

JOURNAL 1968

JAMES W. BEE

1968Lawrence, Douglas Co., Kansas

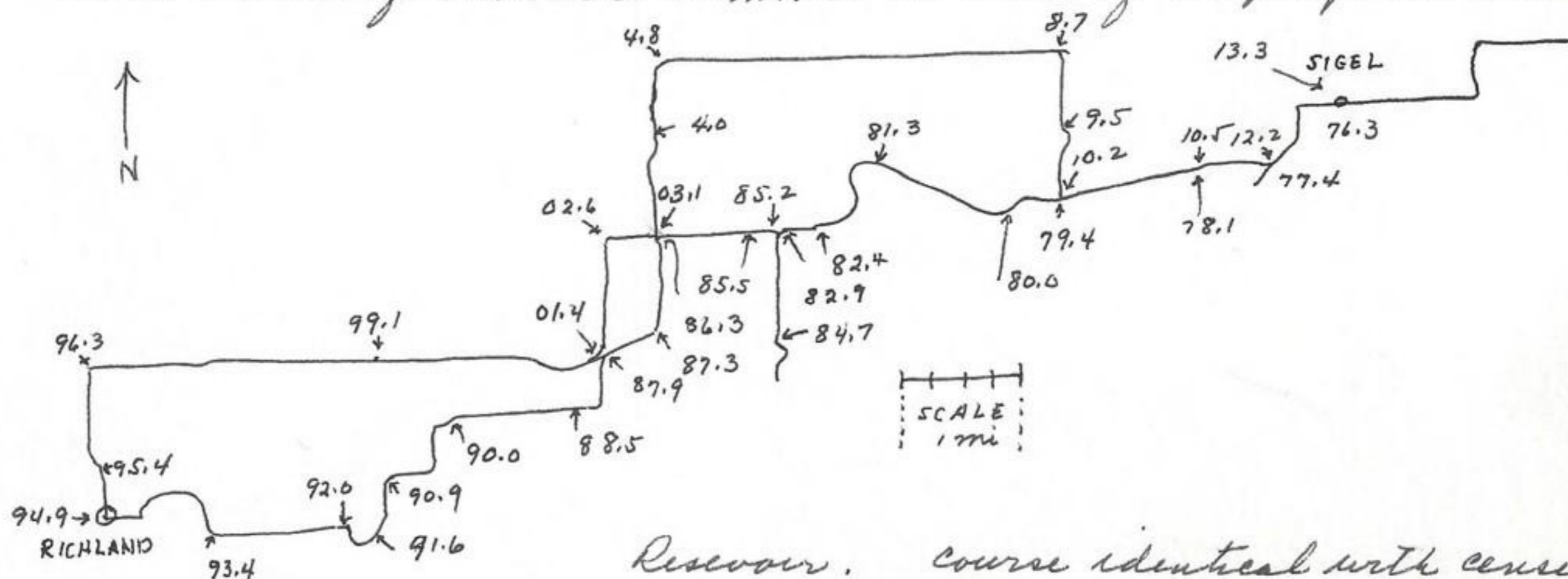
Jan. 4, 1968

Starlings are carrying food to top of house chimneys to continue feeding in warmth of heat. This may be a source of introduction of contamination directly into homes. Slaty-colored juncos first ^{at daybreak} arrive at feeder, cardinal second.

Wakarusa valley, Proposed Clinton Reservoir, Douglas-Shawnee Co., Kansas

Jan 6, 1968

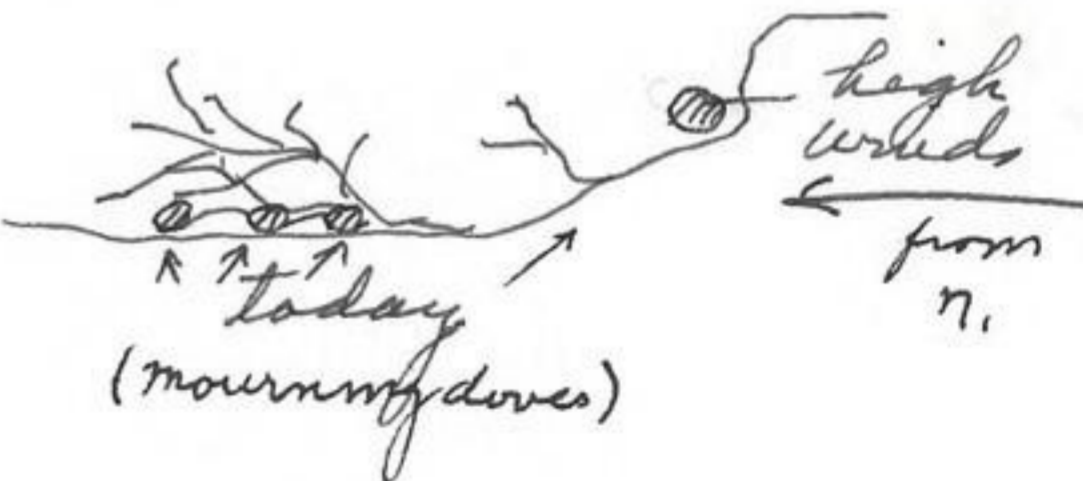
Made census of birds and mammal in area of the proposed Clinton



Reservoir. course identical with census of Dec. 31, 1967. Started from Sigel school at 9:05 A.M. mileage 76.3. Temp. 30°F, strong wind, driving snow. moderate to light snow falling. Fields with mist from driving snow. At Sigel noted 6 cardinals, 12 tree sparrows, 15 juncos (consecutive number of birds with commas indicates a single flock, semicolon indicated different flocks or groups). 77.4 Y in road (this is about 1/10 mi NE of Wakarusa bridge and indicates a Y-like diversion of the road. 77.7 fox squirrel approx. 150' in field from trees. Creek & Wakarusa frozen. 78.1 end proposed Clinton Reservoir dam (original site). 79.2 35 tree sparrows (the large numbers of ^{small} birds are as close an approximation as can be made, and for this number would be a 7' or - 5 birds). 79.4 Petersons Corner and 18 tree sparrows in one group, feeding in weeds and cut milo some 5/10 mi. from trees. 3 meadowlarks on lee of ^{short} weeds along edge of road. They (the meadowlarks were loathe to leave and allowed the car to pass by within 10' of them. This is true of many birds during cold, windy, and snowy days. This kind of behaviorism may be associated with the acceptance and flocking among themselves and with

other species during cold weather. This tendency of ignoring (or accepting) intruders may allow for greater predation which in turn takes a great toll of animals in winter months. 80.0 Wakarusa bridge, water frozen and snow drifted on ice. 2 juncos. 81.3 passing by bridge and leaving main road to continue west. 82.0 2 Titmice 82.1 can see Wakarusa at deep stretch as frozen and covered with snow. 82.4 main road. In last part thru forest the snow coming straight down, now in open fields the snow is drifting by at a shallow angle \searrow . 82.9 now to S across. 83.6 70 horned larks and 6 meadowlark. The horned larks were feeding while the meadowlarks were behind sod or plant barriers and body to ground and ruffled. Barriers for these birds a generally small and not much higher or wider than body, chosen as if to give greatest visibility in all directions but adequate protection. A small barrier may have less side or back drafts or currents than a high-broad barrier. 3 foot milt was available but these birds chose low cut (3 inches) stubble field. As the S side of valley was approached the snow accumulated from the wind blown field. 84.7 base of hill and turned around and retraced some road across these flat open fields. 85.2 back to main road \vee to W. 85.5 Belvoir Bridge, water frozen upstream but 2 small openings down stream at ripples. Snow on ice. 86.3 now to S. 86.9 flock of 3 bluejays, 6 cardinals, 1 song sparrow, 12 tree sparrows, 8 juncos. They were in some place in remnant milt patch bordered by trees. 87.0 bridge over small drainage. 9 cardinals in on flock here. 77.1 meadowlark. 87.3 now to SW. 87.9 4 corners \vee now to S. 88.5 bridge over Wakarusa. water frozen \vee snow covered except on open ripples upstream. 2 cardinals & 23 juncos in flock. 90.0 Wakarusa 40° open to right. 90.9 passing by bridge over Wakarusa. 41.6 4 corners, 2 starling and 12 Eng. sparrows at cattle pens. 91.7 Elk Creek. open except narrow strip along ripples. 92.0 near top of hill on lee side of ridge a flock of 16 cardinals, 14 Harris sparrows, 40 juncos, 18 tree sparrows, 1 rusty blackbird, 12 Eng. sparrows. The rusty blackbird was 3/10 mile from where I observed a flock on a previous year. 93.0 Woodruff road. 93.4 top hill \vee starting to descend. It is unusual to not see

more birds across these uplands. 94.9 Richland. Again no birds along road. This may result from the open exposures to the N winds. 95.4 bridge across Waka-rusa, 96.3 main road & now to E. 3 tree sparrows. 97.3 flock 5 cardinals, 3 juncos, 5 tree sparrows. 97.4 3 juncos. 97.5 red-bellied woodpecker. 98.1 Douglas Co. line. 99.1 4 corners & continuing E. 99.4 3 tree squirrels. 00.0 top hill and descending. 00.1 1 titmouse, 2 chickadees, 12 juncos, 5 tree sparrows. 00.4 14 bob-white associated with 2 slab rocks & road culvert. These rocks seemed to have been used as protection from wind. 2 juncos in same area. 00.6 Creek from Sportman's Lake partly frozen. 6 cardinals, 1 red-bellied woodpecker and 5 tree sparrows. 00.9 6 juncos. 01.0 junco. 01.1 an ^(dark) american roughleg left a tree approx 200' from another tree that held a fox squirrel. The hawk flew E for 2/10 mile stopping 3 times on trees. Associated with this hawk were 2 mourning doves, 6 Harris sparrows, 8 cardinals, 7 goldfinch, 18 tree sparrows, 5 juncos. 1.4 4 corners & now to N. at this corner a light american roughleg left trees & flew W toward the first hawk noted. 0.7 at base of small hill at Kennedy farm noted 18 mourning doves in some place as frequently observed on previous years census. When wind is severe they rest ^{in lee of} near rock outcrops. Today they were on branches on ground further out from rocks. Associated with this general area were 6 Harris sparrows, 4 juncos, 15 Eng. sparrows, yellow-shafted flicker, 8 tree sparrows, red-bellied woodpecker.



2.6 main road, now to E. 2.7 45 horned larks in cattle feeding area. 2.8 6 juncos. 2.9 5 horned larks on road. 3.1 now to N. 4.0 Big Creek (no birds associated with farm. 4.7 2 blue jays. 4.8 now to E. 5.1 2 tree sparrows. 5.3 flock of 4 cardinals, 12 tree sparrows, 5 juncos. 5.6 2 cardinals, 38 tree sparrows. 5.7 13 horned larks. 5.8 Deer Creek. 6.1 6 starling, 30 sparrows. 6.8 24 tree sparrows. 6.9 3 tree sparrows. 7.0 Coon Creek. frozen except few ripples. A red squirrel fed on a 9" corn cob on a branch 6 feet, ^{directly} above the car and remained there for 1 minute until I struck the side

of the ear with my hand. This is another example of confidence in an animal that is generally wary in the field. Meadowlarks seemed to be extremely confident in snow while tree sparrows seemed to be slightly more wary than normal.

7.4 Clifford Coffmans place. 7.5 highest snow drifts encountered so far. It is interesting that the largest springs are associated with this general windswept uplands.

7.8 5 ♂ & 1 ♀ eastern bluebirds. 8.1 2 crows in field. 8.5 old house on ridge. 2 juncos. 8.7 to 5, 6 starling

18 tree sparrows, 12 juncos. 8.9 5 tree sparrows. 9.5 Rattlesnake Point. 1 song sparrow. 10.2 now to E. 6 meadowlarks. 10.3 60 tree sparrows in same general area as noted this A.M. but numbers have increased. 10.5 77 end proposed dam. yellow shafted flicker. 12.2 ♀ in road.

12.3 2 tree sparrows. 13.3 Sigel. 12:00, 3°F Steel snowing and windy. Later in day skies cleared to blue and cold. Had noticed that cattle & horses in the field carried a layer of snow on their backs.

Lawrence, Douglas Co., Kansas

Jan 7, 1967

Early this A.M. at 3°F river below dam (Kaw) open around island but frozen solid above and below island. The



water was from under the ice at the dam and below dam formed a mist above the open water! Snow covered the ice except where wind blown into isolated snow islands. This

A.M. just after daybreak noted a slate-colored juncos at home at feeder.

The area between its wings was covered with snow and small pieces of ice (1/8 inch fragments). This bird would frequently flip its wings with a quick jerk, in the manner of some warblers, as if to dislodge the ice and snow. The nervous flipping of some kinds of birds may be a behaviorism associated with a feeding activity involving accumulation of debris on its back and wings.

Wakarusa Valley, Clinton area, Douglas Co., Kansas

Jan 7, 1967

Annette C and I made census along a road from stall to a

point 5 of Skull (2 conifer tree knoll), ^{thence} straight E past the Boy Scout camp near the Peterson Farm. Started from Skull 2:06 at mileage 58.3. Temp 10° F. Day clear. 58.9 2 juncos, 59.9 2 tree sparrows. 60.1 2 tree sparrows. 60.5 (conifer knoll, now to E). 61.5 40 tree sparrows feeding in short native grass. 61.6 4 crows. 62.4 3 crows; 5 meadowlarks. 62.6 Deer Creek. 63.4 meadowlark 63.5 yellow-shafted flicker. 63.8 Coon Creek 35 tree sparrows 64.2 Clifford Coffman. sparrow hawk. 64.9 Boy Scout bridge 65.0 8 meadowlarks. 65.3 old house on ridge. towhee, 2 juncos, 1 song sparrow at house. 65.5 now to S past Petersons. 65.7 4 tree sparrows. 66.0 Rattlesnake Point. 67.0 now to E. American roughleg hunting in lowlands redtail on ridge to N, 67.2 2 meadowlarks. 68.2 N end dam. 68.5 Marsh hawk, hunted in field to N and after 5 dives in 3 minutes left to E and flew down riparian growth. Another marsh hawk in field to S feeding on mouse. 68.7 bridge. red-bellied woodpecker. 68.8 sparrow hawk 68.9 mourning dove. 69.0 18 mourning doves in cattle feeding yard; difficult to see on ground. 69.3 4 blue jays. 69.4 25 cowbirds. 69.5 song sparrow. 69.6 now to E. 69.7 12 juncos. 69.8 tree sparrow. 70.0 2 crows, 4 goldfinch, 2 juncos, 5 meadowlarks. 70.1 Sigel school. On way home about 2 mi. E of Sigel noted 50 tree sparrows + 30 juncos in one flock and another flock a mile beyond of 18 tree sparrows. Both flocks in open weed field. at Boy Scout camp road noted a marsh hawk.

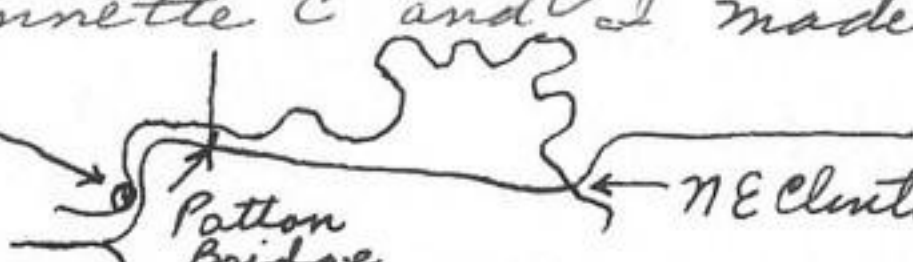
Summary of birds observed:

juncos 2-2-12-2-
 tree sparrow 2-2-40-35-4-1-
 crows 3-2-
 meadowlarks 5-1-8-2-5-
 yellow-shafted flicker 1-
 sparrow hawk -1-1-
 towhee 1-
 song sparrow 1-5-
 American roughleg 1-
 redtail hawk 1-
 marsh hawk 1-1-

red-bellied woodpecker 1
 mourning dove 1-18-
 blue jay 4-
 cowbird 25-
 goldfinch 4-
 not in research area but between Sigel & Lawrence.
 tree sparrows 50
 juncos 30
 tree sparrows 18.

Wakarusa Valley, Clinton area, Douglas Co., Kansas

Jan. 14, 1968

Mary, Annette C and I made trip down Wakarusa River from a point  to the Wakarusa bridge at NE Clinton. Entire route on ice. Enroute

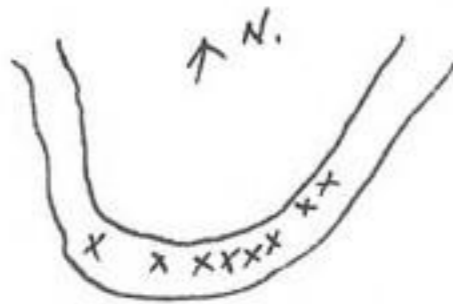
to beginning of river trip made census of all birds and mammals beginning at Sigel School house at 12:25 P.M. East skies clear but entire west skies cloudy and moving E. Temp. 10°F. Wind 5-15 mph from N. At Sigel a farmer was parked at side of road and had 4 coyotes in truck from coyote hunt of this morning. These coyote drives and packs of dogs have the most disastrous effect on wildlife of any of the sportsman's activities. Coyotes, deer, raccoons, opossums and skunks are continuously harassed. I would not be surprised that sort of activity is responsible for lack of pheasants and deer in this area. Left Sigel at mileage 33.2. 33.7 now to S. 34.3 at ∇ in road. 35.1 N end dam (originally proposed). 35.2 cardinal. 36.2 meadowlark. 36.3 passing Peterson Road. 36.9 Wakarusa bridge. river closed with ice and snow on top. Sun now under ^{high} clouds ~~massing~~ pushing in from S. 38.2 passing bridge. It is unusual not to see more birds. Low temp. & wind may be factor. 39.0 Left car and started trip down Wakarusa (12:40), ripples below long stretch slow water is open from W side to within 4' of E side, allowing us to pass without gaining slopes. Water as clear as I have ever seen; can see bottom without interference. 2 cardinals here. Other ripples below the main ripples are open but restricted. Considerable activity in this area. One to 2 sets of coyote tracks, one fox, 3 rabbit, 6 squirrel. It is difficult to sense coyote and fox, and to some extent rabbits because of the reentry of tracks of a single animal onto the snows of the iced river. It is possible that one fox could cruise a mile in the river bed. I believe that the best way would be to list every track encountered in a planned route down the river bed, say 8 feet out from one bank. This would be a compromise because foxes follow near edge while coyotes prefer the center of river bed for long range movement, or another way would be to list all kinds of tracks in a 50' linear strip of river bed every 1/10 of mile. Another problem in census work is the misidentification of tracks. Cats sometimes look like fox, dogs of certain sizes can be confused with coyote. In many instances one is required to find good imprint in snow to determine kind

of animal and even then one can not be positive. Areas away from ^{human} habitation are always easier to survey than areas associated with roaming cats & dogs. Even squirrels and rabbit tracks can be confused and it is necessary to check them out, which requires time. Birds can be checked with some difficulty, especially numbers. In large flocks one must estimate the numbers and in larger groups the error can be plus or minus 15-20 per cent. A second problem is the fact that juncos, tree sparrows & cardinals, as well as other kinds of birds, move down river. Within one flock one can, however, get a good estimate of numbers. The condition of the land surface is snow on all slopes of valley and river channel. Ice on river 98%, snow on ice. More snow on E & N exposures. Although many animal tracks in this area only 4 juncos noted. At first main right-hand turn (1:05) with major drainage from left observed the first large flock of birds. They were associated with the lateral drainage and consisted of 18 juncos, 1 flicker, 3 titmice, 1 red-bellied, 3 blackcapped chickadees, 2 red-tail hawks, (one called as it left). A set of coyote tracks entered main canyon from lateral drainage. There is considerably more activity of coyote & fox, squirrel & rabbit at this point, with tracks indicating hunting or interest in the rabbit & squirrels. Numbers of squirrel, rabbit, coyote & fox tracks will not be recorded because of difficulty of appraisal. A summary will be given at end of trip.

1:10 flock of 18 juncos, 3 black capped chickadees, 6 cardinal, 3 titmice, downy, red-bellied woodpecker. 1:12 spring drainage from right and snow excluded in immediate area of spring. Increase activity of coyote, rabbit & one Peromyscus track or tunnel in snow of river bed. The spring is definitely contributing to increase animal numbers. 1:20 bridge over wakarusa. 40 English Sparrows at farm house. 1:22 about 300' down river from farm house a group of 6 cardinals, 5 chickadees, 4 titmice, 1 downy, 28 juncos, 2 Carolina wrens, 2 song sparrows, 8 Harris sparrows. There are fewer tracks of coyote, fox or dog below bridge than above bridge where river is associated with side of valley & deciduous forests.

1:28 group of 70 tree sparrows, 18 juncos, 7 cardinals, 4 titmice 3 blackcapped chickadees. This group followed along in front of us for 1/10 mile. 1:48 8 juncos, 1 redbellied woodpecker in group. 3 crows to N. 1:50 4 juncos, 5 blackcapped chickadees, 1 redbellied woodpecker, 18 tree sparrows in group. The second

set of tunneling *Peromyscus* in river channel proper. There is a surprisingly few tracks of squirrel and even less of rabbits in snow of river ice. 2:00 group 30 juncos, 11 tree sparrows, 3 black-capped chickadees. 2:05 4 black-capped chickadees, 8 juncos, 1 red-bellied woodpecker. 2:10 drainage from left; increased coyote & fox tracks in area of increased squirrel and rabbit activity. This is frequently the situation at later drainage convergence being a line of trees to main river system. 2 carolina wrens here, one in song and sounded so out of place. 2:15 8 crows concerned over a great horned owl, 2 redstarts attracted to area. In same area a group of 20 juncos, 4 black-capped chickadees, 2 titmice, 2 cardinals, 1 red-bellied woodpecker, 2 kinglet, 2 carolina wrens. 2:22 first contact with N side of valley. Drainage from left. Increased activity and several sets of tracks from lateral drainage. 22 juncos and 2 cardinals here. Have noticed that N-S trending valleys (river channel) have ~~more~~ deeper snow and are windy. 2:28 8 juncos. At this bend there were 8 trampled areas (in 200) involving coyote. These concentrated sparring areas were confined to the N side of river channel. 2:33 red-bellied woodpecker. 2:35 at



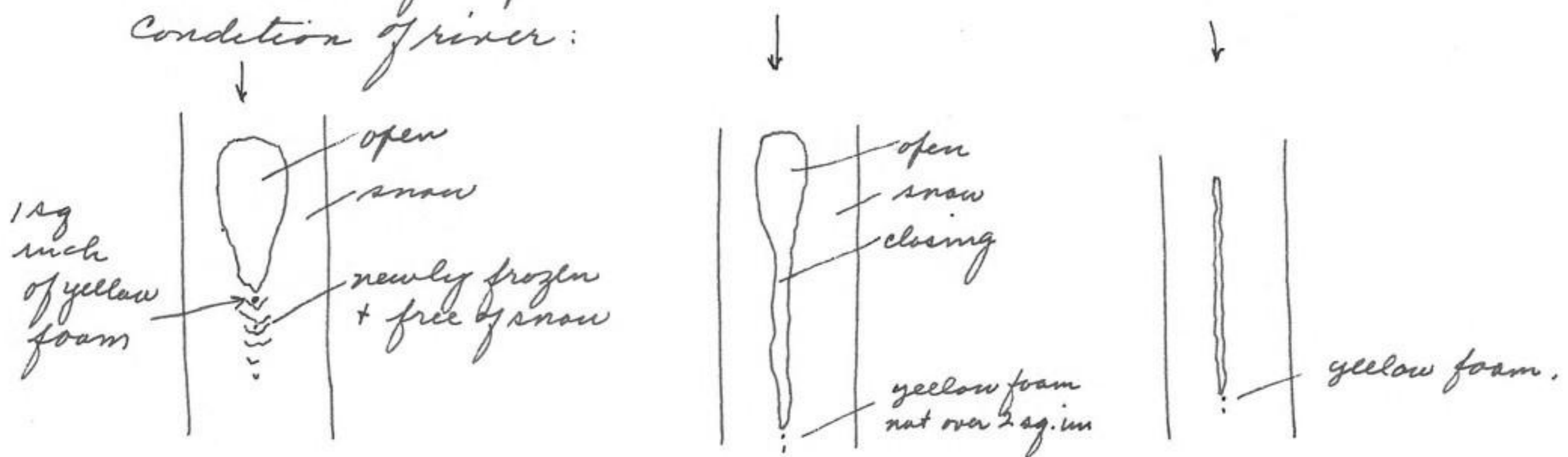
mouth of Peterson lake drainage. 3 sets of tracks (Coyote?) from this drainage. 2 song sparrows, 4 juncos, 2 cardinals, winter wren, ^{brown creeper} here. 2:36 group 60 juncos, 50 tree sparrows, 3 black-capped chickadee, 4 cardinals. This group extended for approx. 200' linear feet of creek. It is surprising that there are not deer tracks along the river or beaver or muskrat. 2:45 increased number of tracks of coyote (or dog), squirrel & few rabbit. 2:48 large group of 120 juncos, 40 tree sparrows, 4 chickadees, 3 cardinals, 18 Harris sparrows. 2:51 a second large group of 90 juncos, 60 tree sparrows, 8 cardinals, 1 red-bellied woodpecker, 1 downy, 4 titmice, 2 carolina wrens, 2 song sparrows. In this area were 2 deer trees (rubbing limbs of black willow) one on each side of river. They were fresh appearing but had been made before the falls of snow. A concentration of tracks (Coyote) were at base of this willow as if attracted by the deer odor. These same tracks led to an opening on E side of river where 2 beaver holes were partially exposed but not used as entrance by beaver.





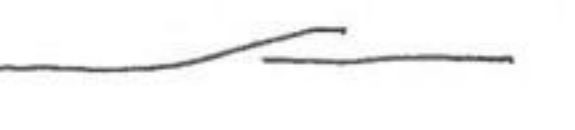


The hole supported water and ^{snuff} branches cleared of bark. It was obvious that beaver lived under ice and were active

but did not make their appearance above ice at any point along river traversed so far, 3:00 red-bellied woodpecker, 2 black-capped Chickadees, 1 song sparrow. 3:08 area of increased activity of coyote tracks associated with squirrel tracks. This is the first area where fox squirrels had crossed the river in organized path. The 4' corridor supported 18 sets of squirrel tracks. Other areas along river show only a single set of tracks or crossings at random in areas of concentration of squirrel activity. In this same area were 18 juncos, 20 tree sparrows, 1 Carolina wren, 1 downy. Temp 26°F, Water 30°F (will check thermometer for accuracy.)

Arrived bridge 3:18. Before returning to car at point of original departure present the following summary of some of the observation of trip:

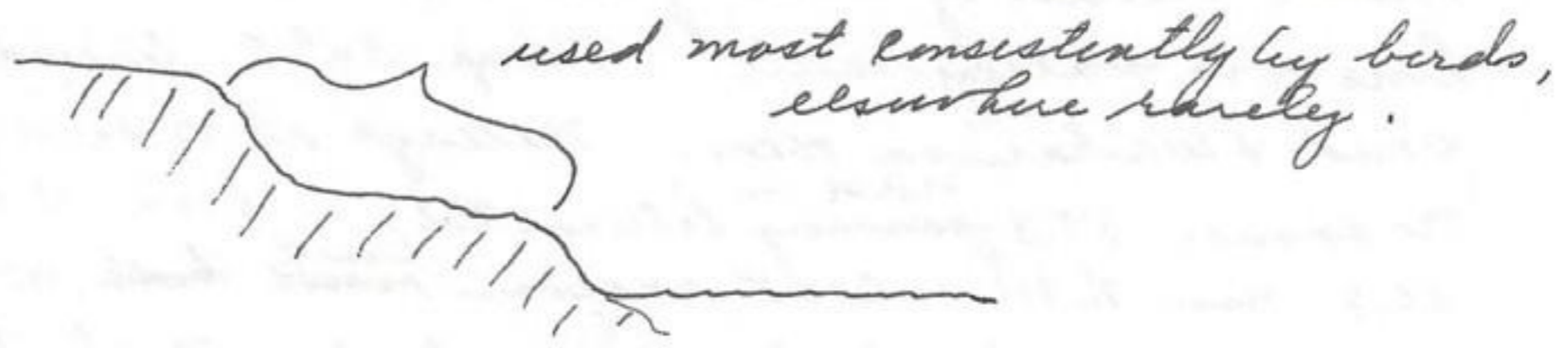


Would estimate that 97% of river is in thick ice covered with snow. Open water from a little as 2 linear feet to 150 linear feet (on rippled stretches). Average open areas about 30'. There was no overflow of water onto ice. Profile views were:



-  normal with slight slope on either edge of river.
-  slope sufficient to cause one to fall and animals to adjust positions.
-  ice thrust but never over 4 feet in extent. These irregularities cause coyotes, dogs & foxes to inspect.
-  elevated or dome formation with fracture systems caused by hydrostatic pressure.
-  older ice level above present level.

If one can hear water under ice, the thickness is thin and although one cannot see because of snow, should evade. The water in all areas was clear.

noted that there was increased coyote & fox tracks at centers of increased squirrel or rabbit activity. There was increased activity at convergence of lateral-main river drainage. Wind controls distribution of birds. On upland or river valley there were practically no birds today but in protected river channel there were great concentrations of birds and there mainly on lee side and sunny side. The river channel used by birds was



Peromyscus trails on snow rare. Rabbits uncommon. Of the occurrence of tracks I would estimate that 50% of the time there would be coyote tracks; 40% of the time red fox tracks; squirrel tracks averaged 1 per 150'; rabbit about 1 per 200'; dog 80%. There were no raccoon, opossum or skunk tracks observed. There was no sign of carrion feeding or capture sets. Identification sign for coyote about 1 per 300'. Cottontail can be distinguished from fox squirrel by:

- 
 rabbit - larger, distance between ~~front~~ back and front feet sometime more than maximum for squirrel. Individual jumps frequently more than 40 inches. Trails uniform. In deeper snow body does not imprint as in squirrel.
- 
 squirrel - back front feet frequently diverging, front feet opposite and near ~~front~~ back feet. Individual sets seldom more than 40 inches. Trails irregular. In deep snow body imprints & feet drag.

Left river at bridge at 3:18 and walked back to car. In the river channel the walking was comfortable. Outside of river channel the wind was relatively strong (10 M.P.H) and cold. Temp 25°F. Passed bridge at 3:55. 402 red bellied woodpecker. 4:05 now to S in deciduous forests. 4:08 2 chickadees. 2 crow to W. 4:10 8 juncos, 5 cardinals, 1 red bellied woodpecker. 4:15 Car. Bird life rare on return trip to car. Left with mileage ~~38.0~~ 39.0. 41.2 bridge 41.7 Peterson road. 54 meadowlarks on S exposure of road (not feeding on road) in 3/10 of mile. 42.5 8 more meadowlarks. 42.9 New dam. 43.1 4 cardinals, 1 song sparrow. 44.4 now to E. 8 juncos 15 tree sparrows. 44.9 Sigel at 4:40 P.M.

Lawrence, Douglas Co., Kansas

Jan 21, 1968

at 2:00 A.M pulse ^(3-4 x) fast, regular and faint. Temp high but no perspiration, skin dry. Lasted 2 minutes then in 5 minutes to normal except high temp. that continued

Wakarusa valley, Douglas Co., Kansas

Jan 29, 1968

mileage 56.2 (4:00 AM)

Made census of birds from Sigel School to Douglas - Shawnee Co line via valley route. Temp 34° F. Wind from N and cold. ponds & Wakarusa open. Mileage at N end proposed dam 58.1. No snow. 59.3 ^{North on} ~~passing~~ Peterson Rd. 60.4 4 meadowlarks, 60.8 now to W. 62.5 raccoon ~~road~~ ^{creek} ~~bed~~, open. 63.6 Deer Creek 65.4 12 meadowlarks, 67.4 shrike, 50 starting; 68.9 south; 70.0 west; 71.0 Douglas Co. ~~Line~~ ^{and wind} 72.7 Richland turnoff and end of census. Time of day ^{and wind} contributed to low population of birds

Lawrence, Douglas Co., Kansas

March 20, 1968

Weight up to 154 from 145 and abrupt tightness in throat for 10 days. Reduced weight but as of April 23 tightness still present but in reduced intensity. Ordinarily ^{required} tightness is associated with reduced weight.

Lawrence, Douglas Co., Kansas

Jan 17, 1968

Warming trend since Jan 15. up to this date there has been 12 hrs. of temperature above freezing since the first of the year. Patters Lake with water on top of ice this P.M. Slopes on Mt. Oread are completely pack from use by sleds, skis etc. This is the first time in 20 years that the area has been so completely and extensively used. Subfreezing temp + good snow have accounted for this condition
[see Jan 21 and 29 on opposite page]

Umw. Kansas, Patters Lake, Douglas Co., Kansas

Feb. 14, 1968

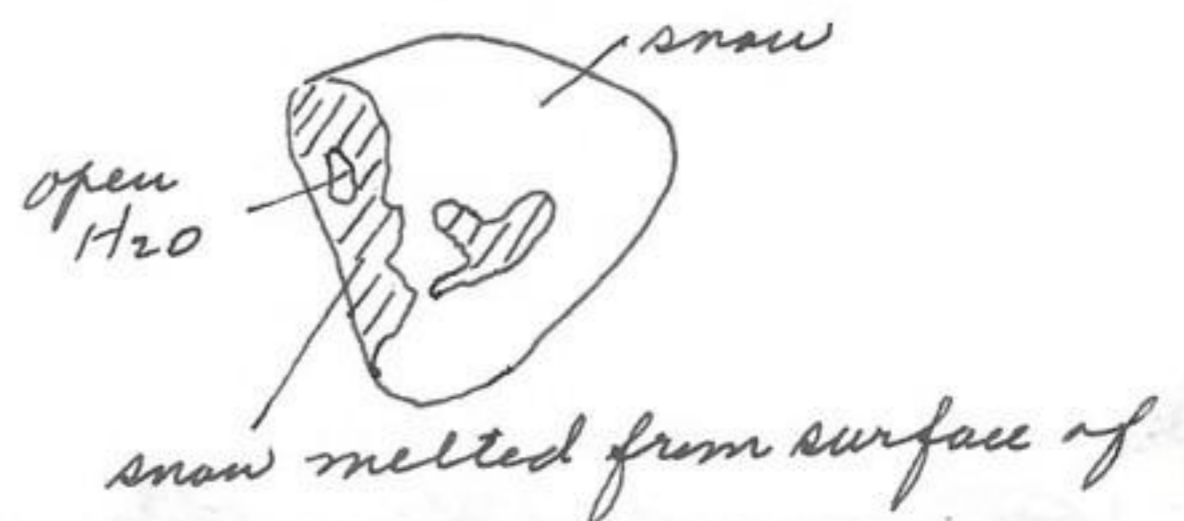
In last three days, Patters Lake has frozen to clear ice.

Feb. 15, 1968

Snowed last night and in A.M. the snow disappeared in those areas which were the last to form ice (in the last 4 days). Thickness of ice controls melting of snow.

In the afternoon all snow had been melted from ice except on S side in shadow of trees.

Lawrence, Kansas Feb 2, 1968

Lawrence, Douglas Co., Kansas

Feb. 24, 1968

morning dove called for first time this spring. It called about 1/2 hour in morning. The cardinals have been calling the last week. Light and clear days seem to be the controlling factor for singing. On cold clear days with temperatures below freezing, they will call frequently.

March 9, 1968

noted first grackle in area of city.

March 18, 1968

Flocks of grackles flying over home (1620 Tenn) and individuals frequently noted in yard. The flocks have red-wings as well. They fly overhead about 6:00 P.M.

[see opposite page for March 20, 1968]

Campus, Umw. Kansas, Lawrence, Douglas Co., Kansas

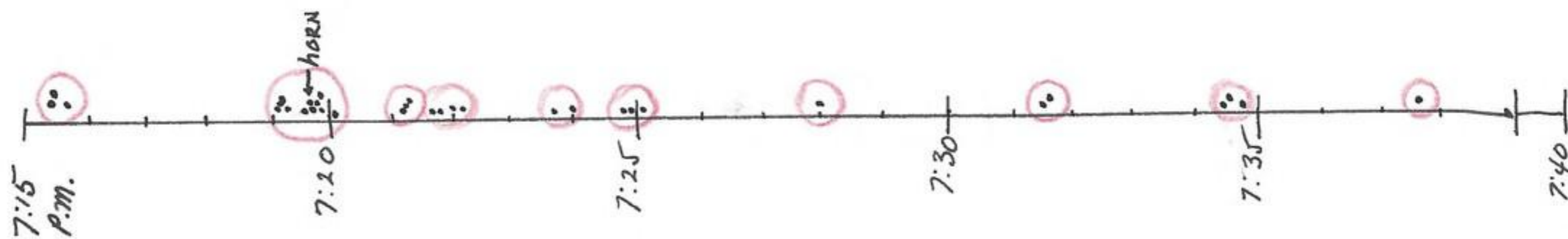
March 23, 1968

After sun had left the horizon, approx 2000 grackles and some redwings entered juniper roosting trees. These trees are along one of the main travelled roads on campus (15th or Sunnyside St). One compact group of approx 6 junipers just SE of chimney (approx. powerplant)

50 feet) held at least 800 birds. These birds drop into trees either from passing flocks or from birds which first alight on higher tree tops nearby & then move to junipers in a quick, darting, downward flight. This behaviorism is characteristic of birds entering roosting areas and perhaps is a mechanism for being less conspicuous at the roosting site, thus minimizing the disclosure of the area to predators. Last night these trees were 'breathing' with bird movement even though it was several hours after dark. When disturbed they shift about the trees rather than fly away.

March 26, 1968

at 7:15 (late twilight) place a tape recorder in junipers (6 junipers of above) and recorded calls for 25 minutes. Their distribution is as follows:



7:15-0
-25
-28
-35
7:19-8
-5
-6
-16
-35
-45
-50
-53
-56
-58
-59

7:20-1
7:21-12
-13
-15
-48
-50
7:22-0
7:22-6
7:23-40
7:24-0
-54
-58

7:25-2
7:27-0

7:31-30
-33
7:34-30
-32
-45

7:37-40

The sound of a horn set off a series of calls, the rest were not influenced by outside interference and they show a periodicity of approx. 3 minute intervals. One dead grackle among trees. The white excrement was covering 70% of the surface of the ground at any one area under the trees.

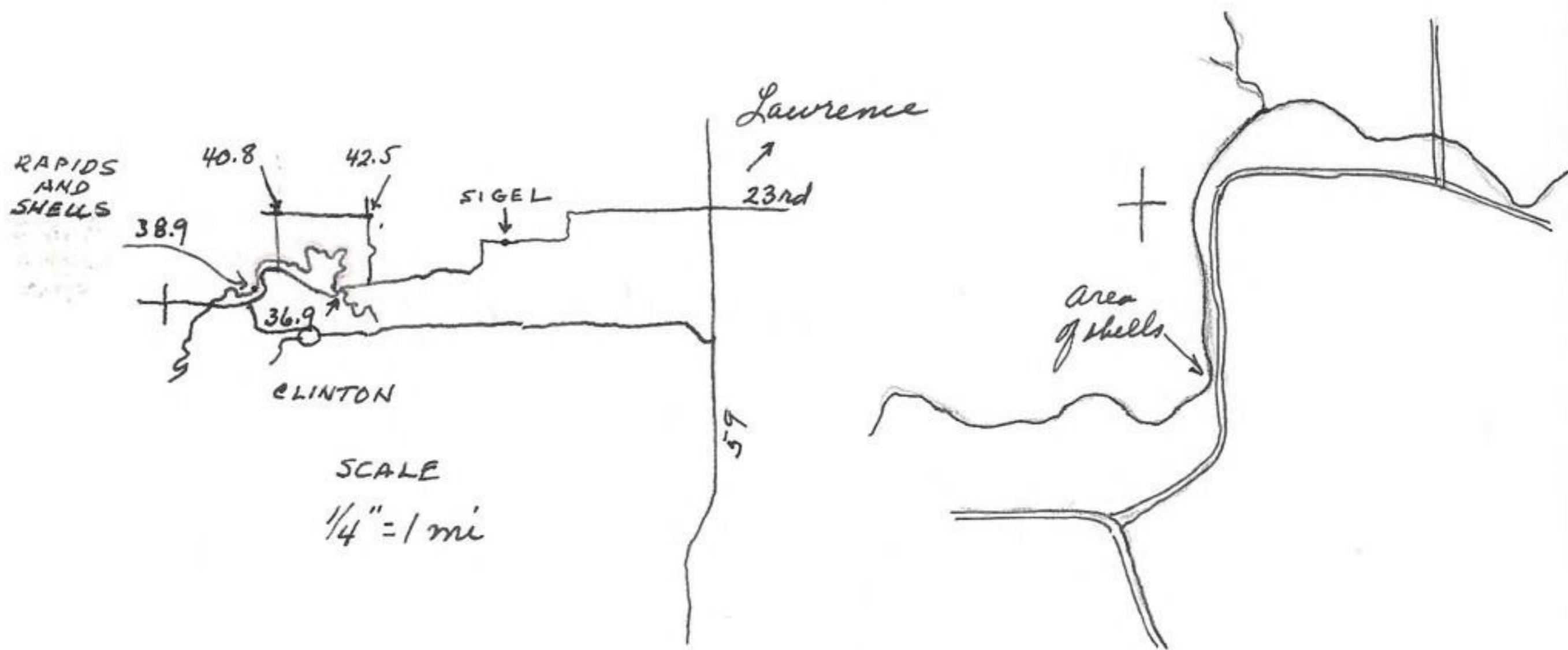
The upright stems were also coated with white excrement. When disturbed at night, they roost in trees rather than leave.

Wakarusa Valley, Clinton area, Douglas Co., Kansas

March 30, 1968

made census from Sigel School to a point along the Wakarusa NE of Clinton and return (via Peterson Road route). Sigel School House at mileage 33.1. Day lozy, moderate wind, temp 70°F meadowlark at school house. 33.7 Cardinal, 33.8 2 cardinals; 33.9 Cardinal; 34.2 ♀ in road; 6 cowbirds, 8 Eng sparrows; 34.8

bluebird, cardinal; 35.0 north-end proposed dam site (old); 35.1
 2 Cardinals; 35.7 2 crows; 35.8 redtail circling to north at top
 of hill and trending W. 36.2 passing Peterson road; 36.8 Wapakusa
 bridge, water brown, 4 Cardinals and 1 flicker; 38.1 passing Patton
 bridge, 2 Cardinals; 38.4 redtail circling above tree along river,
 2 crows beyond. 38.5 now to S; 38.6 fox squirrel, 2 titmice.
 other birds calling beyond limits of road; 2 chickadees. 38.9
 rapids on Wapakusa and checked condition of water. Rapids just
 passable with knee boots and water too fast to see live mussels.
 Downstream from rapids there were 4 accumulations of shells
 on side of river but all of river ^{bottom} covered with water and no rocks
 exposed. I would estimate a sq. ^{cubic} foot of shells exposed. With
 lower water many more will be exposed and at that time a collection
 should be made to compare with those taken in 1966. Returned
 to car and returned to Sigel via N route. Left 38.9. 39.8
 Patton bridge; 40.2 horned lark; 40.6 2 juncos; 40.8 Coon Creek,
 2 ♂ redwings calling, 2 Cardinals, 1 downy, 3 Eng. sparrows.
 41.2 Coffman's place, meadowlark; 41.7 2 meadowlarks, 1 Eastern
 phoebe; 41.9 Scout camp drainage; 42.3 old house on top hill;
 turkey vulture circling to W; 3 juncos; 42.5 now to S on Peterson's



road; 42.7 meadowlark; 43.0 western? meadowlark (on bases of loud
 fall); 43.1 meadowlark; 43.2 meadowlark and crow; 43.3 Rattlesnake
 Point, 2 titmice; (the meadowlarks are mainly on plateaus); 44.0
 to E, water along side of road; 45.3 N. end ^{clear} proposed dam (old); titmouse
 45.5 2 bluebirds, 1 redtail to S, Creek with water flowing; 46.0 Y
 in road; 46.4 cardinal; 46.6 meadowlark; 47.2 Sigel School
 and end of census. Sparrow hawk on Soldier Creek beyond
 census area. Temp at 12:00 79°F. During the day heard

The vegetation today, is in an early stage of development with ^{trees} on sidehills without leaves and with grayish brown color. On some exposures there was an occasional tree in yellowish green foliage. There were more trees in leaf at ~~the~~ base of hills than on upper slopes. Trees along drainages and along river were 80% in leaf (just beginning and greenish-yellow). Frogs were frequently heard calling and butterflies common and of 6-12 species. Percent frequency of birds observed today:

Towhee 2-2-1-

Meadowlark 1-1-2-1-1-1-1-

Chickadee (b. capped) 2-

Eng. Sparrow 8-3-

fox squirrel 1

redwing 2

flicker 1-

bluebird 1-2-

crow 2-2-1-

redtail 1-1-1-

horned lark 1-

downy 1-

Cardinal 1-2-1-1-2-4-2-2-1-

Cowbirds 6-

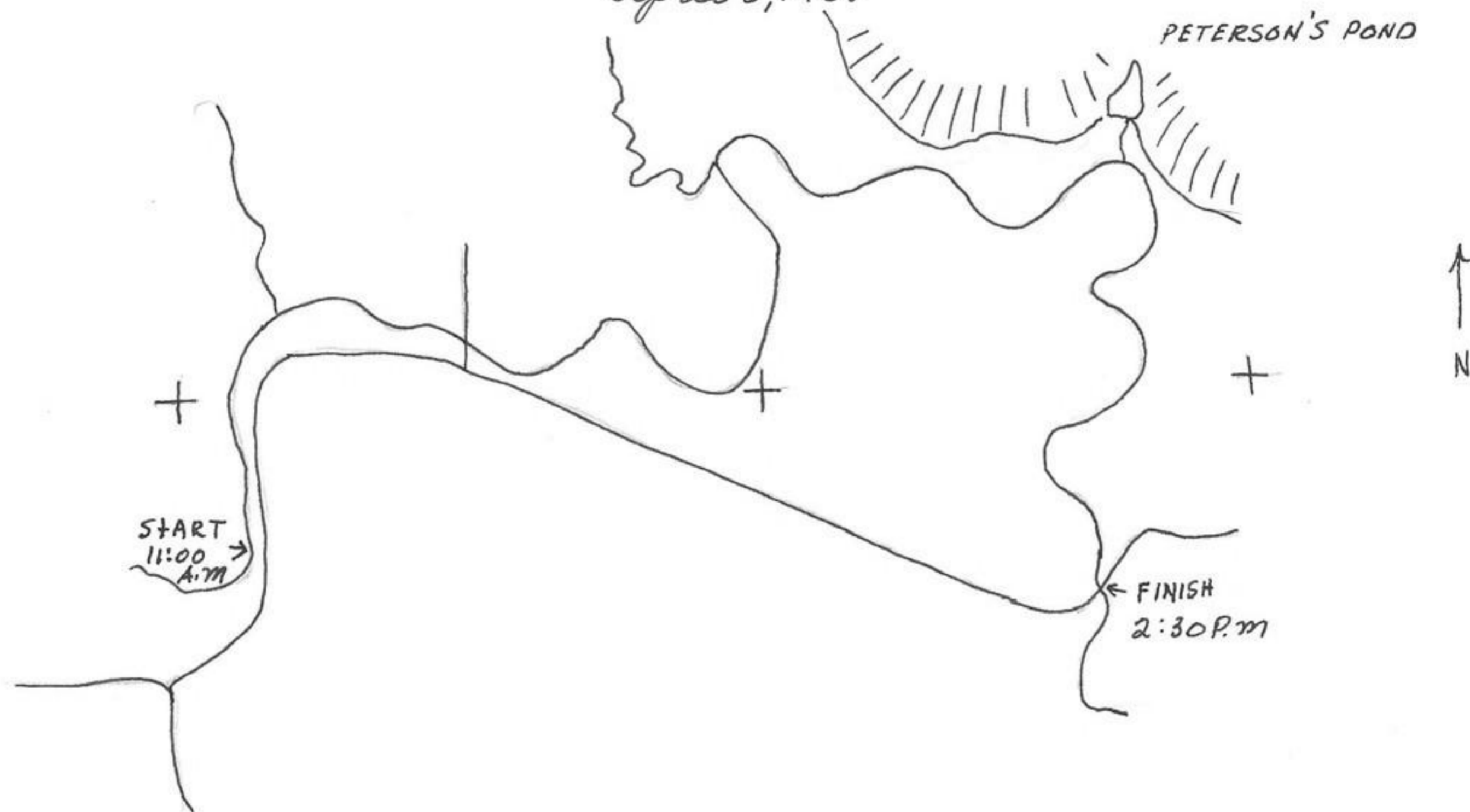
turkey vulture 1-

juncos 2-3-

E. phoebe 1

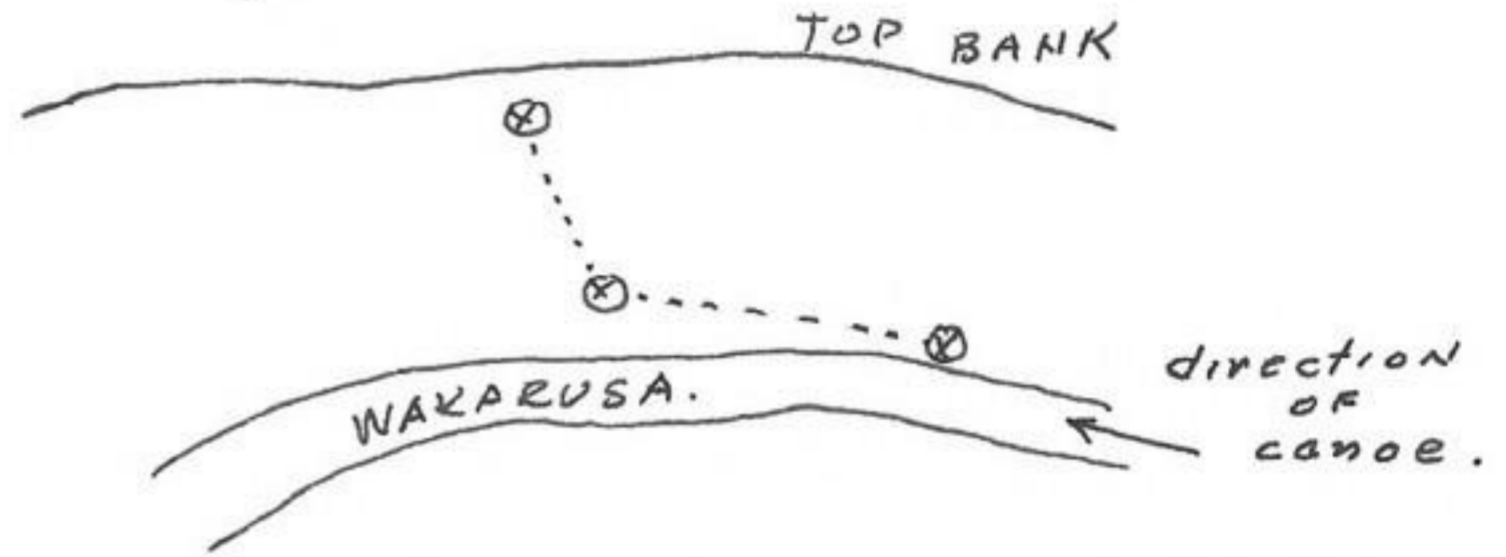
Wakarusa River, Clinton area, Douglas Co., Kansas

April 6, 1968



Annette and I left rapids (NE Clinton) on Wakarusa at 11:00 A.M. and crossed to second bridge. Stopped at Peterson's Pond at 1:00 P.M. and left 1:35. Arrived bridge 2:30 P.M. at a small marsh on SW end of bridge (20' beyond) collected a natrid no. 680306-1. Body length 580, tail 150, wt 96 gms. This snake was in the open among grass (sedges) and showed defense behaviorism. The marsh supported microtine trails. Specific locality is 6/10 mi. E and 7/10 mi. N Clinton (store in center of town), Douglas Co., Kansas.

