values along a transect from intertidal to UBM (uplifted beach meadow) sites. Low type UBMs are classed IIIA3f ErruCalysphag.

Ground nesters in these uplifted meadows are limited to **savannah & Lincoln's sparrows**, abundant enough to compensate for lack of diversity. Fortunately they sing late, and are easy to call in, so were detected in almost every plot. **Orange-crowned warblers** occasionally sang from willow stands. Our sampling is no longer useful for warblers, who've mostly shut down.

At station 18 I heard my first **warbling vireo** of the season. Wetland 65.1, from which it was singing, is a closed canopy stand tall red alder with an unusually luxuriant understory of elderberry and lady fern. Rich Gordon hears vireos annually in a cottonwood stand near the visitor center. The sites resemble each other in having tall deciduous overstory and rich shrub understory

At my stations near the river the only **swallows** I observed were **barns**. Rich Gordon says there is a **bank swallow** colony in the cutbank near my station 18, 0702. Bank swallows have very specific needs. Cut banks in this area show interbedded silt and coarse sand in the upper 6 feet with many protruding interstadial logs. Below 6 feet are coarser sands, gravels and cobbles.

Totalled hourly song intensity was 9.5 compared to the average of 7.36 for the period 0623-to-0704. This intensity was contributed almost entirely by the 2 sparrow species.

19860703 Lower Kax

Lower Kaxdigoowu Héen, from Mword confluence to lower "greenbelt wetland" (Flycatcher Carr). Wetlands 45I, 15.9-8-7, 18.6-8-9

Stations today were widely dispersed because I had to cover a great deal of terrain between Brotherhood Park and backloop Kax bridge. The hike was generally in mature coniferous forest with little deciduous fringe along the creek, easily characterized in terms of birds and vegetation. I had hoped to do more in the lower portions of wetlands 18.6 and 18.2, but time didn't allow. Both of these areas get brushier to the south, and our northern transects on 0604-05&21 will not adequately describe this thicker habitat.

The glamour bird today was a **western tanager** singing repeatedly at station 2, who allowed me to call him close enough for a fleeting glimpse of red face peering over a cottonwood leaf. Otherwise, singing birds were the conifer forest guild, until I emerged in the sedge wet meadow 18.9. **Yellow-throats** and **alder flycatchers** sing here.

Rich Gordon visited my tanager site twice and eventually relocated the bird. Nearby, he also found

his first **magnolia warbler** for the Juneau area. At the same site he also recorded **redstart** and **northern waterthrush**, and 4 of our 5 common warblers. This is probably the most exciting birding site discovered this summer.

PS 2009: Reviewing Adamus (1987) for wildlife values of Kąx̨digoowu Héén, I see he concluded:

“Further downstream on Montana, the expansive wetland complex (UM1) behind the driving range . . . very likely (on a per-unit-area basis) contributes the most to regional diversity of breeding birds. . . The lower Montana wetland (LM1) is also quite diverse for its size . . . The Montana Creek subarea is probably the richest part of the study area for mammals. Deer, black and brown bears, mountain goat, river otter, beaver and many other species occur here.”

Station 9 was floristically diverse and earlier in June would probably have proven equally diverse in birds. Indicator species column gives an idea of the vegetation. Station 9 was selected as fairly representative of lower 18.6.

Totalled hourly song intensity was quite high, a 10.5.

19860704 Lake Creek

Lake Creek bog, Lake Two Creek. Wetlands 227c, 227d & 232

Stations 1 thru 5 today were on Lake Creek.

Singing birds were those expected for coniferous forest. Deciduous fringe along the creek may have supported some warblers but these were not in evidence. Lake Creek is currently being studied by Dan Bishop for Fish & Game, focusing on a marked decrease in **sockeye salmon**.

The large bog to the west of Lake Creek has quite a bit of lodgepole pine, and keys out as IA3aPicoSphag in the Vierick classification. It seems arbitrary to me to classify this type of bog as a needleleaf Woodland, lumping it with all other forest types having 10-to-24% tree cover, when floristically and hydrologically it is clearly a *Sphagnum* bog and more closely related to IIIA3k and IIIB3c types. However I have followed Vierick. I'd expect lodgepole cover to result in somewhat greater bird diversity than that of treeless bogs. But it was so late in the season that I felt fortunate in locating a single vocalizing **juncos**.

Lake Two creek is a recognized salmon stream and should be included in the study. It's smaller than Lake Creek however and upland forest extends right to the banks, usually with hemlock canopy over hanging the bed.