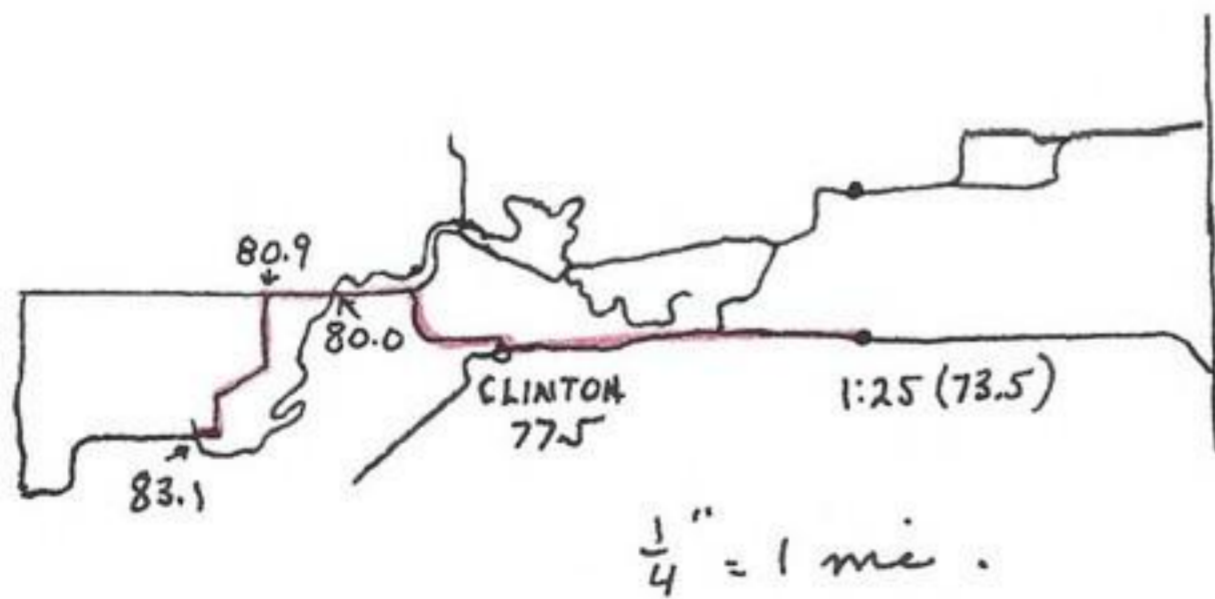
680406-15
 Left bridge at 2:40 and walked back to car at rapids. Birds observed along river included the following, one notable being the American bittern. This bird was along edge of water at a point $3\frac{1}{10}$ miles downstream from where drainage of Peterson's ponds enters the Wakarusa. It flew as we approached to within 30 feet and it left to fly 50' to mid-position on bank downstream. It then walked up slope of bank to near top where it remained motionless with up-thrusted head while we passed by in canoe. Its walk is graceful and direct.



Slope in small trees and shrubs and bird visible at all times. Other birds noted were:

turkey vultures, titmice, calling singly or in pairs, flicker, blue jay, crow, great horned owl, redtail, robin, juncos, one group of 4 birds, great blue heron, red-bellied woodpecker, cardinal, chickadee, downy woodpecker, Carolina wren, eastern phoebe, 8 quail in one group, frogs calling, warblers sp.?. On return trip via road noted bluebird, shrike, horned lark and golden crowned kinglet, and killdeer. According to a local farmer (Patton bridge), the Wakarusa River was dry between ponds in 1936).

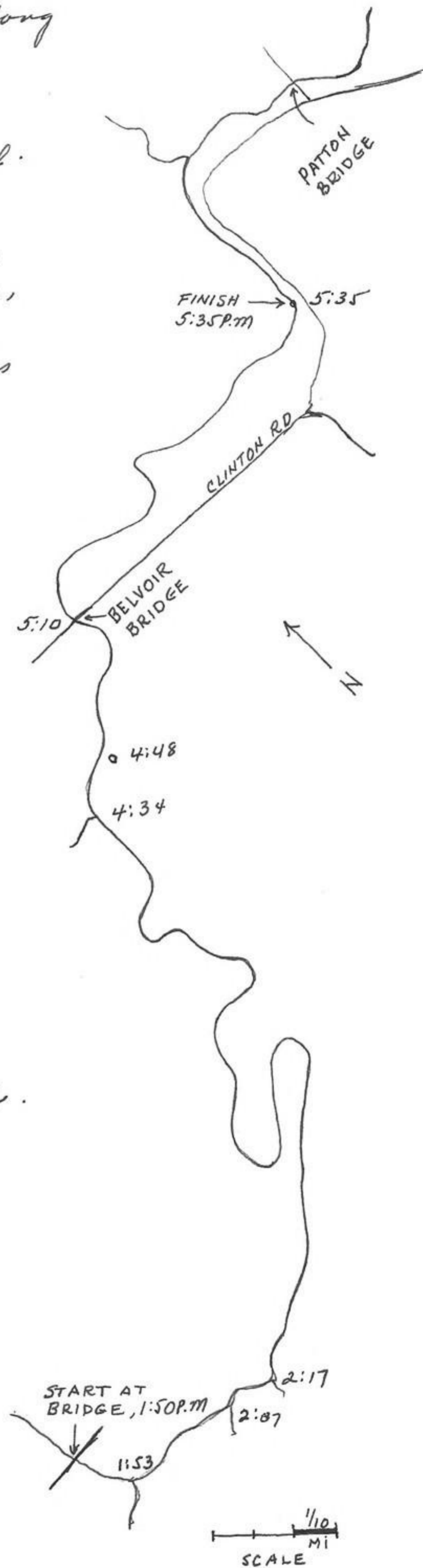
Wakarusa River (Clinton area), Douglas Co., Kansas
 April 8, 1968



Annette C and I made canoe trip from second bridge above Patton or just one beyond Belvoir bridge, to rapid NE Clinton. South end of proposed Clinton Reservoir down at mileage 73.5 (1:25 P.M.). Strong wind from W. Sky 10° cloudy.

74.1 meadowlark; 74.2 mourning dove; 75.0 cardinal; 76.0 meadowlark; 77.5 Clinton; 80.0 Belvoir bridge, meadowlark; 80.9 to S, meadowlark; 81.4 meadowlark; 81.8 to W; 82.2 meadowlark; 83.1 bridge over Wakarusa and point of put-in. On bank at bridge collected a *Carphophis* no. 680408-1 from under a section of cloth rug lying on the ground. This snake measured 227 body, 34 tail, and weighed 10 grams. The specific locality is $9\frac{1}{10}$ mi. S and $3\frac{3}{20}$ mi. W Clinton (center of town), Douglas Co., Kansas.

Left bridge 1:50 in canoe. 1:51 2 cardinals,
 2 slate-colored juncos, 2 small frogs along
 edge of river. 1:52 2 crows calling.
 1:53 drainage from right, clear water
 entering. 1:54 cascades (stopped for few
 minutes). 1:58 started again. 2:00 cardinal.
 2:03 4 goldfinch. 2:06 2 cardinals, 2 black-
 capped chickadees, titmouse, 4 juncos.
 2:07 drainage from right and rapids below.
 2:13 left ^{from} above rapids, redbellied woodpecker,
 great blue heron tracks. 2:17 Chickadee.
 drainage from right with clear water, cascades
 above drainage. bullfrog (2 inches) on
 bank, bluebird calling. 2:18 redtail,
 chickadee, 4 juncos, 2 cardinals, 2
 titmice. 2:23 2 downy woodpeckers,
 cardinal singing, 2 juncos. frog
 (small and *Rana pipiens*) approx 1 per
 100'. 2:28 first carp jumped in water,
 titmouse. stopped 5 min. 2:35 turkey
 vulture. 2:43 fox squirrel seemed con-
 siderably tamer than in fall; 4
 titmice, 2 turkey vultures, redtail,
 cardinal, flicker, chickadee, hairy wood-
 pecker. 2:46 G.W. owl, titmouse,
 2 chickadees. 2:50 above owl left
 again and was chased by 2 blue jays.
 2:57 downy woodpecker, 2 chickadees.
 3:06 Chickadees. 3:12 2 titmice, 2
 chickadees and group 8 goldfinch.
 3:18 4 chickadees, 2 titmice, 2 cardinals.
 Temp air 46°F, water 57°F. 3:20 crow.
 3:23 beaver active at large hole at bend.
 3:27 bull frog (3 inches), second one so far.
 red-bellied woodpecker. small frogs
 average 1 per 300'. 3:30 2 red bellied
 woodpeckers flew from N side of river to
 S side and from 30' high fought with
 bodily contact to ground, hitting with
 considerable force. 3:37 Chickadee.
 This stretch slow-wide with beaver
 sign. 3:45 chickadees. marsh hawk
 flying high to N. 2 turkey vultures



680408-17

these vultures could be the same ones as ^{previously observed,} 5 juncos. Stopped and resumed at 4:15. 4:16 red-bellied and 2 cardinals. 4:17 red-tail hawk. 4:20 3 juncos, the raccoon tracks are along edge of river but frequently tracks lead down to water and then return as if the animal was approaching river for washing food or drinking purposes. 4:21 cardinal, 4:22 cardinal. The high water mark of this season is about 3' above present level and shows periodicity of lowering. 4:32 group goldfinch (12), mourning dove, 2 cardinals, red-bellied woodpecker, titmouse. 4:34 drainage from left with clear water. 4:45 juncos. 4:48 passing house to right, phoebe and chickadee, cardinal. 4:50 stopped - left 5:04. 5:05 titmouse and chickadee. 5:09 muskrat left burrow and swam down stream. 5:10 Belvoir bridge. 5:10 2 cardinals, chickadee, titmouse. 5:20 beginning of wooded area, red-bellied woodpecker. 5:27 titmouse. 5:30 5 cardinals (together), 4 chickadees, red-tail, G.H. Owl, ^{titmouse} great blue heron. 5:35 arrived at cascades and end of complete river census. Son James Robert and Greg Estes met us at this point and they continued down stream to Patton bridge where we picked them up. No census of roadside populations on return trip to Lawrence. Distance covered approx. 5 miles ^(3 hrs. 45 min). Summary of birds observed (river census)

black-capped chickadee 2-1-1-1-2-2-1-1-1-2-4-1-1-1-4 = 25	red-bellied woodpecker 1-1-2-1-1-1 = 7
Cardinal 2-1-2-2-1-1-2-2-1-1-2-1-2-5 = 25	downy 2-1 = 3
titmouse 1-2-1-4-1-2-2-1-1-1-1-1 = 18	flicker 1-
turkey vulture 1-2-2 = 5	phoebe 1-
red-tail 1-1-1-1 = 4	goldfinch 4-8-12 = 24
marsh hawk 1	juncos 2-4-4-2-5-3-1 = 21
crow 2-1 = 3	great-horned owl 1-1 = 2
bluebird, eastern 1	great blue heron 1-1 = 2
hairy woodpecker 1	fox squirrel 1
mourning dove 1	blue jay 2
	muskrat 1
	also saw pipeviper, Cophophis, small frogs, bull-frog, beaver sign.

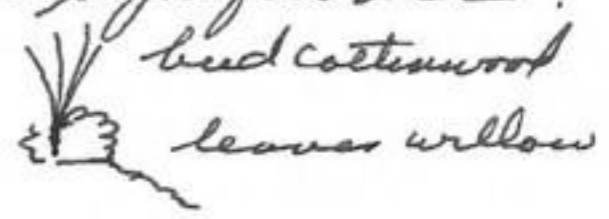
Kansas River (Kaw), Lawrence to Eudora, Douglas and Leavenworth Cos., Kansas

April 10, 1968

made solitary canoe trip from Lawrence to Eudora, leaving at 9:00 A.M. water of river 56°F (in shade as all water temperatures are recorded, air (in shade) 62°F. most of route will be by current

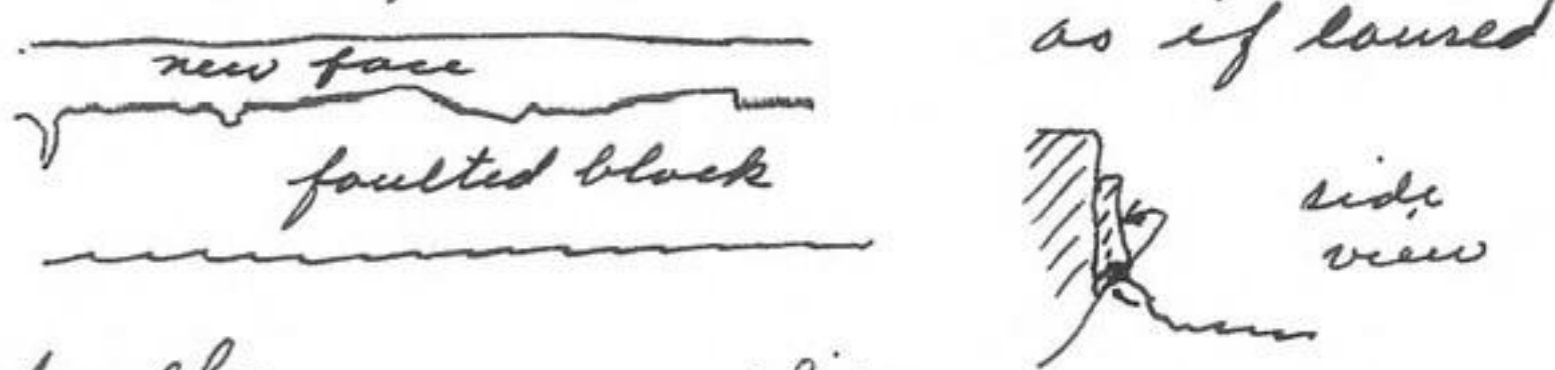
floatation. Birds along edge of river in riparian communities will not be recorded except larger birds. The numbers between the bridge at Lawrence and the high power lines that cross the river downstream (10:05) however were counted and are as follows: Chickadees 8, robins 3, crows 2, kingfisher 1, cardinals 12, flickers 4, titmice 4, juncos (slate colored) 2 groups of 4 each, grackles in groups of 10-6-300. The large group of grackles occupied approx 400' of linear river edge and the birds were in lower 1/3 of branches of cottonwoods. All birds were calling or singing, 6 mourning doves, 1 meadowlark, 20 starling, 10 Eng. sparrows, 1 blue jay, 2 downy woodpeckers, 15 red-wings singing on territories. No frogs or turtles. 10:09 drainage from right. Have been floating with current only since utility lines. From area on N side river on flood plain, NW from 10:09, heard 5 calls from spadefoot toad? No other frog calls. 10:10 Kingfisher. no surface activity of fish.

High water mark 1 foot above present level of water with skinny smooth surface below. This level of one foot in contrast to average of 3 feet in Wabarusa. A ratio of river size & current to height of water mark may be of some significance. Cottonwood trees in bud, willow_{low} in leaves.



10:22 great blue heron left S side & flew to N side.

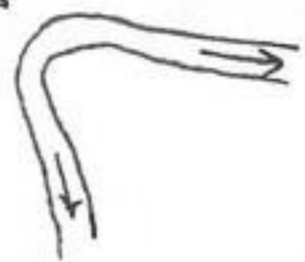
Kingfisher in same area. Two bank swallows circling over river and alighting on dead limbs of tree (log jam) in river. These swallows were within 100' of nesting bank. The nesting bank has new face with outer 1-1 1/2 feet showing or in the process of faulting down. The curious fact is that the faulting is occurring along the entire length of cliffs at the same time and degree of intensity by earth quake or superionic blast.



10:45 Capsize Point being gradually eroded back. Surveyor on slope making charts of this changing bank. 10:50 Horned lark left sand bar on N side and flew S across river. This is the usual flight pattern of this bird. 10:58 opposite short cut channel. First turtle, on log, green and flat. Can occasionally hear frogs calling in ponds formed by sandbars.

11:04 6 gadwalls, 3 pairs mallards, 2 bluewings. The gadwalls were in most sheltered position. 10:09 first huge carp jumped out of water. 10:11 mouth mud creek. Some beaver activity here but not in comparison to previous years. There seems to have been an overtrapping of this animal this winter.

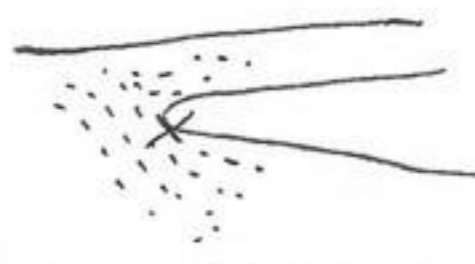
Wind from NW and from Mud Creek up river, 680410-19
 parallel to channel. To east of mud creek the wind was blowing
 parallel to channel showing how the river course dictates the
 direction of the wind. 11:25 New beaver cutting



including 5 trees 5" in diameter. A fox squirrel
 worked along bank until it encountered a tree felled
 by beaver, at which time the squirrel ascended the trunk to the
 first beaver cut. The squirrel registered the odor of this cut and then
 continued up the bank ... The usual composition of

birds in riparian community but not as common as area east
 of Lawrence. Crow flew over river. 11:31 noted a fox squirrel 2 feet
 from edge of water, smelling dam mud. 11:35 beaver house on bank.

11:36 end island (growth part). The 3 pairs of mallards were rest-
 ing on sand bar. 11:42 recent beaver sign of 7 trees (3"-4" dia)
 felled. 11:50 stopped on sandbar on N side. 13 western
 sandpeeps fed in ripples



moving. In this area collected a series
 of shells. *Leptodea fragilis* 680410-1 to 680410-20; *Leptodea*
laevissima 680410-21 to 30 and *Lasmigona complanata* 680410-31.
 These shells constituted the entire population of this sandy-gravel bar
 of 50' x 150'. Resumed trip 12:35. 12:54 beaver house on
 bank. 12:57 2 mourning doves in willows at edge of river.

1:04 middle major bend Turkey vulture. Ciconiids unusually numerous on
 river. sands and in groups of 5-10. Many minnows in shallow water at
 edge of river. Bull frog tadpoles in water. No frog on bank.

1:30 2 ♂ baldpates, 1 ♀ baldpate, ♂ ♀ bluewing in one group on edge
 of sandbar. Air 74°F, water 62°F. 1:38 approx. 50 logs
 tied together and aligned on approx 1/10 mile of bank. N side.

It is my belief that this type of barrier contributed to accentuated
 erosion rather than prevents erosion. Riparian birds considerably
 fewer than this A.M. and may be a factor of time of day. Day
 now quiet & practically windless. Arrived Eudora bridge
 2:10 P.M. Daughter Annette arrived 3:00 and we continued
 conoering to mouth of Wakarusa.

At Eudora bridge (300' upstream)
 Collected group of minnows *NOTROPIS STRAMINEUS* (sand shiner) 680410-32 from
 shallow water at edge of river. Capture by damming off entrance
 to shallow water then forcing minnows into
 channel leading to entrance and then damming
 upper end of channel. In this short segment
 of 3 feet of channel scoured out the water onto the

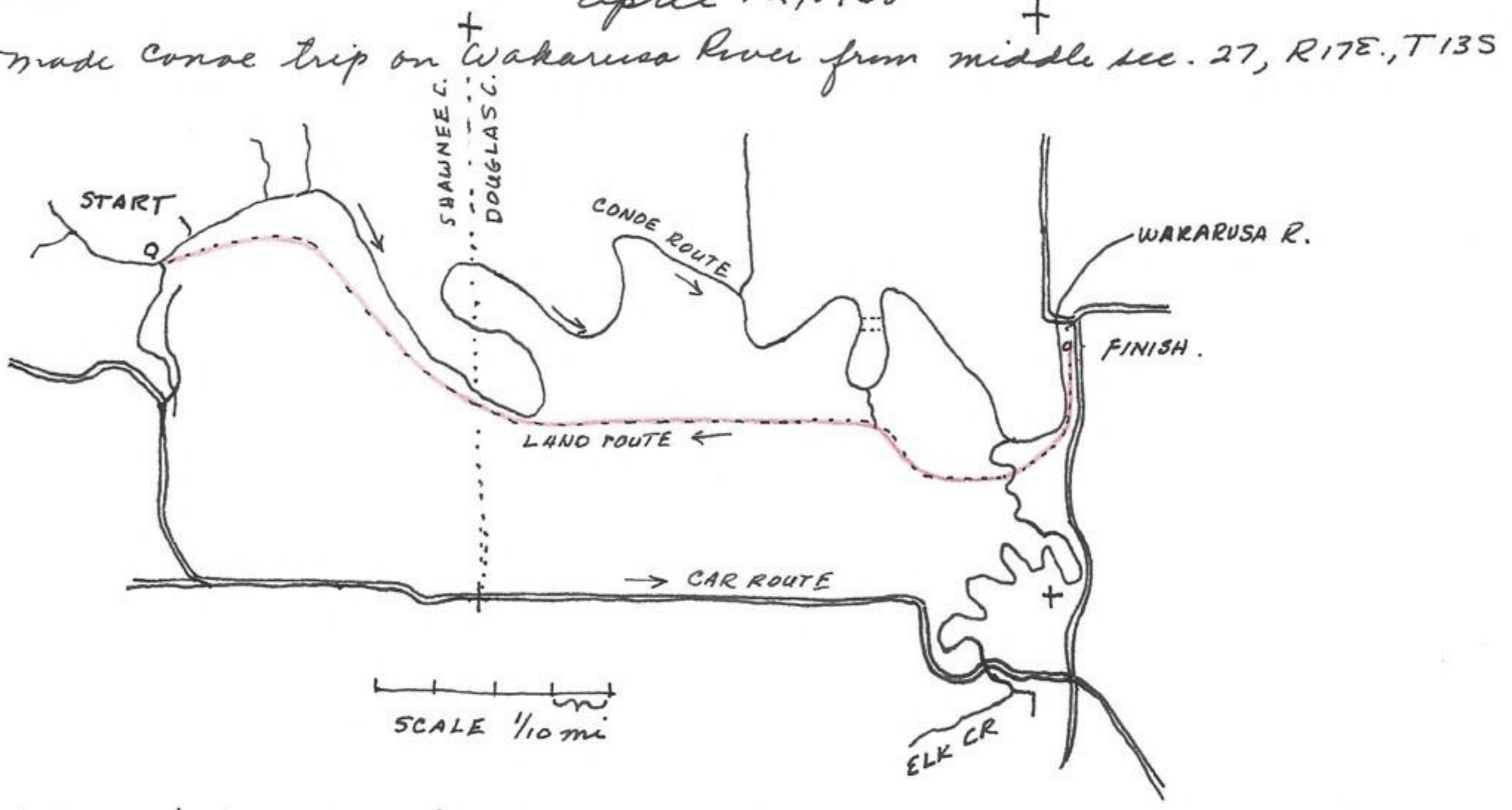


sands and picked up the individual minnows as they became immobile on the sand. 32 minnows were taken in this one group. These fish have a capacity to move over shallow barriers with their backs out of water. Some minnows were trapped in isolated shallows and presumably would be eaten by herons or animals. There were great blue heron tracks in the area, 3:17 beaver house with branches uneaten. 3:19 mouth Wakarusa This area has always been used by beavers but not much sign now at this season. As we ascended up Wakarusa passed a mole mallard with injured side & leg. It swam upstream in front of us until overtaken and then dove several times, finally coming up behind us when it continued back down the river. 3:25 American Coot, only one on river. Arrived Wakarusa bridge N Eudora at 4:00 P.M.

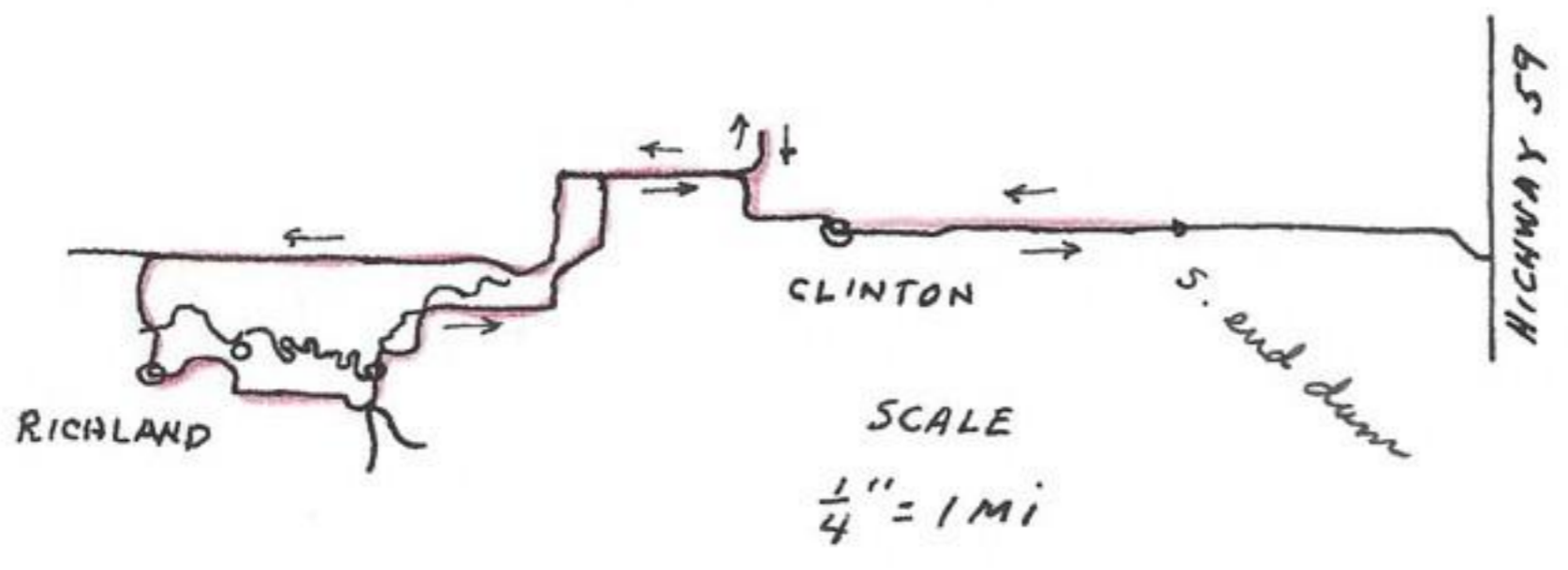
Wakarusa River, Richland area, Douglas - Shawnee Co., Kansas

April 12, 1968

Made canoe trip on Wakarusa River from middle sec. 27, R17E, T13S



To a point approx. 3/10 mi. down stream from entrance of Elk Creek. Enroute made roadside census from S end proposed Clinton Reservoir dam to Richland and return.

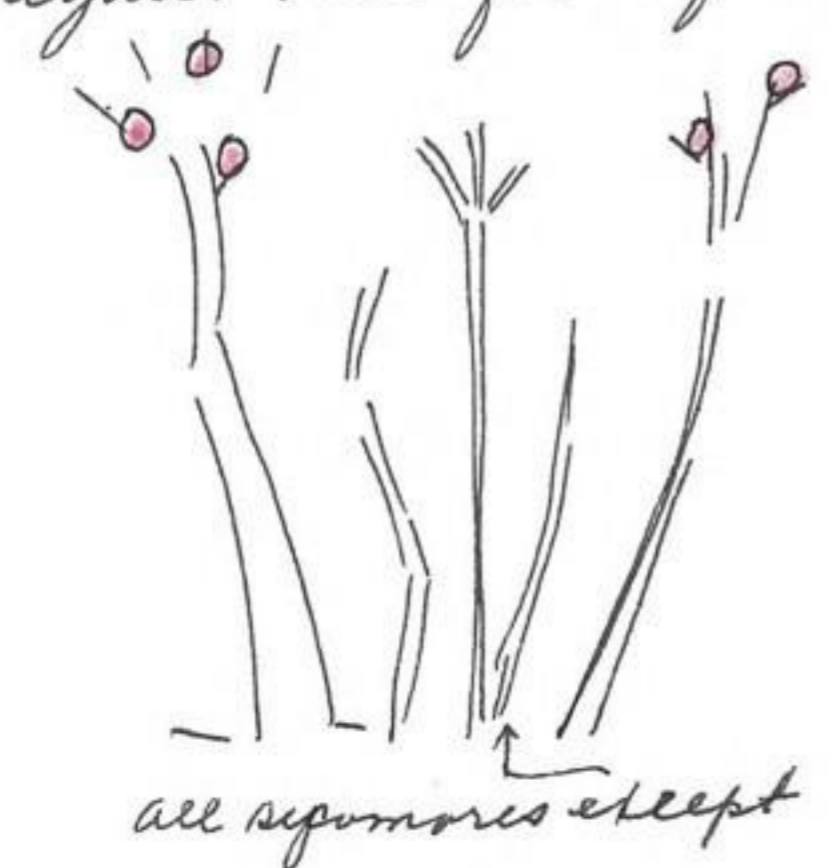


Sky 9:00 A.M. with 100% clouds and strong SW wind. Started census at 9:00 A.M. at S end proposed Clinton Reservoir dam at mileage 31.3. 31.8 meadowlark. 32.5 meadowlark. 32.8

meadowlark. 32.9 meadowlark. 33.7 starling. 34.8 meadowlark. 34.8 horned lark. 35.3 Clinton, 8 Eng Sparrows (center of town). 35.9 3 cowbirds.

36.5 robin, redtail hawk. 37.8 Belvoir Bridge, meadowlark. 37.9 eastern bluebird. 38.3 meadowlark, 2 grackles. 38.7 4 meadowlarks. 39.2 to 5. 39.8 mourning dove, 3-horned larks. 40.0 meadowlark, 3 Eng. sparrows. 40.2 2 blue wing teal, 2 cardinals. 40.4 now to W. 41.1 4 sparrows sp.?, 1 meadowlark, 41.3 redtail hawk, 42.2 2 sparrows sp.?, 42.6 4 corners cross-roads. 42.8 meadowlark, 43.7 meadowlark, Douglas Co line. 44.2 mourning dove. 42.3 to 5. 45.8 meadowlark. 46.3 bridge over Wakarusa. 46.8 Center of Richland. 48.7 starting point on Wakarusa River. Left canoe and equipment here and drove car to next bridge down river (just beyond Elk Creek). 49.2 Woodring Road, 3 grackles, 2 mourning doves. 49.7 meadowlark. 50.4 Elk Creek bridge (over Elk Creek). 51.2 bridge over Wakarusa.

(10:00 A.M.)
 Left by foot back to canoe, travelling along base of hill. Birds observed were titmouse, turkey vulture, cardinal. 10:03 leaving road and travelling W. There is a noticeable noise on edge of plateau to S from high wind blowing trees. Chestnut leaves out to 6 inches in length (7 pedals). downy, song sparrow calling, cardinal, 2 Carolina wrens, 2 chickadees. 10:08 Crossing Elk Creek. Clouds now about 50% of sky. Cardinal. 10:13 Point of rocky ridge (W side Elk Creek Canyon and now along base of ridge. 10:16 major drainage, warbler (gray, eye ring, white belly, outer tail feathers white), 2 titmice, 2 Chickadees. 10:22 2 titmice, flicker, cardinal. 10:23 fox squirrel on ground and seemed unusually tame. 8 species butterflies including large yellow and black swallowtails, ^{of the 8 species} 1 per 30', mainly in forested area. 10:25 edge of field, titmouse, marsh area at SE end dry & no microtine trails. 10:30 hillside service road to feed. 10:22 good ^{dom} sedges and many microtine trails and continues 200' to spring at SW end of field. 10:24 end field & now in timber. 10:38 Cardinal. 10:40 at great blue heron colony on county line. 5 birds on nests. on approach to within 100' of trees they stood up and then on closer approach left, first 2 of them and then about 20 seconds later the remaining 3 left. Two of them departed with considerable contact with branches of the tree. The 5 birds remain in ^{the air to W + N in} area and 2 returned to alight on top branches of the highest tree for a few seconds. The 5 nest were large and placed high in tree. There were no other nests. Directly below nests the ground and leaves were 70% white-washed with excrement, some portion of pattern directly into water of river. deer tracks at base of trees and first ones observed since leaving the car. Turkey vulture, 2 crows, 3 jays and 3 chickadees in immediate area.



680412-22

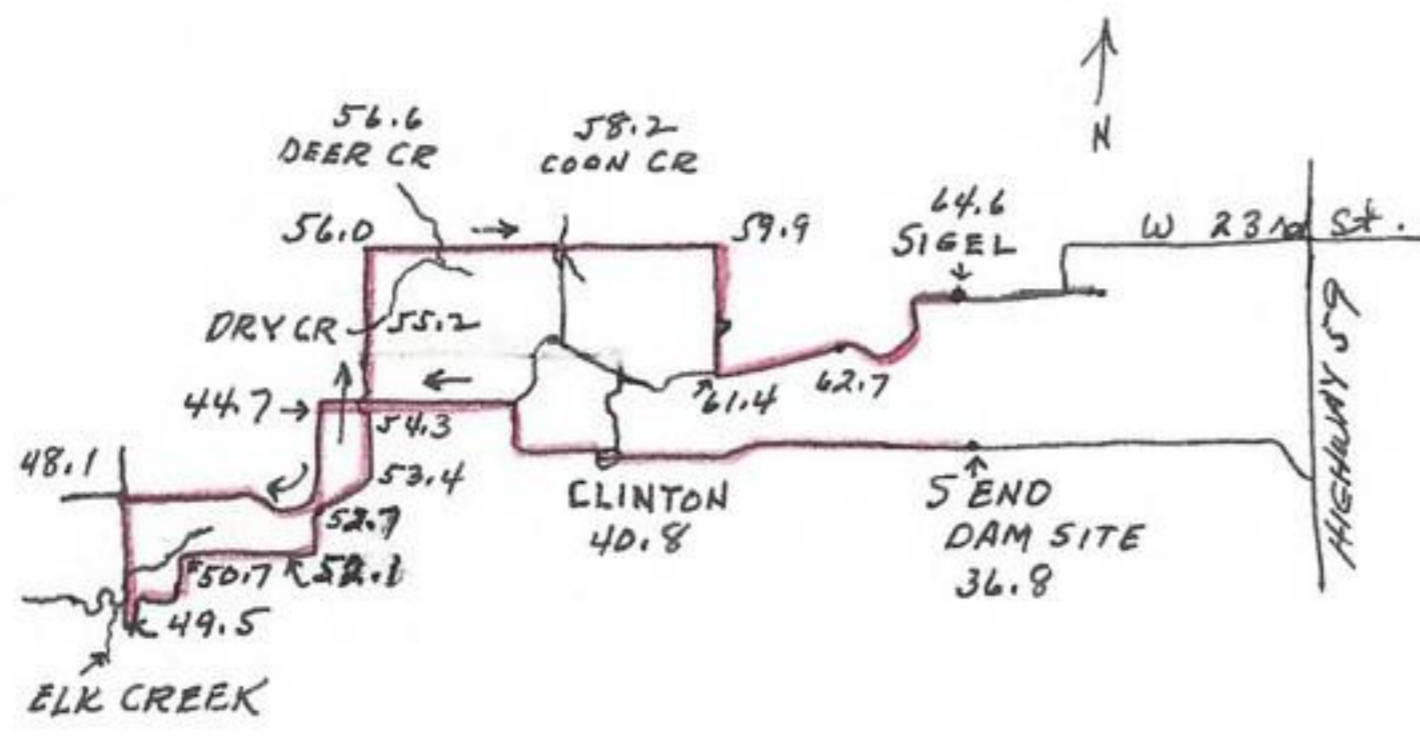
Left 10:48 and continued up river. 10:49 drainage, 3 titmouse, 7 chickadees, warbler sp? . 10:51 8 goldfinch, 1 cardinal, black swallowtail butterfly and first one of this large species observed today, phoebe (far removed from building). 10:54 cardinal, 2 titmouse. 10:56 leaving forested area. 10:57 cardinal, 10:58 cardinal. 10:59 redtail hawk, 2 titmouse, 9 song sparrows. 11:00 creek. 11:01 rocky point of ridge and along open field. 10:02 cardinal. 11:04 mourning dove, cowbird. 11:06 drainage, 2 bluejays, first morning clock butterfly, cardinal, red bellied woodpecker, 3 robins, 5 goldfinch. 11:10 arrived conae. Clearwater out of drainage at this point. Left conae 11:15 Will collect unionid molluscs and will consider them as of the great blue heron colony locality. On bank of river noted 3 2" *Rana pipiens*, 1 *Pseudacris*, 1 *Rana* and 2 chickadees between start and 11:25 period. 11:25 cardinal, yellow-shafted flicker. 11:23 titmouse, 11:28 sprung right. Maple leaves falling into river. 11:32 major drainage left and good flow clear water. Stopped here & left 11:45. 11:53 red-bellied woodpecker, downy, 2 chickadees. 12:00 log jam. 12:02 great blue heron colony again by conae route. All birds on nests and they left sooner than when approach by land. 12:12 at bend and first Louisiana water thrush. 12:15 ♂ & ♀ wood-duck, ♂ flew down stream, ♀ swam and when overcome dove for several times, coming up at edge of river. This ♀ appeared to be injured as it dove rather than escape by flying which they usually do when closely pursued by conae. 12:20 passing by sycamore where on previous years there was a g. b. heron nest. No nest in tree this year. Red-bellied woodpecker. 12:23 W end curve. ♀ woodduck still swimming in front of conae. downy & titmouse. 12:24 chickadee. 12:26 gr. blue heron left edge of river and seemed larger than other bird noted today. Fox squirrel on bank. 12:40 log jam and required portage, 2 titmouse, gr. blue heron. 12:45 on other side log jam. 12:47 titmouse, 2 chickadees. 12:52 end major turn, cardinal, red-bellied woodpecker, chickadee. 1:02 major drainage left. 1:05 S curve. ♂ & ♀ woodduck, both left and were not same pair as previously observed. Downy here. 1:10 2 titmouse, 2 chickadees. 1:20 piracy of river, new channel with 4 foot drop. W segment channel in log jam, E. segment free of logs and only center line of seepage water. Will return later in week and photograph this new channel and abandoned oxbow or hairpin bend. Deer crossing three new channel. Left 1:30. 1:37 2 chickadees. 1:40 drainage right. titmouse, cardinal, Eng sparrow singing and some mile from farm house or buildings, 2 chickadees. 1:45 Elk Creek, 3 titmouse, 2 chickadees, cardinal. 1:47 bridge and point of pull-out of conae. At bridge collected *Rana pipiens* 680412-1. 71 total length, 43 gms wt. 30' from water

There ~~are~~ more log jams and debris in river this year than I remember in previous years. It may be that first spring floods will clear the channel. The wind has been strong and steady and more noticeable in channel than I ~~can~~ remember. One employs more energy and constant attention to loose (salo) than on the Kaw River, especially with the strong and variable wind of today. Loaded canoe on car. This is a good arrangement to place car at destination before starting canoe trip. Left at 2:12 at mileage 51.2. 51.7 to N. 52.1 maw at river. 52.6 3 pairs horned lark, one dropped down to road, in almost perpendicular angle as if it may have been in courtship behavior in air. 53.0 horned lark. 53.1 2 horned larks. 53.2 horned lark. 53.4 horned lark. 53.6 bridge over Wakarusa. 54.2 4 corners & now to E. meadowlark. 54.8 meadowlark & now to N. marsh hawk high in sky. 55.3 meadowlark. 55.6 2 meadowlark. 55.8 now E on main road. meadowlark. 56.6 Belvoir bridge. 57.4 now north thru forest. 58.0 large tree blown across road & so return to main road. 3 crows, titmouse, 2 chickadees. 58.5 back to main road, cardinal. 60.2 Clinton. 60.6 2 lowbirds. 62.0 6 starling. 63.6 grackle. 64.2 S end proposed Clinton Reservoir dam. End of complete census.

Mouth Elk Creek, Wakarusa River, Douglas Co., Kansas

April 14, 1968

Returned to near mouth of Elk Creek ^{with Mary} to photograph case of river stream piracy. Day cool, 40% clouds in sky. Strong wind from NW. Mileage at S end proposed Clinton Reservoir dam 36.8. 37.4 meadowlark, 38.6 meadowlark, 39.2 meadowlark.

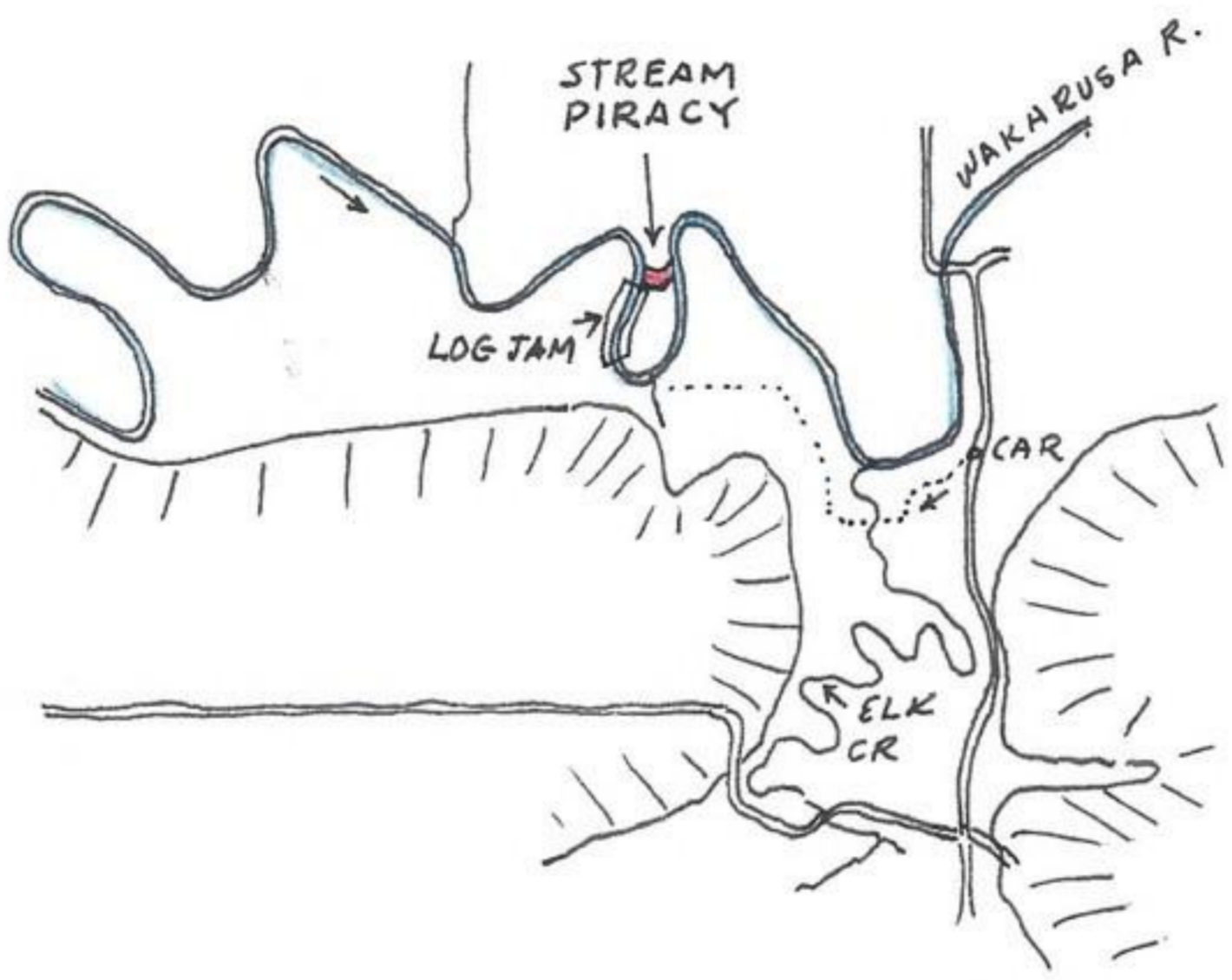


40.1 turkey vulture navigating with difficulty, starling. 40.8 Clinton. Eng sparrows and 3 grackles in town. 41.3 meadowlark. 41.5 meadowlark. 42.1 6 grackles. 42.3 2 Cardinals. 42.8 E bluebird. 43.3 Belvoir bridge. 43.9 meadowlark, 44.0 Cardinal, 44.3 shrike and meadowlark. 44.7 now to S.

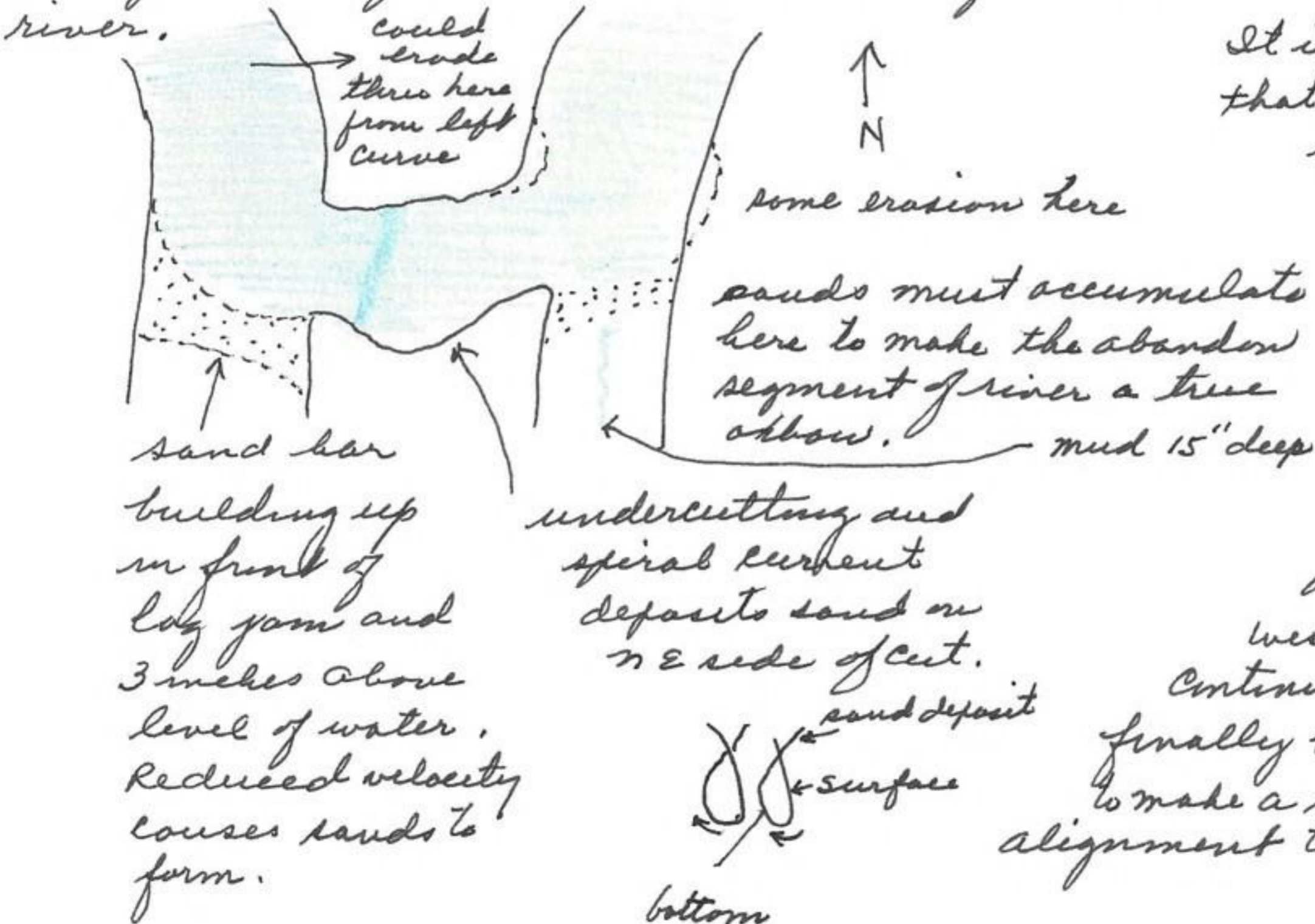
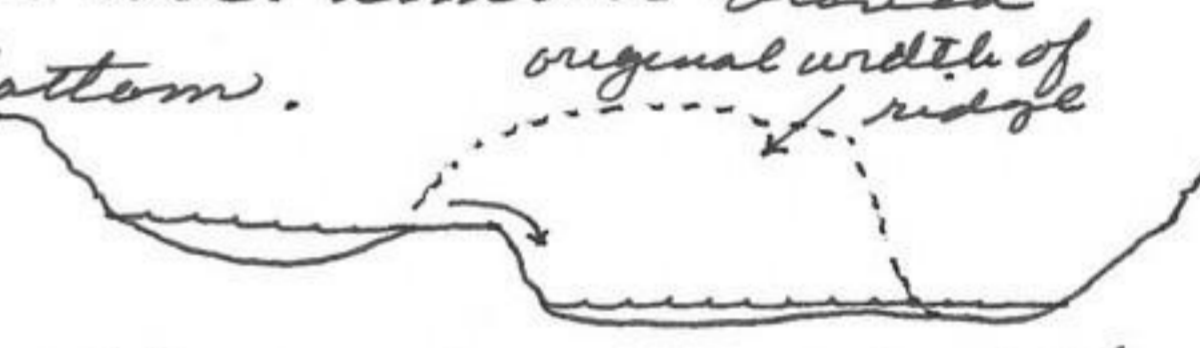
45.2 song sparrow. 45.4 cardinal. 45.5 passing by Harry Kennedy place. 45.8 2 mourning doves, blue wing in pond, cardinal. 45.9 now to W. 46.0 meadowlark. 46.6 drainage from lake to right. 46.9 2 bluejays. 47.2 top hill. 47.4 turkey vulture. 48.1 four corners on sidehill & now to S. shrike here. Shrikes are usually noted at this corner or not far from it. 48.3 Cardinal. 48.4 cardinal. 48.9 bluebird. 49.2 bridge over Wakarusa.

phoebe at bridge, also cardinal. 49.5 stopped on road nearest mouth of Elk Creek. at 2:15^{PM} started for the log jam a stream piracy up Wakarusa river approx. 4/10 mi from mouth of Elk Creek. titmouse and cardinal near road. 2:16 bluebird. 2:20 log jam in Elk Creek. most trees had been cut by man and dumped into creek. Red-bellied woodpecker, cardinal. 2:25 cardinal at second drainage, 8 goldfinch. 2:28 Wakarusa River. 2:30 ^{crossing field to new} end of ^{new} oblow, 2 titmice. 2:36 S end oblow. 2:40 site of stream piracy. 3 titmice.

A turkey vulture flew up and down the log jam and was definitely concerned with the area. The width of the ridge separating the two streams is approx. 100' and the new channel has excavated down to a mud-clay formation and the lip had eroded back some 4/5 of the distance across the



ridge. with further erosion the west limb or branch of the stream will grade to stream bottom. In time the river will grade to level of east segment and should change the aquatic environment of the west segment of the river.



It is speculated that the erosion will continue to S and eventually reform a hair-pin loop in river, or erosion on outside of upper west curve could continue to erode and finally break through to make a straight-line alignment to river course

- Recorded the following photographs (35 mm color)
- 680414-1 S end of Karpin river course at opis, no abandoned. Center of side
 680414-2 Log jam (about middle) shooting ^{stream in center of channel + not to concave} north to stream piracy (new cut bank)
 680414-3 Mary at stream piracy, to E. Original stream to right, now dry. Falls beyond,
 680414-4 Mary at falls of stream piracy.
 680414-5 Stream piracy at falls, from S side
 680414-6 East leg of Karpin bed, now abandoned. Mud knee deep in center
 680414-7 Stream piracy from E side.
 680414-8 " " " " "
 680414-9 Mary at stream piracy; falls in background.

Left 3:45. On flood plain SW piracy channel measured elm tree with circumference of 25 feet. Tree hollow. 10 goldfinch here. 4:00 drainage S end. Titmouse, redtail, 2 chickadees. 4:05 Rocky Point. 4:10 Elk Creek. Titmouse, robin. Car 4:16. Returned Lawrence via valley road. Mileage at bridge 49.8. 49.9 meadowlark. 50.3 to N. 50.7 at Wakarusa. 50.8 bobwhite. 50.9 to E. 51.1 horned lark, 51.5 mourning dove, 2 crows. 51.8 horn lark in road. 52.0 horned lark, 52.1 bridge over Wakarusa, titmouse, mourning dove. 52.2 sparrow? . 52.7 to E. meadowlark. 52.9 2 redwings, 1 meadowlark. 53.2 4 crows. 53.4 to N. 53.6 sparrow sp? . 54.0 meadowlark. 54.2 sparrow?, cardinal. 54.3 main road but continue N. 54.7 shrike, meadowlark. 54.8 meadowlark. 55.2 Dry Creek. 56.0 to E. 56.6 4 starling. 57.1 Deer Creek. 57.6 meadowlark, cardinal. 57.8 8 grackles at farm house. 58.0 2 meadowlarks, 1 shrike, 1 mourning dove. 58.2 Coon Creek, cardinal robin. 58.3 meadowlark. 58.4 meadowlark. 58.6 Clifford Coffman's farm, meadowlark. 58.9 flicker, chipping sparrow, meadowlark. 59.1 2 eastern phoebe. 59.3 Boy Scout ^{Comp} drainage. 59.7 old house. 59.9 to S (past Peterson farm). 60.2 3 meadowlarks. 60.4 meadowlark, crow. 60.7 Rattlesnake Point. 61.4 to E. 62.9 2 crow. 62.0 stomped 200' of rocks in field but no snakes, some Peromyscus nests. 62.6 Cardinal. 62.7 N end proposed dam. 62.8 2 Cardinals. 63.4 "Y" in road. 64.0 cardinal. 64.1 to E, 5 goldfinch. 64.6 Sigel School at 5:05 P.M and end of Census.

Lawrence, Douglas Co., Kansas

April 15, 1968

Noted chimney swift in Lawrence. This is the first one observed this season. Only 3 birds observed. Chipping sparrows have been singing the last 3 days on campus.

April 19, 1968

At noon in rain noted a robin to carry material to nest in red pine just N of Hall Laboratory of Mammalian Genetics.

* Wakarusa River, Douglas Co., Kansas
April 23, 1968

Wakarusa River crested at noon at 25.3 feet (Dutton Bridge).
Flood stage is 27 feet. The Kaw reached a peak of 13.1
early in morning. Flood stage is 18 feet.

(insert) April 24, 1968

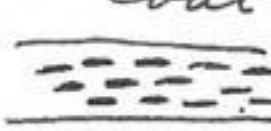
Wakarusa River is back to 12 feet today. Kaw is 12.3.
First Baltimore orole observed today!

April 19, 1968 Douglas Co., Kansas

28 cedar washings on campus.

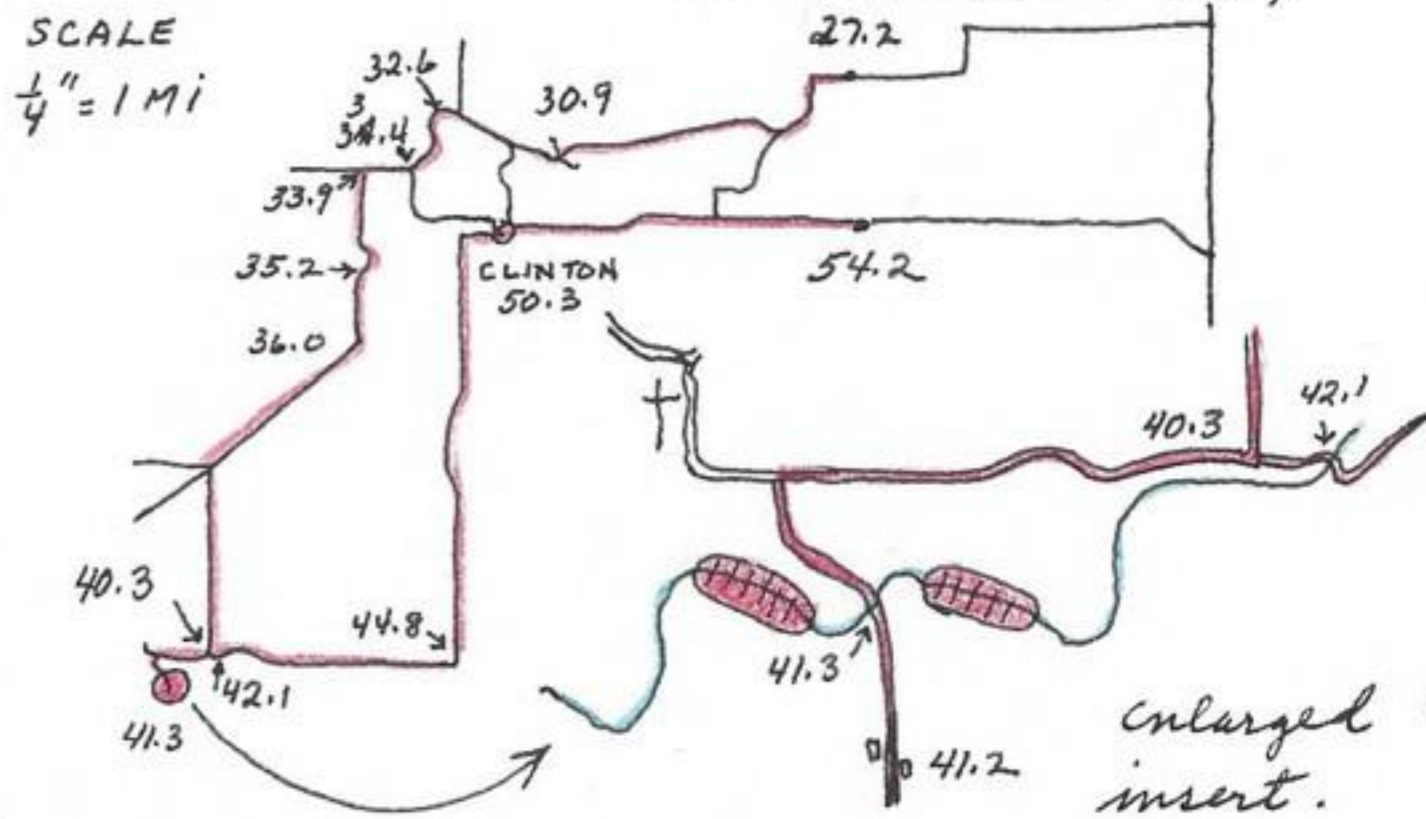
Rock Creek, Douglas Co. Kansas

April 21, 1968

Mary Pauline and I made census of Wakarusa drainage and collected unionids in upper Rock Creek. Day overcast and rain scheduled for this P.M. Enroute to Sigel noted a redtail and Swainson hawk. Sigel 27.2 mileage at 11:05. 27.5 meadow-lark and cardinal. 28.3 redtail circling. 28.4 Y in road. Eng. sparrows at cattle pens, cardinal. 28.6 Creek with clear water. 29.0 3 turkey vultures. 29.1 N end proposed dam. 29.3 savanna sparrow. 30.0 redtail circling on hill to N. 30.3 2 crows. 30.4 passing Peterson Road. 30.9 Wakarusa bridge, water 3 feet above usual level, cardinal. 31.4 savanna sparrow, meadowlark. 32.2 turkey vulture at Patton Bridge, cardinal, 8 grackles. 32.4 2 blue jays, cardinal, titmouse. 32.6 to S thru forest. phoebe, cardinal, titmouse, chipping sparrow, downy. 33.1 yellow-shafted flicker. 33.4 main road, cardinal. 33.6 bluebird. 33.9 to S. 34.2 2 horned larks. 34.5 2 blue jays far from woods or trees. 34.7 savanna sparrow. 35.0 base of hill, bluebird and cardinal. 35.2 top hill, chipping sparrow. 35.5 5 cowbirds. 35.9 2 blue jays. 36.0 main road. 36.1 2 blue wing teal in pond. 36.4 redtail, sparrow hawk, meadowlark. 36.8 Crow, meadowlark. 37.7 2 meadowlark, meadowlark, cowbird, meadowlark. 38.1 meadowlark, 2 cowbirds. 38.4 savanna sparrow, Crow. 38.6 meadowlark. 39.3 meadowlark, Chipping sparrow. 39.5 cardinal, blue jay. 40.3 Rock Creek, now to right. 41.2 farm yard, turned around and back to creek. 41.3 Rock Creek crossover (11:45 A.M). Collected series of unionids below and above crossover. no 680421-1. Coal seam well exposed. Fossil tree with different marks , rather than ^{leaf} scars. This is one of the interesting rock exposures on creeks.

Left 12:50. 42.1 ^{abandoned} old river bridge ^{site}. Phoebe nest with 6 eggs. Blue jay in area. 42.8 redtail. 42.9 meadowlark. 43.4 meadowlark. 43.7 meadowlark. 44.8 now to N.

45.3 meadowlark. 45.5 meadowlark. 46.7 bluebird. 46.0 crow, 2 grackles. 46.3 2 meadowlarks, killdeer. 47.2 mockingbird. 48.1 Rock Cr. bridge. 49.1 3 cowbirds. 49.4 main road, shrike. 49.8 to E, shrike, meadowlark. 50.2 12 grackles. 50.3 Clinton. 50.4 robin. 50.8 sparrow hawk. 51.2 starling. 51.6 meadowlark. 52.2 2 mourning doves. 52.9 Rock Creek, meadowlark, cardinal. 53.5 meadowlark. 53.7 2 grackles (at house). 53.8 meadowlark. 54.2 S end proposed dam. End complete census.



April 23, 1968

680423-27

The following Unionids are of general acquisition, some of which were among a miscellaneous assortment of shells not accepted by the Smithsonian Institution at the time the K.U. collection was transferred (1967) to that institution.

- 680423-1 Proptera purpurata
- 680423-2 Ligumia recta latissima Coffeyville
(Verdegis River), Montgomery Co., Kansas.
Collected by R.E. Scammon, March 22, 1909.
- 680423-3 Unionerus tetralasmus Crooked Creek,
1/2 mi. W Fowler, Meade Co., Kansas. Aug
30, 1941.
- 680423-4 Ibid.
- 680423-5 "
- 680423-6 "
- 680423-7 Unio curvieri Orleansville, Algiers, Africa
Oct. 1899.
- 680423-8 Unio complanatus. Chenango River, New York.
- 680423-9 Proptera alata Marias des Cygnes River,
Pomona, Franklin Co.,
Kansas.
- 680423-10 Megalonacis gigantea Neosho River,
(NW 1/4, S30, T29S, R21E.) Neosho Co., Kansas
Aug 23, 1957.
- 680423-11 Same as above and same no. Heaviest shell in coll.
- 680423-12 Megalonacis gigantea Neosho River,
2 mi. W St. Paul, Neosho Co., Kansas.
- 680423-13 same as above
- 680423-14 Quadrula cylindrica White River, Arkansas.
Collected by R.E. Scammon, April 15, 1909.
- 680423-20 Lasmigona complanata Marias des Cygnes, Lyon Co., Kansas.
Aug. 7, 1956.
- 680423-21 Crenodonta peruviana. Marias des Cygnes,
Franklin Co., Kansas. Aug. 15, 1956.
- 680423-22 Lampsis anodontoides Neosho River,
Allen Co., Kansas. Aug. 1957.
- 680423-23 Unionerus tetralasmus Crooked Creek, 1/2 mi.
S. Franklin, Meade Co., Kansas.
- 680423-24 ibid
- 680423-25 Anadonta grandis Crooked Creek, 1/2 mi.
S. Fowler, Meade Co., Kansas. Aug. 30, 1941.
- 680423-26 Proptera purpurata Neosho River, Logan
Co., Kansas. Aug. 1956.

- 680428-28
- 680423-27 Proptera alata Maras des Cygnes,
Franklin Co., Kansas. Aug. 1956
- 680423-28 Megalonasa gigantea Oswego,
Cherokee Co., Kansas. April 1950.
- 680423-29 Proptera purpurata Neosho River, Coffeyville
Co., Kansas. Aug. 1957.
- 680423-30 Crenodonta peruviana rastrofata (peruviana
intergrade). Maras des Cygnes. Franklin
Co., Kansas. May 1960.
- 680423-31 Quadrella metanerva Neosho River,
S. mound, Neosho Co., Kansas. April
1950.
- 680423-32 Fusconia flava Neosho River, Lyon Co.,
Kansas. Aug 1956
- 680423-33 Proptera purpurata Neosho River, Chetopa,
Labette Co., Kansas.
- 680423-34 Gastrocopta rograndensis. Silvertin,
Brewster Co., Texas.
- 680423-35 Lampsilis splendidus Allamaha
River, Georgia.
- 680423-36 Plagiola lineolata Neosho River,
Osage, Cherokee Co., Kansas. April
1950.
- 680423-37 Obliguaria reflecta Neosho River,
Cherokee Co., Kansas. Aug. 24, 1957
- 680423-38 Fusconia undata Spoon River, Illinois
- 680423-39 Truncella truncilla Pottawatomie Creek,
Lane, Franklin Co., Kansas. Feb. 23, 1950
- 680423-40 Hawan murusculus Wabash River,
Indiana.
- 680423-41 Proptera purpurata
Neosho River, Neosho Co., Kansas. Aug 23, 1957.
- 680423-42 ibid.
- 680423-43 "
- 680423-44 Quadrella quadrella
Maras des Cygnes, Osage Co., Kansas. Aug 14,
1956.
- 680423-45 ibid
- 680423-46 Lampsilis radiata siliquaidea White River,
Stone Co., Barry, Missouri. April 24, 1909.
Collected by R. E. Scammon.

- 29
- 680423-47 Lampsilis radiata siliquoides. Kansas, unspecified.
- 680423-48 Actinonaias carinata. White River, Garfield, Arkansas. March 25, 1909. Collected by R. E. Seammon.
- 680423-49 Ibid.
- 680423-50 Tritogonia verrucosa. Neosho River, Lyon Co., Kansas. Collected by James W Bee
- 680423-51 Ligumia subrostrata. Wakarusa River, NW Clinton, Douglas Co., Kansas. JW Bee
- 680423-52 Unionicus tetralasmus Patters Lake, University of Kansas, Lawrence, Douglas Co., Kansas
- 680423-53 Ptychobranchus fasciolaris White River, Arkansas. Collected by R. E. Seammon March 25, 1909.
- 680423-54 Actinonaias pectorosa. Duck River, Tennessee, March 24, 1909. Collected by R. E. Seammon
- 680423-55 Plagiola lineolata. Ohio River, Ohio. April 14, 1909. Collected by R. E. Seammon
- 680423-56 Fusconia undata. White River, Barry Co., Missouri. April 14, 1909. R. E. Seammon.
- 680423-57 Cyclonaias tuberculata. White River, Benton Co., Arkansas. April 14, 1909. Collected by R. E. Seammon.
- 680423-58 Leptodea fragilis Wakarusa River, Lawrence, Douglas Co., Kansas. March 30, 1909. Collected by R. E. Seammon.
- 680423-59 Quadrula pustulosa. Neosho River, 2 mi. W and 2 1/4 mi. N Emporia, Lyon Co., Kansas.

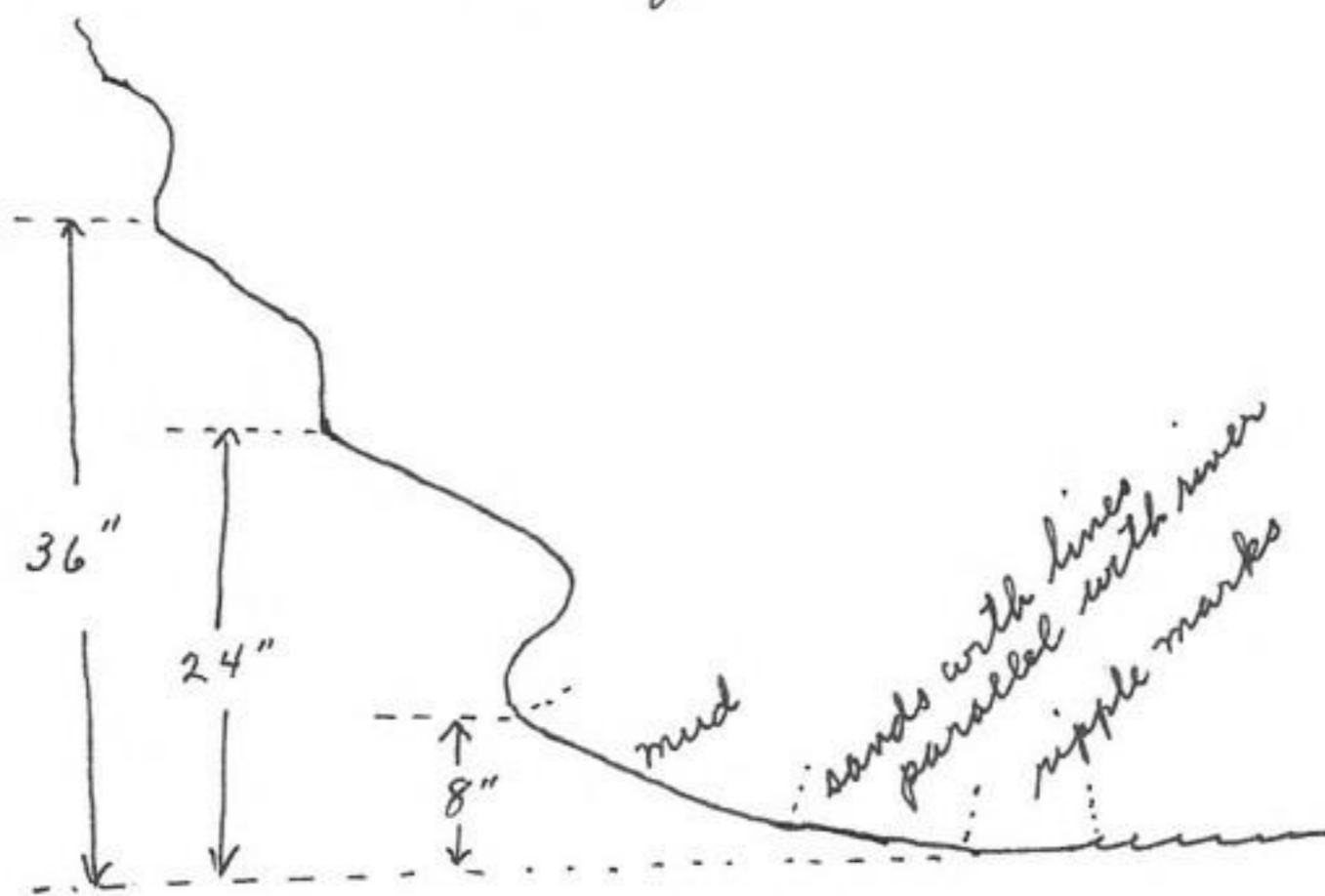
(Cont. next page)

- 680223-60 Obliquaria reflexa. neosho River, 2 1/2 mi. Sand
 1 3/4 mi W Jola, Allen Co., Kansas
- 680223-61 Lasmigona complanata nw Clinton, Wakarusa
 River, Douglas Co., Kansas. James W Bee
- 680223-62 megalonais gigantea marais des Cyres River, Kansas
- 680223-63 megalonais gigantea marais des Cyres River,
 Kansas. James W Bee
- 680223-64 Ligurnia recta marais des Cyres River,
 Kansas. James W Bee
- 680223-65 Amblema marais des Cyres River,
 Kansas. James W Bee
- 680223-66 Lampsilis ovata ventricosa. neosho River,
 Labette Co., Kansas
- 680223-67 Unio merus tetralasmus Crooked Creek,
 S Fowler, meade Co., Kansas. James W Bee
- 680223-68 Amblema marais des Cyres River,
 osage Co., Kansas. James W Bee
- 680223-69 Proptera purpurata Verdigris River, Kansas
 James W Bee
- 680223-70 Proptera purpurata neosho River, neosho
 Co., Kansas James W Bee
- 680223-71 Unio merus tetralasmus El Dorado, Butler
 Co., Kansas.
- 680223-72 Lampsilis ventricosa marais des Cyres River,
 Franklin Co., Kansas. James W Bee
- 680223-73 megalonais gigantea marais des Cyres River,
 Franklin Co., Kansas
- 680223-74 Anodonta grandis Crooked Creek, S Fowler,
 meade Co., Kansas. James W Bee
- 680223-75 ibid.
- 680223-76 Leptodea laevissima north River, Coffey Co.,
 Kansas.
- 680223-77 megalonais gigantea marais des Cyres River,
 Osage Co., Kansas. James W Bee
- 680223-78 Tritogonia verrucosa Salina, Saline Co.,
 Kansas James W Bee
- 680223-79 megalonais gigantea marais des Cyres River,
 Osage Co., Kansas. James W Bee

Kaw River, Lawrence to Eudora, Douglas - Leavenworth Cos., Kansas

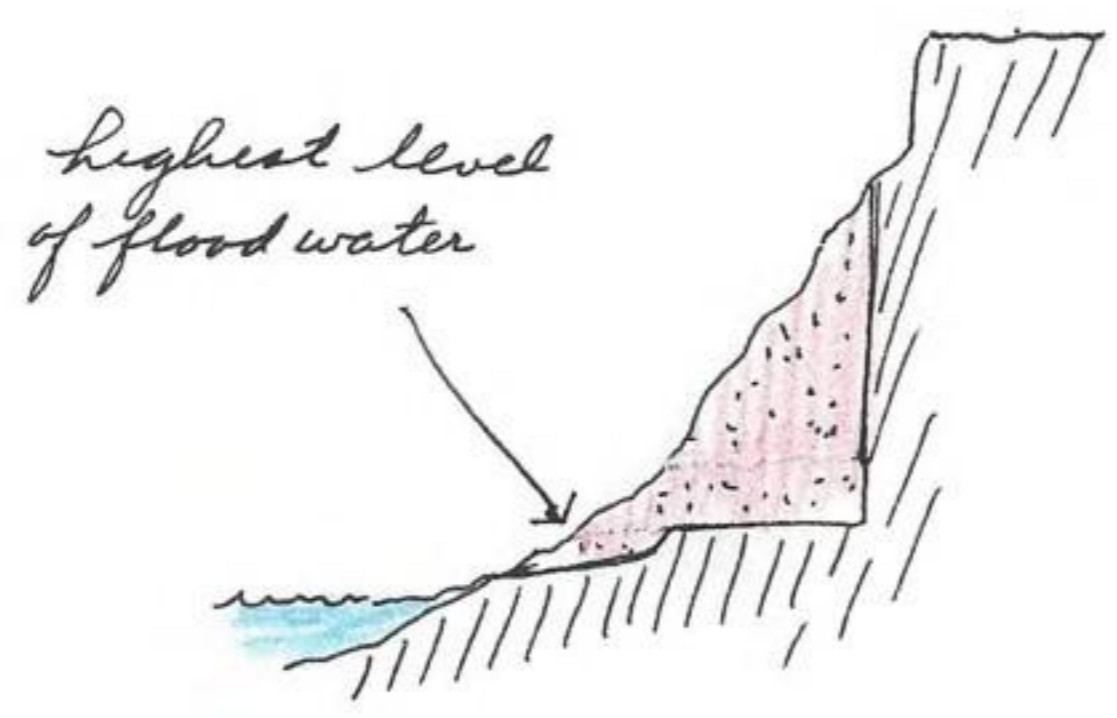
April 27, 1968 (see page 26 for April 24, 1968)

made solitary ^{conoe} trip from bridge at Lawrence to bridge on Waterusa north of Eudora. Left 9:18 A.M. Air temp 64°F, water 56°F, both in shade. Birds calling in riparian community including pewee. 9:30 a spotted sandpiper left bank of river and started to fly down stream along edge of river when a great horned owl left from an overhanging tree. At that moment the sandpiper changed course abruptly toward center of river and then turned and flew up stream. It called loud at the time of initial contact with the owl. In approximately 30 seconds, 2 crows flew π across river and started to harass the owl which had alighted about 200' down river. The crows were followed by a sparrow hawk and finally a robin voiced its protest. 9:46 Outlet from Fmc plant. A brilliant green mass is associated with the discharge. Since the rain of April 23 the water has lowered approx 36 inches. The profile of bank is as follows and is constant along the entire river course. The upper and lower level were most deeply eroded; the middle level, least so. The upper and lower level shows evidence of being formed by carp with recessed concavities. Most places show root systems. 10:12 passing under high voltage power line. Birds observed so far include: 8 blue jays, 13 cardinals, 20 titmice, 2 flickers, 3 mourning doves, 6 chickadees, 7 grackles, 2 crows, 1 great horned owl, sparrow hawk, pewee, yellow warblerlike call, 2 hairy woodpeckers, 1 downy. 10 carp have jumped out of the water so far. Beaver tracks common and runway over bank profile of high water of April 23. Have ^{right} been drifting with current since utility line 10:12. Slight head-on wind and variable. No frog calls in area π side where heard last trip. 10:30 5 bluejay flew across river from π to south followed by 2 redtails flying on same altitudinal level. After checking two trees the jays returned to π side. They call vigorously while flying between trees but have subdued call while searching in trees. Flicker drumming. Can hear 3 groups of bluejay in various directions, all identifying by vigorous calls. Still floating with current. 10:39 bank swallows excavating hole in first set of sand cliffs since major damage from right. These cliffs are approx. 400' long between stands of riparian trees. These swallows call continuously at ex-



10:18 opposite drainage ^{right} ~~left~~ bank swallows excavating hole in first set of sand cliffs since major damage from right. These cliffs are approx. 400' long between stands of riparian trees. These swallows call continuously at ex-

Excavation site. When I approached to within 150', they left and returned in 3 minutes. They are silent when they leave the cliffs, but call occasionally while flying beyond the nesting site. They travel in a group and sometimes completely disappear from sight. When they return to nests they by-pass the holes several times before stopping, at which time the calling begins and is continuous and vigorous. They never remain at nests for prolonged periods but leave periodically. My presence, call of spotted sandpiper ^{and blue jay} ^{tree} were ~~the~~ external factors that caused them to leave, all other times I could not account for. Birds in holes leave about 3 seconds after main group departs, which is in unison. Some remain in nests from one group approach to another approach. Departure is always by dropping down from nest. Generally two birds are at hole, one inside and one outside. I have observed 5 in one hole. Excavations from deep holes to holes just slight concavities in the bank. Area marked by white sand below nesting holes. Sand being excavated is damp & darker than associated sand. The site consisted of 38 holes in various stages of completion and all within approx 20 linear feet. 6 other holes about 15 feet beyond. There were no other holes in sand cliffs. The number of birds in area was 4 times the number of holes. Two birds alighted on ^{exposed branches of a} submerged tree, 8 feet away. 10:07 beaver activity, and bark cleaned from trees that had fallen into water, (N side). 11:14 spotted sandpiper on log in middle of river. Wind now of velocity to slow canoe so will assist by paddling. 11:16 spotted sandpiper. 11:20 Harris sparrow. 11:30 dead snapping turtle on bank, head upstream and on belly. It measured 28 inches total length. Flies attracted my attention to this turtle. State of decomposition would place it as a victim of last flood. 11:39 dead beaver in water, ♀, 48 inches total length. State of decomposition more advanced than turtle. 11:42 Copsize Point. This area is gradually being eliminated by erosion. The profile of cliffs upstream from Copsize Point on S side is reformed by last flood (April 23) and cliffs are perpendicular and beach is broad. The sands and clays that had sloughed off during the winter are now removed and clean sands of original banks are exposed. This area supports



the highest and most perpendicular cliffs in this stretch.

11:53 2 spotted sandpipers. 11:55 at entrance of channel. Several small trees have eroded into river. An American Coot feeding on N side of river some 50 feet from shore. Observed first large turtle on log. About 8 inches & flat (green).

11:58 beaver house and activity across from entrance of mud creek. area has always been a favorable place for fish as indicated by surface activity and would be a excellent place to swim.

12:00 680427-32 at bend and The inside bend of this



12:08 beaver house on bank and cut trees. On bank in concavity in sun (N side) was a pilot black snake. When disturbed it reacted aggressive with open mouth and forward movement. This aggressiveness has never been demonstrated under normal land conditions and may be a result of the intruder ^{making} approach from water. This snake measured ^{3000 mm} 51 ^{mm} body length and ^{194 mm} 7 1/2 inches tail. No weight taken. 100 feet below this snake (downstream) was a Natrix, sunning on partly submerged log. On approach it left to water and disappeared.

12:18 ♂ redwing flew across river from S to N to investigate. 2 spotted sandpipers. These are not duplicates of previously observed sandpipers. 12:22 end of growth on island. 12:38 a northern waterthrush was feeding among willows on beach. It proceeded the cone for about 150 feet and toward the last allowed me to approach within 15 feet. This bird is noticeably smaller, less aggressive, more warblerlike in movement in its inspection of surroundings than is the *Louiseva* waterthrush.

12:40 passing major drainage ^{at} to left. 12:52 spotted sandpiper. 12:53 several trees with new leaves eroded into water. 1:05 rock pile in center of river and beginning of diversion canal to left. Beaver tracks all along N side river in mounds of last flood. 1:07 stopped to check for Indian artefacts on broad exposure of sands + gravel (N) and selected set of unusual rocks. Left 2:05.

2:13 bend of river at point. A natrix was swimming up river at edge and investigating small pools. It dove and did not resurface. 2:24 8 bank swallows building nests on east side of drainage entering river. 100 These nests are



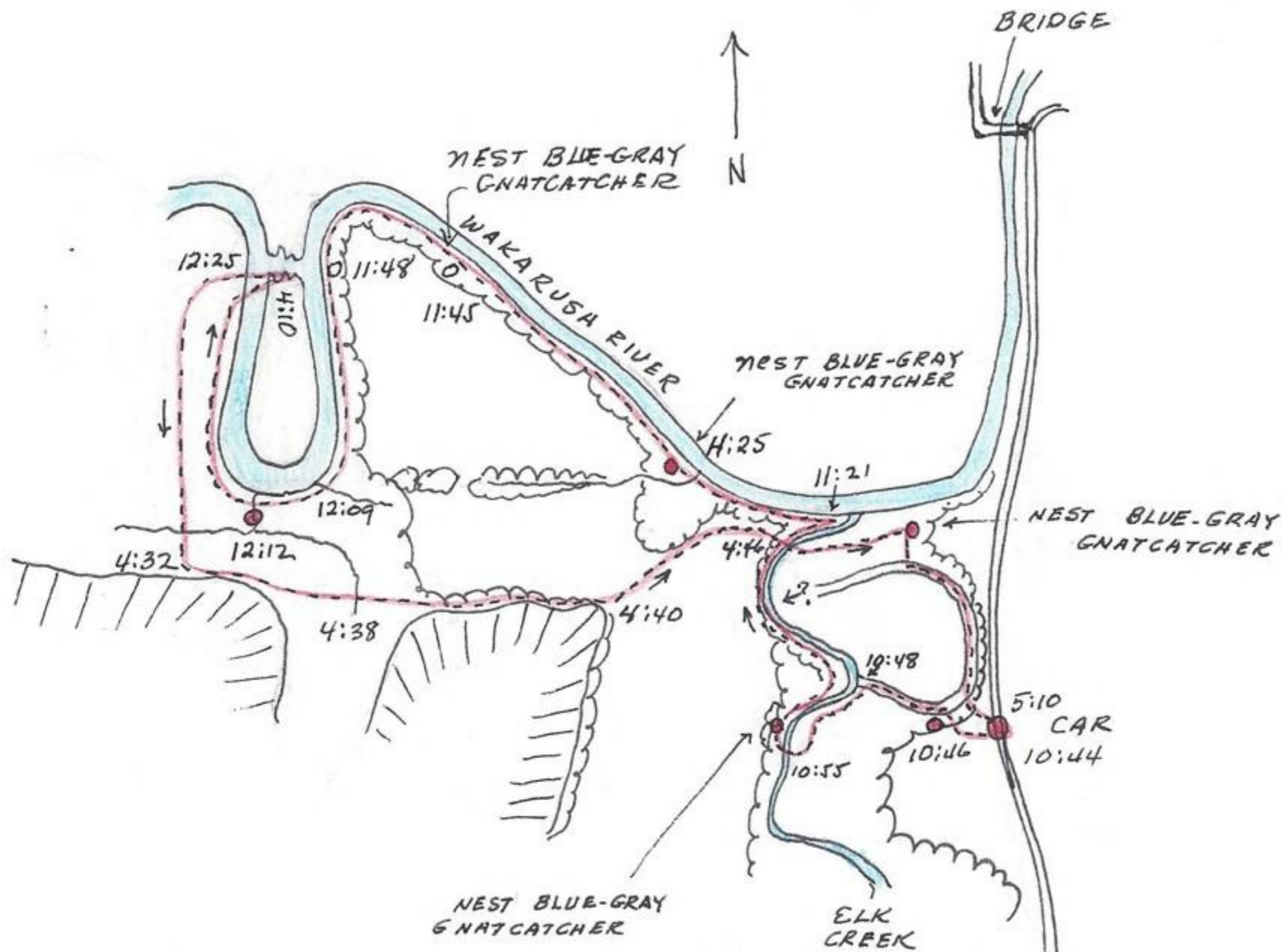
approx 100 up stream from double drainage entrance (island of trees). 2:29 first of lowland trees. 2:32 ♂ white throated sparrow. Raccoon tracks common. Air temp 68°F, water 60°F. 2:36 end tract of trees, now ears. 2:43 first rock harrier. 2:53 Am. Coot. trees on right side look like a tornado damage. Bridge 2:57. Picked Chris up here and left 3:15. 3:18 Coot on upper erosional bank and one in river. 3:30 spotted sandpiper. 3:30 15 trees eroded into river. 3:33 mouth Wakarusa. Depth water 1/10 mi up stream 12 feet. Arrived bridge 3:55.

Wakarusa River. Apr 4/10 up stream from mouth Elk Creek, Douglas Co. Kansas.

April 28, 1968

Checked stream peracy on Wakarusa River to see what effects the recent flood (April 23) had upon the new channel. Made complete census between Sigel and Elk Creek. Day clear in morning, slightly hazy and slight wind. Sigel at mileage 47.4 at 9:48 A.M. 47.6 meadowlark. 47.8 2 bobwhite. 47.9 now to S. 48.4 meadowlark, 48.5 ♀ in road. ♂ Eng. sparrow and 2 starling at cattle pens. 48.8 14 blue jays in one group. They call continuously and especially loud between trees. 48.9 eastern bluebird on fence post and always flip to ♀ when passing. 48.9 2 blue jays. 49.2 6 blue jays. 49.3 ♀ end proposed dam (old site). Cricket frogs calling along roadside. 51.1 Wakarusa Bridge. Water uniform brown and above normal level (receding from storms of 23rd). There is not the cloudy formation of silt as is found in lower Wakarusa near Eudora. Cardinal and lowbird at bridge. 51.3 5 bluejays (there is an unusually large number of jays this A.M., and all calling vigorously). 51.6 meadowlark, chipping sparrow. Hillsides dull yellowish-brown in contrast to dark greens of riparian trees along Wakarusa. 52.1 lowbird. 52.3 meadowlark, 52.5 passing by Patton bridge. 52.7 18 goldfinch and distributed along the hillside for 300 feet. 52.8 now to S thru forest. 53.7 titmouse, 2 chickadee. 53.4 2 chickadees, titmouse. 53.6 main valley road, titmouse. 54.0 ♂ redwing. 54.4 Belvoir bridge, titmouse and cardinal. 54.8 meadowlark, 54.9 meadowlark. 54.9 2 barn swallows. 55.0 Chipping sparrow. 55.2 3 meadowlarks. 55.3 2 meadowlarks. 55.5 2 meadowlarks. 55.8 ♂ redwing, eastern phoebe. 55.9 redwing. 56.0 meadowlark. 56.3 2 lark sparrows. 56.6 4 starling, 3 Eng sparrow, meadowlark, 2 lowbirds. 56.7 ♂ redwing. 56.9 2 lark sparrows. meadowlark. 57.0 4 crows, housing come via Kennedy farm road from main road. 57.2 little green heron in water at edge of road, cardinal. 57.3 Cardinal, titmouse. 57.7 dramage, red headed woodpecker. 57.9 redtail, Chipping sparrow. 58.2 titmouse. 58.3 top hill. 58.4 redwing. 58.5 lowbird. 58.6 12 ♂ redwings in on flock, 2 lark sparrows, meadowlark. 58.7 2 meadowlark, lowbird, Chipping sparrow. 59.1 meadowlark. 59.2 4 crows on side of hill, now to S. 2 meadowlarks. 59.7 redtail, 2 crows, Chipping sparrow. 60.1 Chipping sparrow, cardinal. 60.4 bridge over Wakarusa. 60.8 stop. Left car ^{10:44} and travelled to site of stream peracy. at car titmouse, cardinal, lowbird. 10:46 2 cardinal bluejay, blue-gray gnatcatcher with nest 1/2 complete, in elm

20' high (nest) and about 1/2 way to top of 40' high tree. 680428-34
 redtail, warbler sp.?. 10:55 Elk Creek crossing at log jam. at



crossing noted a song sparrow showing territorial behavior with head feathers erect and concerned with my presence. Singing and nesting behaviour is apparently accomplished on winter grounds. mud nearly to top of upper erosion level. Erosion tracks common and at all levels. Lower mud level knee deep. 10:58 2 Cardinals ♂ + ♀ and 6 blue jays passing to N. 3 ♂♂ and 1 ♀ lowbird in courtship. 11:01 Blue-gray gnatcatcher and nest. Birds disclose nest by their actions, calling continuously and visiting nest. Both birds at nest (30' diameter). One had 2 inch down feather of an owl (g. horned?) and lost control but regained before it floated to ground. nest walls 100% complete and being lined with down. Outside of nest covered with a grayish lichen. Nest 20' high on outer edge of tree on west side. Both birds left nesting area at one time and flew E ago across Elk Creek (150') away and did not call there. Left nesting area 11:12. 11:13 Titmouse, cardinal. 11:15 Chickadee at nesting hole. 11:17 at edge of forest noted a lark sparrow, redbellied woodpecker, pewee and titmouse. 11:21 mouth Elk Creek. 11:25 mouth drainage, nest of blue-gray gnatcatcher, elm. 30' high, in 40' tree. 4 blue jays, titmouse, Eng sparrow singing and nesting in trees along Wakarusa some distance from habitation. The mud at mouth of this drainage is knee deep with semi-solid creek bottom.