19860705 Auke Lake

Wetlands 228A, 227A, 226, 237, 21

To sample the shores of Áak'w, I borrowed Dan Bishop's canoe and put in at his house—Station

1. Paddled clockwise around the northern lake-shore, then cut back to a point just north of UAJ property.¹⁰

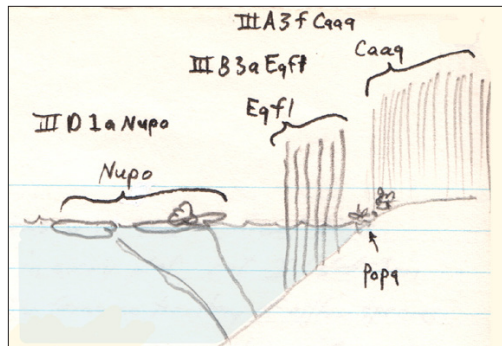
The progression of terrestrial, emergent, and floating-leaved plants for most of the sample stations was so consistent that I described it only at station 1. Henceforth the type was referred to as CEN; *Carex-Equisetum-Nuphar*. Only shrub or forest types were recorded for individual plots.

Depth of emergent horsetail agrees fairly well with the 15 cm mentioned in Viereck. *Potentilla* was frequent on the C-to-E border.

At 4:00 to 5:30 there was no traffic noise, and I could hear all but the quieter birds from the entire periphery of the lake. Even so, my list of birds out-of-plot was scanty. Song intensity at 4am, mid-lake, during peak in early June must be cacophonous. Width of the CEN belt narrows on the east shore, where conifer upland encroaches more closely and bottom falls off more rapidly. But CEN is present, and certainly of value to foraging **dabblers**, **kingfishers** etc. Perhaps this side should be given some recognition on wetland boundary photos. I did only 3 stations on this side and found it quite uniform.

PS This side is important in winter for water-fowl as it is the last to freeze, for reasons of wind

¹⁰ Boy, that dates these old notes. University of Alaska Juneau, became UA Southeast—UAS—not long after this study..



exposure and possible upwelling. **Geese and goldeneye** hang out, and **wood duck** in early January 87.

Stations 17 to 20 were at the head of Auke Creek where it drains the lake, above Glacier Highway bridge. In this protected inlet CEN extends far out from the banks.

At station 21 below the bridge I heard my first **fox sparrow** of the study. They are abundant in montane and subalpine scrub locally, for example on Perseverance Trail, but for reasons I can't explain, less common at sea level. At Glacier Bay they nest in postglacial alder thickets, but not here. This bird sang repeatedly from tall red alder with lush salmon berry and devils club.

Station 23, mouth of Auke Creek, was actually my only intertidal station in the study.

19860706 West of rivermouth

Uplifted beach meadows. Wetlands 69.3, .4, .5, 69A, 69.9, 71.2

Vegetation types today were similar to those encountered 0702 in Brotherhood Park. Instead of referring to them as high (IIIB2c) and low (IIIA3f), I began to call them simply wet (usually IIIA3fEr-Sphag) and dry (either IIIB3eAnge or IIIB2a mixed, meaning composition is too variable to characterize).

Topographic relief does not always correlate well with particle size in substrate and consequent drainage features, although in general the slightly raised surfaces have coarser particles. At station 1 conditions were xeric. Drought tolerant species such as *Rhacomitrium* and *Fragaria* are common or typical here. Older marine terraces with coarse sand and gravel, such as the 200-year terrace at Eagle Beach where I live, were described by Schoephorster (1974) as the most excessively drained soils of the CBJ. This is not wetland by any definition, but pockets of such soil occur throughout the uplifted beach meadow sites, and halophytic species such as *Leymus arenarius* may retain dominance for some time after uplift beyond extreme high tide.

As in Brotherhood Park, **savannah & Lincoln's sparrows** were the dominant birds. I didn't hear

songs or conclusively recognize both in every plot, but listed them because I doubted any plot sampled was outside of the foraging territory of either species. At times there seemed to be more than a dozen sparrows chipping incessantly within the 100-foot plot radius.

Young spruce are coming up, and in places such as stations 14 to 19, they are closely spaced enough to fall into forest classifications IA3b & IA2a. The former is described as Sitka spruce bog in Viereck 86. I feel the word bog should be removed from level 4 so that all spruce types with 10 to 24% canopy fall into IA3b. See my *Wetland classifications for Juneau* and notes on use of new Viereck classifications. "

Stations 9&13 were on Creek 71.2. This is a former tidal slough, now uplifted beyond extreme high tide. Currently active tidal slough farther to the south are similarly deeply incized, sometimes more than 10 feet, and these deep channels are preserved during uplift into supratidal elevations, even though they now carry only small quantities of runoff. There was no detectable flow at station 9, and moderate flow at station 13. Pebbles and sand formed the bed, while finer silt composes the banks.