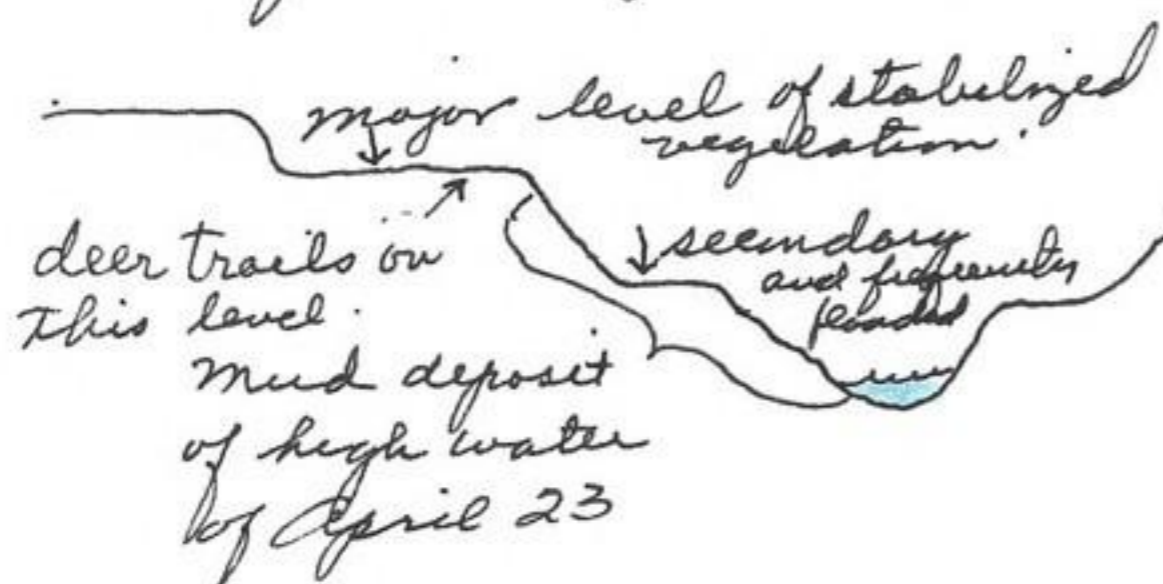
It is almost impossible to extricate boots from this mud when firmly secured.



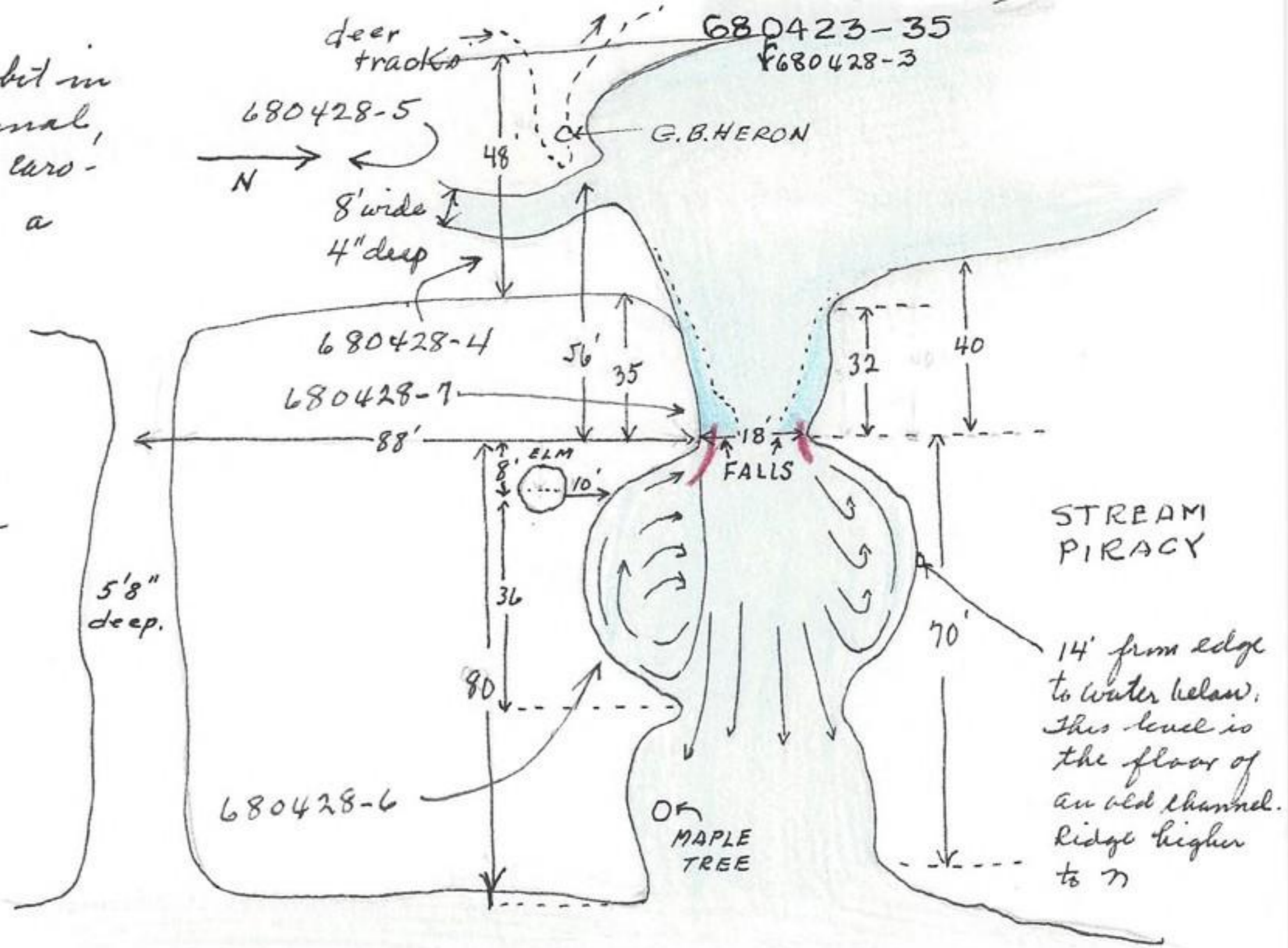
11:35 cottontail rabbit in dense growth, cardinal, titmouse. 11:36 2 Carolina wrens. 11:38 a ♂ + ♀ cardinal.

Deer trail on upper erosional level and is consistently used. Approx 4 individuals had passed by and plants still bent. This level is always preferred to valley level or lower erosional levels of the Wakarusa.

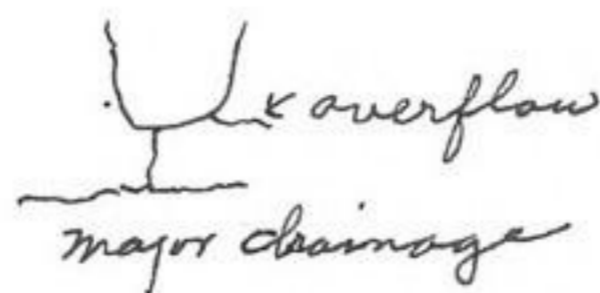
Tracks large and trending upstream. There are at least 4 pairs of English sparrows using natural hole in trees for nesting purposes. Red-bellied woodpecker in area. 11:45 blue-gray gnatcatcher nest in upper 4/5 level of 45 foot high maple trees. Leaves just starting on maple. Nest in center of tree. The territory is broader in cases where nests are placed high in trees. nest 1/5 completed and bird active in nest construction. 11:48 on east side of stream piracy. Great blue heron on sand bar on west side of piracy. It left upstream. Red-bellied woodpecker and titmouse in area. While preparing to photograph piracy from east side a great blue heron arrived and alighted on sandbar on west side of piracy. A large carp was observed to jump into falls on left hand side but unsuccessfully. The log jam in channel on east side had been removed but logs on extreme bank to east still remained but readjusted since last high waters on the 23rd. Erosional levels along river of one major bench and one secondary ones.



Left area at 12:00 and continued up stream of abandon channel. Mud level continues and channel with water but debris from log jam beyond has not passed down this channel. Deer continue up



stream but always keeping out of mud zone. ^{Raccoon} tracks on all levels although one generally assumes they follow edge of stream. 12:08 fence posts ^(old) as if to form a trap. Birds uncommon here. Redbellied woodpecker, 12:09 first overflow channel at bend. 2 chickadees. 12:12 major drainage to left. Water clear and enters from what appears as semi-permanent flaw. Redbellied. Captured a *Hyla versicolor*



approx. 20' up drainage

from entrance into Wakarusa. This *Hyla* no 680428-2 was completely green and measured:

It was 3 feet

from water and among forest growth 1 foot high among trees.

5 bluejays passed to N. 12:20 titmouse, chickadee. One can hear noise of fall at peracy from here. 12:22 white-throated sparrow

at edge river. Redbellied woodpecker calling. The log jam is in tact and has not been dislodged. Minor accumulations have been added. This was surprising but explainable by peracy

by-pass. High water lined the abandoned channel as in main river. Swainson thrush (2), one called. Arrive west side

peracy at 12:25. 3 sets of fresh deer tracks in mud down to small channel and then return to continue up stream. These are the same tracks that I followed since just beyond entrance of Elk Creek. Photo 680428-3 of peracy channel from W to E.

Small channel into abandon channel now 8' wide & 4' deep and flowing. Solid bottom. Photo 680428-4 of west side of peracy with branch reticulum frame. Sand bar & channel can be

seen. Photo 680428-5 of log jam shooting downstream. Photo 680428-6 of falls to west. Photo 680428-7 of carp jumping into falls. (1000 sec.). Also 680428-7? ^{Werp from same area} Carp, ranging in size from 1 foot to 3 feet,

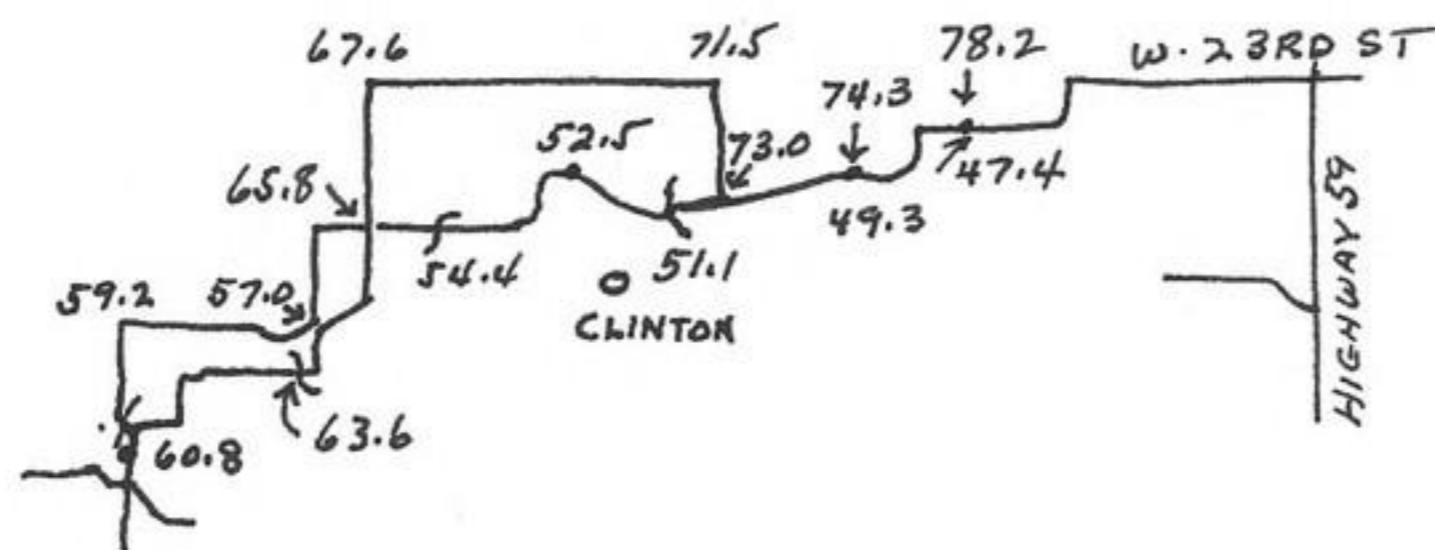
passed over falls at the rate of one per 3 minutes, either very conspicuously by jumping clear of water or by forcefully swimming against the current entirely underwater. One fish jump 8 feet

out of water (arc) but in opposite direction. Several (7) jumped into bank at side of falls, one into me as I prepared to photograph

them. 1/2 of the attempts were misfires. In the 3 hrs & 45 minutes at falls observed approx. 75 attempts at gaining passage of fall of which 2/3 of them were successful. The water above falls, except on sides is down slope but relatively smooth to edge. Beyond falls the circulation of water is down. a stick (3, approx 1 foot passed by in 3 hrs & 35 min) disappeared

below falls and reappeared in middle of pool, then circulated to left and returned to edge of falls and disappeared again to reappear and move to right hand circulation of pool to move to edge of falls. Water arriving at edge of falls is forcefully churned into general agitation of water directly below falls. White water to beyond first pool. Counted number of maple seeds passing over falls. They passed by at all points but mainly in center and on a frequency of 16 in first 5 min; 23 in next 5 min. and 12 in third 5 min. Wind perhaps 1 or 2 miles per hour. The only bird to pass thru peracy channel was a Louisiana waterthrush (at 2:50 and flew upstream). 2 Cardinals flew higher thru area. One group 5 bluejays passed N up old abandon segment of river. The steep sides of the pool below falls prohibits passing of raccoon, or terrestrial mammals. There was no sign of muskrat or beaver concerned with the immediate area. Measurements of peracy on 2 pages back and these can be compared to changes made on future erosion from major flood periods. It is recommended that a fish station should be placed across the Wakarusa to determine movement of different kinds of fish. Left 4:10 P.M. 4:12 fox squirrel. 4:15 cardinal, 2 great crested flycatcher, downy. In this area there is a broad slope from west to east and populated with some rather old and very large trees. 4:25 titmouse. 4:28 a titmouse was calling from top of tree in a modified 3 note call. It called from same stationary position without even turning body for a period of at least 5 minutes. Movement below this bird did not distract it. 4:30 turkey vulture. 4:32 base hill and now on trail. 4:33 Swainson thrush singing with characteristic ascending call. 2 bluejays. male ~~titmouse~~ ^{summer} Tanager gave three calls. 4:38 main drainage, cardinal, deer tracks moving E. 4:40 rocky pt. 4:43 cardinal, 3 bluejays. 4:46 crossing log jam. Large stump with center splinter on W side. Northern waterthrush here. Continued to field, thence along an elevated and abandoned drainage system of Elk Creek, thence to car, arriving 5:10 P.M. Left at mileage 60.8. passing by bridge at 61.2, cardinal. 61.5 lark sparrow. 62.0 8 Harris sparrows. 62.1 now along Wakarusa, cardinal. 62.13 now E, savanna sparrow. 62.5 horned lark. 62.7 small bridge, cardinal. Valley slope to S in grass native grass and apparently being related with heavily grazed slope to east. 63.0 horned lark.

63.1 3 mourning doves. 63.6 Wakarusa bridge, 5 bluejays, 2 cardinals. 64.0 meadowlark. 64.2 row to E, at 4 corners, 4 barn swallows, 1 redwing. 64.6 5 ♂ redwings, 2 cardinals, meadowlark. 64.9 to N. meadowlark. 65.0 meadowlark. 65.2 flicker. 65.4 2 meadowlarks. 65.6 3 cottontail rabbits in 200' of linear road. 65.8 main valley road and continuing N., cardinal. 65.9 2 2 grackles feeding together, 2 mourning doves, 3 meadowlarks. 66.0 meadowlark. 66.4 eastern bluebird, meadowlark, mourning dove. 66.5 meadowlark, Killdeer. 66.7 Dry Creek, 4 barn swallows, meadowlark. 66.9 loggerhead shrike. 67.0 loggerhead shrike. 67.2 meadowlark. 67.9 cardinal. 67.6 row to E. meadowlark. 67.8 meadowlark. 68.0 2 meadowlarks, bobwhite calling. 68.2 2 ♂ redwings. 68.4 3 ♂ redwings. 68.5 5 crows, 2 Harris sparrows. 68.6 Deer Creek, cardinal. 68.9 meadowlark. 69.1 redwing, meadowlark, starling. 69.3 sawbird, 2 mourning doves, meadowlark. 69.6 mourning doves, meadowlark, robin. 69.9 Coon Creek, redwing, 4 Harris sparrow, 5 blue jays. 70.0 2 meadowlarks. 70.1 meadowlark. 70.2 Coffman farm. 70.4 meadowlark. 70.6 cardinal, 70.7 phoebe, 70.9 Bay Scout drainage, cardinal. 71.0 2 savanna sparrows. 71.3 old pioneer house (no attempt to preserve). 71.5 meadowlark, bluebird, row to S past Petersons. meadowlark, flicker, 71.8 meadowlark. 71.9 meadowlark, 72.1 meadowlark. 72.4 Rattlesnake Point. bobwhite calling. 72.6 meadowlark, crow. 72.8 meadowlark. 73.0 row to E. Killdeer at pond. 73.7 3 ♂ redwings. 73.8 savanna sparrow. 73.6 2 redwing, mourning dove. 74.3 N end dam. 74.8 cardinal. 75.1 ♀ in road. 3 barn swallows. 75.4 2 cardinals ♂ & ♀. 75.9 cardinal. 76.0 2 meadowlark, crow. 76.1 meadowlark. 78.2 Sigel School House at 6:15 P.M. and end of complete census. This time of late afternoon has produced a decided increase in bird activity over mid afternoon period.




ROUTE TRAVELLED FOR
ROADSIDE CENSUS.

One mile E of Sigel noted a vesper sparrow flycatcher which was the first one observed this year.

Kaw River, Douglas Co., Kansas

April 30, 1968

Measured circumference of several cottonwood trees approx 2/10 mi. NE of Lawrence City waterworks. These trees are part of riparian forests along the edge of the river. They measured 15', 9'10", 14'8", 18'6", the latter a double tree with solid base.  All measurements chest high. A tree on north side of river about 300' E of N end of bridge over Kaw, measured 11'6".

Lawrence, Douglas Co., Kansas

May 1, 1968

Photographed 2 fish collected by Gerald Smith and Richard Kachw; photo 680501-1 N.G. from Beaver Dam Wash near mouth of Virgin River, Mohave Co., Arizona.

Photo 680501-2 N.G. from meadow Valley Wash, Lincoln Co., Nevada.

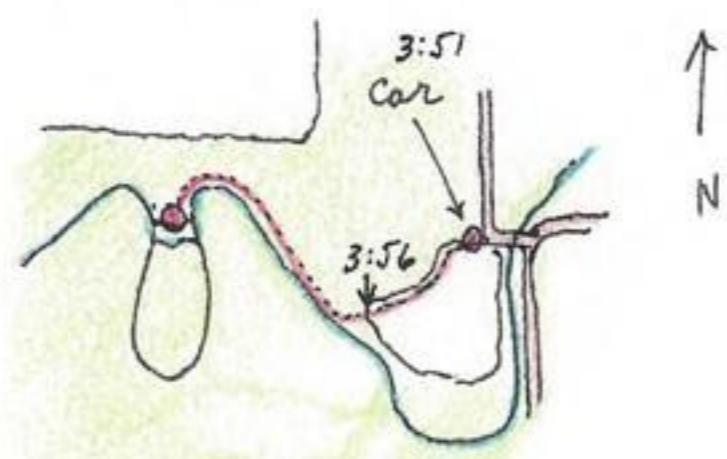
Wakarusa River, approx 4/10 mi up stream from mouth Elk Creek, Douglas Co., Kansas

May 2, 1968


Inspected stream peracy on Wakarusa River. made complete census to area, following precisely the route of April 28, 1968 (see route of that date) mileage 27.9 at Sigel School. Day hazy, no clouds, temp 90°F, strong wind from S. Cold front predicted this P.M. (late). Time 3:22 P.M.

29.1 I in road. 29.8 N. end proposed dam. High wind keeping birds down. 31.0 Killdeer at ephemeral field pond at Peterson Road junction. 31.4 2 crows in field. 31.5 bridge over Wakarusa. 31.7 swanna sparrow. 32.9 by Patton Bridge. 33.0 Chipping sparrow. 32.2 to S thru forest. Cardinal. 33.6 Cardinal, 33.8 Cardinal and titmouse, 2 blue jays. 34.0 main valley road. 34.8 Belvoir bridge. 35.2 2 grackles. 35.5 redwing. 36.1 8 redwings in dispersed grouping, 1 meadowlark. 37.3 have left main road & now at 4 corners and to W.

The trees on the sidehill are about same as riparian forests along river except with more yellow. 38.0 drainage from lake to right. 2 redtails, Killdeer. 38.3 bluejay, turkey vulture. 38.5 out of river valley and top of hill. 39.5 4 corners on hill and to S, turkey vulture. 39.7 bluebird (all bluebirds are eastern). 39.9 crow. 40.5 bluebird and chipping sparrow. 40.6 bridge and parked car on west side. will make approach to stream peracy by N side of river. Left car 3:51, cardinal



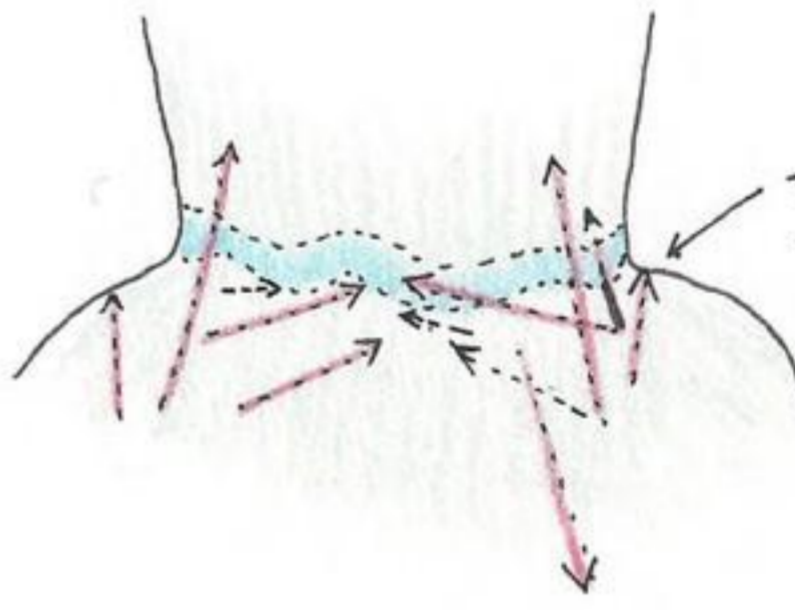
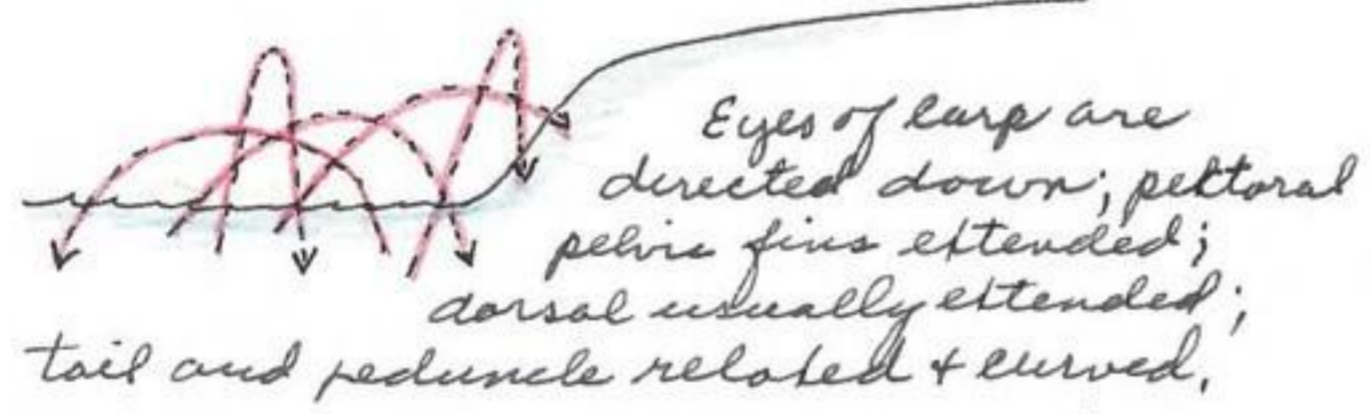
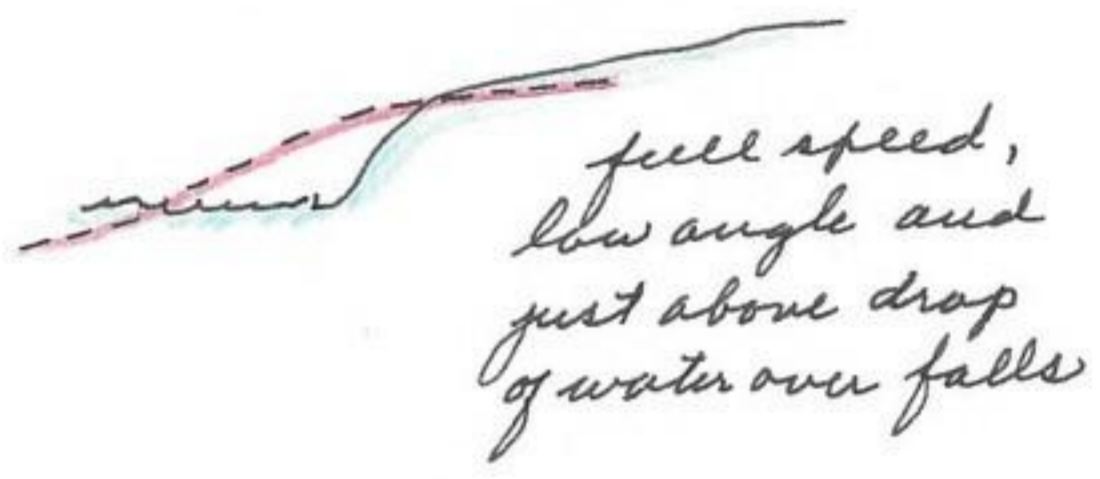
3:56 into trees, 2 cardinal, Eng sparrows calling. 3:58 elm on upper first erosional level 116 inches in circumference. 4:00 cardinal, blue-gray gnatcatcher. 3 bluejays. 4:04 2 mourning doves.

Terraces:

1. best developed and steepest trees.
2. less developed and legjams frequent.
3. variable

4:05 3 bluegays, Eng sparrows calling. 4:08 arrived N side of falls of stream peracy. Will photograph fish and make general observations. Maple seeds passing over falls at approx. 30 per second and mainly on south side falls. Pool below fall kept clean of seeds but beyond the seeds collect in compact groupings around and in front of branch barriers in river.

and 680502-3. ^{to 680502-7} ~~Three~~ photos of carp. 680502-1, 680502-2, and 680502-3. Water continuous across falls from bank to bank and no bottom exposed. Carp jump falls in a variety of ways. The best and most successful is this:

Fish attempting to swim directly into current are generally unsuccessful. Most successes are at edge of falls on either side. Variations are:



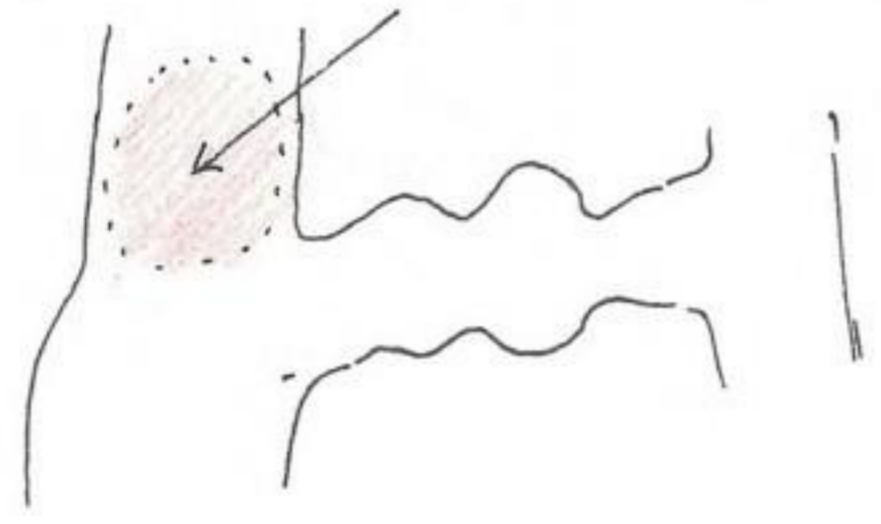
full speed, low angle and just above drop of water over falls. sides worn smooth by fish contact. When large carp hit here (and elsewhere) the thud is felt on bank 10 away.

The smaller bluegills and sunfish attempted swimming against current but it involved a jump and swim to get them over. In the two hours and 52 minutes at falls would estimate that attempted jumps at the falls and of this number 1/3 were successful in passing the barrier. Two 15 min checks were as follows:

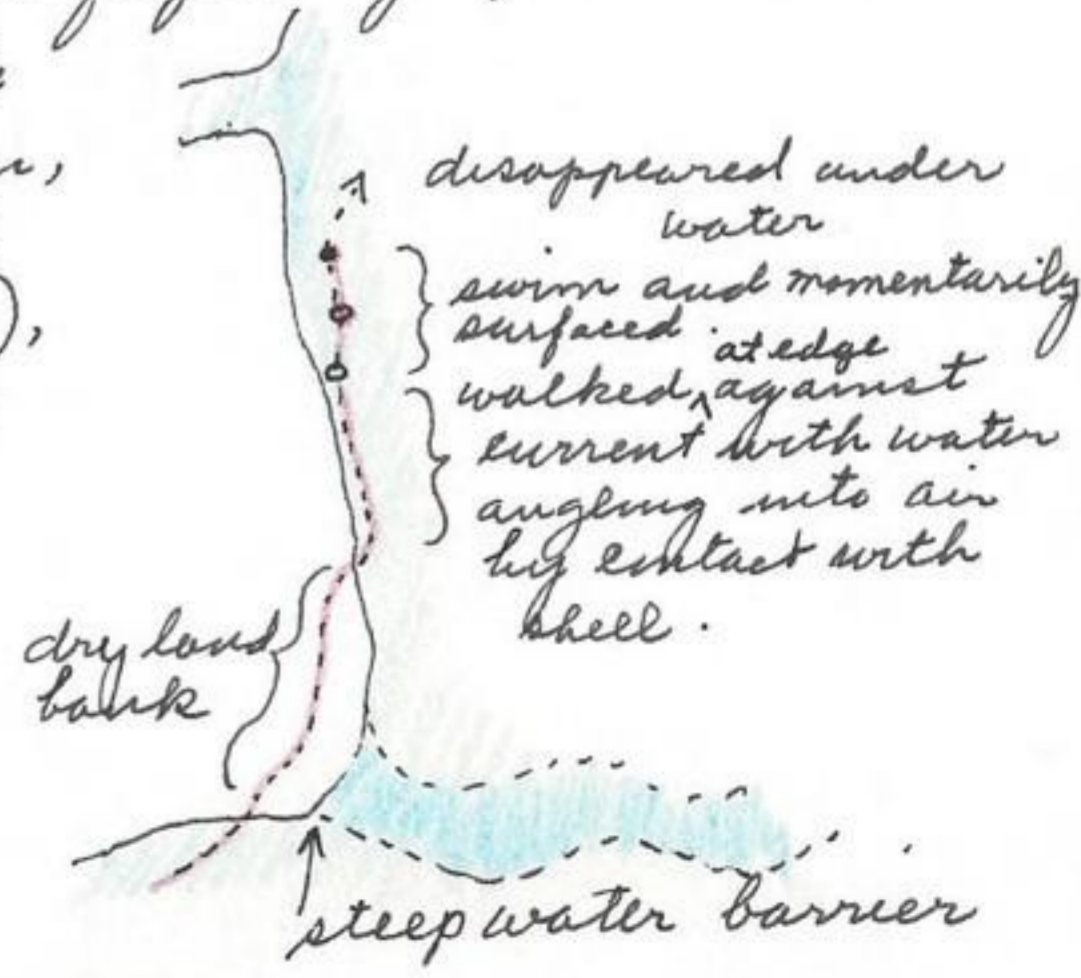
5:45-6:00	26 perch-sunfish size,	1 gar,	19 carp,	3 silver carp-like fish.
6:00-6:15	18 " " " "	0	16 " "	4 " " "

The size of the carp ranged from approx 16" to 3'. The two gar were about 2 feet long and the small fish of all sizes up to 8 inches wide.

The old channel (east limb) is shallow and water 8 feet toward S end. The channel leading into W limb is 3 feet wide and water 2 inches deep. There is considerable turtle action at mouth and channel (east limb), with fast movement of surface waters and air bubbles. The turtles rarely expose body but frequently expose head.



at 5:55 a turtle (flat, smooth, green, small spots, 8 inches (carapace)), gained fall by the following route. This is the only one noted in the approx 3 hrs of observation



disappeared under water swim and momentarily surfaced at edge walked against current with water angling into air by contact with shell.

at 5:45 shadow of trees on w side west limb of river now on falls. 680502-41
at 6:10 maple seeds over falls about 1/3 number, nearly record. at
6:17 a fox squirrel descended w. bank of w limb of Larpus creek
(directly w of piracy stream) and by standing on small branch at
edge of water was able to drink without standing in mud. It
drank for 4 seconds & then left. at 6:35 another fox squirrel
crossed side side of piracy stream from E to W. It moved slowly,
with body held high. It finally crossed west branch of
abandoned stream (on log jam) and disappeared in forest. It would
have been necessary for this squirrel to have original come from
the west bank of the abandoned (west) channel. The only birds
moving across immediate area were 1 cowbird that alighted
in top of tree above channel, called twice & then continued west;
1 group 3 jay that passed N on west bank of west channel;
2 titmouse which passed N to S across falls proper and 2
cardinals passing thru general area from W to E. There were
no birds using the edges of the new piracy channel to move
up and down the stream. Except for the fish, the turtle
was the only vertebrate using new stream course. No beaver, nor
muskrats, spotted sandpipers, g. b. heron used area. There was
no tracks of raccoon or beaver in falls area. Left 7:00 P.M.
and retraced route to car. 7:02 titmouse, cowbird, chickadee.
7:04 redbellied woodpecker, 7:07 redbellied woodpecker. 7:13
♂ & ♀ cardinal. 7:15 white breasted nuthatch ♂ & ♀. Great crested
flycatcher to N beyond river channel (my route on upper erosional level or
that level below the valley level). 7:20 edge open field. In distance
beyond census area can hear cardinal, titmouse, g. c. flycatcher.
mourning dove. 7:25 bluejay. 7:27 car.

Left with car at mileage 40.6 at bridge & continued E. 40.7
2 mourning doves. 40.9 2 meadowlarks. 41.1 2 crows, cardinal,
bluejay and 2 lark sparrow. 41.3 redwing blackbird, savanna
sparrow. 41.5 along river, redtail. 41.7 now to E. Clouds
forming to west and sun will soon be exclude. There are
associated with a cold front. 42.1 small cement bridge.
savanna sp. 42.3 savanna sparrow and horned lark. 42.6
horned lark, 43.0 bridge over wakarusa. 43.4 savanna sparrow.
43.6 to E. 4 barn swallows. 2 mourning doves, meadowlark. 46.7
2 redwings. 43.8 3 redwings. 44.0 meadowlark, 2 ♂ redwings,
44.1 redwing. 44.2 to N, 2 lark sparrows. 44.3 meadowlark,
44.5 cardinal. 44.7 meadowlark (2). 45.0 Chipping sparrow,
Harris sparrow. 45.1 main road and continuing north. 45.2
8 grackles (this appears to be a late evening fledging area for these
birds) 1 redwing, cowbird. 45.3 meadowlark, redwing.
45.6 shrike. 45.7 2 cardinal, meadowlark. Cricket frogs

680502-42

calling along side of road. One frequently hears them along route.
 45.8 flock of 100 blackbirds, sp.? to north. 2 meadowlarks, 46.0
 2 mourning doves, robin. 46.2 2 meadowlarks. 46.2 2 meadowlarks.
 46.4 2 meadowlarks. 46.7 2 bluebirds. 46.8 now to E. meadowlark.
 46.9 meadowlark. 47.2 bobwhite. (8:00 P.M. now) and lights fading.
 47.5 mourning dove, meadowlark. 47.8 Deer Creek. 48.2 shrike,
 meadowlark. 48.4 cardinal, ^{redwing} 48.6 robin, grackle, 2 meadowlarks.
 48.8 shrike (all shrikes have been loggerhead). 48.9 Coon Cr. Cardinal.
 49.2 meadowlark (2), ^{redwing} 49.3 Coffmans farm. meadowlark, cardinal.
 sun gone from vapor trails of high jets and lights fading. 49.6 2
 Cardinals. 49.8 meadowlarks. 50.0 Boy Scout drainage. 50.1
 meadowlark, cardinal. 50.3 3 meadowlarks. 50.6 to S redwing
 cowbird, meadowlark. 50.9 2 meadowlarks. 51.0 meadowlark.
 51.1 meadowlark, savanna sparrow. 51.3 meadowlark. 51.4 Rattle-
 snake Point. 51.6 meadowlark, redwing. 52.1 to E, horned lark.
 52.2 2 redwing, ♂ bluewing teal, savanna sparrow (roadside pond).
 52.5 killdeer. 53.3 N end proposed dam. (8:25 P.M.), cardinal.
 53.9 cardinal. 54.1 cardinal. 54.8 meadowlark. 54.9 meadowlark.
 Sigel School House 55.2 at 8:30 P.M.

Lawrence, Douglas Co., Kansas

May 2, 1968

Photo 680502-5 of vase presented by Dr. Sal Sugar.

Patterson Lake, Univ. Kansas, Lawrence, Kansas

May 2, 1968

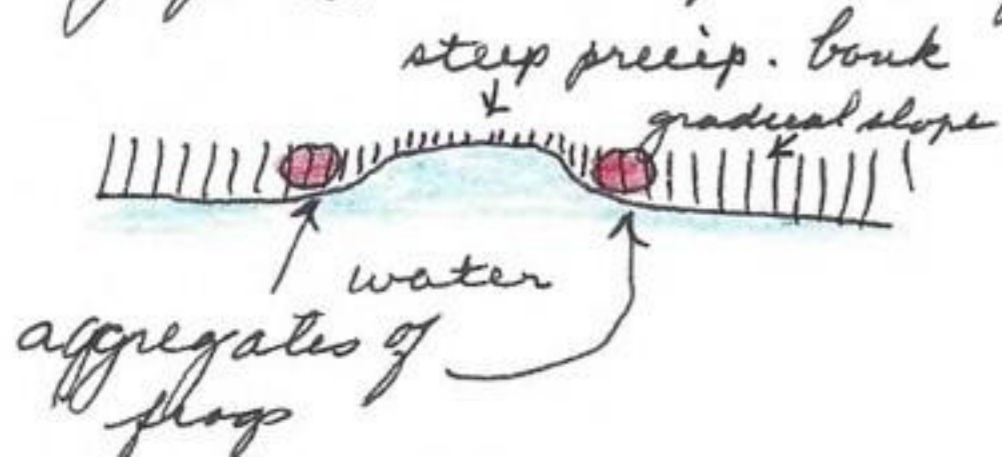
2 eastern kingbirds and flock of pine siskin on campus.

Wakarusa - Kaw River, Douglas-Leavenworth Co., Kansas

May 4 1968

Annette P. and I made canoe trip from Klingman's Crossing, down Wakarusa to mouth, thence to mouth of Soldier Creek on the Kaw River. Left Klingman's Crossing at 9:50 A.M. Water higher than usual summer level. Birds in immediate area, 100' either side of river which is usual delimitation for census work were: cardinal, redbelly woodpecker, vireo sp?, redwing blackbird (field side of riparian growth). 9:55 vireo sp?, titmouse, 3 bluejays, redwing, Baltimore Oriole. 10:00 titmouse, cardinal. 10:03 redwing, bluejay. 10:05 Crow, brown thrasher. 10:06 curve now to extreme left. 10:07 Kingfisher flying high and calling. 2 ♂ Cardinals. 10:09 2 red-bellied woodpeckers, one apparently defending a territory. 10:10 now extreme right hand turn, cardinal, bluejay.

10:11 2 Chickadees, blue-gray gnatcatcher, 4 bluejays. 10:15 vireo sp.?, bluejay, ^{Baltimore Oriole} Titmouse. 10:16 first ripples directly below drainage from right and associated with large drainage also from right. Conae three without touching rocks. No unoids on small island of exposed rocks to left. 3 cardinals, bluejay, spotted sandpiper, vireo, chickadee at these ripples. 10:18 great horned owl left and flew down river. 10:20 cowbird, vireo, Baltimore Oriole, Titmouse, peewee. 10:21 reverse curve. 10:28 6 ~~Cowbird~~ Cowbirds, redwing, bluejay, cardinal, yellow warbler, redbellied woodpecker. 10:30 redheaded woodpecker and red-bellied woodpecker. 10:38 bend. bluejay, cardinal, mourning dove (2). 10:40 10 goldfinch, cardinal, Swainson thrush calling, fox squirrel slowly investigating bank. Chickadee. 10:40 5 bluejays, major cliff outcropping (Tongoussie sandstone). Ripples easily negated. beaver tracks all along route. wind starting to blow. Cowbird. (spotted sandpiper, same as the one first observed). 10:48 cardinal, Swainson thrush, bobwhite called. 10:40 3 bluejays. Rana pipiens, Pseudacris and small Rana catesbeiana along bank and increasing in numbers and activity. 10:55 3 bluejays flew by and in 1 minute 2 more. muskrat swimming in water, yellow-shafted flicker. 11:03 ♂ + ♀ Baltimore Oriole. 3 Chickadees, 15 grackles, 2 redwings, 2 cowbirds, vireo sp.?. 11:08 mourning dove, 11:12 4 bluejays, 3 Chickadees, Titmouse. 11:21 grackle, Cowbird, Baltimore Oriole, 3 Chickadees. One Rana pipiens? at edge of hole into which it retracted as we approached. 2 mourning doves, redtail. 11:27 raccoons had excavated shoreline level (8 inches above present level) for approx 200 linear feet. 11:30 Cliffs, with lower level covered with ^{bullet} green moss. 8 cedar-wormings, 3 grackles, redbellied woodpecker, cardinal. Noted a flycatcher with bars, eye ring. Indigo bunting, Chickadee. 10:35 Cardinal, 2 bluejays. 10:40 Chickadees, Baltimore Oriole. 10:52 spotted sandpiper. 3 bluejays, cardinal, Chickadee, Titmouse. Redheaded woodpecker. 11:54 drainage from right Chickadee, cardinal. 5:58 low sloping rock exposure, blue jay, redbellied woodpecker, spotted sandpiper. ^{Collected} 680504-1 to 680504-6 frogs by moving conae along edge of river where frogs would jump off of bank into conae. It would estimate that Rana pipiens were 1 per 20 feet. In favorable places they would aggregate ~~and~~ in numbers of 4 to 10. These frequently on either side of bank barriers such as perpendicular bank.



12:10 highway bridge across Waharusa. Eng sparrow only birds at this busy crossing. 12:10 cardinal. 12:11 g. horned owl left trees and flew down river and alighted in tree overhanging river. 3 robins attacked the owl. Titmouse, 2 cowbirds, Baltimore Oriole, house wren. 12:15 2 robins, 6 grackles, cowbird, redwing, brown thrasher. 12:18 great crested fly. Beaver have eaten bark from cottonwood that tk had eroded into stream since April 23. 12:21 Baltimore Oriole, 3 bluejays. 12:21 Carolina wren, cardinal, 2 robin. The maple is the dominant tree along edge of river. 12:26 Railroad bridge. Baltimore Oriole, 3 robins, 2 phoebe. 12:29 Baltimore Oriole, cardinal. Old bridge piling have formed a barrier, catching debris. 12:33 Baltimore Oriole, redbellied woodpecker, Titmouse. 12:42 Cowbird, cardinal, 3 grackles. small natrix swimming across river, one large adult approx. 60' beyond. The adult was working ^{in water} among branches of a fallen tree and when approached it surfaced and expanded body and then with a quick jump forward dove under water. 12:50 downy woodpecker, Eng. sparrow, green heron. 12:53 Baltimore Oriole. 12:56 bridge W of Eudora. 8 goldfinch in top of tree, 3 bluejays, 2 chickadees. 4 grackles, Baltimore Oriole. 12:58 30 English sparrows at wood or sectioned tree dump. also one mourning dove and 4 ♂ redwing blackbirds. 1:08 Eudora sewage, Titmouse, redheaded woodpecker, Natrix in water, 3 grackles. 1:12 first large bullfrog (5 inches body). It was lifted from mud & water at edge of river and only after about 10 seconds did it jump from puddle. Kingfisher flying high. The two Kingfishers noted so far have been flying high. 1:20 2 cardinals. 1:23 ♂ woodcock. It flew down river into Kaw. Titmouse, chickadee & Baltimore Oriole. 2 large flat turtles. There has been other turtle activity in lower reaches of the river. 1:30 2 spotted sandpepers. 1:32 Baltimore Oriole. Arrived mouth of Kaw River at 1:35 and because of strong NE wind, landed to N side of Kaw and stopped on ^{head of} high sand cliff (1:40) for lunch. At this point collected 2 toads. nos 680504-12 and 680504-13. They were within 3 feet of each other and were the only toads along 200 of edge of river examined. They jumped into water and immediately swam to shore and unlike frogs, gained sand bank instead of remaining in the water. Left 2:20 with strong wind. 2:30 first duck call of season. It was singing from a tree on right bank just before large single tree on same bank. Fought wind to N curved and then by following on N side river were free of wind. Utelily lines crossing river in middle of bend at 3:15. 3:17 railroad bridge ^{and drainage} to left. 3:20 Coot left bank, flew out into river and return to bank some 200' down river on same side. 3:28 3 sandwing.

They were feeding on wet sands of a sand bar and 3 feet from water. 3:30 A great horned owl was noted alighting in a tree and drainage entrance to left. It was awkward in adjusting to position. As we approach it flew S across river and carried a pilot blacksnake in its claws. The snake was held by its body and midsection. The owl alighted in a tree on S side, again awkwardly.

3:31. Mouth drainage where owl was first noted. 3:38 18 nests of the bank swallow. Nest on new bank slip. 3:39 first of large trees on bank. 3:40 rocks in center of river. 3:44 log jam and ♂ & ♀ woodduck in left channel. Noted a Baltimore Oriole on steep sand bank 100' from trees. An eastern Kingbird on log jam.

4:00 15 gadwalls, 6 bluewing ^{and flew down river} in one flock on S side river on sandbar at edge of river. Gadwalls left, teal remained.

4:08 ~~East~~ ^{South} end of bend and arched railroad bridge. A ♂ red-wing on down tree in middle of river. 4:30 approx 350 nests of bank swallow on south side of river on high-long sand cliff exposure. These nests were of one aggregate. Nests were being excavated but delayed departure of many birds after main group left cliffs would indicate nesting birds. The upper level was most extensively used and will be the more permanent slope in case of flood waters. At one moment as we rounded by, the greater number of swallows flew slowly overhead in close formation and nearer to our heads than normally and for about 8 second seemed to show an aggressive behaviorism toward the intruder.

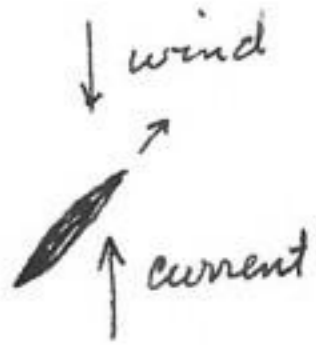
4:38. 13 avocet, 2 spotted sandpipers, 4 gadwall ducks and 13 bluewing teal were together on edge of sandbar island (main channel side). The gadwalls left first, then the teal, then the spotted sandpiper. The avocets remained and as we approached to within 40' they all moved from the shallow water to the edge of the sandbar and remained there until we were within 30' to 20', at which time they all left, with first vocal call and flew slowly and gracefully and in formation down the sandbar to alight some 150' beyond. They preformed exactly the same way on our approach and when they left they flew in formation out ^{toward} into the river and thence up river past the house. Their confident nature and dignity of flight is not the behaviorism of local fauna. They remind one of a tropical pattern of behaviorism.

4:46. beaver swam toward bank house. 4:58 mouth Soldier Creek. Continued up creek to railroad + car bridge arriving at 5:10. Wind still strong and on one occasion it caught the side of the house and forced it across the surface of the water. Wind have the



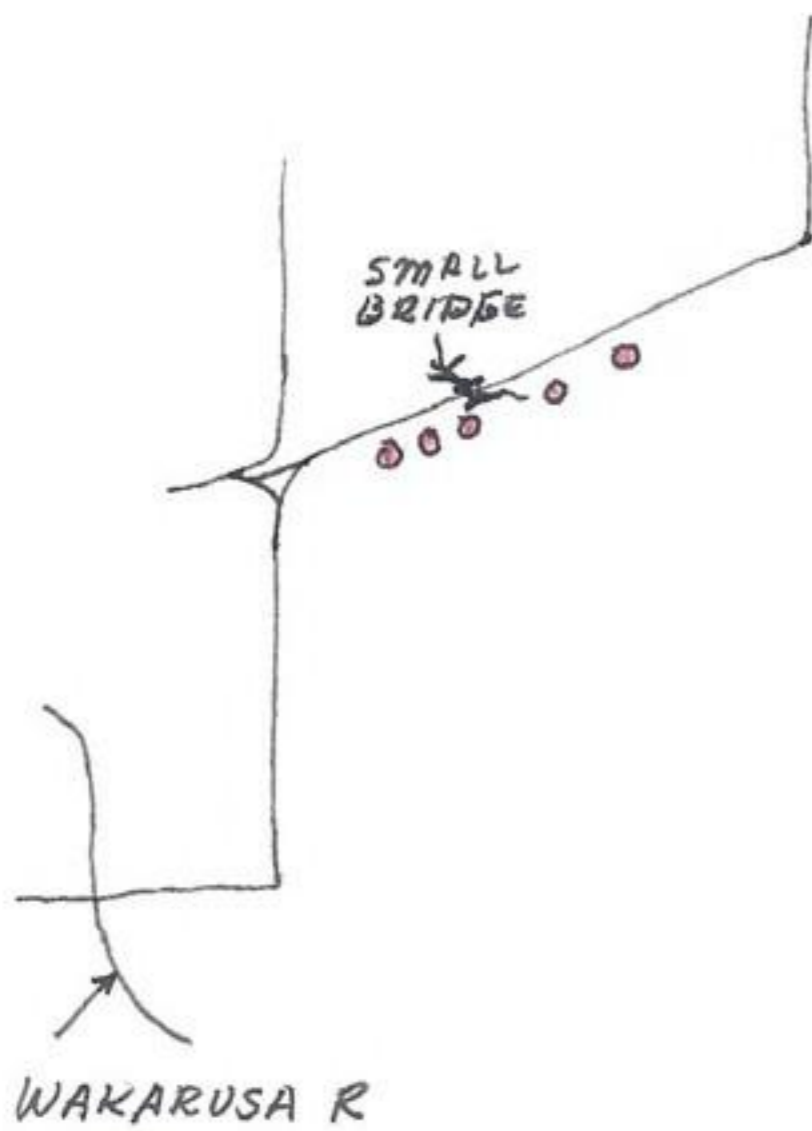
680504-46
effect of a keel and when in combination with current moves the canoe forward.

Wakarusa River, ^{4/10 miles up stream from} near mouth Elk Creek, Douglas Co., Kansas
May 5, 1968



Annette P and I inspected stream peracy on Wakarusa River. No complete census was made but important observations were recorded. Day warm, clear, windy.

Dickcissel. This bird occurred in only two places in area of proposed Clinton Reservoir, or elsewhere for that matter of fact. Followed same route as of April 28. At a point in section 20,



T 138, R 18 E as indicated on map, observed and heard calling 5 dickcissels. Two others were heard singing at a point where 850' contour line cross E-W road in sec. 13, R 18 E, T 13 S. It is peculiar that these were the only dickcissels observed on entire trip and where they occurred were in combination of several in a group, in these cases 2 and 5. Is it possible that these groups are family groups which maintain their identity during migration periods. Ordinarily these birds are generally distributed in the breeding period. In both cases the dickcissels were in lowland positions.

Redwing blackbird. at 3:00 P.M there were no redwings on territories in area of above map between small bridge and diagonal road to bend. at 6:30 there were 8 on territories there.

Lesser yellowlegs. 3 at pond just east of point where Peterson road joins main valley road. Two lighter than the third one.

Red-headed woodpecker: Four observed along census route. There is definitely an increase in numbers.

Horned larks: Usually observed in road but, ⁱⁿ all usual places they were singing in fields.

Hawk sp.: a hawk hovered above field 1 mi E of Clinton. It was not an osprey, red-tail, Swainson's nor roughleg.

Raccoon. Extensive digging along bank of Elk Creek about 1 foot above level of water.

Solitary sandpiper. One flew up stream, to convergence with stream peracy and after a second of confusion as to continue up main course of river or cut thru peracy channel, decided on channel but when it observed us at falls it flew almost straight up and

wheeled around and flew down stream. On Elk Creek made approach to edge of bank of entrenched creek. Directly below was a solitary sandpiper. It left with a spotted sandpiper-like call and flew 200' up stream, then to top of trees at a steep angle and then as rapidly dropped back into channel and flew downstream. The flight is rapid and erratic. The black wings & back are characteristic. as is the ^{rapid} flight. At the moment this sandpiper left a great horned owl also left from a small tree not more than 20' from the bird. It flew upstream.

Blue-gray gnatcatcher. Another nesting bird recorded from rocky point of ridge on trail to piracy stream.

White throated sparrow. Two observed, one at west bank of river directly west of piracy channel and in general area where observed on previous trip. The other at rocky point at mouth of Elk Creek flood plain.

Carp. At fall of piracy stream noted approx 15 carp attempt jump at falls and then after we had talled for a few minutes and a line was thrown into water, the carp stopped jumping for the remainder of the stay. Success in gain fall was negative in the 15 trap attempts. Several perch & bluegills attempted.

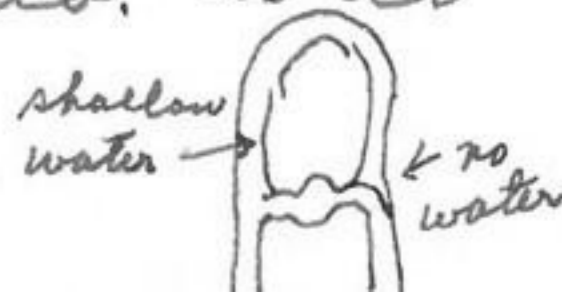
Hiodon alosoides (Goldeneye); Caught one specimen no 680505-1 from a point 5 feet east of convergence of two sides of first pool below falls. It was taken with worms. This fish is a gamey and would be a good fish to propagate for flyfishing. This is the specimen that is listed as a silver karp like fish of previous census of fish jumping falls.

Carolina wren SW of falls. adult carrying worm in mouth.

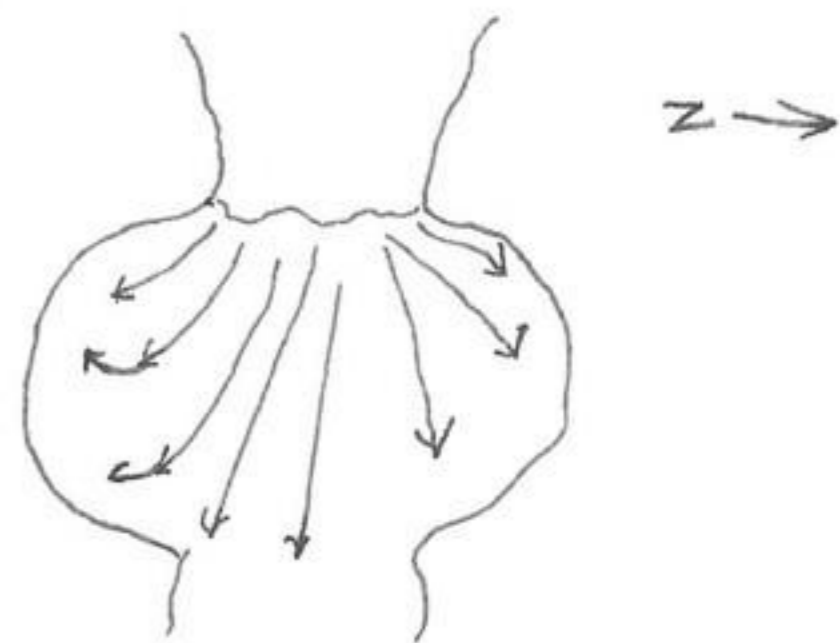
Butterflies. Smalltail and 3 other species on sandbar at head of stream piracy.

Green heron tracks on sand bar above falls. No recent great blue heron tracks nor deer tracks.

There is no water connection across sand barrier and abandoned stream but water still in lower E limb, as it joins the mouth of stream piracy. In main pool below falls, the currents have changed and

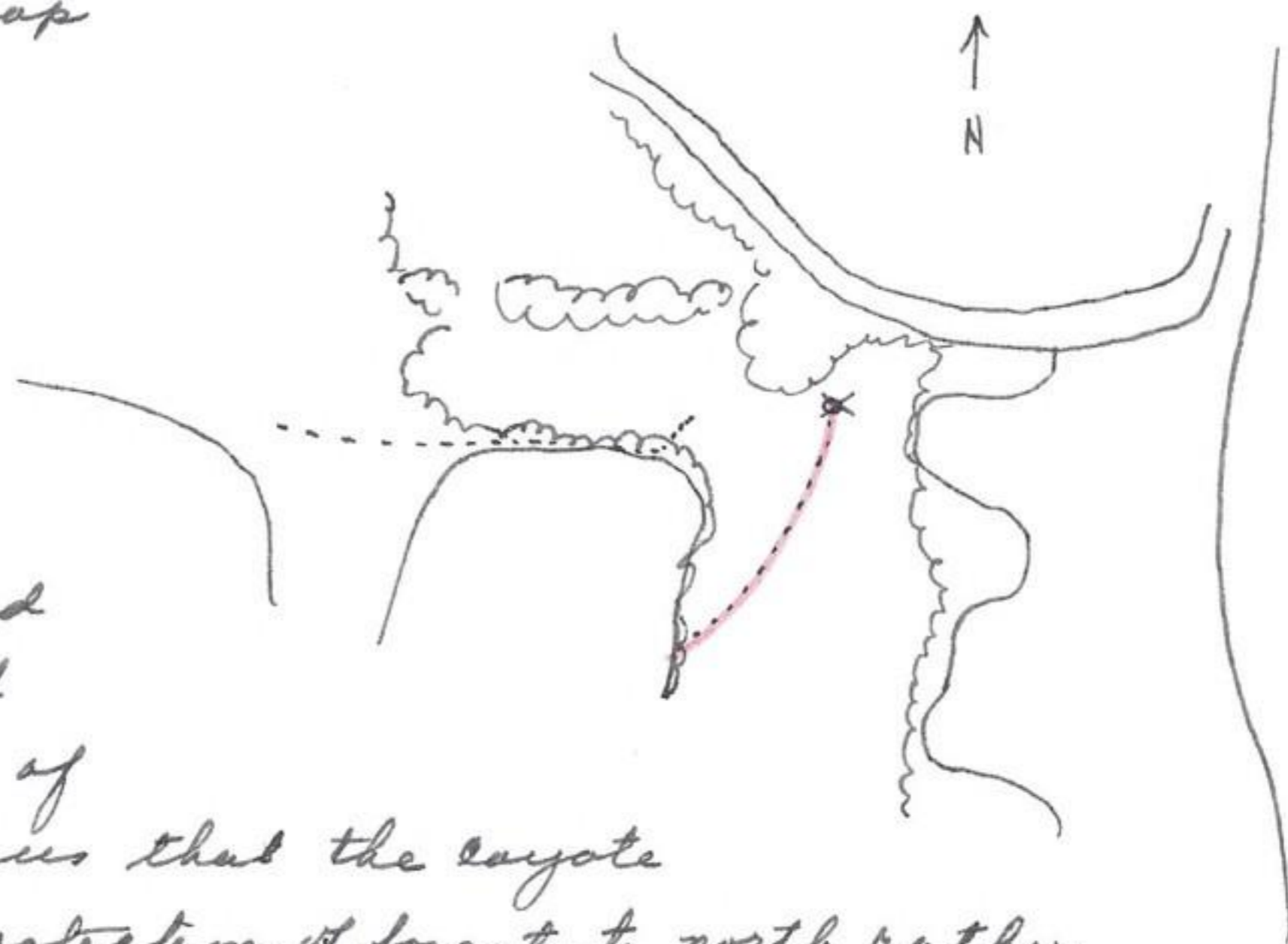


water is dispersing in all directions from falls. There was a minor counter flow on N side and it was here that most of the carp were jumping.



Coyote on return from stream peracy followed a course among trees to point marked on map and then we left and stepped out onto plowed field. At

this moment a coyote left spot X and ran at full speed across open plowed field to hillside of trees. It is curious that the coyote did not seek the protection of forests to north rather than run for such a long distance of exposed open field, unless it may have had a den in the direction of the trees and was attempting to draw our attention away from the den.



Birds observed along road (usual route): vulture, redtail, cardinal, savanna sp, lark sparrow, meadowlark, horned lark, mourning dove, bluejay, yellowlegs, redhead, grackle, cowbird, redwing, barn swallow, Eng sp, titmouse, dickcissel, crow, chimney swift, bobwhite, phoebe, bluebird, chipping sparrow,

Birds observed at falls area are (general area): chickadee, bluejay, great crested flycatcher, great horned owl, cardinal, Carolina wren, house wren, solitary sandpiper, white-throated sparrow, mourning doves, titmouse, red-bellied woodpecker, downy, crow, redtail, vulture, bluejay, Eng sp, green heron, cowbird, Swainson thrush.

Lawrence, Douglas Co., Kansas

May 6, 1968

noted 2 coyotes about 2/10 mi. S of highway 10 at the Coop plant E of town. They ran along top of broad ridge in plowed field. It was raining at the time of observation. Time approx. 9:00 P.M.

Lawrence, Douglas Co., Kansas

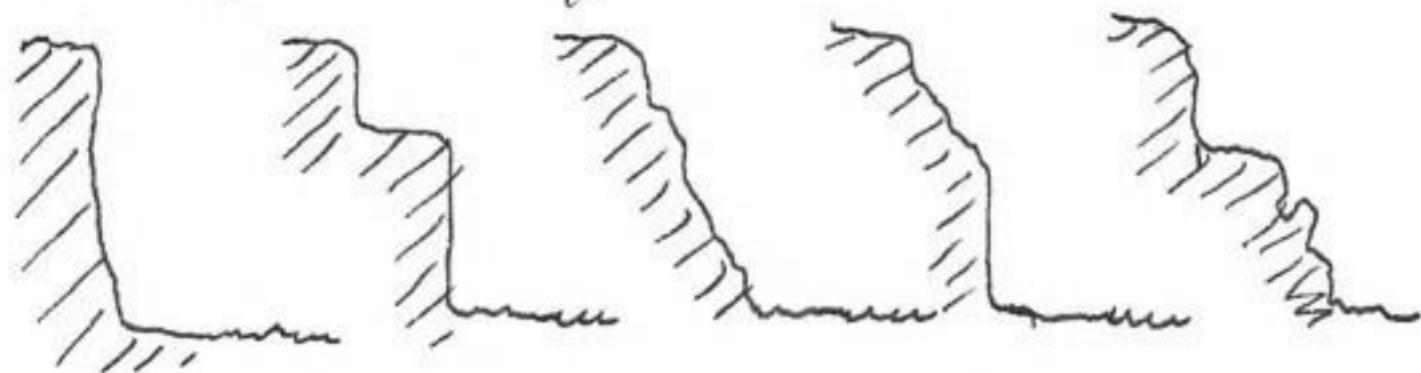
May 8, 1968

English sparrows feeding young on ground. young same size as parent.
Swainson thrush & Cowbird in backyard of 1620 Tenn. Starling with young
in nests. First hummingbird observed today at 1620 Tenn.
Robin feeding young on ground. Starling building second nest.

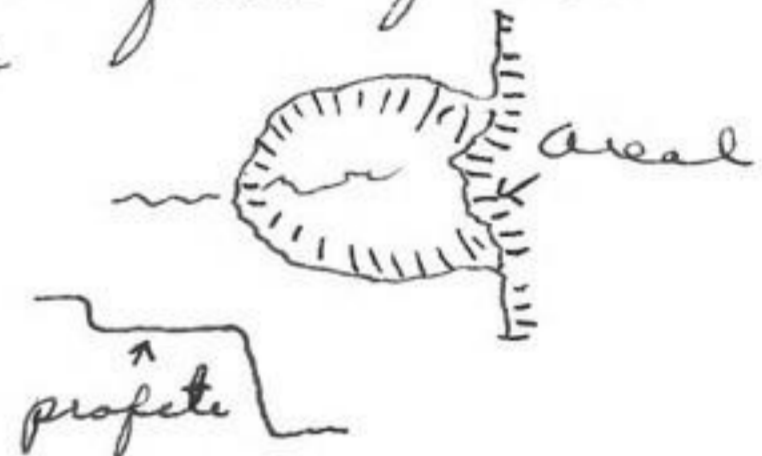
Kaw River, Johnson Co., Kansas

May 9, 1968

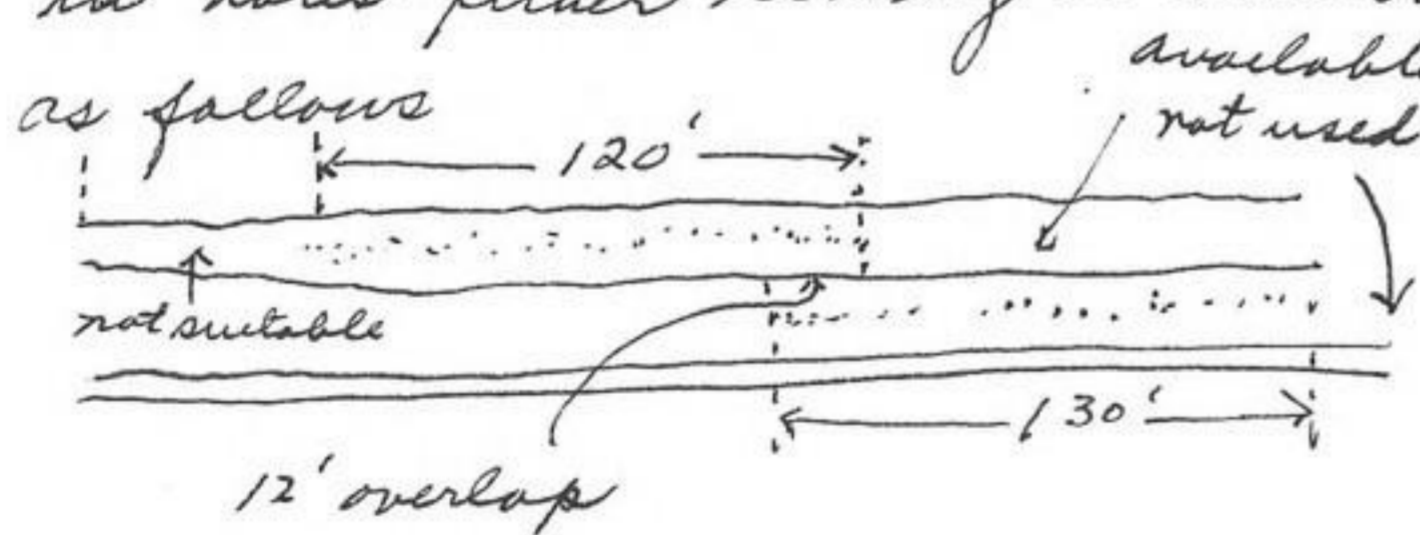
Inspected nesting colony of bank swallows at a point on the Kaw
River between Eudora and De Soto. In allowing for river bank
erosion since map last revised, would place the position as
follows: 4.10 mi. S and 3.10 mi. W of NE corner of sec 25, R21E, T12S.
This site is approx. 300' up stream from rock barrier on south side of river. Made
approach from road to south near point where river comes closest to
road. River bank erosion varies from perpendicular cliff to
the following variations. at points where water from field
draw over edge



the pattern is a
broad cirque
on a higher
level bench.



There did not appear to be much profile change since last
inspected on previous canoe trip. at colony site there was not much
activity, in fact, I was inclined to believe that the birds had desert-
ed the area as only 5 or 6 birds were present. at the most there were
not over 15 birds in the air at one time. vocalization was at a
minimum. a close inspection disclosed the presence of other birds
in holes either resting or incubating eggs. Made count of holes

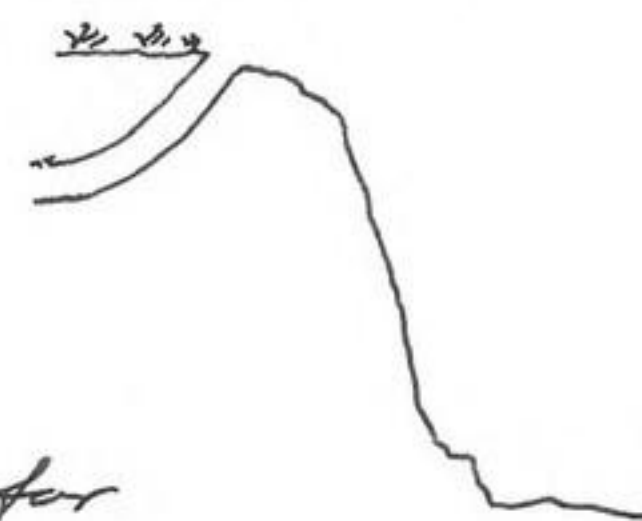


In the upper level there were
288 holes; in the lower level
298 or 586 total. This in
comparison to 500 on previous
counted (see last trip on river)
of special interest is the overlap
of 12 feet with usable linear
space beyond ends of each

series. The holes were placed in the upper 2/3 of available cliff and
in no instance less than 1 foot from the top of either level. Holes
usually with excavation striae at entrance and the floor with a
medial strip. Upper holes of drier sand than lower holes.
Considerable deep loose sand below nest at base of cliff from
material excavated from holes. This sand offers poor footing
and may act as a barrier for predators. Holes from those
just started to those 3 feet deep. Most of the holes held frag-
ments of weed stems from a hand full to 6 or 7 small pieces.
One nest, 26 inches into bank held 2 eggs that measured 18.9 x 12.4 (fresh)
and 17.9 x 12.2 (just starting with blood). A second nest held one egg 16.6 x 11.7 (fresh).

47
One nest which was isolated (3 feet) from 680509-50 held one fresh egg and one egg on outside of hole in sand 4 feet below. There is a tendency for fracture systems to be elevated. One example: area between holes continuously pecked. Except for a recently dug hole at top and toward the east end of colony, there was no other sign of predators concerned with the colony. A fox track was in sand at edge of river but it did not inspect colony. Excrement of swallows increased in amount from occasional dropping at edge of water to a frequency of 1 per every 4 inches at base of cliffs. The dry appearing sands associated with active elevation had now merged into general caliche of sands. The hole at top of cliff is most likely a coyote but there were no tracks of any kind of animal associated with the hole.

It is a beaver, is a most unlikely place. The diameter was about beaver size. In the immediate area of the colony noted a spotted sandpiper, an eastern kingbird that made contact with water of river on 4 occasions either for pecking up insects or drinking; it flew across river, 2 pairs of dickcissels, 2 pairs ^{Indigo bunting in plowed field.} savanna sparrows ♂♀, ♂♀ Baltimore Oriole (some 1/10 or more miles from trees) feeding on insects of weeds song sparrow in log pile below with ruffled feathers of head.



at edge of bank. They flew out and around as I passed by and also on return. These birds were in short weeds in a corridor of 10-15 feet between the bank and cultivated fields to S and E. The following birds were noted in the river bottoms and sidehill forests at the edge of the valley associated with the general area of the colony: dickcissel, eastern flycatcher, spotted sandpiper, bank swallow, blue jay, Baltimore Oriole, redtail, meadowlark, mourning dove, redtail hawk, grackle, redwing blackbird, red-bellied woodpecker, downy woodpecker, Eng. sparrow, Indigo bunting, savanna sparrow, chipping sparrow, lark sparrow, song sparrow, pewee, cardinal, black capped chickadee, titmouse, cowbird, starling, robin, Swainson thrush, brown thrasher, crow, turkey vulture, barn swallow, loggerhead shrike, horned lark, mockingbird, eastern bluebird, bobwhite, goldfinch, sparrow hawk.

Lawrence, Douglas Co., Kansas

May 17, 1968

Rose-breasted grosbeak on campus and feeding low in elm tree.

May 18, 1968

There is a sequence of appearance of parts of pine tree inflorescence and leaf development and one should test this sequence by placing a capture basin under the tree. This terminal evidence may be more meaningful than initial development of flower & leaf forms. This type of information would test cone development, leaf shedding, cone shedding etc.

Wakarusa River, Wakarusa Town area, Shawnee Co., Kansas

May 18, 1968

made census of birds along Wakarusa in area of the town of Wakarusa in the upper drainage of the river. Left Lawrence 8:30 A.M. Strong wind (30-40 mph) from W. Temp. 58°F. Left bridge (see map) in cone at 9:55 A.M. Will keep complete record along route. at bridge a phoebe and cardinal. 9:56 drainage from left. a 5 inch (body length) bullfrog in water to height of head & eyes. Body settled in mud. Swainson thrush along edge. 10:09 2nd riffle titmouse; warbling vireo-like bird but call not typical; redstart feeding in trees bordering river; redbellied woodpecker and redheaded woodpecker 100' apart; 2 barn swallows feeding above trees above river channel. 10:15 grackle; redtail hawk. 10:17 bend right; pewee, 2 crows. 10:22 Indigo bunting. 10:25 eastern bluebird calling; a fox squirrel on edge of water which is not the usual place inhabited by this animal. They seem to be nearer water in spring and tamer than those noted in the autumn when they are on upper bank and wary; cowbird. From this ^{riffle} collected a series of unimids 680518-1. The dominant form is *Ausubonia grandis* and *Lamprolaima complanata*, the former in overwhelming dominance. Other species few in kinds or numbers. *Urolophus tetralasmus* large. 10:35 riffle 3. pewee, cardinal, chickadee. 10:50 pewee, cardinal, bluejay. 10:53 riffle 4 and good exposure of cliffs. The riffles are of such occurrence that numbers will not be recorded. This area is just one series of riffles and pools. 10:57 blackpoll warbler, ♂ & ♀, feeding in low trees bordering river; ^{blue} gray gnatcatcher calling. 11:02 cliffs. 11:03 drainage, fox squirrel; Swainson thrush; vireo sp? 11:08 abrupt turn to left, redbellied woodpecker, cardinal; leaving hillside. 11:18 pewee, chickadee, 2 cardinals ♂ & ♀. back to ridge again. 11:23 2 bluejays, wind & clouds increasing; mourning dove. raccoon tracks all along way but seldom over 1 or 2 animals represented. 11:26 dam & road; Eng sparrows. a Louisiana waterthrush fed on rocks of dam. 11:39 2 pairs ♂ & ♀ cardinals, 4 grackles, redtail hawk, 2 crows. 11:40 pewee, cardinal, chickadee. 11:41 drainage left; Swainson hawk, cardinal. 11:44 redtail hawk. 11:46 Kingfisher flew up stream. 11:47 drainage left right. beaver activity mouth this drainage. Beaver are uncommon on this section of the river. 12:00 slight bend, yellow warbler, house wren, vireo sp? 12:02 long shale bank. a Swainson thrush fed on the bare surface of this bank; cardinal, great crested flycatcher, redtail hawk, redbellied woodpecker. 12:07 bridge, phoebe, chickadee.

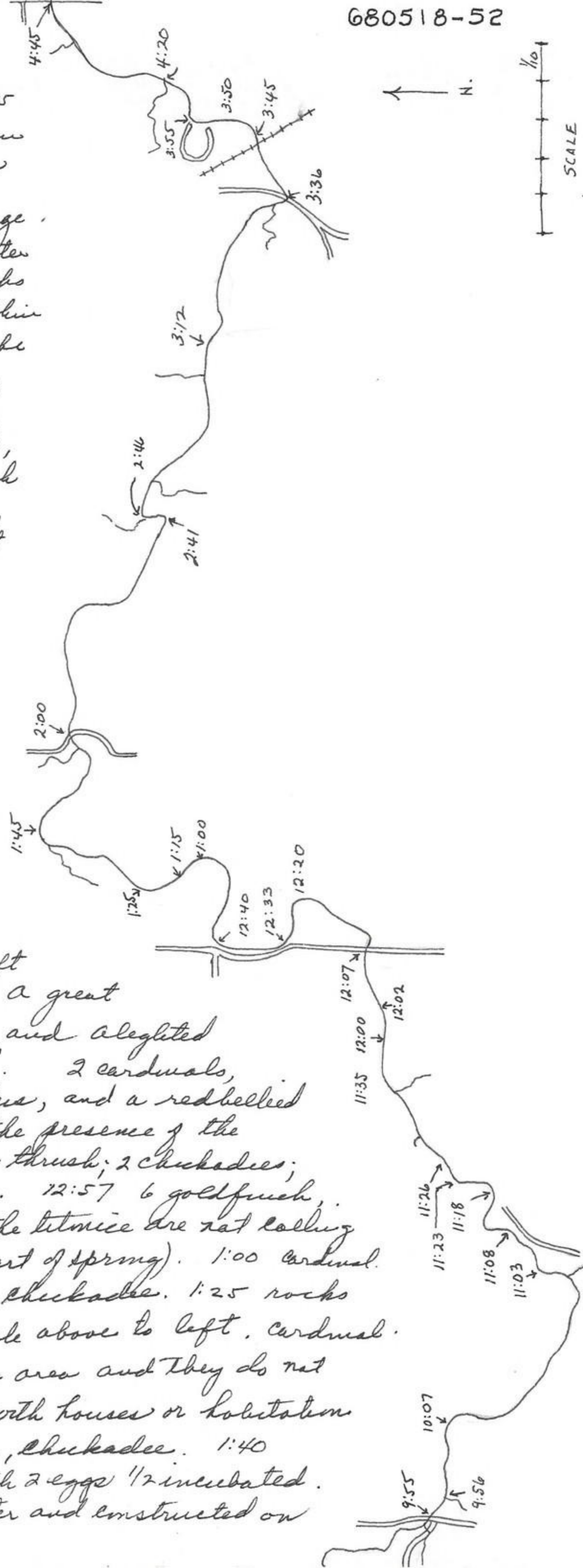
The course of the river up to approx. 11:35 was recorded and then fitted onto regular map (U.S.G.S topo).

12:20 at bend are large blocks of rock with water ripple marks. The rocks in this ^{general area} vary from thin flat to massive blocklike rocks of several tons wt.; Chickadee, flycatcher (g. crested), 2 cardinal, titmouse, 10 goldfinch including 3 males, Great horned owl left tree bordering river.

12:33 bend. 12:34 ♂ woodduck left edge of river, called, and flew down stream.

12:40 now to SSE; 2 cardinals, chickadee, titmouse; good riffles below; yellow warbler; Baltimore Oriole ♂; vireo sp?

12:50 redtail hawk left tree bordering river. A great horned owl left tree and alighted down river about 300'. 2 cardinals, 2 great crested flycatchers, and a redbellied woodpecker reacted to the presence of the owl. 12:53 Swainson thrush; 2 chickadees; Catbird and titmouse. 12:57 6 goldfinch, 2 pewees, titmouse (the titmice are not calling as they do in earlier part of spring). 1:00 cardinal. 1:15 2 cardinals, pewee, chickadee. 1:25 rocks in large slabs with shale above to left. cardinal. 1:29 5 chimney swift in area and they do not seem to be associated with houses or habitation. 1:31 2 cardinals, pewee, chickadee. 1:40 mourning dove nest with 2 eggs 1/2 incubated. nest 4 feet above water and constructed on



SCALE
1/10 MI INTERVALS

U.S.G.S TOPO (1955)

mass of debris left by last high water (leaves). 1:45 bend and now to SE, 1:48 great horned owl, 4 crows, 3 cardinals. 1:50 cardinal, rose breasted grosbeak ♂ & ♀. pewee; thick low rocks to right. 2:00 bridge (apron type); cardinal. The strong wind and demand on navigating canoe is detracting slightly from census taking. 2:05 beaver cuttings, otherwise sign uncommon. The islands of rocks are generally grown to sycamores. There is a low (1 foot) growing plant on the riffles with many times only a water channel wide enough for the canoe to pass through. 2:04 green heron. 2:07 cardinal. 2:09 old abandon road crossing. 2:10 cowbird. 2:11 ♂ & ♀ Baltimore Oriole, great crested flycatcher, cardinal, chickadee. All chickadees are blackcapped. 2:12 measured two elm trees on south bank, they measured (chest ^{circumference} height) 20' and 19' 6" respectively. The largest was the base of three main trunks, the small of 2 trunks. Left trees at 2:19. yellow warbler. 2:40 widest section of the river observed so far (at bend); cardinal, pewee, brown thrasher; redtail carrying small snake. 2:46 drainage left and wide pool; large angular boulders and riffles below. 2:50 drainage left; downy woodpecker, sharpshinned hawk to right; pewee; chickadees. 2:55 farm crossing; cardinal, chickadee, bluebird, 7 goldfish, pewee, 6 barn swallows. 3:08 drainage left. Baltimore Oriole, vireo sp? 3:00 almost three long straight stretch of river. Many sycamores. The wind has caused many small branches & leaves (1 foot long or less, that is the combination of leaves on the branches) in water. These have called in non-circulating waters as masses of green leaves. At some points the wind has kept these leaves and other debris in masses in the river with the only barrier the wind pressure. 3:13 Swainson thrush, cardinal, 3 bluejay, chimney swift, yellowthroated flicker. 3:17 curve and drainage; fox squirrel, pewee, 6 chickadees (a family). 3:23 3 cardinal, great horned owl. 3:26 rose-breasted grosbeak, cardinal. 3:30 fox squirrel. 3:33 great crested flycatcher; family of 6 black capped chickadees, the adult feeding the young. Last long straight stretches of river without riffles. 3:36 bridge, 12 Eng sparrow. For 1/10 mile below bridge were nest of these birds in water as if they had been dislodged and fallen into the water. 3:41 cardinal. 3:45 railroad bridge. 3:50 long flat rocks. Carolina wren, bluejay. 3:55 stopped at N end of oxbow and checked buds there including a family of 6 chickadees, the adults feeding young which were following them among the branches; robin; 3 cardinals

Swanson thrush fed on open exposed bank. Returned 4:13.

4:15 6 chickadees; ♂ + ♀ cardinal. 4:20 coned up drainage to left; great crested flycatcher calling; Swanson thrush.

4:25 returned. 4:27 fox squirrel at edge of water. 4:32 yellow-shafted flicker, 2 chickadees. 4:35 blackpoll warbler, ♂ + ♀ cardinal. 4:45 bridge (highway 75). Phoebe, Baltimore Oriole, cardinal. Air temp 61°F; water 68°F being 7 degrees warmer than air temp. From a slope 1/10 mile NE of bridge collected 2 *Diadophis*:

680518-2 213 body, 54 tail, 5 1/2 gms wt.

680518-3 264 " 47 tail, 9 gms, ♂

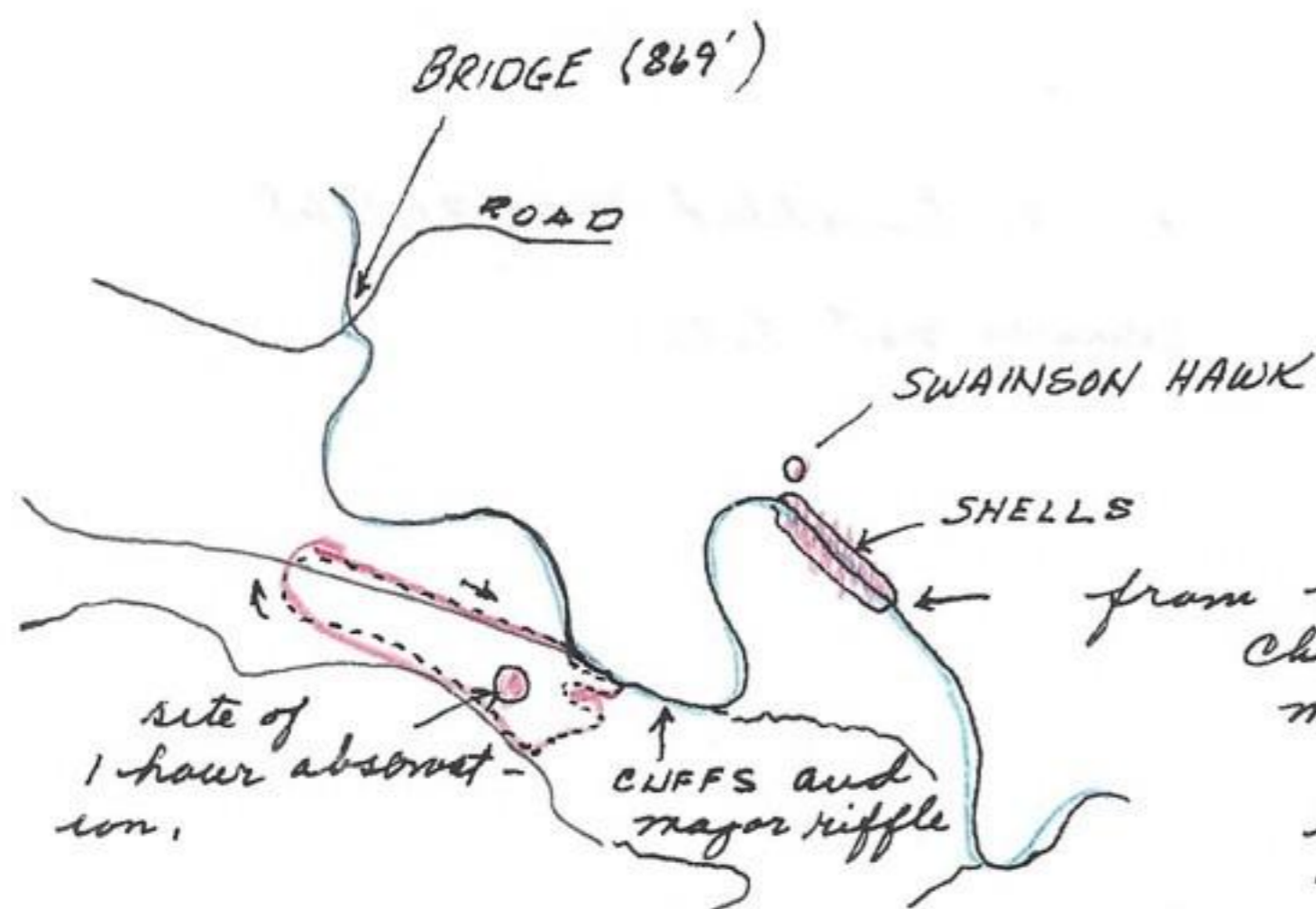
In measuring the river determined that the distance traversed was 6 miles and the shortest land distance was 4 miles or 2/3 distance by river. Other 6 mile stretches of the river was measured and regardless of the area measured the land distance (shortest distance) was always approx 2/3 distance of river course. In other words, meander formation is a dynamic process and equal amounts of energy is expended per linear distance of downgrade flow. The river between time interval 9:55 and 1:45 is characterized by alternating riffles & pools while the course between 1:45 and 3:36 is relatively free of riffles and is continuous slow moving water. The character of the meander is different in the two sections of the river, the upper meandering, the lower limits less so.

Wakarusa River, (Peterson farm area, ~~NE~~ E Clinton), Douglas Co., Kansas.

May 19, 1968

Annette and I visited area S of Peterson farm and E of Clinton. Day cool, partly cloudy, wind about 15 mph. 2:00 P.M.

Birds from Sigel. 32.1 shrike, 32.6 ♂ ♀ cardinal, 32.8 Indigo bunting. 32.2 Y in road, Eng sparrows, chickadee. Creeks beyond have small amount of H₂O and clear. 33.8 eastern kingbird. 33.9 N end proposed dam (old). 34.5 redheaded woodpecker, meadowlark. 35.1 3 Cowbirds, 2 meadowlarks, redwing, killdeer, swanna sp at pond. 35.4 14 black tern flying 10-15 feet above field; lark sparrow. 35.6 bluejay. 35.7 bridge. Put horse in river on E side of bridge and planned to float to Peterson road to inspect shell area and then return by river if current not too swift. Enroute will visit the deciduous forest on slope to S.



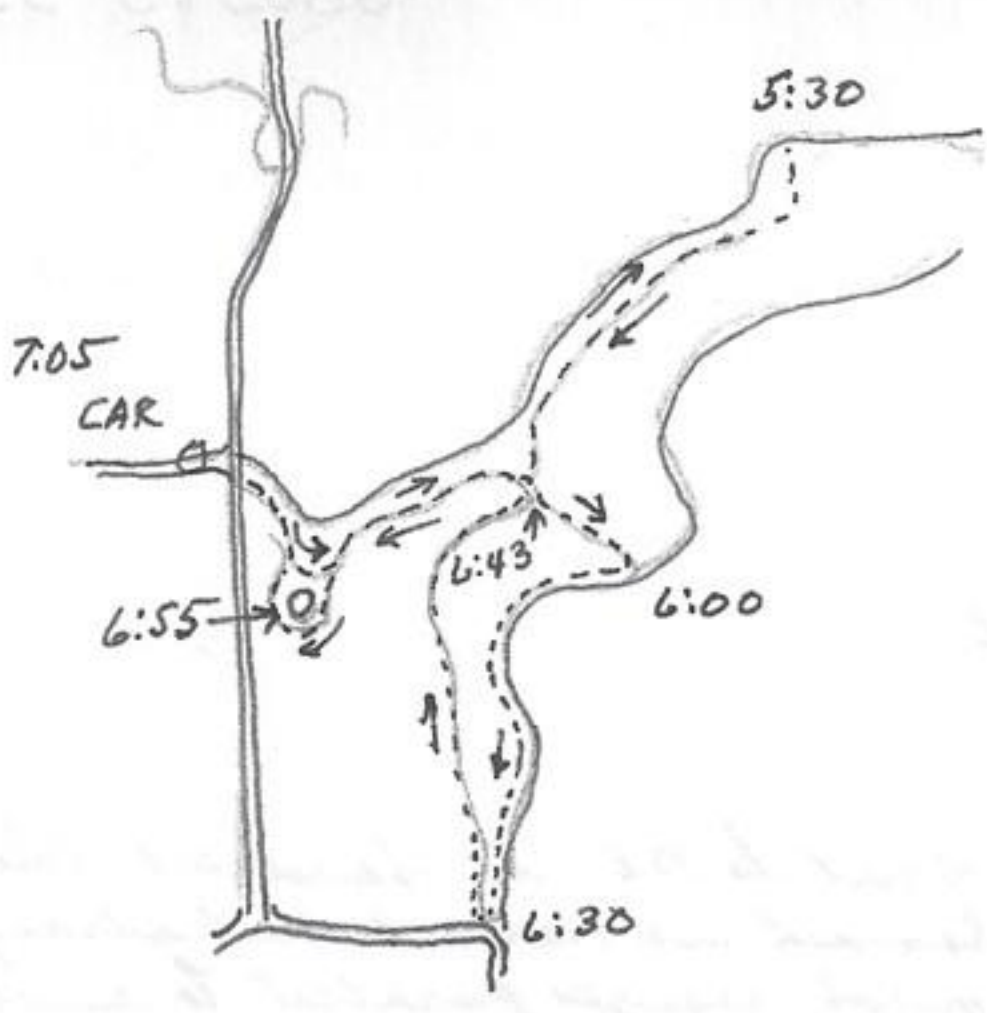
from bend to NE to bend SE this river channel is narrow and straight with mud ridges parallel to river. many old tree stumps. water from NE bend to bridge slow and poollike except major riffle.

The following birds were observed along river route: great blue heron tracks at cliff riffle; new beaver house in some general area; several cardinals some including pairs of ♂ + ♀; single and groups of chickadees (family); pewee, great crested flycatcher, Indigo bunting, eastern kingbird (3 feet from edge of water); bluejay, mourning dove; bobwhite calling; titmouse; eastern bluebird; turkey vulture, Swainson thrush; chimney swift, Baltimore oriole, Swainson hawk (in comparison with redtail, has larger wings, no call, more confident, white on upper tail coverts, cereles less); house wren. In forest observed one area for one hour where redstart were observed nesting several years ago, and noted 2 Carolina wrens, 5 bluejays. These two species plus a great horned owl that left the upper edge of the forest and flew into the area were the only birds observed outside of a redbellied woodpecker and a downy woodpecker. The jays harassed the owl the full hours observation. A starling fed young in a hole of a dead tree near top of hill. Under a rock on upper edge of forest collect a *Eumeces* no. 680519 - 1 It measured 72 mm body, 111 tail, 9 gms weight.

Rock Creek, SE Clinton, Douglas Co., Kansas

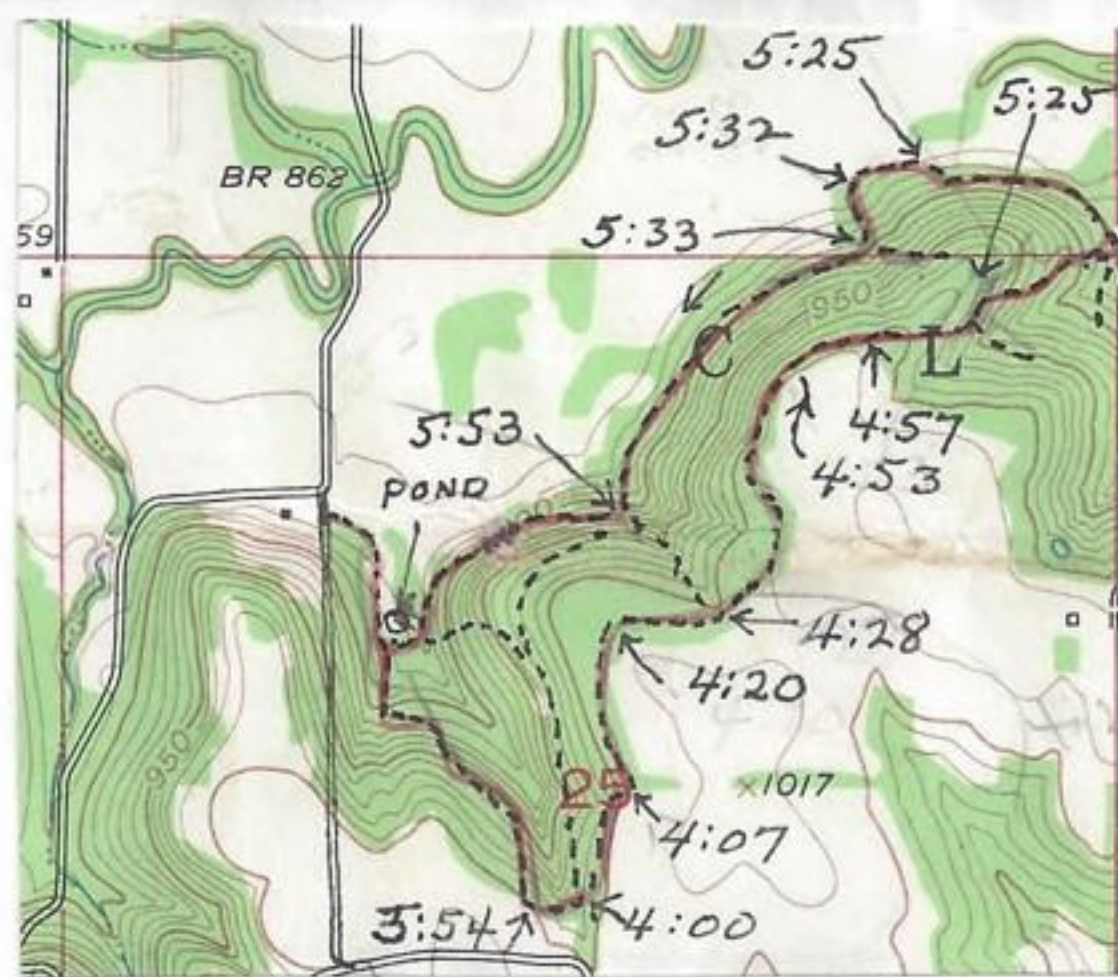
May 21, 1968

Checked birds in deciduous forests on S side of Rock Creek. Enroute made complete census starting at S end of proposed dam of Clinton Reservoir. at mileage 87.9 (approx. 5:00 P.M). 87.9 Cowbird, 88.1 redwing, meadowlark. 88.3 redwing, eastern kingbird, 88.4 meadowlark; 88.5 dickcissel. 89.6 S at Coleman's corner 4-barn swallows there. 89.9 no to W. meadowlark. 90.0 kingbird, bobwhite, 2 lark sparrows, dickcissel. 90.3 dickcissel and.