11 PS 2023. This must refer to additional commentary provided for Adamus, wrapping up our 1986 field work. I no longer have a copy. I also have no maps of my numbered recording stations or even of the Adamus wetland unit IDs. In many cases, that makes it hard to

Horses are grazing along the southern transect and have completely altered the species composition and appearance of meadows at most stations. Grasses are encouraged especially *Calamagrostis*, while many forbs are suppressed. Iris is left untouched, and dense tufts stand out colorfully against the close-cropped turf. Probably most of our uplifted beach meadows have been grazed and or mowed at some point in the past century, and it would be interesting to learn more about the short and long-term effects on community succession.

About halfway between stations 6 and 14, a pair of **snipe** begin vocalizing from treetops, and continued until I left. Also at station 20, recorded my first **least sandpiper** of the study. It was calling from the top of a powerline pole. Least's are the only peeps known to nest on the Mword wetlands.

19860710 Backloop hotspots

Upper Duck, repeats of our 'greatest hits'. Wetlands 655.1, 34, 18.2 and several undesignated.

Koren had low song intensity when she sampled Duck Creek on 0612, and suggested I do a repeat. In walking from Taku to Mendenhall Boulevard, I heard not a single peep from anything, except distant **jays** and **ravens**.

Of course songs are low intensity everywhere now, and I should have done the repeat sampling

earlier. If indeed there is low nesting density along Duck Creek it is difficult to explain, because although back yards him in both sides, there is adequate alder Willow Cottonwood. My only guess would be **cat** predation.¹²

After Duck Creek I revisited several stations along Back Loop Road at which I had found not only unusual nesting species, but high diversity of common species, and high song intensity. The intent was to relocate the rarities, and to compare present song intensity with previous levels. Only the **solitary sandpiper** at station 2 was relocated. The **waterthrushes** at station 3 and **yellowthroat** at station 4 we're not heard. At station 4 I had previously heard **alder flycatcher** now silent. However 2 yellowthroat males were singing occasionally there. Song intensity at all former hot spots was rated 1 except for station 5, which scored a 2. It seems apparent that many species have ceased to sing or do so rarely enough that sampling is highly biased and incomplete.

¹² PS 2023: Typically such places can start out with lots of singing early in the nesting season. But moving into July, they empty out as cats pick off most fledglings and even adult nesters. Duck Creek is probably a "sink," diverting reproductive energy that'd be better invested away from humans and their offleash carnivores.

Period #1 - 6/4 to 6/21

Hourly song intensity ratings - Richard Carstensen
0 = dead quiet 4 = constant noise

	6/4	6/5	6/11	6/12	6/13	6/16	6/17	6/18	6/19	6/21	total	Ave
0400-0500	3-4	2	2	1	2	2	3-4	2-1	3-4	1-2	22.5	2.25
0500-0600	3-4	1	2	3-3	3	2	1	1	3	2-3	21.5	2.15
0600-0700	3	2	3-4	1-2	2	1	1-0	1	2	3	19.5	1.95
0700-0800	2-3	3	2	1	2	1	3	1	2	2	19.5	1.95
0800-0900	1	1	2	1	1	3	3	1	3-4	1-0	15.5	1.55
0900-1000	1	1								2-3		
total	13.5	9	11.5	7	10	7.5	11	5.5	14	10	98.5	9.9

excluding 0900-1000
ave = 9.9 or 1.5
6/16 = 2.5 or 1.5
thus 15.5

ave = 5.5 or 1.5

Period #2 - 6/23 to 7/4

	6/23	6/25	6/26	6/27	6/28	6/29	6/30	7/2	7/3	7/4	total	Ave.
0400-0500	2	3-2	3-2	1-2	1-0	0-1	2	2	3	2	16.5	1.65
0500-0600	1	2	2-1	1-2	1-0	2	2	2	3-2	1	15	1.5
0600-0700	1-0	2-1	2-1	2	2-3	1	2-1	2	1	1	14	1.4
0700-0800	1-0	2-3	1	2-3	2-3	1-0	1	1	2	0	13	1.3
0800-0900	1-0	NA	1-2	3	NA	1	1	2-3	2	0-1	15.1	1.51
total	4.5	10.6	8	10.5	7.5	5	7.5	9.5	10.5	4.5	73.6	7.36

Recorded during a relatively recovery rain from our house at Lake Creek (some intensity also noted)

from our house at Lake Creek

from Little Lake Creek in IA to Pitt

NA 8.5 + 4 = 2.1
8.5 + 2.1 = 10.6

NA 6.5 + 1.5
6 + 1.5 = 7.5

Ave intensity

Period #3 7/5 - 7/11

	7/5	7/6	7/10	7/11
0400-0500	1	2	0	3-0
0500-0600	1	2	1	1
0600-0700	2	1	1	0
0700-0800	1	1	1	1-0
0800-0900	2	1	1	0
total	7	7	4	3

Hourly song intensity
0604 to 0711