Route travelled May 21, 1968
 Census not total.

[Faint, illegible handwritten notes and bleed-through from the reverse side of the page.]



Route traversed in red; other connecting trails shown. Since U.S.G.S map of 1950 there is a new road directly up hill to W and the house at base has been raised by tornado. This map is for May 24, 1968 (not May 21, 1968). For May 21 see opposite page.

reducing blackbird, dickcissel. 90.4
 dickcissel. 90.5 2 meadowlarks, 2
 90.6 dickcissel, eastern Kingbird.
 90.7 to S. bluebird. 90.8 redwing, 2 meadowlarks. 91.0
 meadowlark, 91.3 dickcissel. 91.4 bridge on Rock Creek,
 pewee. 91.8 base hill and stop. left car and investigated
 forests to E. On first top of trip recorded kinds of birds
 observed in order of appearance: 2 ^(ruby-throated) hummingbirds, one chas-
 ing the other and making a sound like the forceful rush of air
 thru primaries of a nighthawk. I have never heard this sound
 from hummingbirds; 2 field sparrows at edge of forest, ♂+♀, the
 male singing with increased cadence toward end of call; male
 Indigo bunting, cardinal, redbellied woodpecker, mourning dove,
 fox squirrel, great crested flycatcher, chickadee, eastern bluebird,
 hairy woodpecker, bluejay. at 5:30 returned to W. and then to
 top of hillside. Birds recorded in this case as they appeared:
 pewee, chickadee, Indigo bunting, Kentucky warbler ♂+♀,
 Swainson thrush, turkey vulture, great crested flycatcher, Swainson
 thrush, Swainson thrush, chickadee, gray squirrel, Empidonax?,
 chickadee, great crested flycatcher, 5 titmice (family?), redtail
 hawk, titmouse. at 6:00 at top of hill and will follow along
 trail just in forest and record birds as they appear. redbellied
 woodpecker, Swainson thrush (6:04 rock fence), red squirrel,
 redbellied woodpecker nest and young in oak, nest 24' high. The
 young called at a rate of 7 calls per second. cardinal, dickcissel,
 Swainson thrush, catbird, Swainson thrush, ♀ Indigo bunting
 concerned as if young or nest. Road contact (6:30) From here to fence
 recorded only different kinds: Swainson thrush, brown thrasher,
 great crested flycatcher. Fence 6:43. From here to pond recorded
 different kinds only. Cardinal, Swainson thrush, brown thrasher.
 Pond at 6:55. Tree grown on bank since pond constructed. Cont-
 inued to car. Left 7:05. Complete census to J end dam. 91.9
 eastern Kingbird. 92.0 titmouse; 92.1 bridge. 92.4 cardinal;
 92.6 grackle; 92.7 cottontail (scarce this year), 2 dickcissel, 3 redwings.


92.9 now to E. 93.0 meadowlark. 93.1 2 dickcissel. 93.2
 2 dickcissel. 93.3 eastern kingbird, dickcissel, meadowlark.
 93.5 dickcissel. 93.6 dickcissel. 93.7 now to N, dickcissel.
 93.8 bobwhite. 93.9 now E., cardinal. 94.1 dickcissel. 94.4
 meadowlark. 94.7 3 horned lark chasing one another, grackle.
 95.0 grackle, 2 meadowlark, bobwhite. 95.1 2 eastern kingbirds,
 meadowlark. 95.5 3 redwings. 95.5 2 dickcissel, 2 redwings
 95.7 5 end proposed dam.

Rock Creek, S E Clinton, Douglas Co., Kansas
 May 24, 1968

5 end proposed Clinton reservoir dam at 55.9 (3:00 P.M.). Will
 make complete census to Rock Creek area. Rain just stopping
 since about 2:00 P.M. Skies clearing but considerable
 cloudiness. Temp approx. 65°F. 60.3 barn swallow. 60.4
 meadowlark; dickcissel, 5 male redwing blackbird together
 and when dispersed flew to separate territories. 60.6 2
 dickcissels. 60.7 redwing ♂; most plowed fields with ^{standing} water
 from rain. 60.9 4 black tern flying low in plowed field,
 more cricket frogs along side of road than usual. 61.3 Rock
 Creek and water approx. 2 1/2 feet higher than normal. 61.4
 meadowlark. 61.6 meadowlark, 2 dickcissels at ^{Collins} ~~Coleman~~
 farm. 62.0 mourning dove. 62.3 dickcissel. 62.5 to S, cardinal,
 62.6 dickcissel. 62.7 dickcissel. 62.9 redwing. 63.0 meadowlark,
 redwing. 63.1 grackle. 63.2 meadowlark. 63.3 cardinal. 63.9
 bridge over Rock Creek, water high but approx 2 feet below
 highest of last few days of rain, water brown. ^(3:15 P.M.) Corn approx.
 1 foot high. 63.7 cardinal. 63.8 base of hill, Crow
 left field to W. Parked car by remains of house raised
 by tornado of previous years. In this area W of road are:
 Indigo bunting, great crested flycatcher, cardinal, bobwhite,
 sun is now shining for first time. 3:20 now entering forest
 to E of road. Will record birds by time as they occur.
 3:21 great crested flycatcher calling. 3:23 pewee. There are
 more butterflies than on previous trip but not the variety in
 other parts of the Wakarusa drainage. 3:25 lake and the
 following birds associated: 2 blue jays, 2 cardinals, Baltimore
 oriole, ♀ blue grosbeak, great crested flycatcher, ♂ Baltimore
 oriole flew over lake and 300' beyond, pewee, redbellied
 woodpecker, 4 turkey vultures going E, cowbird. Left
 pond or lake at 3:32 and follow up drainage to S vegetation
 wet and trail muddy. 3:33 great horned owl left tree
 and flew up gully and was not challenged by other birds

3:34 bee hive in tree with noticeable sound of wing movement, and approx. 50 bees at mouth of cavity. This tree approx. 60' from where owl left. No birds associated with bee hive, 3:36 leaving gully to left. 3:37 pewee. 3:38 redbellied woodpecker. 3:42 5 chickadees (when chickadee is recorded at this time or on previous trips, the species is black-capped). 3:43 ♂ and ♀ cardinal, pewee. 3:45 deer tracks measuring $2\frac{1}{2}$ inches and $2\frac{1}{8}$ inches appearing in trail and so fresh that water is squeezed out of muds where imprint is made. They are in the direction of my course. 3:47 cardinal ♂, raccoon tracks in mud and some distance from water. 3:50 trail now near drainage channel. 3:52 pewee, tree frog and cricket frogs calling to head of drainage to SW. 3:54 head of trail at top of hill. Birds in open field were 5 bluejays, 2 blue jays, 2 field sparrows, 2 mourning doves. Ponds to left low in water. 4:00 on rimrock trail, 2 great crested flycatchers, pewee. 4:01 head of gully and beginning of rock fence to left, ditched in field to right. This trail follows on brink of hill, in forest and bordering open fields to right. Deer tracks still in trail and preceding me. 4:02 Baltimore oriole crow, 4:03 dickcissel, wind blowing leaves of trees because of bordering open field. In deep forest the leaves are quiet, 4:04 Acadian flycatcher. 4:07 dickcissel, at large dead tree at edge of forest at point where trail crosses old fence line running SW. 2 dickcissel east in small trees along fence line, black-capped chickadee. 4:10 pewee, great crested flycatcher, 2 bluebirds, mourning dove. 4:11 now along rock fence again. 4:12 hairy woodpecker nest and young (same as on previous trip). The young are now calling about 6 calls per second and not as vigorously as on previous trip. ♀ arrived and called, walked around tree and finally to hole and fed young from entrance & then called and flew to NE. The ♀ did not arrive until 3 minutes after I arrived. Can hear young 100' from nest. 4:18 left nest and continued on trail. 4:19 crossing rock fence and turning to right. At grove marker approx. 80' east of fence line. The oblique perched on top of base and slightly leaning. It is remarkable that it has not fallen over. The oblique is 32" high. 4:20 recrossing fence line and where trail momentarily leaves forest to reenter a few feet beyond. Skies lousy. 4:24 cardinal. 4:28 main trail divides and left trail goes down canyon to left (marked short cut home). 2 bluejays here. The 2 sets of deer tracks show

that these two deer started along Kellert trail for approx 10' and then turned around and retraced to convergence of down gully trail in which direction they left. Left trail convergence at 4:34. 4:36 field contact; chickadee, mourning dove. 4:38 saw along rock fence. One large elm ^{to right} had 5 trunks to near base and on of the trunks dividing higher up (20') or 6 main upper trunks. 4:40 great crested flycatcher; Swainson thrush flies below understory trees seldom 8 or ^{more} 10 feet above the ground. 4:42 ~~titmou~~ ^{red-eyed vireo} calling and another answering about 200' away. The call is 2 notes and sounds something like a titmouse which generally has 3 notes to call. This ♂ + the ♀ which had been answering remained in area. The male fed on a large green tree bug and held in claws on limb while it pecked at it. These two birds were approx 20 feet from the nest and young ^{calling 1 per second} of the red-bellied woodpecker. The ♀ redbellied fed young in nest at intervals of about every three minutes and entered hole to feed young although young could be seen at entrance. Hole approx 20' above ground ^{in Elm}. Gooseberries 1/2" in width. The red-eyed vireo calls with a 2 note for about 5 times and then with a 3 note call. The song is repeated about every 3 or 4 seconds. 4:50 left nesting area. 4:51 large oak to right of trail. 4:51 great crested flycatcher. 4:53 trend now to E. fresh coyote trail. 4:57 field contact, 3 crows in field, now trail goes more into forest. 5:00 on ridge trending NE. trail with more rocks and down grade. 5:03 trail divides one to right and one to left, both leaving ridge. Followed right fork. 5:04 trail forks, one right and one left, will follow left. 5:07 on flat bench of trail, gray squirrel, 6 chickadees. 5:08 canyon floor. 5:09 corner of fence and open wheat field beyond to N. The trail just traversed enters main canyon trail at 80' S of corner of fence. At corner of fence the same two deer tracks previously encountered started up main canyon trail and then after 12' returned and crossed field to E. 5:11 pewee, 2 titmice calling, one with short ending. Their calls are fewer and different than in early spring; 5 chickadees. 5:12 3 chickadees. 5:16 ♀ opossum and 3 young dead in trail and no evidence of injury. ♀ measured 27 inches, the young, which were within 4 inches of each other at proper angle to mother, measured 11 inches in total length. 5:18 cardinal. 5:25 road with considerable mud + standing water. 2 cardinals, one red-eyed vireo; coyote tracks ⁽²⁾ in mud and fresh. 5:27 road enters field

Redtail hawk about 1/10 mi to E.; mourning dove. 5:30 great crested flycatcher. 5:32 back on trail at old dead elm. Sign at convergence of trail says "To Tombstone". no deer tracks on this trail. Birds uncommon. 5:35 redbellied woodpecker, 2 black-capped chickadees, one Swainson thrush. 5:38 Swainson thrush. 5:39 great crested flycatcher. 5:42 large elm to right. 5:43 2 bluejays. (from previously named elm, it is best to go up canyon trail for about 200' then to W to ridge and intercept trail along bobwire fence, thence W. or up diagonal trail to SW.) 5:48 pewee, Swainson thrush. 5:55 wire fence and now to W., great crested flycatcher, titmouse, great crested flycatcher has a chirp when pursuing insects. 5:58 2 chickadees. 5:59 mouth canyon, chickadee, Carolina wren, 2 turkey vultures, Baltimore oriole. 6:02 gully ^{below} pond. 6:04 dead tree at head of pond. 6:07 leaving pond. One group 200 minnows in pond about 80 m size . Cardinal, great crested flycatcher and pewee at pond. 6:11 main road and end of census. In area to west of road at point of hill above old raised house, 10 Turkey vultures and 1 redtail circled about 100' above point for approx. 5 minutes then left to S + W. The redtail circled as if one of the vultures. It did not call. Left ⁱⁿ car at mil. 64.0 at 6:20 P.M. 64.2 ♂ ♀ cardinal. 64.3 bridge. 64.7 redheaded woodpecker, mourning dove, 3 barn swallows. 64.8 2 grackles, robin, meadowlark. 64.9 redwing, 2 mourning doves, eastern kingbird, meadowlark, brown thrasher, grackle in same area. 65.4 3 dickcissels. 65.1 grackle. 65.3 cardinal. 65.4 main road (Clinton road), now to E. 2 dickcissel and barn swallow. 65.5 5 ♂ grackles in one group. 65.6 meadowlark, Eng sparrows. 65.9 2 meadowlark. dickcissel. 66.1 2 horned larks. 66.2 Coleman's form. dickcissel. 66.5 Rock Creek. 67.2 dickcissel. 67.3 dickcissel, cowbird. 67.4 meadowlark, 2 redwing blackbird, 67.6 dickcissel, redwing blackbird. 67.9 S end of proposed Clinton Reservoir dam. meadowlark. Time 6:25 P.M. and end of census. Will keep list of different kinds of birds between here + Lawrence: Redwing. grackle, meadowlark, dickcissel, Eng. sparrow, 2 red-headed woodpeckers on top of same fence post. Outskirts of Lawrence.

Rock Quarry, 9/10 n n w Washington Creek School, Douglas
Co., Kansas,

May 25, 1968

At a point in sec 20 (3/20 mi. E and 8/10 mi S of NW corner)
R19E, T13S. at rock quarry collected the following herps.

680525-1 Ophisaurus attenuatus. 220 mm body, 305 mm tail,
71 gms. 26 mm of tail length is regenerated.

680525-2 Ophisaurus attenuatus. 211 mm body, 425 tail,
84 gms.

680525-3 Bufo 62 mm length, 25 gms wt

680525-4 Bufo 69 mm length, 37 gms wt.

680525-5 Pseudacris 24 mm length, 1.4 gms

680525-6 Pseudacris 23 mm length, 1.5 gms

680525-7 Pseudacris 22 mm length, 1 gms

680525-8 Pseudacris 27 mm length, 2 gms

680525-9 Pseudacris 25 mm length, 1.7 gms.

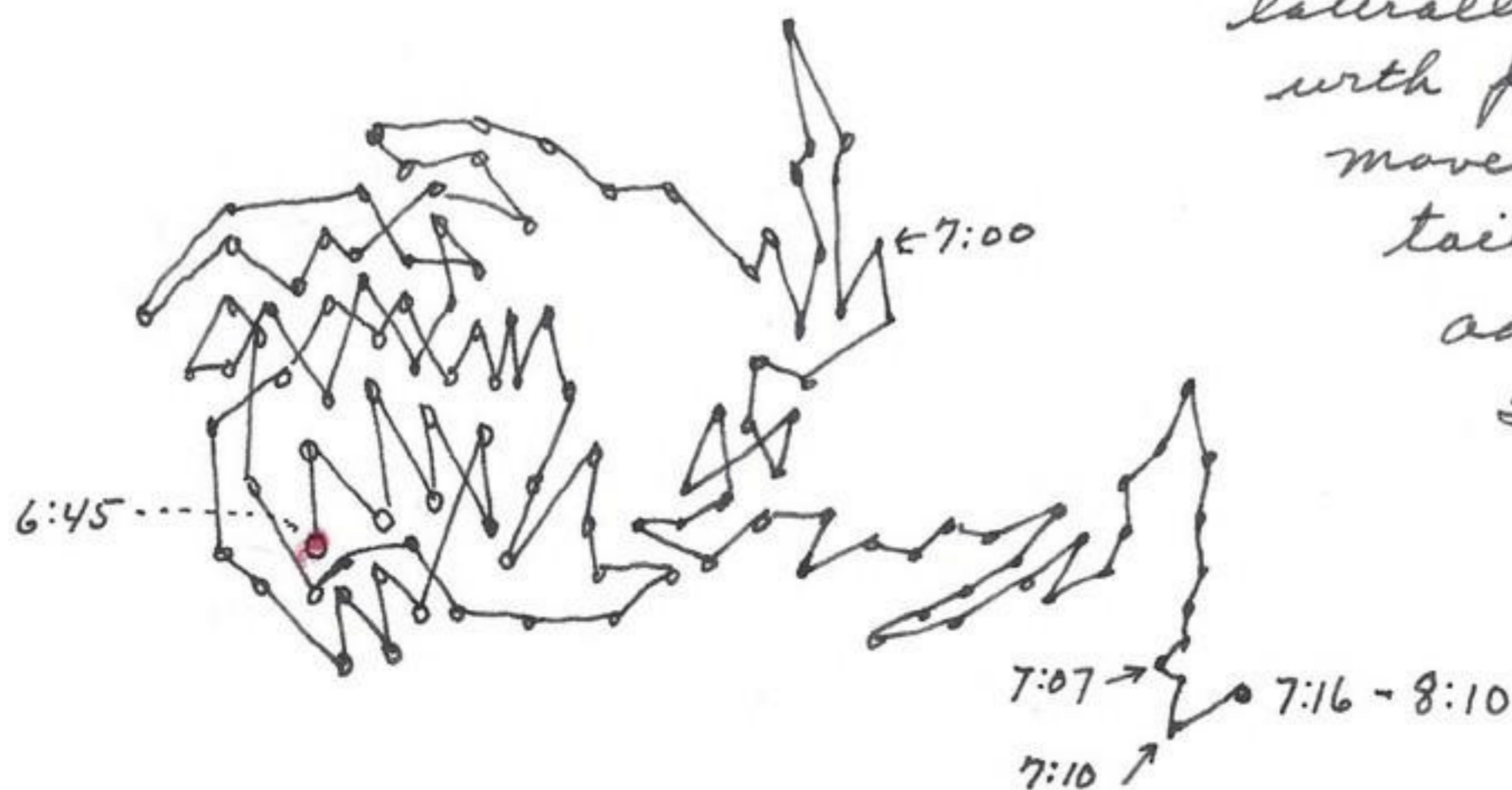
680525-10 Pseudacris 24 mm length, 1.5 gms

680525-11 Pseudacris 23 mm length, 1.5 gms.

680525-12 Ophisaurus 223 mm length, 230.0 mm tail

680525-13 Ophisaurus. 100 mm length [160 mm] tail.

From specimen no 680525-2, Ophisaurus, cut 30 mm of tail
and placed it on a piece of paper at 6:45 P.M. The tail immedi-
ately reacted by moving from side to side in a curved angle,
attaining movement of the cut end three space. The shifting
of position of the end was recorded. The tail frequently
turned over from time to time. Beyond 7:10 the tail moved
only by touching tail. at 7:16 the
tail would react but would not move
laterally. at 8:05 still active
with pressure. at 8:20 no
movement. The tip of the
tail occasionally used to
advance movement.



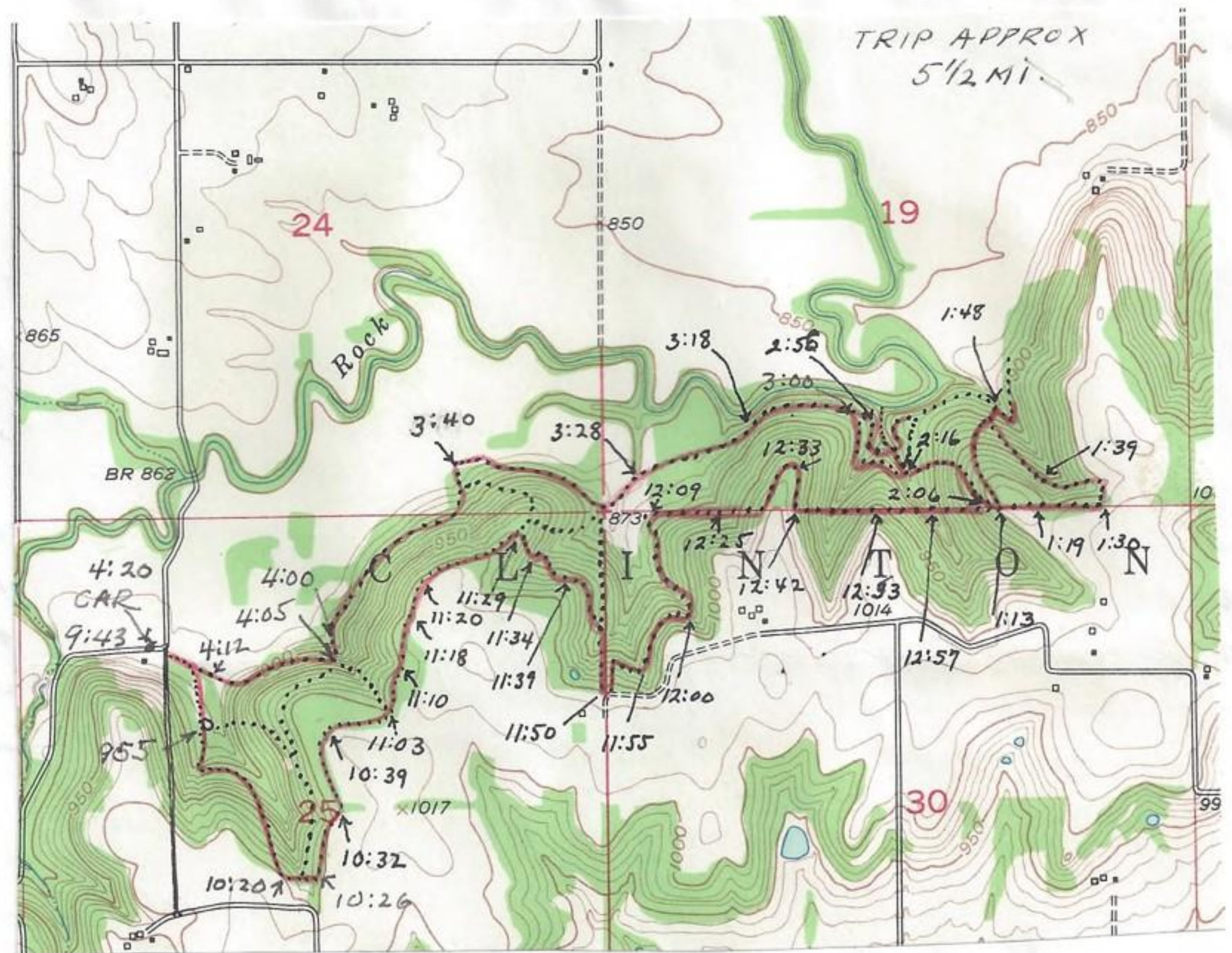
There is a definite tendency
to turn to right with
always forward
movement. at one
time at about 6:55
the tail vibrated for
a fraction of a second and only at that one instant.

Enroute to the quarry listed all birds to S end of proposed dam from Lawrence including: meadowlark, bobwhite, cricket frogs, grackle, dickcissel, redwing, barn swallow, crow, Eng sparrow. Water on upper seasonal bench of Wabamusa, top of Rock Creek. The ditches along side of road are full and extending into drainage ditches of fields. Has been raining for last 24 hrs & now etc about 4:00 P.M. is temporarily let-up. From S end dam drove directly to quarry. 8 or 9 shallow pond not over 1 1/2 feet in depth. Pseudacris would jump into ponds and swim out into pond and remain on the bottom, some with difficulty and would stand upright. Some of these shallow lakes are bare and frogs can easily be procured. In other ponds with cattails and other vegetation, reclaiming of frogs is difficult or impossible. Apparently depth of pond is more important than vegetation. The two toads were under rocks at edge of pond, they jumped into the water and swam immediately to shore. Six tree frogs (Hyla), 2 narrow-mouths and cricket frog can be heard. No Rana pipiens observed. The pond on extreme left on entering quarry is producing most frog calls and the pond that has most cattails. In area are: field sparrow, Baltimore Oriole, dickcissel, Indigo bunting, ^{blue jay, downy,} Cardinal, ^{3 redwing blackbirds,} chickadee, The two grass snakes were taken approx. 250' apart, one (no 1) under a sheet of cardboard 10' from a pond in grassy area and no. 2 from 5 feet of hole between two rocks not associated with water. Time 5:30 P.M. with cloudy sky. Left 5:45. Will keep census to S end of dam. Mileage 9.1 just as I started down hill were 2 cottontails. Chickadee, pewee. 9.2 cardinal. 9.3 downy. 9.4 base hill. Water flowing across road. Indigo bunting, bobwhite calling, dickcissel, 9.5 dickcissel, dickcissel. 9.6 3 dickcissels, eastern kingbird, lark sparrow, dickcissel, redwing, redwing. 9.7 eastern kingbird, dickcissel. 9.8 dickcissel. 9.9 redwing, 2 bobwhites, eastern kingbird. 9.95 main road. Eng sparrow. 10.0 redwing, dickcissel, redwing. 10.1 redwing, dickcissel, 10.3 dickcissel, dickcissel, 10.4 dickcissel, dickcissel, redwing. 10.6. S end dam. + end of census. Birds between here & Lawrence. dickcissel, redwing, grackle, e. kingbird, meadowlark, shrike. Atmosphere dense bluish.

Rock Creek, SE Clinton, Douglas Co., Kansas

May 26, 1968.

Made census of deciduous forest S. of Collins farm and SE of Clinton. This hillside forest is associated with Rock Creek. Left Lawrence 9:15 A.M. Cloudy sky, 100%, with dark lines



of clouds in eschelon formation, wind 8-10 M.P.H., temp 55°F, wind from NW. Different kinds of birds observed to S end proposed Clinton Reservoir dam are: Eng sparrow, grackle, robin (Wakarusa same height as last evening), dickcissel, redwing blackbird, meadowlark, eastern kingbird, mourning dove, red headed woodpecker, barn-swallow. Mileage S end dam 35.8 36.0 meadowlark, redwing, dickcissel, 36.2 dickcissel, redwing, redwing, redwing, all males. 36.5 redwing. About 150 swallows above farm house trees and sp.?. 37.2 Rock Creek, water lower than yesterday evening. dickcissel. 37.5 2 barn swallows. 37.6 horned lark, dickcissel. 37.9 dickcissel. 38.1 mourning dove, grackle, chimney swift. 38.3 now to S. meadowlark. 38.5 bluebird (all bluebirds are eastern), 2 redwings, dickcissel. 38.7 savanna sparrow, redwing, meadowlark. 39.1 grackle. 39.4 bridge. Water at high level was at edge of upper level below valley level, now down 2/3. Goldfinch calling, cardinal, Indigo bunting. 39.5 Indigo bunting, 2 cowbirds. Wind bending upper parts of trees. 39.7 base of hill. Leaving car at 9:43 A.M. field sparrow and Indigo bunting at old area of old raised house. 9:44 entering forest. 2 crows calling. 9:45 2 cowbirds, 2 great crested flycatchers. Sceloporus under rock. 9:50 great crested

680526-1 *Diadaphis*

228 body, 43 tail, 7gms.

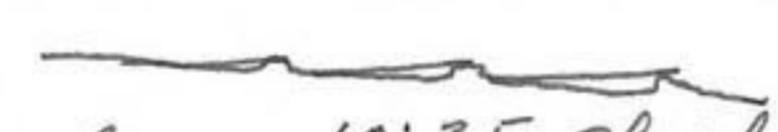
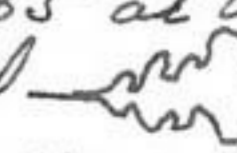
680526-2 *Carpophis*

206 length of body, 30 tail, 5gms.

680526-3 *Carpophis*

231 length, 38 tail, 5.5gms

when *Carpophis* was placed in killing jar the head was anchored at one spot on glass of jar with concerted effort to burrow in specific spot. The tail is also used for a burrowing tool. The *Diadaphis* uses head mainly to search out areas. *Diadaphis* dies first and *Carpophis* is long lived in killing solution (10% EVOH)

flycatcher, turkey vulture to E. 9:51 mourning dove, pewee,
 downy woodpecker, fox squirrel. 9:52 2 bluejays, mourning dove
 9:55 pond, titmouse, cardinal, redbellied woodpecker. Continuing
 up creek to S. 9:56 crossing drainage, 2 bluejays, chickadee
 family of 6, acadian flycatcher (generally easy to get into field of
 binocular), 9:48 great crested flycatcher, titmouse. 9:56 cardinal.
 10:07 2 bluejays, titmouse. 10:09 titmouse. 10:10 great crested
 flycatcher, chickadee. 10:12 great crested flycatcher, 2 red-eyed
 vireos (song like catbird but about every 5th note sounds like a
 titmouse note). 10:20 top of hill. Birds in open field are: dickcissel,
 ← 2 *Corophus* ^{and 1 *Sceloporus*} under one rock, cold and sluggish in movement, 2
 barn swallows, Indigo bunting. 10:26 now on runrock trail.
 where trail crosses rock fence; cardinal, redtail hawk left tree
 to right. 10:28 cardinal. 10:30 dickcissel. Although this
 trail is thru forests, it is near edge of wheat field and is
 so influenced. Raccoon tracks in trail since last rain. This
 trail is clear of all previous tracks. 10:31 redtail alighted in old
 dead tree directly above me and then left immediately after
 seeing me below. 10:32 crossing at end of tree fence that joins
 forest. old tree at this point. 8 crowing crowing in field to SE (2/10 mi.)
 and calling. 2 dickcissel on tree line to E. Trail with debris
 dams and mud filling in . 10:33 Swainson
 thrush, chickadee, cardinal. 10:35 chickadee. 10:37 2 cardinals.
 10:39 Rock fence and now to E. Tomestone 55' E of rock fence
 cut through ^{and to left or right of trail}. Will record details on a subsequent ^{page} trip (of tomestone).
 Swainson thrush, cardinal. ♀ redstart. Left tomestone at 10:54.
 The Tomestone is between the two points where trail cut thru rock
 fence at two places. 10:57 titmouse, cardinal, cardinal, ♀ summer
 tanager. 10:58 2 great crested flycatchers, pewee, 11:00 oak tree with
 6 main trunks, 5 of which come to base. The leaves is elmlike but with
 large serrations. 11:03 trail down gully to left with sign that says
 short cut home. Temp. 56°F. no sun. wind blowing leaves on all
 levels of the tree. all tracks in trail erased since last rain, except
 an occasional footprint of my last visit along trail. 11:05 along
 rock fence. 11:10 6 trunk elm tree at drainage; pewee; chickadee,
 10:12 titmouse. 11:13 large oak on right measures 85" at breast high
 and bulges more at base. Leaves deeply indented . 11:18
 slight bend. 11:20 gray squirrel and major bend. 11:21 great crested
 flycatcher and now back into forest, titmouse. 11:26 now down
 grade. 5 turkey vultures directly overhead and flying W. 11:29
 now leaving ridge and to right. 11:30 divergence of trail and
 following right up canyon. Swainson thrush, crow calling
 11:34 bottom of drainage (approx 1 qt water per 5 sec. flowing),
 raccoon tracks. Trail turns to right. 11:37 raccoon tracks still
 in direction of down trail. 11:39 cardinal. Trail now on flat ridge

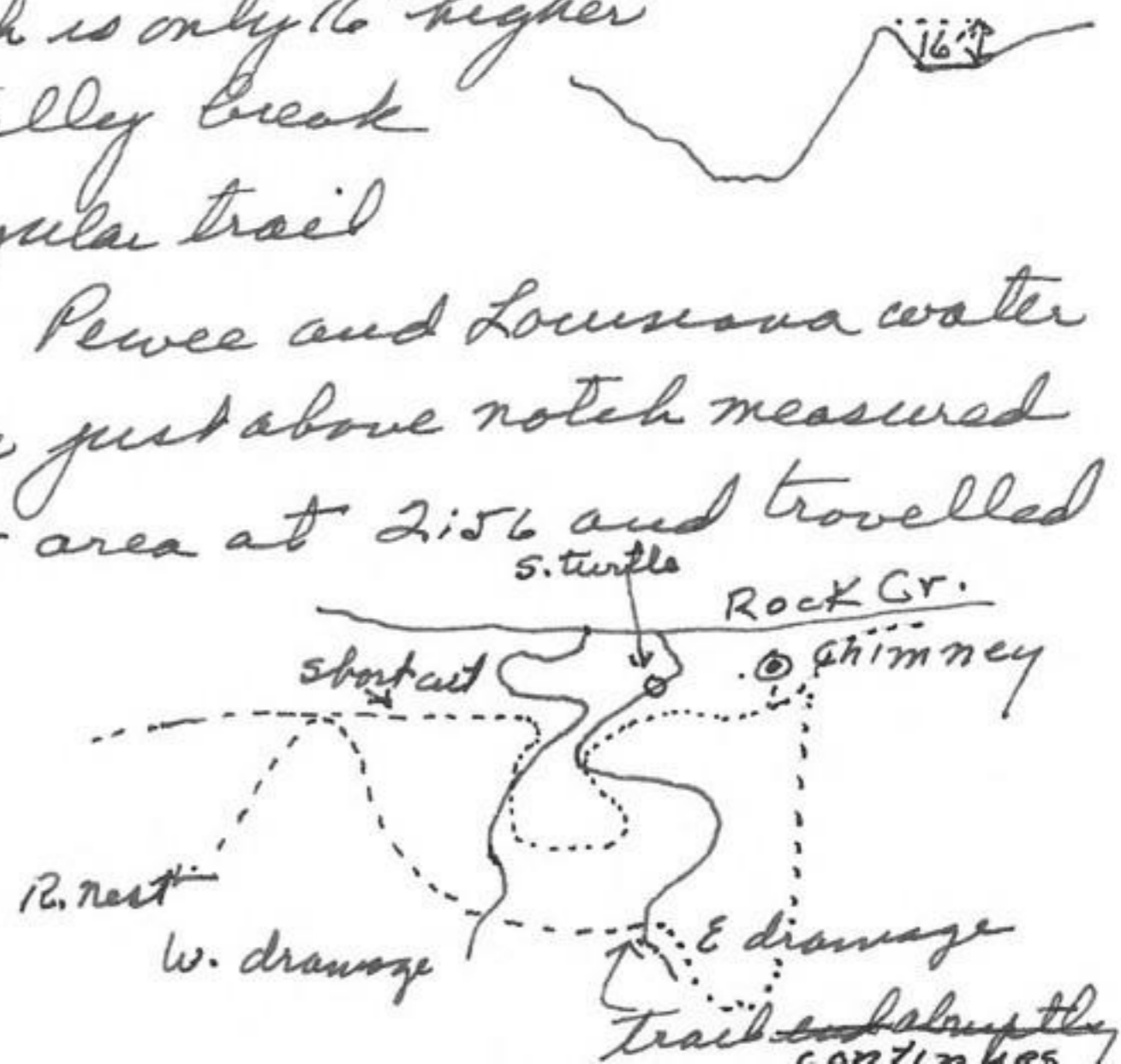


ABBIE
VANCIL
DIED
May 16, 1857.
AGED
13 yrs. 2 ms.

Information from tombstone (see notes 10:39). This marker is of three section: oblique measuring $26\frac{1}{2}$ in height with point, 5 inches across at top, 7 inches at base. The oblique rests upon a base 5×10 , $\frac{1}{2}$ " slope. The ground support is a unit 14" square and extends into the ground. The marker is slightly tilted to the NE but not sufficiently to cause the oblique to slide off its base which it rests by weight only. This stone should be checked for rate of erosion and growth of mosses & lichens.

and unusually few birds. 11:41 fence line + old road. water running in trail in road. Bluejay. Road eventually flattens out. 11:45 Swainson thrush. 2 cardinals. Minor drainage from right. 11:47 goldfinch, Indigo bunting. Can hear frogs calling to SW and probably from pond. Butterflies not seen except small ones. Sun out for 6 seconds and then disappeared as rapidly. 11:48 approaching slope that leads to top and to right second growth. 11:50 top at burnt tree. Eastern bluebird in tree. yellowthroated flicker. 11:53 now back on first upper bench to N but on open cleared side of road trail. This area to E has been cleared of almost all trees at one time and is now in grass and some large trees and some second growth, especially lower slopes. Chickadee, great crested flycatcher. 11:55 major drainage, mourning dove. 12:00 point of ridge and will cut straight across, following fence line that follows section line. Chickadee, 12:03 bottom drainage. Great crested flycatcher. Raccoon tracks. Cardinal. a trail leads down canyon. Cardinal. 12:07 now E. 12:09 ^(5 sec) head of feed at gate. and thence to E along fence that follows section line. Cardinal. ^{dry} Leaves pile up as barriers across drainages in a rhythmic manner. Pewee. 12:13 titmouse. This fence line separates the virgin forest to left and cut over lands to right. 12:14 Chickadee, cardinal, downy woodpecker. 12:17 blue gray gnatcatcher, 6 chickadees, red-eyed vireo, titmouse feeding young. These birds (at 12:17) were all together. Pewee. 12:24 Swainson thrush. 12:25 main drainage. Swainson thrush. 12:28 first major bench, chickadee. 12:30 second major or first down from top bench. 12:31 top. The area to N is a good area for forest study. Great crested flycatcher. will leave fence and follow out to point and then return to fence line. will follow first bench below top. cardinal. 12:33 point of ridge great crested flycatcher. 12:41 back to fence line. This bench makes a good route for observation. Great crested flycatcher. Hairy woodpecker. Great horned owl left tree and flew down into drainage unchallenged. 12:45 goldfinch 12:46 bottom of canyon, redbellied woodpecker feeding on ground. Great crested flycatcher. water flowing about 1 gal per 5 seconds. and more than any drainage crossed so far. Cardinal, great crested flycatcher. on a limb 3 feet above ground, pewee. 12:53 titmouse. 12:55 summer tanager. Crow calling to S. 12:57 bottom of gulch and about same amount of water as previous drainage but possibly more. 1:00 titmouse, chickadee. 1:10 bluejay, Swainson thrush.

1:13 top. all trail leads π down ridge. 1:19 crow. 2 deer entered forest from edge of field. 1:30 head gulch. cardinal, from here crossed gulch to left and made way thru forest. no trail present or crossed. 1:39 cottontail. Chickadee. 1:48 convergence of trail. checked trail up canyon and cross over and then returned to convergence of trail. Followed this trail up slope to SW. 2:02 pewee. 2:06 top trail at point passed at 1:13. from here made way thru forest without trail to bottom of canyon. at 2:13 just before bottom noted a pewee, and Chickadee. at 2:16 at meander with flat ridge below. This area is very primitive. Followed drainage downstream. next bend with high exposure of shale on w bank (40' high). 2:20 Chickadee, downy woodpecker. 2:27 Chickadee, titmouse. 2:29 first fish. small 8' long snapping turtle. Other small minnow beyond toward river. Arrived trail 2:30 There is an abandoned trail up stream but it ends abruptly at water. From W. From 2:30 checked Chimney and then returned to creek (at point of low ridge or notch between two drainages, and at 2:34 started down creek to Rock Creek 200' beyond. At mouth 2:36. Mud from high water of Rock Creek all the way with new channel down to original bottom. The mud does not extend up creek beyond the point where trail enters creek. The water has been 4 feet higher than now. water now just to mouth of side creek and at height of ^{base of} west root of old tree. Chickadee, pewee here. Left 2:37 and at 100' up creek found a snapping turtle attempting to get up over a 1 foot barrier of dry leaves + sticks ^{lodger in} creek bed. It measured 25 inches total length + carapace 11 1/2". no raccoon tracks on soft muds associated with high waters. Returned to trail at notch which is only 16" higher below notch which will eventually break thru. Continued up around regular trail and arrived at w. side of notch. Pewee and Louisiana water thrush here. a cottonwood tree just above notch measured 102" in circumference. Left area at 2:56 and travelled W to trail divergence. one trail to Rattlesnake nest, one to shortcut to Chimney and the regular E-W trail. The E ends abruptly however.

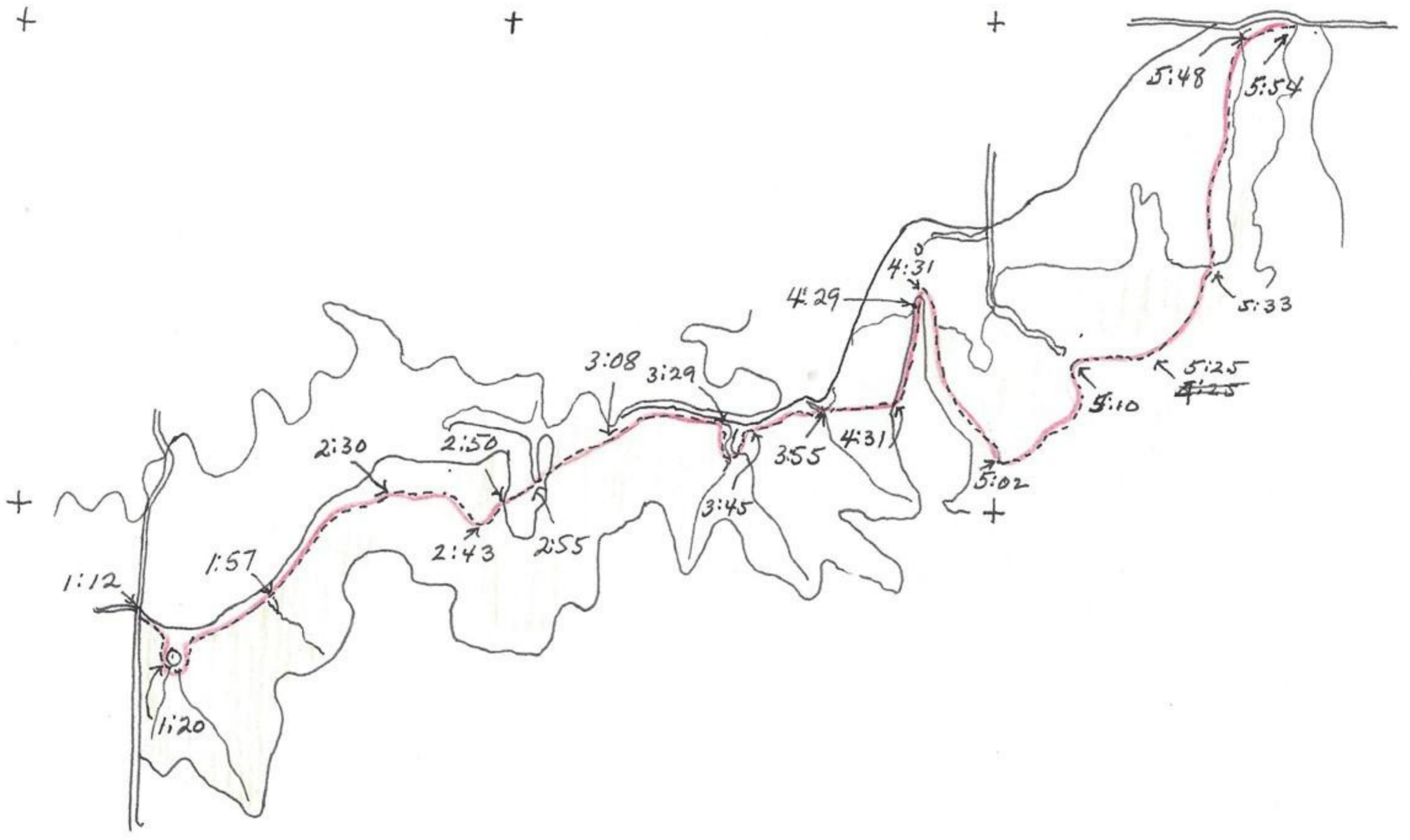


3:05 titmouse, chickadee, 3:08 downy; great crested flycatcher. 3:11
 cardinal, whitebreasted nuthatch. 3:18 bend of river and point where
 trail fords river to Collins farm. 3:20 pewee, chickadee, crested flycatcher,
 Swainson thrush. 3:27 blue-gray gnatcatcher, edge of forest, redbellied
 woodpecker. 3:28 crossing drainage in center of field, Indigo bunting,
 chickadee, cardinal. 3:30 gate SW corner field. Indigo bunting,
 chickadee, cardinal. ^{Cottontail} 3:35 pewee, Swainson thrush, downy woodpecker,
 redbellied woodpecker. 3:40 redheaded woodpecker, great crested flycatcher.
 3:45 pewee. 3:50 redbellied woodpecker. 3:56 chickadee, fox squirrel.
 Bell vireo, titmouse. 3:59 redbellied woodpecker, raccoon tracks,
 Acadian flycatcher. Elm tree to right of trail measures 10 1/2 feet at
 chest height. A land snail 6 feet high on bark, S side. About 100'
 beyond to S trail goes up slope of canyon. Bobwhite fence corner on
 ridge to W at 4:05. 4:08 Kentucky warbler, pewee. 4:10 Chickadee,
 redtail hawk, great crested flycatcher, redbellied woodpecker,
 bobwhite calling. 4:12 3 goldfinch, pewee, red-eyed vireo.
 4:20 car.

Rock Creek. SE Clinton, Douglas Co., Kansas

May 28, 1968

Made census along wooded slopes of S side of Rock Creek from
 a point where tornado raised a home to S end of proposed Clinton
 Reservoir dam. From Lawrence to dam site recorded kinds of
 birds: (water was lower about 3 feet low than yesterday or 3 feet below
 edge of upper erosional level. Redwing, dickcissel, grackle, meadow-
 lark, mourning dove, Eng sp., barn swallow, now at south end
 of dam. mileage 87.2 (will keep complete census from here on. at
 11:00 A.M. 87.3 redwing. 87.4 redwing, redwing. 87.5 redwing.
 87.7 redwing, dickcissel. 87.8 redwing, redwing, grackle. 88.0 dick-
 cissel, 88.5 Rock Creek, water 4 feet. 88.7 meadowlark, eastern
 kingbird, dickcissel. 89.3 grackle, dickcissel. 89.4 dickcissel.
 eastern kingbird. 89.5 dickcissel, grackle. 89.7 to 5, 2 cowbirds,
 chipping sparrow. 89.9 barn swallow, dickcissel. 90.0 dickcissel.
 90.1 eastern kingbird, dickcissel. 90.2 dickcissel, dickcissel,
 dickcissel. 90.3 meadowlark. 90.4 shrike. 90.7 bridge over Rock Cr.
 cardinal, water to within 1 1/2 feet of normal, Indigo bunting, 91.1
 base of hill and left car at 1:12 P.M. Turkey vulture, ♂ ♀ cowbird,
 5 turkey vultures circling ridge to E. 1:15 2 chickadees, great crested
 flycatcher, 2 bluebirds, 1:18 cardinal, 8 cedarwaxwing flying
 down canyon from lake area; acadian flycatcher, 1:20 pond



ROUTE TRAVERSED THROUGH
 DECIDUOUS FORESTS ON ^{S.} SIDE OF
 ROCK CREEK VALLEY. DISTANCE
 BETWEEN + = 1 MILE. DISTANCE
 COVERED = 4 3/4 MI.

pond has been overflowing for several days; redbellied woodpecker, 2 turkey vultures. 1:25 big tree at pond (SE). 1:30 pewee; ¹crested flycatcher, downy, 1:33 cottontail, chickadee, downy ♂. 1:36 pewee, gnatcatcher. 1:35 red-eyed vireo (call a modified catbird with an occasionally a pewee note call inserted in its call; pewee, left 1:45 redtail calling. 1:47 chickadee 1:50 fence line. 1:50¹ redbellied woodpecker, 1:53 main trail. oak left of trail 84" in circumference as trail to S goes up incline, or approx. 150 up canyon from flatter alluvial part of mouth of canyon. 1:55 great crested flycatcher, 2 chickadees, pewee. 1:57 large elm on left side. This tree about in middle of alluvium 6 great crested flycatcher near this tree on alluvium; redbellied woodpecker, opossum tracks in trail; 4 cardinals, white-breasted nuthatch, ¹Kentucky warblers, 2 titmice. all birds listed at 1:57 in same general area. 2:03² fox squirrels calling about 100 feet from where birds were concerned and back squirrel way; Swainson thrush, chickadee. 2:08 3 Kentucky warblers. Their call is sharp and sound like the vigorous kissing of the back of ones hand. Call given about every second or more. One bird moved between two other birds. A ♀ on one hand and a ♂ on the other. Courtship with ♀ and defense with other male as it approach ♀. This bird is confident and easy to observe. Area understory at base of slope. The female flutters wings, slightly raised and at a high speed. Left this area at 2:23. Two hobwhites left forested area about 50' from warblers. These warblers have been noted in some place on previous trips in last week. 2:24 Swainson thrush. 2:25 2 bluebirds, downy woodpecker; 2 redheaded woodpeckers, probably nesting in trees bordering field. 2:30 trail to field but will continue E on main trail. 2:33 Swainson thrush, white breasted nuthatch. titmouse. 2:46³ cardinal. 2:47³ scarlet tanager ♀, redbellied woodpecker. At turn to right with steep grade, then levels off. 2:41 squirrel in bush; crows calling to N. 2:43 top of ridge, trail right to Tomestone, followed trail down canyon. Trail convergence & now to left. 2:44 bluejay. 2:46 fence line & flat spot. 2:48^{trails} redbellied, Bell's vireo. 2:50 gate at SW corner field. Opossum in trail. 2 cottontail rabbits; 2 crested flycatchers, Indigo bunting. Cardinal, house wren, Turkey vulture, 2:53 Indigo bunting. 2:55 crossing creek in center of field. Cardinal, Indigo bunting.

Snapping turtle 3 feet out of water on bank. Carapace 200 mm in length. These small lateral creek must support many snapping turtles and a population study could be made by traversing these creeks in their lower reaches. a. Walnut and locust tree have invade lower end of E field and are approx (walnut) 10. feet high. Smaller oaks are also present. 2:58 now into woods. blue-gray gnatcatcher, chickadee, pewee, This is a good forested area with many large oaks. 3:02 blue marked tree. trail convergence. (Right to rattlesnake nest, will continue on regular trail. Redtail hawk screaming, preceded by fox squirrel calling, 3 titmouse chasing each other. This area really climax. 3:06 passing by lateral stream meander (rattlesnake nest segn). 3:08 river contacts hillside, trail down to ford. water down 2 or 3 feet since last checked. G. Crested flycatcher. 3:10 titmouse, white breasted nuthatch. 3:11 cardinal, first deer tracks in trail and from east. They measured 75 and 60 mm in length and could be the same as those observed on the 26th, downy woodpecker, young calling from maple ^{rest} 40' high. At this spot a crow left from about 1/2 way up canopy and called vigorously. 3:10 large oak fallen across trail and natural fall. diameter approx. 28 inches. 3:20 blue marked tree, downy. titmouse, redbellied woodpecker, chickadee, 325 short cut to Chimney, ^{b.g.} gnatcatcher, titmouse. deer tracks continued on regular trail. 3:29 Louisiana waterthrush in creek to left out 80' down from notch between two major drainages of this area. The water thrush called vigorously with a loud chirp. It displayed its expanded tail feather and wings held out and vibrating with body in bent low. It reminded one of a mourning dove in feigning display. The waterthrush crossed water without hesitation and when I partly hid myself it returned down stream to where first observed. Its mate arrived by dropping straight down into creek and joined the ♀(?). This performance took place within 20' of my position. A small unmarked bird was on lower branch on edge of bank. It was heavily marked with stripes, short tail and large bill than the waterthrush and may not have been the young of this pair of waterthrushes. On approach a gray squirrel fed on leaves of tree about 12 feet from waterthrush and remained for about 2 minutes within clear view of me. When it left it moved with great speed

as if having noticed me for the first time. Titmouse in area. Chickadee, Cardinal, pewee in same area. 3:36 leaving area. 3:43 around trail and back to notch on opposite side of notch. and at point where trail leaves gully to chimney site. Water in Rock Creek down approx. 2 feet since 26th. 3:45 chimney, ruby-throated hummer. 3:49 creek (Rock Creek) leaves side of valley, Titmouse, deer tracks travelling w for first time and some size of previously observed on previous trips. 3:53 Chickadee, deer track are no longer in trail. 3:55 crossover. 3:56 gate. 3:57 field and now up mt side. Forests of scrub-oak type and considerably drier, however, green moss at many places on ground under oaks; red-bellied woodpecker. first large butterfly today (morning cloak). 4:00 second morning cloak, *Diadophis* under a log. 4:13 top of upper ledge. Under rock were *Diadophis*, narrow-mouth toad, *Eumeces*. Considerable hickory on top. Fallowed just above upper ledge. Birds uncommon. 4:20 end of field and no bird so far. 4:21 Chickadee, crickets calling on top and not in forests. 4:23 redbellied woodpecker, acadian flycatcher among sumac. 4:27 area of overhanging cliff. 4:29 locust tree supporting overhanging rock which has produced a greater overhang extent than usual. Best view of Wokarusa of any point along edge of valley. This tree is about 40' from point of ridge. 4:31 first bench below point and will continue S.E. From this bench directly below point and a few feet to E collected the following herps: (plus a box turtle in same area)

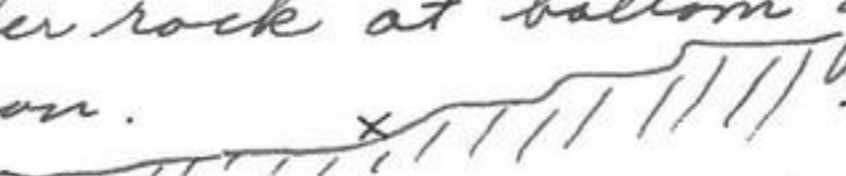
<u>680528-1</u>	<i>Carphophis</i>	body 230 mm, 48 tail, 10 gms
<u>680528-2</u>	narrow-mouth toad	length 27 mm, 2.2 gms
<u>680528-3</u>	" "	" 25 mm, 1.5 gms
<u>680528-4</u>	" "	" 24 mm, 1.7 gms
<u>680528-5</u>	" "	" 26 mm, 1.8 gms
<u>680528-6</u>	" "	" 23 mm, 1.4 gms
<u>680528-7</u>	" "	
<u>680528-8</u>	<i>Eumeces obsoletus</i>	body 118 mm, 173 tail, 43 gms
<u>680528-9</u>	" "	body 123 mm, 150 tail, 54 gms. (of which 40 mm of tail was regenerated.
<u>680528-10</u>	<i>Eumeces</i>	body 63, tail [55], 7 gms.
<u>680528-11</u>	<i>Pseudacris</i>	24 length, 1.5 wt.
<u>680528-12</u>	"	23 length, 1.5 wt.

Redbellied woodpecker at point. Left point at 4:43. Chipping sparrow can be heard calling to n in valley. 4:48 downy woodpecker + nest of young. First deer tracks going nw. and it is apparent that this benchland is used as a thoroughfare. Birds uncommon to rare. 4:50 old road now grown over (down slope). 4:56 few drops rain with local cloud mass passing over. 4:57 major drainage. 5:00 fence line and old road bed that goes down canyon. now grown over; cardinal; pewee. 5:02 head of gulch, now toward

rock quarry. Chickadee, gray squirrel, ⁵7:05 chickadee, ⁵4:08 titmouse. ⁵7:10 rock quarry. Box turtle in road. At point where glass snake was capture by a rock den, noted a *Eumeces obsoletus* under a rock. Indigo hunting. Sun out. as shower continued east. Cardinal, mourning dove, Chickadee, 3 redwing, cowbird
 5:20 leaving rock quarry and changing reel. 5:22 fence line. Indigo hunting, pewee, 5:25 now going NE along top of ridge. Butterflies are uncommon, especially large one, in comparison to a month ago. Some cactus on ridge. 5:33 fence line, meadowlark, redtail calling to W. an old nesting area. Carabid (fresh) beetle on thorn. Chipping sparrow. 5:36 mourning dove, 5:40 brown thrasher, bobwhite, chipping sparrow, chickadee, titmouse, 5:42 rock fence, meadowlark, single goldfinch, mourning dove. 5:45 great crested flycatcher; 2 lark sparrows, 2 bluebirds, chipping sparrow. 5:48 junco point. Cardinal, great horned owl. There does not appear to be any aggregate of birds or insects at the terminal of this ridge. Pewee, 5:54 extreme end, cardinal. 5:57 now at bottom of hill. Fence gate just to E at exactly 6:00 P.M. Birds in immediate area of a point east of S end of proposed dam are: mourning dove, dickcissel, redwing, cowbirds, bobwhite, grackle, meadowlark.

SE Clinton, Rock Creek, Douglas Co., Kansas

June 1, 1968

Collected several herps and butterflies at a point 4/10 mi E and 5/10 mi. N of the ^{SW} corner of sec 25, R 18E, T. 13S. The herps were from under rock at bottom of slope of second bench on E side of canyon.  They measure as follows:

- 680601-1 narrow mouth toad. 32 mm length, 3 grms wt.
- 680601-2 *Carpophis* 120 body, 26 tail, 5.5 grms wt.
- 680601-3 " 165 body, 23 tail, 3.5 grms wt.
- 680601-4 " 227 body, 45 tail, 8 grms wt.
- 680601-5 " 175 body, 30 tail, 4 grms wt.
- 680601-6 *Eumeces* 47 body, 40 tail, 2 grms
- 680601-7 " 27 body, 41 tail, 6/10 grms.

The following butterflies from alfalfa fields on top to E.

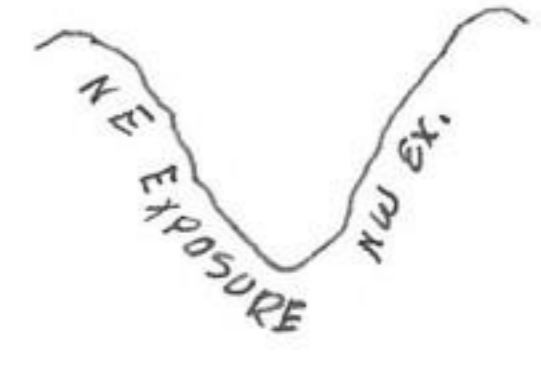
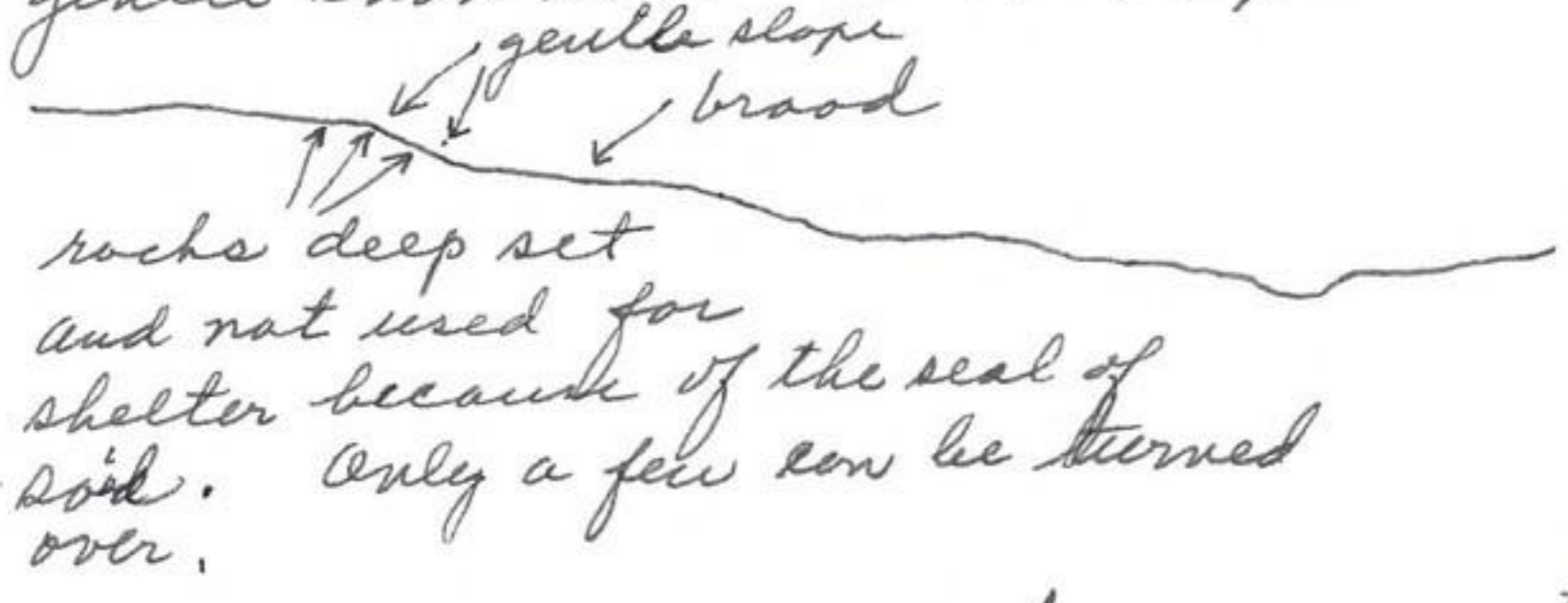
- 680601-8 *Papilio thoas*. Only a single individual noted in field. maybe unusual record. It was feeding on flower of alfalfa. most common and about 4 per acre.
- 680601-9 monarch.
- 680601-10 Butterfly. In forested area and more common where there is a partial opening with sun light.
- 680601-11 Blue butterfly. Border of forest field.
- 680601-12 butterfly from open areas

680601-13 butterfly.
680601-14 skipper

In open areas, 680601-74

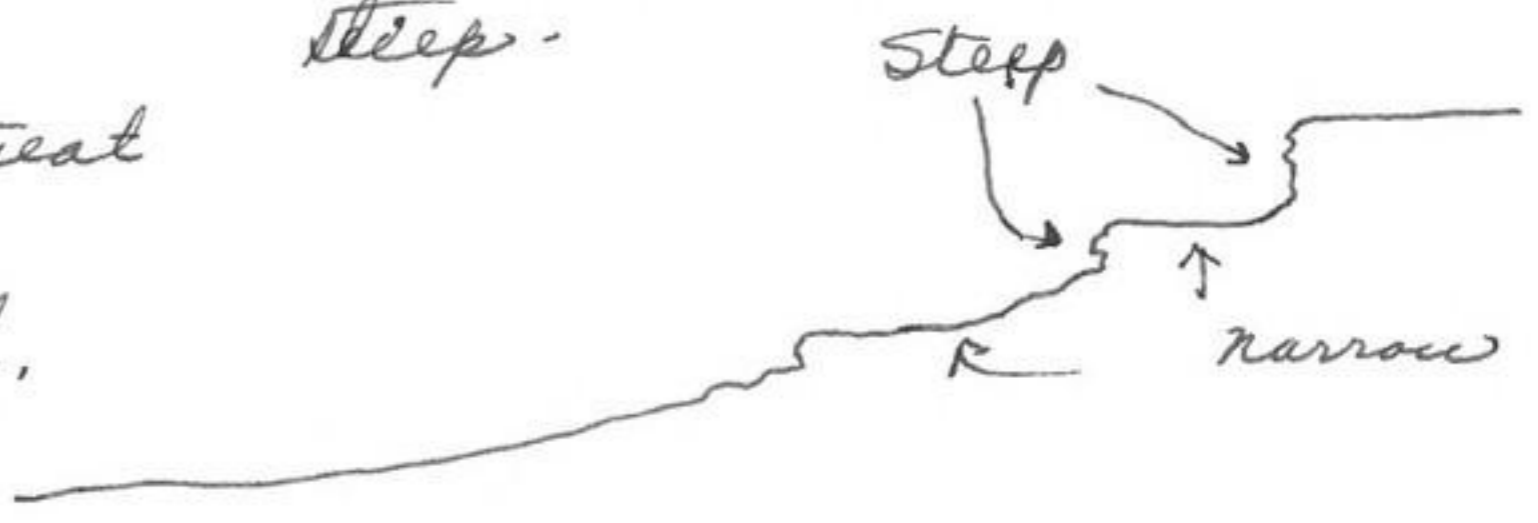
at the bottom of drainage above pond collect a turtle;
680601-15 *Chelydra serpentina*. 260 mm total length, carapace 108 mm; wt 316 gms.

There is a difference of topography of erosional benches of the sides of the Wakarusa-Lock Creek drainage. On the NE exposure the benchlands are general broad and slopes more gentle than those on NW slopes.



The rocks are flat, ^{and} on top of soil with favorable retreat of herps underneath. These rocks can be easily removed. These slopes seem to be more arid or drier than NE exposures.

In contrast to slopes on NW exposures the benchlands are narrow and the slopes are abrupt and steep.



A ruby-throated hummingbird in some area as herps. Fox and coyote tracks in trail.

5 mi. W Lawrence (P.O.), Highway 40, Douglas Co., Kansas

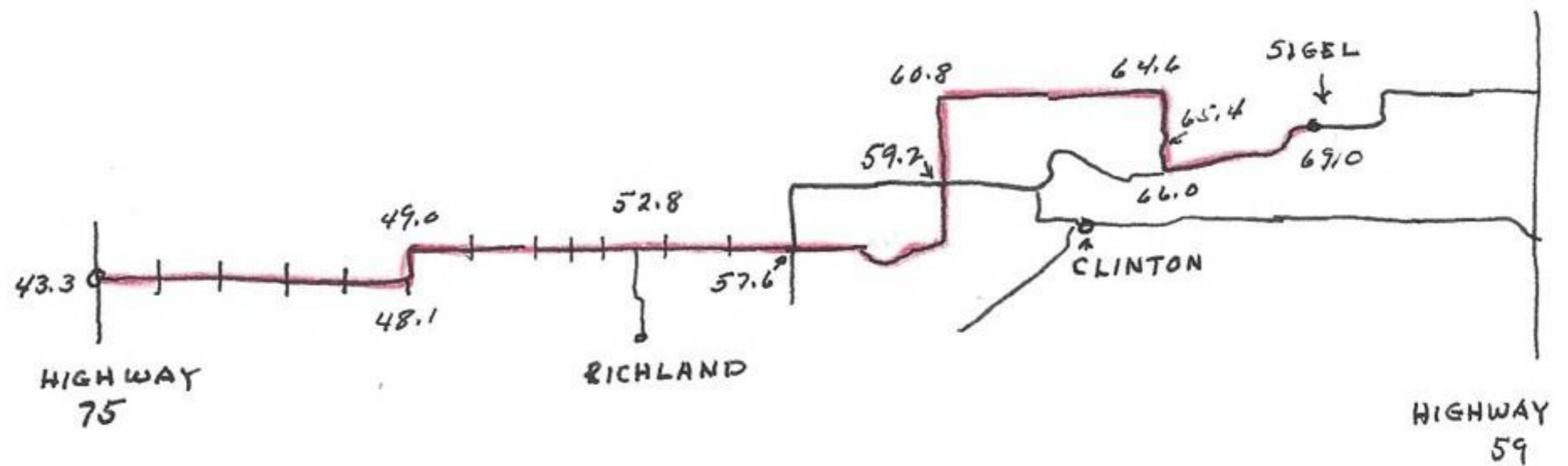
June 3, 1968

noted an upland plover on top of utility pole along road. This area is associated with extensive field of native andropogon, annually cut. This field (NE of inter-section) would be a logical place for this species for breeding.

Wakarusa Valley, Highway 75 to ^{Siegel School at} NE end proposed Clinton Res. dam, Shawnee-Douglas Co., Kansas

June 4, 1968

Recorded birds observed from highway 75^N on regular Wakarusa valley road, to Clinton, thence to ~~the~~ end proposed dam. Recorded according to mileage. Started at 5:25 P.M.



43.3 Highway 70 at point where Wabasca Valley road turns E.,
 4 barn swallows. 43.7 cowbird. 44.0 meadowlark,
 mourning dove. 44.2 loggerhead shrike. 44.4 redwing,
 meadowlark, 3 mourning doves. 44.5 meadowlark,
 redwing bluebird. 44.6 redwing, meadowlark. 44.8
 3 meadowlarks, meadowlark. 45.5 meadowlark, 4
 barn swallows. 45.6 4 meadowlarks. 46.1 starling.
 46.3 meadowlark. 46.6 3 cowbirds, 2 meadowlarks.
 46.9 shrike, eastern kingbird, dickcissel. 47.8 redwing
 48.1 now to N. 48.9 meadowlark. 49.0 to E. 49.4
 meadowlark, redwing. 49.9 3 redwings. 50.0 Disney
 School. 50.7 2 mourning doves, barn swallow,
 redwings. 51.5 meadowlark. 52.2 meadowlark,
 redwing. 52.5 meadowlark, mourning dove. 52.8 Rich-
 land road turnoff. 53.3 redheaded woodpecker. 53.9
 dickcissel. 54.1 dickcissel. 54.4 County line. 54.7
 dickcissel, eastern kingbird, dickcissel. 54.9 dickcissel.
 55.8 mockingbird. 55.9 3 bluejays, dickcissel, meadow-
 lark. 56.1 2 bluebirds, 2 mourning doves. 56.6 Creek,
 titmouse. 56.9 drainage from lake, dickcissel, meadowlark,
 cardinal, bobwhite, mourning dove. 57.4 mockingbird,
 dickcissel, lowbird. 57.6 4 corners on side of hill and
 continuing E. 2 dickcissels, shrike, 8 barn swallows.
 57.7 meadowlark, dickcissel. 57.8 3 dickcissel, meadowlark
 57.9 3 redwings, cowbird. 58.0 crow, mourning doves. 58.2
 to N. dickcissel, redwing, mourning dove. 58.6 dickcissel,
 mourning dove, mourning dove, mourning dove. 58.9 2
 meadowlarks, 2 cardinals. 59.2 main road, lark sparrow,
 redwing, dickcissel, meadowlark. 59.4 2 mourning doves,
 redwing, loggerhead shrike. As this shrike flew out to
 capture an insect, a butterfly chased the shrike. 59.5
 meadowlark, meadowlark, meadowlark. 59.7 bluebird,
 brown thrasher. 59.8 meadowlark, great crested flycatcher.

60.0 Indigo bunting, meadowlark. 60.2 meadowlark, meadowlark, dickcissel. 60.3 meadowlark. 60.4 2 meadowlarks. 60.8 now to E. Baltimore Oriole, mourning dove. 61.0 meadowlark, meadowlark. 61.2 meadowlark. 61.3 meadowlark. 61.5 mourning doves. 61.8 deer creek, cardinal, dickcissel. 61.9 2 mourning doves. 62.1 dickcissel, meadowlark, mourning dove, mourning dove, redwing. 62.3 grackle. 62.4 meadowlark. 62.5 2 mourning doves, redwing, dickcissel. 62.7 shrike, mockingbird, bobwhite, dickcissel. 62.9 Coon Creek, mourning dove, bobwhite. 63.1 redheaded woodpecker, 2 redwings. 63.3 Common farm, dickcissel, shrike, meadowlark, meadowlark, 2 lark sparrows. 63.7 cardinal, dickcissel. 63.9 Boy Scout drainage. Indigo bunting, cowbird. 64.1 dickcissel. 64.2 meadowlark, Baltimore Oriole. 64.4 dickcissel, meadowlark. 64.6 now to S. meadowlark, dickcissel, redwing. 64.7 meadowlark, meadowlark, dickcissel. 64.9 meadowlark, dickcissel. 65.0 meadowlark. 65.1 meadowlark. 65.2 2 meadowlarks. 65.4 Rattlesnake Point (top). 65.5 dickcissel, redwing, 2 cowbirds. 65.6 3 redwings. 65.7 mourning meadow dove, dickcissel. 65.9 dickcissel, 2 grackles, 2 redwing. 66.0 now to E. 28 grackles feeding in a loose flock at pond. 2 redwings. 66.1 2 redwings, dickcissel, 2 grackles. 66.7 2 mourning doves, redwing. 66.9 meadowlark, mourning dove, redwing. 67.2 N end proposed down (old). 67.3 phoebe. 67.4 ♂ + ♀ bluebird, 2 dickcissel. 67.7 cardinal. 67.9 Y in road, 3 barn swallows. 68.2 2 cardinals. 68.4 cowbird, 2 grackles. 68.9 meadowlark, dickcissel, bobwhite. 69.0 Sigel School House (6:45 P.M) and end of census. Birds between here & Lawrence are: shrike, meadowlark, Indigo bunting, barn swallows, dickcissel, redwing, eastern kingbird, grackle

43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 5165L
 HY 75
 RICHLAND

E. meadowlark	8	5	3	1	1	1	2			1	1	2	2	5	6	4	2	2	5	4	1	1	57
Dickcissel			1	1					1	4	1	1	7	2	1	1	3	2	5	3	1	2	38
redwing blackbird	3					4	1	1				3	1	2			2	2	1	6	6		32
mourning dove	4					2	1					3	5	2	1	3	4			1	3		29
cowbird	1		3									2					1		2			1	10
barn swallow	4	4				1						8										3	20
loggerhead shrike	1		1									1	1			1	1						6
shrike			1																				1
bluebird												2		1								2	5
redheaded woodpecker									1									1					2
eastern kingbird			1							1													2
mockingbird											1	1					1						3
blue jay											3												3
titmouse												1											1
cardinal												1	2		1		1				1	2	8
bobwhite												1					2						4
crow													1										1
lark sparrow															1			2					3
brown thrasher															1								1
great Crested flycatcher															1								1
Indigo bunting																1			1				2
Baltimore Oriole																1				1			2
grackle																	1			2	30	2	35
phoebe, eastern																						1	1

SE Clinton, $4\frac{1}{10}$ mi. E and $5\frac{1}{10}$ mi N of SW corner sec 25,
R. 18E, T. 13S, Douglas Co., Kansas. 680605-77

June 5, 1968

From the head of drainage system collected the following butterflies and lerpis. The butterflies were from two positions, one an open field of clover in blossom and in forest adjoining.

680605-1 Swallowtail (from field)

680605-2 monarch (from field)

680605-3 silver spot (from forest)

680605-4 white with orange (field)

680605-5 butterfly (in open among forest). This butterfly is very confident and will consistently approach and light on either one's body or net. They maintain a territory in contrast to the whites that seem to move directionally and usually with the wind.

680605-6 ibid.

680605-7 blue. edge positions

680605-8 common moth of forest. This moth is a dominant.

680605-9 large skipper

680605-10 white cabbage butterfly. open situations & border.

680605-11 butterfly with broad orange ^{base} stripe. This butterfly inhabits open trails in forests and is strictly territorial with 3 or 4 using identical flight lanes and alighting on same plants. They fly back and forth along trail with definite limits. With contact with another butterfly, the two would fly together, generally in an upward flight.

680605-12 *Aleodopsis* 2.5 body, 5.5 tail, 6 gms.

680605-14 *Carphopsis* 2.25 body, 3.4 tail, 6.5 gms

A ruby-throated hummingbird observed in forested area; one on border between forest and field and visiting flowering clover.

The clover fields do not support butterflies in numbers observed on a previous trip when 20 or 30 could be observed at one time. Today there were occasions when there were no butterflies, and on other times only one or two. Winds of this part of the country are not favorable for butterflies.

Snakes are not common in dense forested area although there are favorable rock environments. It requires some sun to felter thru or an opening to produce best requirements for snakes.

Green cicadellid in trail in forest where sun shined on trail.

Cuckoo's calling more than on any previous trips to this area. (yellow-billed).

Enroute to this area made complete censuses of birds beginning at the S end proposed Clinton Reservoir dam. Birds between Lawrence & dam are: Eng sp., grackle, meadowlark, cowbird, dickcissel, redwing, Indigo bunting, barn swallow. Wind from S and about 15 m.p.h. temp around 88. Sky with beautiful cumulus & 20% of sky.

92.9 S end dam, dickcissel, 93.0 dickcissel, dickcissel, meadowlark. 93.2 dickcissel, redwing, dickcissel. 93.3 dickcissel, meadowlark, redwing. 93.4 dickcissel. 93.5 redwing, dickcissel. 93.6 dickcissel. Field on both sides of this section plowed and no dickcissels or birds present. 94.1 mourning dove. 94.3 Rock Creek, water down to approx 1 foot. 94.4 meadowlark, dickcissel. 94.6 Collins farm, meadowlark, usual English sparrow at farm. 94.9 dickcissel. 95.0 2 grackles, cowbird, meadowlark. 95.4 redwing and to S., 2 bluebirds. 95.5 mockingbird, meadowlark. 95.7 meadowlark, dickcissel, redwing. 95.8 dickcissel, redwing, dickcissel. 95.9 meadowlark, shrike. 96.0 meadowlark. 96.2 dickcissel. 96.4 bridge over Rock Creek. meadow flycatcher. water muddy and about 8 inches above normal non-rain periods. 96.5 Indigo bunting, ^{corn approx. 3 feet high} 96.7 base of hill. 96.9 bluejay, Indigo bunting. 97.1 dickcissel, dickcissel, dickcissel. 97.2 now to E. 97.3 dickcissel, 97.4 4 bluebirds, ^{chipping sparrow} 97.5 end of census and leaving car.

3 7/10 mi. E and 8/10 mi. N Lawrence (P.O.), Douglas Co., Kansas

June 6, 1968

From the above locality, collected a six-lined racerunner no 680606-1. It measured 70 mm body, 139 tail, 11 gms.

A few observations are recorded:

A male redwing blackbird was sitting on a wire of a telephone line 35' from a railroad track. It was calling in protest as I passed by. At this moment a freight train (80 cars and traveling about 50-60 miles per hour) passed by. The redwing remained on the wire during the time the train passed. Its unconcern of this train indicated a highly specific degree of habituation for trains that passed thru his nesting territory. After the train passed a female joined the ♂. It was at a nest of young in the short shrubs below the ♂.

Along the Kaw River a grackle was ⁶⁸⁰⁶⁰⁶⁻⁷⁹ feeding on beach 5 feet from water. A spotted sandpiper walked & ran by the grackle with definite concern about the grackle. At 20 feet away the grackle left and pursued the spotted sandpiper by almost direct contact.

Two yellow-billed cuckoos together and one called frequently. These birds are calling more frequently than earlier in the season.

Lawrence, Douglas Co., Kansas

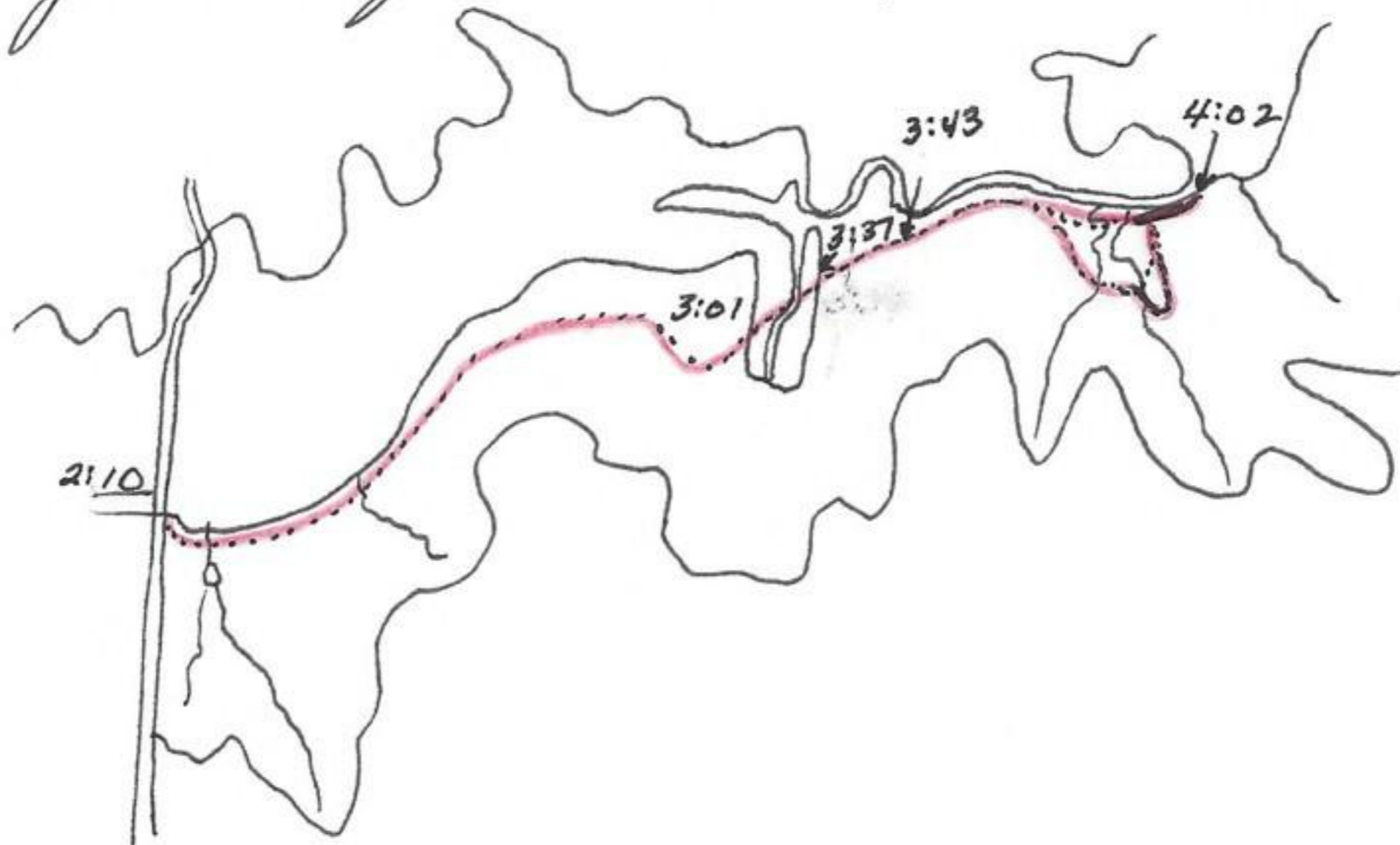
June 7, 1968

Observed a ♀ starling on lawn in the process of picking up nesting material. It had 5 or 6 stems in its mouth and then set them aside to pick up a worm and work it over after which it consumed it. It did not pick up the bundle of nesting material but continued to feed. After approx. 1 minute it flew up into a juniper tree and approached a male starling. She solicited copulation from the male by standing close to the male. The male responded by copulating. These are the pair of birds that had raised a family of approx. 1 week ago.

Rock Creek, SE Clinton, Douglas Co., Kansas

June 8, 1968

made census of birds on hillside S of Callins farm area. starting at base of hill (see map). Temp approx. 80°F. wind



approx. 15 m.p.h. from S. Skies hazy but clear. Started at 2:10 P.M.
2:11 great crested flycatcher. 2:13 chickadee, yellowbilled cuckoo.
2:15 great crested flycatcher. 2:21 chickadee family of 7, cardinal.
2:27 forest relatively quiet of birds; wind high on upper ridge but only leaves gently blowing below on lee side of hill

67
2:29 barbed wire fence convergence with N S ⁶⁹⁰⁶⁰⁸⁻⁸⁰ line on ridge; chickadee calling. 2:33 main trail at old oak, now going down hill in trail. This oak is on same general level as a tree on west side of trail which has three main trunks to base (leaves large of elm-like but not of that species.); deer tracks going down trail and of the same measurement as those of previous trip. These tracks were made last night or early morning. 2:34 chickadee. 2:35 large elm on alluvium to left; redbellied woodpecker, Acadian flycatcher, titmouse; cow hear an indigo bunting to N some 200 at edge; crow calling from field to N. deer tracks continuing east in trail. 2:42 pewee; great crested flycatcher. 2:51 area where Kentucky warbler had been noted but not present today; chickadee, fox squirrel lying on limb in top of high tree; redbellied woodpecker. 2:56 cottontail. chickadee. 2:57 white breasted nuthatch; great crested flycatcher, chickadee; 4 chickadees. 3:00 downy woodpecker, fox squirrel. 3:01 cardinal. 3:03 trail left to field; redbellied woodpecker, cardinal, chickadee; a green crested beetle in precisely the same sunlit spot in trail that has been observed on previous trip. 3:05 redbellied woodpecker, chickadee; titmouse. calling as if young in area, one of which issued a high pitched call almost out of range of human hearing. These birds attracted a redbellied woodpecker to area. 3:11 great crested flycatcher; red-eyed vireo. 3:16 cardinal. 3:17 redbellied woodpecker. 3:18 trail now flattens out on benchland, cardinal; red-eyed vireo. 3:20 trail leaving benchland and grade increasing (rock hanging from fence pole); chickadee, cardinal, white-breasted nuthatch. 3:26 ridge and now to left hand trail down ridge 3:27 great crested flycatcher on limb 10 feet above ground in scrub-oak type association. 3:28 great crested flycatcher (flat bench area). 3:29 marked tree on trail. 3:30 main up canyon trail. 3:31 gate at S end field. yellow-billed cuckoo calling. 3:35 cross-drainage in middle of field; 4 chickadees, 2 titmice, redbellied woodpecker, 2 great crested flycatcher. 3:37 enter- ing forest. 3:40 trail to rattlesnake nest. This area in forest is of down light; deer tracks still in trail. 3:41 chickadee. 3:43 meander leading into Rock Creek (no water) = 3:44 bend of river. 3:45 trail to ford in river; house wren. 3:46 deer tracks back in trail, titmouse, chickadee, redbellied woodpecker. 3:48 tree across trail, titmouse, cardinal. 3:50 red-bellied woodpecker. Trail use more by horses in this area and is muddy and difficult to navigate; deer still use rather than traverse vegetation border- ing. 3:51 yellow-billed cuckoo. These birds seem to be increasing

58
81

3:53 short cut to chimney. 3:55 site of Louisiana waterthrush
of previous trip. no bud in area, creek ran without water but
damp. 3:56 low divide between drainage. water in east
creek, ^{1 qt per 5 sec.} Deer crossed at this divide. 4:58 Chimney, red-eyed
vireo. deer tracks going east and west. 4:02 point of trail
where Rock Creek goes N. water in creek muddy and near normal
level. ^{and 10' N trail} Craw on plateau to S. Approx. 200 feet E of Chimney
the hillside is excavated as if used in pioneer days for rock
quarry. There is one kind of gnat that selected eye lids and
is annoying. Another kind of fly inhabits open field, esp-
pecially those used by cattle and selects the back of head.
These flies will follow one into forest for a 100 feet or so.
mosquito more common on trail nearer base of hill than
on upper slope. 4:05 Chimney, will follow left hand trail
that goes S and around to west on nearly horizontal level.
Fox track in trail. deer tracks both up & down. I get the
impression that this area is the center of deer activity as
tracks lead in both directions and are more common
than elsewhere. 4:07 2 titmice, the ♀ vibrating wings
on approach of male. 4:08 red-eyed vireo. 4:12 shale
cliff in drainage; great crested flycatcher. 4:13 crossing
drainage. The trail that was believed to end abruptly here
from west is a continuation of this trail. 2 deer left bush
approx 100' down stream. 4:28. chickadee, titmouse.
4:24 cardinal. 4:28 trail to ford, cardinal, great crested
flycatcher. 4:30 titmouse. 4:33 cardinal, 2 chickadees.
4:34 trail to field. 4:36 drainage, cardinal, titmouse.
great crested flycatcher; chickadee. 4:40 cardinal. 4:44
cardinal; 4:45 downy. 4:48 crested flycatcher. 4:50 titmouse
chickadee. 4:55 redbellied woodpecker, chickadee. 4:55
Kentucky warbler, chickadee, cardinal. fox squirrel. 4:58
crested flycatcher, redbellied woodpecker, chickadee, cuckoo.
5:04 large elm to right on alluvium. 5:05 collected Bufo
in trail. no. 680608-1 Bufo. 77mm body, 41 gms wt.
left. 5:20. 5:23 convergence 2 barbed wire fences, crested
flycatcher. 5:24 ¹ titmouse. mayflower fruit now over 1
inch in diameter. 5:27 cardinal. 5:30 6 chickadees.
great crested flycatcher, titmouse. 5:31 cardinal, field
sparrow. 5:33 drainage, cardinal, chickadee, great crested
flycatcher. 5:34 chickadee. 5:35 chickadee, 5:37 road &
end of census.

There is a decided increase in butterflies since last
trip and on the proportion of at least 90 per cent increase in

both numbers and species. This applies, also to aff. insects. 680608-82
The green scudged beetle on previous trip occurred about 6 per route covered whereas today observed approx 100 in same area covered. These beetles are in trails in forests. Collected one no. 680608-2.

The silver spotted butterflies have increased from approx. 1 per trip to at least 15 today.

It is unusual not to see turkey vultures or redtails today. The general impression today is that there were fewer birds in area. Variations in numbers or kinds for any particular region is great. It is add that there were no Swainson thrush in area.

Records birds between base of hill and south end of proposed Clinton Res. dam. 38.5 start. 38.7 indigo bunting. corn up to as high as four feet. 38.8 bridge. 39.1 meadow-lark. 39.2 meadowlark, dickcissel. 39.5 redwing meadowlark dickcissel. 39.6 2 mourning doves. 39.7 mockingbird. 39.8 now to E. 39.9 dickcissel. 40.2 dickcissel. 40.8 meadowlark, dickcissel. 40.9 Rock Creek. redbellied, Indigo bunting. 41.6 redwing, dickcissel, meadowlark. 41.8 redwing. 41.9 meadowlark. 42.0 redwing, dickcissel, barn swallow. 42.1 dickcissel, dickcissel, dickcissel. 42.3 south end proposed dam.

Lawrence, Douglas Co., Kansas

June 8, 1968

Mrs. Faubel reports of courtship of painted bunting at Hedden Valley Girl Scout Camp: ♀ on edge of roadway and ♂ in roadway where he flattened out wings, tail and head on ground and then raised head & tail as it assumed an upright position. On standing its wings vibrated at a high speed. Leaving the road, it flew past the female without visible recognition and alighted beyond where it again repeated its ground display. After passing the ♀ several times they left the area. This activity was associated with a hedgerow.

1 1/2 mi. W and 1/10 mi. N Sigel School House, SW Lawrence, Douglas Co., Kansas.

June 9, 1968.

Collected in the area of old road that descends E side of valley and along rock fence directly below. There is a general requirement for *Diadophis* and *Carpophis* of relatively open

situations, however small, with enough clearing for sunshine. Flat rocks that have migrated down slope a best places for these snakes. Those nearest the base of the slope are generally more effective in supplying favorable conditions. Lizards are more frequently found nearer source of rocks. Rocks on top of ledges or slope are frequently productive. Rocks among dense forests are less favorable. *Carphophis* tolerates more shaded situations than *Diadophis*. The following snakes were collected here:



<u>680609-1</u>	<i>Carphophis</i>	263 body, 36 tail, 10gms.
<u>680609-2</u>	<i>Carphophis</i>	248 body, 33 tail, 10gms
<u>680609-3</u>	<i>Carphophis</i>	181 body, 34 Tail, 4.5gms
<u>680609-4</u>	<i>Diadophis</i>	267-body, 46 tail 9gms
<u>680609-5</u>	<i>Diadophis</i>	278 body, 47 tail 11gms.

In working my way back slope thru undisturbed forest growth (second growth) found that there is considerable variation in plant association; each variation of a specific character. Factors are probably slope, soil, overhead exposure and other unexplainable causes.

Rock Creek,
SE Clinton, 4/10 mi. E and 5/10 mi. N of SW corner sec. 25, R 18 E,
T 13 S., Douglas Co., Kansas.

June 12, 1968

Collected the following butterflies from this general area, either in open weed field at head of drainage or at edge of forest:

680612-1	mourning cloak.	In forested area near edge
680612-2	black swallowtail.	Open field.
680612-3	silver spot	Open field
680612-4	large silver spot	Open field
680612-5	silver spot	open field
680612-6	Angle-wing	open field
680612-7	Angle-wing	open field
680612-8	white	open field
680612-9	orange	open field
680612-10	large skipper	open field
680612-11	crescent spot	open field
680612-12	moth	open field.
680612-13	Diptera	open field.

June 18, 1968
 Following butterflies from SE Clinton along Rock
 Creek:

- | | |
|-----------|----------------------|
| 680618-1 | Admiral |
| 680618-2 | " |
| 680618-3 | " |
| 680618-4 | " |
| 680618-5 | Eyed brown butterfly |
| 680618-6 | " " |
| 680618-7 | Angle wing |
| 680618-8 | Cicadella |
| 680618-9 | Cicadella |
| 680618-10 | Cicadella |
| 680618-11 | Bumblebee |

680612-14	<u>Alypia octomaculata</u> (Fab.)	Egbert, 680612-84	Edge
680612-15	_____	spotted foresters	Edge
680612-16	_____	angle wing	Edge
680612-17	_____	admiral.	"
680612-18	_____	"	"
680612-19	_____	"	"
680612-20	_____	"	"
680612-21	_____	"	"
680612-22	_____	Hackberry empress	Edge
680612-23	_____	Eyed Brown. Woodland trail	"
680612-24	_____	"	"
680612-25	_____	"	"
680612-26	_____	"	"
680612-27	_____	butterflies	Edge
680612-28	_____	"	"
680612-29	_____		

First evidence of chigger on my body and associated with wet weather.

4 1/10 mi. E Watson Grange, Shawnee Heights, Shawnee Co., Kansas

June 15, 1968

noted a scissortail flycatcher on utility line along highway 10. at approx. 2:00 P.M. On return at 4:30 P.M. this bird was within 200' of the area where first observed. A scissortail flycatcher was also noted at 7 1/4 mi. W Lawrence on highway 10. This is the same area where scissortails have been observed on previous years. A turkey vulture and a kingfisher were in some dead tree at edge of pond. A western kingfisher ^{bird} at approx. 4 mi. W Lawrence on highway 10.

SE Clinton, ^{Rack Creek} 4 1/10 mi. E and 5 1/10 mi. N of SW Corner Sec 25, R. 18E, T. 13S, Douglas Co., Kansas

June 16, 1968

Collected the following butterflies from the above area:

- 680616-1 Eyed brown
- 680616-2 ?
- 680616-3 ?

The eyed brown most active in trails and openings in forest and near edge, especially at twilight. Have noted that the admiral butterfly have definite territorial areas and defend other butterflies of the same species & others. On tree trunks they will follow each other by walking for as much as 2-3 feet. On many occasions they will contact in flight and gradually descend to ground or into plants.

← (see opposite page) June 18, 1968

1 mi. N and 2/10 mi. W Lawrence (P.O.), Douglas Co., Kansas.

June 19, 1968

Collected the following insects and herps from edge of Kaw River where exposed sands covered an area of approx. 1 acre. Some ^{low} weeds helped to stabilize the sands.

The cicindelids were aggregated into 3 definite territorial areas and in those areas were occurred at about 5 per 10x10 feet. The robber fly was associated with the Cicindelids.

Number	Cicindela repanda	eastern tiger beetle
680619-1	"	"
680619-2	"	"
680619-3	"	"
680619-4	"	"
680619-5	"	"
680619-6	"	"
680619-7	"	"
680619-8	"	"
680619-9	"	"
680619-10	"	"
680619-11	"	"
680619-12	"	"
680619-13	"	"
680619-14	"	"
680619-15	"	"
680619-16	"	"
680619-17	"	"
680619-18	"	"
680619-19	"	"
680619-20	"	"
680619-21	"	"
680619-22	"	"
680619-23	"	"
680619-24	"	"
680619-25	"	"
680619-26	"	"
680619-27	"	"
680619-28	"	"
680619-29	"	"
680619-30	"	"
680619-31	"	"
680619-32	"	"
680619-33	"	"
680619-34	"	"
680619-35	"	"
680619-36	"	"
680619-37	"	"
680619-38	"	"
680619-39	"	"

- 680619-40 Cicindela
- 680619-41 Diptera
- 680619-42 Robber fly
- 680619-43 Bufo toad
- 680619-44 Bufo toad

1 mi. N and 2/10 mi. W Lawrence (P.O.), Douglas Co., Kansas

June 20, 1968

Collected the following beetles from same area as June 19 above. For all tense and purposes this represents at least 90 to 95% of the Cicindelid population of this area. Collection on both days made in late afternoon from one hour before sundown to sundown.

- 680620-1 Cicindela
- 680620-2 "
- 680620-3 "
- 680620-4 "
- 680620-5 "
- 680620-6 "
- 680620-7 "
- 680620-8 "
- 680620-9 "
- 680620-10 "
- 680620-11 "
- 680620-12 "
- 680620-13 "
- 680620-14 "
- 680620-15 "
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- 680620-19 "
- 680620-20 "
- 680620-21 "
- 680620-22 "
- 680620-23 "
- 680620-24 "
- 680620-25 "
- 680620-26 "
- 680620-27 "
- 680620-28 "
- 680620-29 "
- 680620-30 "

Number 680620-30 is a black Cicindelid and smaller than the others. It was collected in an isolated clearing but within 50' of the regular Cicindelids.

I would estimate 5 robber flies in colony. Noted on several occasions that the robber fly would leave the ground at the same

680620-87
 time the Cicindlid would leave and would chase and alight about a foot from the Cicindlid without making contact on the ground. In one instance the same robber fly chased the single Cicindlid 5 consecutive times, alighting near the one pursued. Also noted Cicindelids to fly out over wheat that adjoined the sandy area and then without alighting, return to the sandy spot. A barn swallow that hunted insects over the wheat darted at Cicindelids. One injured Cicindlid adult, or at least incapable of flight, attempted to evade by digging into sand.

A group of approx. 30 grackles were at a temporary pond about 100' from sandy area. At this time of day (1/2 hr before sundown) they collect at watering and bathing pools and offer a call that is, ^{more} generally given as a disturbance call, something on the order of the call given when a cat is the center of concern. This disturbance call was given on each of three other aggregations of grackles pursuing the same behaviorism of drinking and bathing.

Univ. of Kansas, Lawrence, Douglas Co., Kansas

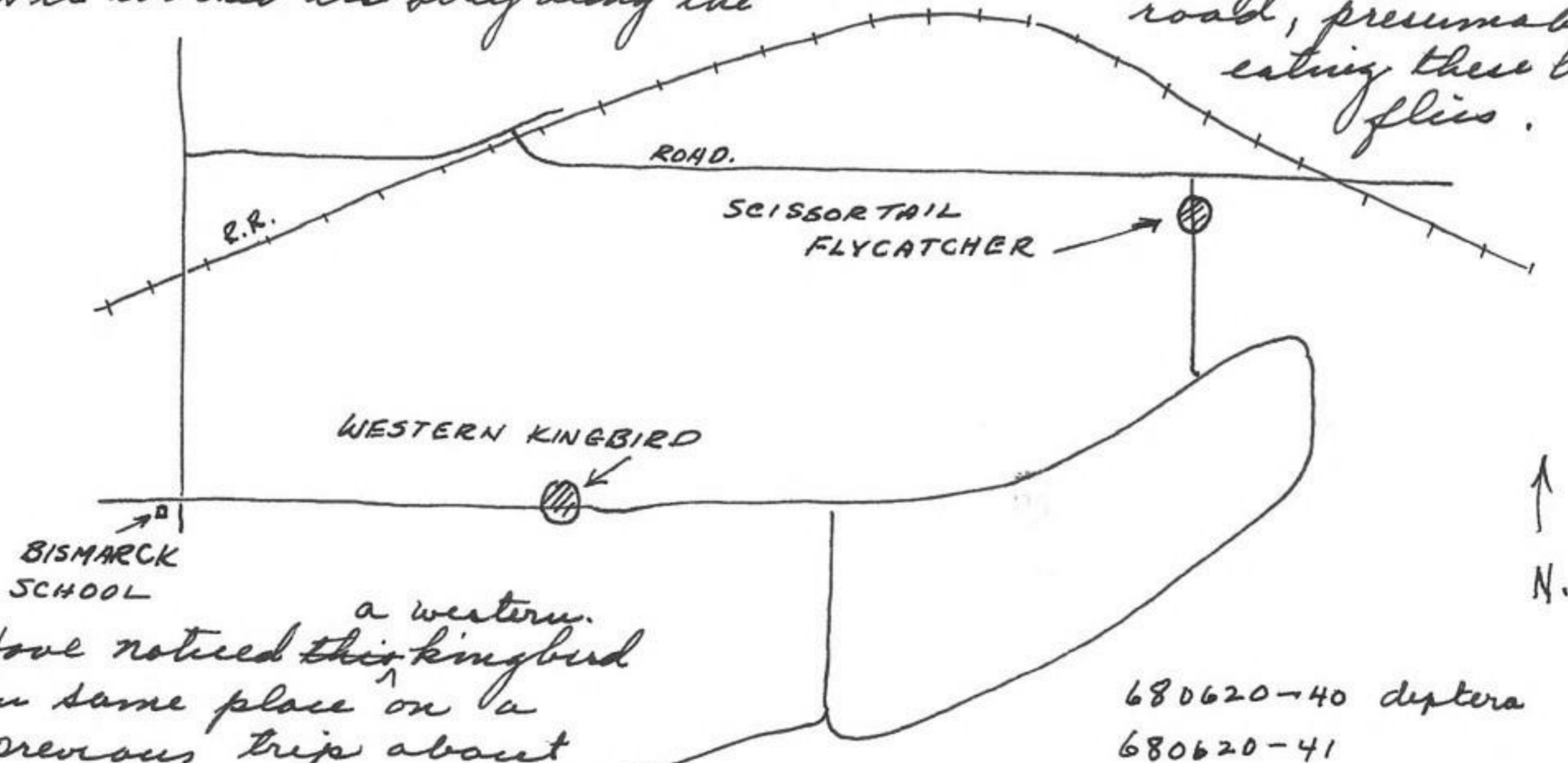
June 20, 1968

The following moth 680620-31 from office in the Strong Building. It had apparently entered by window

9/10 mi. N and 3 3/10 mi. E Lawrence (P.O.), Douglas Co., Kansas

June 20, 1968

Collected 8 alfalfa butterflies no 680620-32 to 680620-39. A high wind had forced these butterflies to edge of road. A scissortail flycatcher hunting along this feed road, alighting on dirt in road as it worked its way along the road, presumably eating these butterflies.



a western. Have noticed this kingbird in same place on a previous trip about 1 week ago (2 3/10 mi. E and 1/2 mi. N Lawrence (P.O.))

680620-40 diptera
 680620-41

Rock Creek, SE Clinton, Douglas Co., Kansas

June 21, 1968

This is a locality including river valley, forest slope and plateau above. These are insects collected by various individuals and at different times and are brought together under one catalogue date: Locality and date only,

680621-1	Diptera	May 7, 1961
680621-2	Diptera	July 16, 1966
680621-3	Diptera	April 27, 1968
680621-4	Diptera	Sept. 6, 1967
680621-5	Diptera	April 3, 1968
680621-6	Diptera	Oct. 1, 1960
680621-7	Diptera	May 5, 1968
680621-8	Diptera	April 11, 1968
680621-9	Diptera	April 27, 1968
680621-10	Diptera	Sept 26, 1966
680621-11	Diptera	Sept 10, 1968
680621-12	Diptera	May 9, 1968
680621-13	Diptera	May 9, 1968
680621-14	Preying mantis	Sept. 12, 1966
680621-15	water skater	March 27, 1968
680621-16	water beetle	Oct. 27, 1967
680621-17	water beetle	June 13, 1966
680621-18	beetle	Sept 1, 1966
680621-19	beetle	July 9, 1964
680621-20	beetle	Sept 28, 1966
680621-21	wasp	Nov. 2, 1966
680621-22	water beetle	May 2, 1968
680621-23	beetle	July 14, 1966
680621-24	beetle	April 27, 1966
680621-25	beetle	Sept. 15, 1966
680621-26	beetle	Aug 28, 1966
680621-27	diptera	Oct, 1967
680621-28	diptera	May 16, 1964
680621-29	diptera	April 21, 1966
680621-30	bee	Oct 21, 1966
680621-31	wasp	May 1966
680621-32	insect	May 20, 1967
680621-33	bee	Aug 21, 1960
680621-34	bee	Sept. 28, 1966
680621-35	bee	May 17, 1966
680621-36	bee	June 18, 1967
680621-37	dragon fly damselfly	July 12, 1967

680621-38
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680621-89

diptera may 5, 1967
 diptera nov. 10, 1960
 diptera Sept. 25, 1966
 diptera june. 8, 1965
 lace wing july 21, 1966
 diptera july 22, 1966
 bee Sept. 23, 1960
 fly may 9, 1967
 diptera Oct. 3, 1961
 fly. april 30, 1963
 diptera april 7, 1960
 diptera Sept. 18, 1961
 ichneumon may 5, 1964
 mosquito Sept 16, 1967
 robber fly april 26, 1961
 diptera Sept 29, 1965
 robber fly Aug. 1, 1962
 robber fly Oct. 15, 1957
 diptera june 28, 1966
 robber fly Sept. 23, 1960
 diptera may 7, 1960
 diptera Sept. 28, 1965
 bee may 14, 1960
 bee Sept. 28, 1963
 wasp may 10, 1963
 wasp may 14, 1960
 wasp date?
 bee Sept. 25, 1960
 diptera Sept. 23, 1963
 velvet ant Sept. 19, 1958
 black ant may 7, 1966
 mosquito Oct 3, 1967
 wasp may 18, 1967
 wasp Oct. 2, 1962
 diptera may 13, 1962
 wasp july 27, 1966
 bee Oct. 14, 1962
 wasp Oct. 9, 1967
 wasp may 16, 1967
 hymenoptera Sept. 22, 1961
 tipulid may 5, 1965

3 6/10 mi. E and 3/10 mi. N Lawrence (P.O.), Douglas Co., Kansas

June 23, 1968

Collected the following insects from sand dunes. These sandy areas have been in this area as long as I can remember, although limited in extent and development. They now occupy an area between cultivated fields to north and uncultivated areas to S. The area to S is depressional and is not suitable for agriculture. Riparian forests beyond depression area to sands adjacent river. This area may have been the edge of the Kaw at one time and since then trees have grown between here and the river and have since been cut.

The sand is pure in about an area 50x40 and elsewhere has a few weeds growing from surface. One large robber fly in area, all others were small 1/2 inch ⁱⁿ length.

680622-1 to 680622-80 Cicindela _____

680622-81 to 680622-89 Cicindela _____

680622-90 to 680622-92 Cicindela _____

680622-93 _____ silver spot butterfly. Only one in area.

The other common butterfly at dunes were alpha butterfly. The two ~~Cicindelids~~ other than the common one were always solitary and peripheral to typical sand area.

Observed the following behaviorism of the large cicindelids (680622-1 to 680622-80):

When approached into wind they would fly forward for 8-15 feet, generally along sandy routes. When approached with the wind they would fly 20-30 ft. and upon alighting would most frequently tumble over several times in the course of a linear foot before coming to rest. I have noticed when pinning these beetles that when removed from jar ^{killing} they will, in almost 100 per cent of the time, come to rest with legs upright and regardless of readjustment of these beetles will remain on their backs. The route of escape when approached is usually along avenues of sands, but some times they fly laterally into weeds. When one alights a foot or so from another, the one already in position will run over to new arrival and will make a weak contact but will not pursue. Observed one to feed on small insects on sand. Upon alighting in sparse vegetation in sand area, they desperately run to edge where they have unobstructed position for a get-a-way and where they remain until disturbed again. These beetles are best approached by

moving slowly to within three feet and then thrusting the net 1 1/2 feet beyond them so that the net is in position to capture the insects as it leaves the ground. If the net is not in position one most frequently misses by a foot or so. By thrusting the net forward and then backward toward insect is the most successful method. If the position of the insect is such that it is moving straight from its body alignment, the best method is to swing the net, or following the insect as it makes its departure. One has more deliberate time to adjust to variance of flight. To run across sands swinging a net at random is futile; patience is required and to follow one insect at a time. Ordinarily the beetle leaves the ground at 5 feet. When in net they can make a buzzing sound with their wings which is never heard elsewhere. I would estimate that the 80 specimens collected represents 1/5 the population on an area equivalent to 80x80 feet.

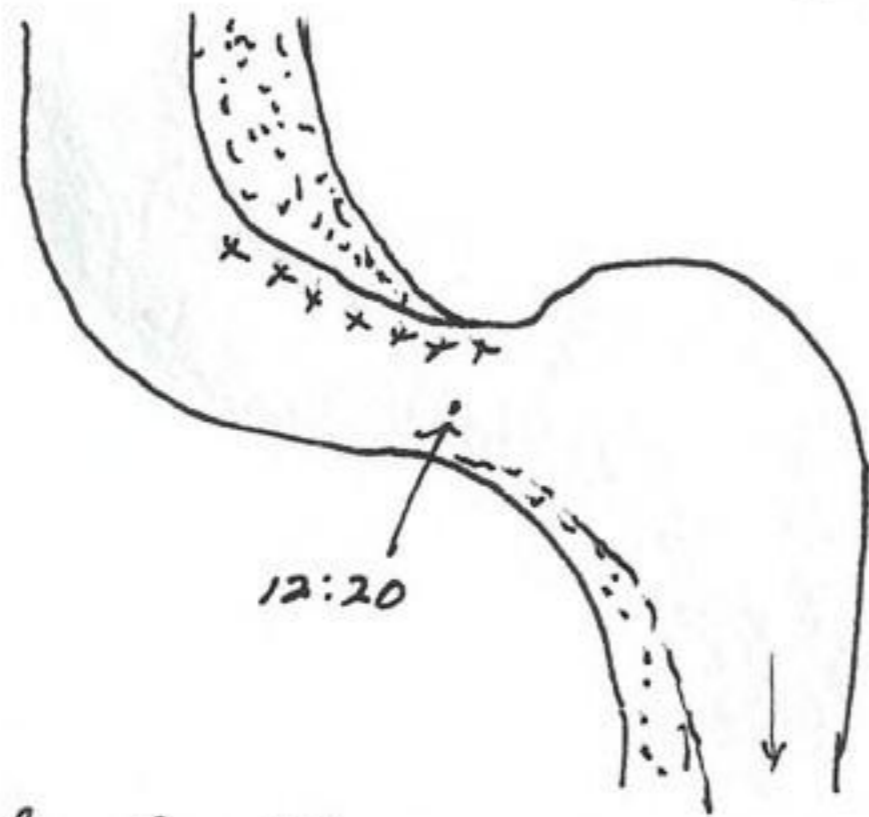
Kaw River, Lawrence to Stranger Creek, Douglas-Leavenworth Co., Kansas

June 23, 1968

Made solitary canoe trip from bridge at Lawrence to R.R. bridge on Stranger Creek, a distance of 19 miles. Day clear in morning and ^{later} wind from SW, sufficient to cause cottonwoods to bend and wave to near white-top in some long straight courses in direction of wind. Water relatively high a covering many sandbars. Air temp 73°F, water 78°F. Will keep record of all water birds, hawks, crows and a list of different kinds associated with riparian forests. Left 8:35 A.M. 4 grackles, 1 brown thrasher, 6 purple martin and 4 bank swallows in area below dam. As I proceeded down river noted that grackles were most frequently observed in association with the areas occupied by man and less frequent elsewhere. This time of year they occur as singles, usually 2 or 3 and up to 8 in a flock and occur at approx 1 group per 150' or so. They are near water and call frequently. 9:00 Can hear or see the following birds and is representative of the riparian forests near town; cardinal, grackle, Indigo bunting, bank swallow (average 2 per 2/10 mi), dickcissel, mourning dove, redwing blackbird, cuckoo, Baltimore Oriole (1 or 2 per 1/2 mi), goldfinch, titmouse, bluejay. One cottontail followed along trail 2 feet above water. The water is at a point where vegetation

(weeds, willow etc) begin and at this time the river edge is green to water. Different color root systems are conspicuous (yellow, orange, pink). 9:08 Killdeer calling. In 5 minutes of travel did not see bank swallow above water. 9:09 mouth of FMC water outlet. 9:24 ♂ + ♀ Baltimore Oriole chased blue jay for 150', then another 50' before returning to nest area. 9:25 two adult barn swallow feeding and alighting on dead limb of tree over water. A young was at center of activity. No calls until within 20' and then vigorous while passing directly under the young bird and for 100' beyond. The young was in the shade and could fly. 9:30 fresh beaver and raccoon tracks. Yellow warbler & robin. 9:34 fresh beaver digging in bank. 9:40 passing under high utility power lines. First hell frog 6" on bank and out of water. 9:44 opposite main drainage from right. Noted a Natrix (some red on sides) on log and 2 feet above water and in shade. At 10' it gracefully dropped into water rather than dive headfirst. About the only way to collect these Natrix is by gun. 9:50 red-bellied woodpecker (the new birds are being recorded as they appear for first time on trip). 10:00 first eastern pewee calling. 10:01 Kingfisher. 10:02 stopped to check bank swallow colony on S side river just east of last continuous stand of riparian forests. Counted 359 holes, 60 adults in air at colony, 19 young at entrance of nests of which 11 were single, 5 doubles and 3 with 3 young. Adults were entering and leaving other nests where young were not at entrance. The young were just slightly smaller than adults. Most adults fed in field to S, some over river. Left Colony 10:30. 10:48 an eastern Kingbird left S shore and flew across river to inspect me at 20'. 10:52 Capsze Point (gradually being eroded away). 10:55 Bank swallow colony on south side river approx 1/10 mi. E of Capsze Point. Consisted of 470 nests with greatest concentration in one central surface of cliffs and the rest of the nests placed laterally. Approx 98 adults in air at colony. On N side of river approx 40 rested on sands of sand bar. One can generally determine nesting areas by presence of birds either resting or flying near by. Left colony 11:05. 11:13 pirate channel to S ~~at~~ Good bend at back. Bobwhite called, yellowthroat warbler called. 11:18 opposite entrance of Mud Creek. Fewer grockles now than in town. 11:35 mouth of Pirate Channel (lower). No water in channel. Killdeer and 2 spotted sandpipers here. 11:38 south end of

the vegetated part of sandy island. Chickadee. 2 redwings in area and usually see them at about this point. G.S. owl left log jam island and flew E toward land, being chased by 2 blue jays. Bails of paper and plastic from Lawrence 11:43 redtail left trees. 11:52 major drainage from left and water continuous with water from Kaw. 12:20 center of curve. On N side of river along sand counted 40 turtles.



(Species? but with long thin necks and small heads, probably a soft shelled turtle). They were at edge of water adjacent to expansive area of sand. Water with current. As the canoe passed by they left and with only head above water swam toward middle of river or down stream.

Rarely a splash but only the head

The further away the more visible for a few seconds to 20 seconds. It remained above water. This head resembles a snake in extent of head above the water. This head resembles a snake been noted above this point, this are showed a concentrated group of these animals. It is possible that their presence is associated with the pond.

12:35 at tree segment of shore with drainage on each side, to left. In drainage to left of trees 2 bank swallows entered nest. There are good cliffs to SW but not used by swallows.

At one point west of above named "island of trees" the cliffs were perpendicular to water.

12:40 beaver holes with fresh willows at mouth which were probably muskrat. 12:45 killdeer called. 12:50

240 holes of bank swallows (200 feet up river from rock barrier on left side river). Approx 60 buds in air at nesting site. 1:12

Eudora Bridge. Strong wind from SSW. 1:33 mouth Wakarusa

river. 1:43 killdeer. 1:55 2 crows on log jam sand bar on E

side river. 2:00 great blue heron, flew up river. 2:08 another great blue heron left bank of river and flew upstream. 2:09 first

contact with railroad at bend. Kentucky warbler in trees on right at bend. 2:17 passing under utility line. The Bait-

more orials approx 2 per mile and generally distributed. 2:30

raft ran to here (see previous notes as to position when first noted up river). I would have guessed that it would have floated to the Missouri river in high floods by now. 2:31 beginning sand cliffs to left. 6 bank swallows but no conspicuous nests.

2:45 approx. 1/2 way E along sand cliffs. Bank swallow nest in colony. nests (55 holes) in an indentation along perpendicular cliffs. The protected cove was made by a drainage from a pipe. Some nests were within 2 feet of top and all relatively high. Fifteen ^{birds} were at colony, most of them flying out over the water below the colony. From a clay strata at water level collected a *Quadrula quadrula* (680623-1) This shell may be of Pleistocene age.



2:55 260 bank swallow nests in colony approx 1/10 mi. upstream from large trees on bank to left. many of the nests were excavated with extensive digging above hole and it was not ascertained if earned by ~~pe~~ beak or wing. raccoon track below as usual.



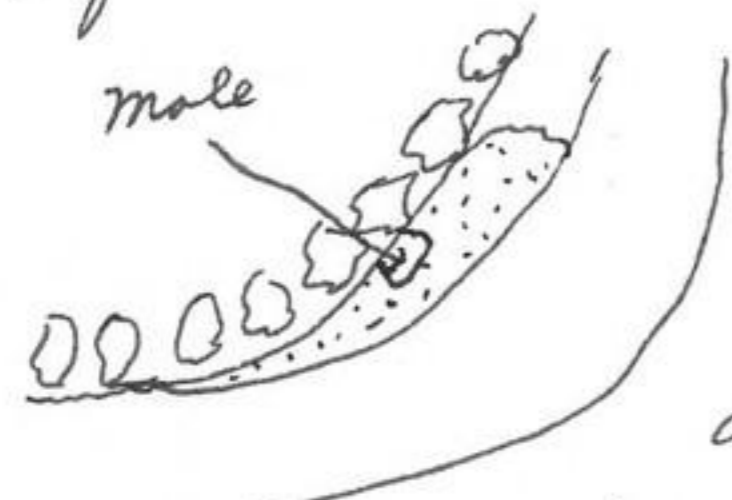
3:00 Rock island (formerly a rock barrier at edge of river but now near middle of river) with water to within 5" of top of highest rock. 3:04 a great horned owl left log jam island and flew to landward followed by 2 bluejays. 3:08 2 crows. 3:12 *Rana pipiens* jumped into canoe. There is not the numbers of *Rana*, *Pseudacris* or *Acris* along banks as in earlier spring. 3:15 redtail left top cottonwood. First cricket frog called today. 3:26 killdeer. 3:35 mouth creek for short distance and then returned (Captain Creek). Water temp in creek 85°F, air 85°F. Water in Raw at mouth (just above entrance of creek so there would be no reflection of temp of creek, water 87, air 80°F. Left 4:00 from mouth.

This creek can be navigated and is shallow. 4:02 arched bridge at R.R. 4:21 Colony of swallows. 478 in lower bench, 217 in upper bench or 695 total. (see May 9, 1968 for information on this same colony. As a comparison: on May 9 there were 288 holes in the upper level and 217 on Jun 23. " " " " 298 " " " " " " 478 " " "

This would indicate that there was some stepping of cliff in the upper level and a decided increase in numbers of holes in the low level. The young in three nests called continuously as if deserted. At the base of the sandy cliffs (lower level) some nests had fallen with the breaking away of the cliff and had become incorporated in the talus below. These nests and young were excavated by raccoons and the young (2 inches long) were eaten. Feces of the raccoon were at the edge of each excavation. Other kinds of animals associated with the base of the colony were: Bufo

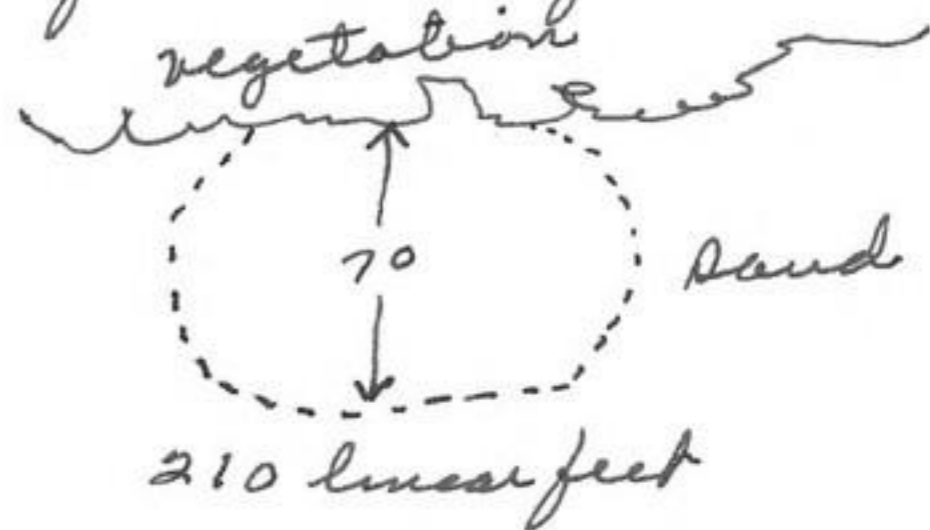
These toads and their young (1/4 to 1/2" in length) were among sands of the talus and were covered with sands as if they had been digging there. Several cicadeleds were collected at base of cliffs and were most common where sands were dry and directly below the nests of the colony. These beetles nos 680623-10 to 680623-24 had conditioned themselves to escape in a different pattern than those on open exposed situations in other localities. These beetles had to contend with water on one side & cliffs on the other side.

Left 5:12



5:20 on left side of river on sand bar. This is the most beautiful of sand exposures on the Kaw. It is as smooth as a flat field and all the sand particles are small and of a uniform size. Some of the animals associated with this sand exposure are:

a mole. had extended its tunnel as far as 70' from vegetation bordering the sand and a total of 210' linear feet. Several turtles (soft shelled?) left their tracks on the sand, one set measured 8 inches wide, another 6" wide with tail mark



which undulated



between the set of tracks. These turtles moved directly landward from the edge of the water and at their more distant point from the water (average 40'), excavated depressions. A white-tailed deer left the vegetation at edge and moved 140' toward water before turning around and returning to the riparian vegetation. It did not run in either direction.

Arrived mouth Stranger Creek 5:56, bridge 6:05. Both insects and butterflies uncommon along river, as well as bird life.

WSW Linwood, 3/20 mi. N of SW corner sec 22, T12S, R21E, Leavenworth Co., Kansas.

July 1, 1968

Check a rock quarry for herps. Ideal area but saw only 6 lizards. This quarry would make an excellent setting for a home with the several alcoves of excavated cliffs. One position has a commanding view of the creek to the W. Observed a land (box turtle) in center of a fresh dropping of raw feces. It was eating the material and searching for insects. Two other such piles of feces had been thoroughly worked by this or other box turtles.

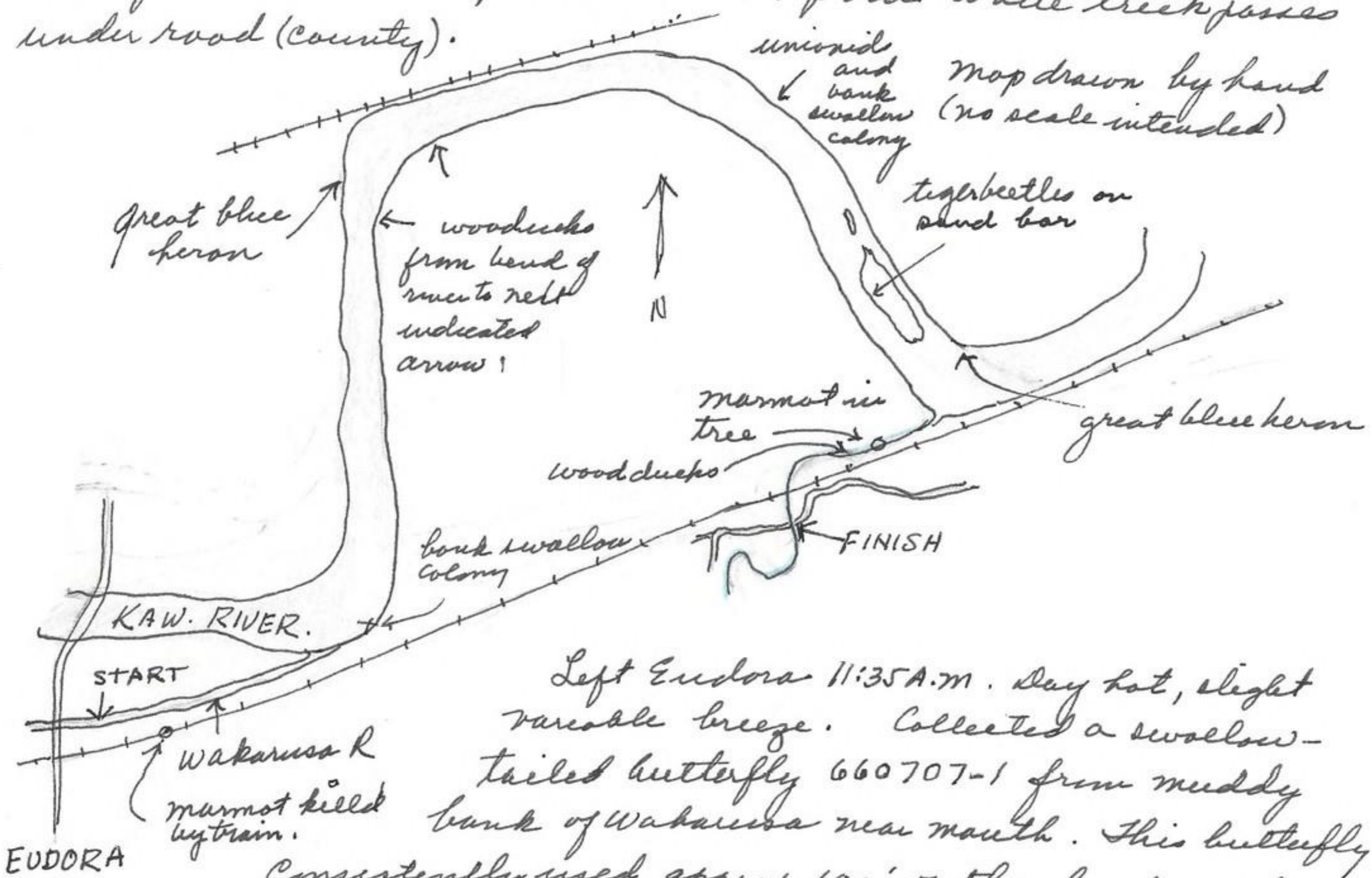
680701-96
 Collected the following insects from this quarry:

- 680701-1 _____ brown butterfly
- 680701-2 _____ small brown & yellow butterfly
- 680701-3 _____ alfalfa butterfly
- 680701-4 _____ dark black (small) butterfly
- 680701-5 _____ tick

Kaw River, Eudora to Captain Creek, Douglas, Johnson and Leavenworth Cos., Kansas

July 6, 1968

Caroline Malseed and I made canoe trip down Kaw River from a point on the Wakarusa River below bridge N of Eudora to a point on the Captain Creek at point where creek passes under road (county).



Left Eudora 11:35 A.M. Day hot, slight variable breeze. Collected a swallow-tailed butterfly 660707-1 from muddy bank of Wakarusa near mouth. This butterfly

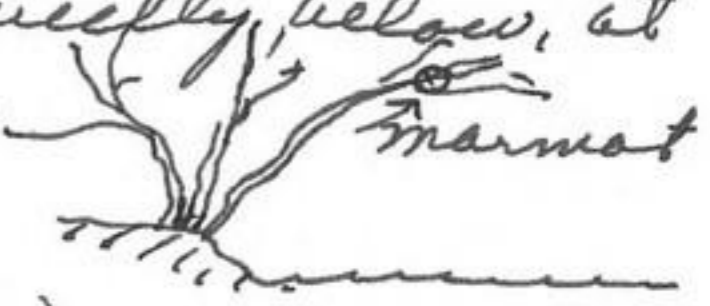
Consistently used approx 100' of this bank and remained in same area for 10 minutes until captured. At 12:00 curae of river (Kaw) counted 185 bank swallow nests. 40 ^{adult} birds in air
 12:38 ♀ wood duck and 8 young 1/2 size and capable of moving on water with feet & wings. They moved down stream for approx 2/10 mile and then entered vegetation on land at which time the ♀ moved out away from the bank to center of river and then flew to opposite side of river beyond. As soon as the young left the water she moved away from the area. Air temp 86°F, water 80°F
 From bank of clay at water edge collected the following unionside:

680706-2 *Quadrula quadrula* ^{raw and chalky} 680706-2b and also 680706-2c. ⁶⁸⁰⁷⁰⁶⁻⁹⁷
" " " " (pair of shells)
680706-3a *Legumia recta latissima*. 680706-4b *Proptera alata*.
680706-4 (see next page)

These shells were from clay below sand cliffs and may be of Pleistocene age. No. 680706-4c *Quadrula quadrula* + recent at base of cliff

From large sand island collected the following series of *Crematogaster*: 680706-5 to 680706-13. They were on damp beech and damp to dry exposures of sands but rarely on hot exposures of pure sand. They leave ground and fly close to surface which makes capture difficult. Those on beach fly out over water & return, or up beach, or onto drier sands beyond beach. A diptera from this area 680706-14

Arrived mouth Captain Creek 2:45. At a point where large rock is in water of creek on S side, noted an adult ^(1/2 grown) *Marmota monax bumbleri*, in a blackwillow tree. It was 14 up in tree on a branch over water. From its position facing E over water it remained motionless until we pushed canoe directly below, at which time it descended on the inclined limb and then vigorously ran landward into the vegetation.



150' beyond in creek (up creek) were 6 young wooducks & an adult ♀. They swam up creek for approx 2/10 mile and then disappeared onto land & vegetation. Some times the female would fly certain section of the creek. At the bridge (county road) collected one buckeye butterfly

680706-15 from edge of creek in a dry retreat - ion. Left bridge at 3:40 after having arrived at 3:30 and arrived car at Eudora (approx 2 1/2 miles along track) at 4:20 to return to bridge to pick up canoe.

Some observations of the trip along Kaw are:

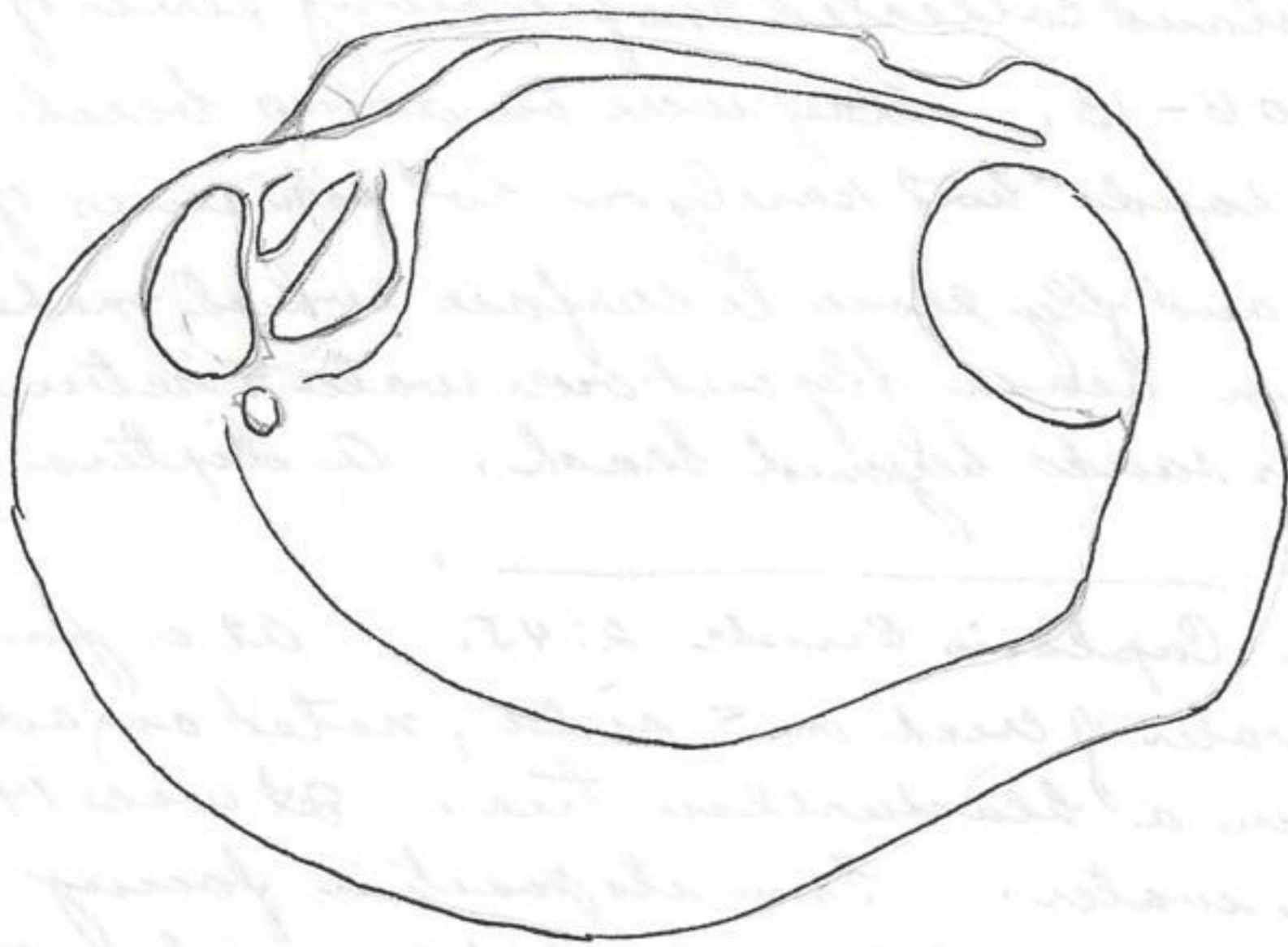
2 turkey vultures they are forced to use wings when winds are absent.

No redtails observed along river but one at bridge at Captain Creek. 3 pelliceers only, 2 of which were on sand bar W of the area where remains were collected.

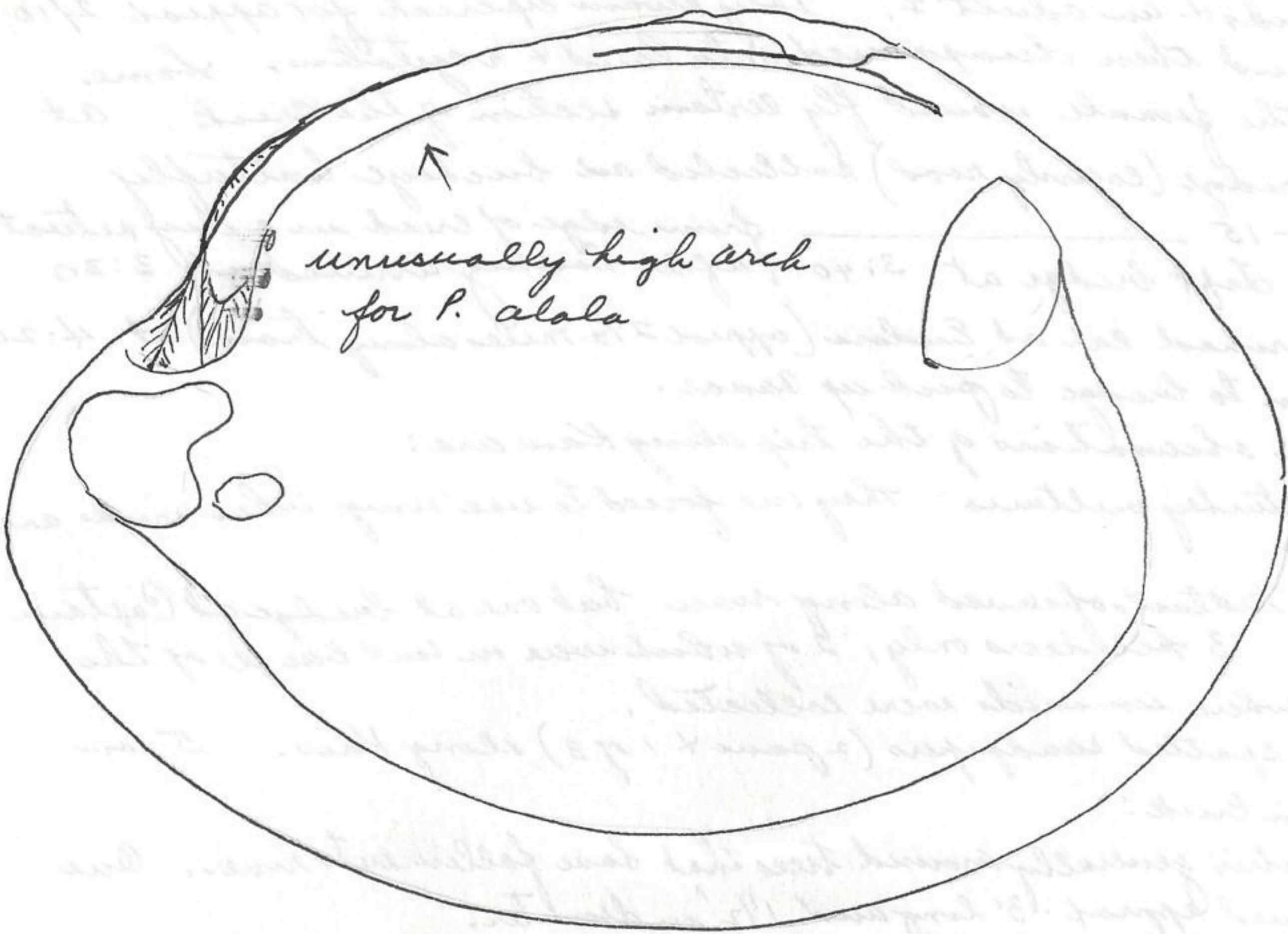
7 spotted sandpipers (2 pairs & 1 of 3) along Kaw. 5 on Captain Creek.

Natrix generally around trees that have fallen into river. One measured approx. 3' long and 1 1/2" in diameter.

Turtles (soft shell) about 1 per 75' of river. Head about size of thumb. Other turtles with head about size dollar.



670706-3

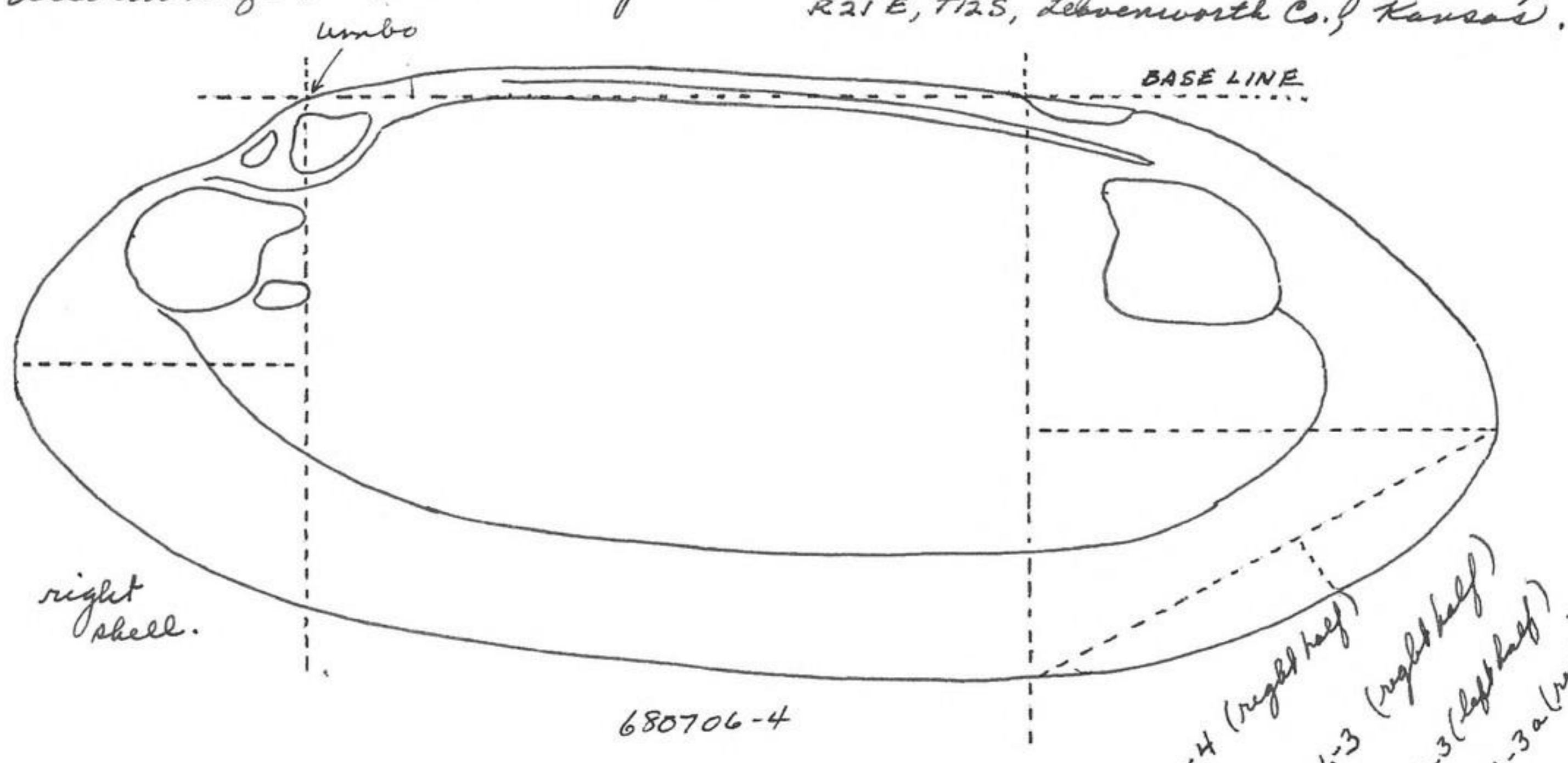


Proptera alata

680706-4 b.

Dominant insect along river, creek and railroad grade is the dragon fly. at a point where railroad leaves cliffs east of Eudora noted a dead *marmota monax bunkeri*, probably killed by a train.

Recorded the measurements of umorid no 680706-4, *Ligumia recta latissima* (Rafinesque). New record for the Kaw River. also in size. Exact locality 1/2 mi. S and 1/2 mi W of NE corner of sec 27, R21 E, T12 S, Leavenworth Co., Kansas.

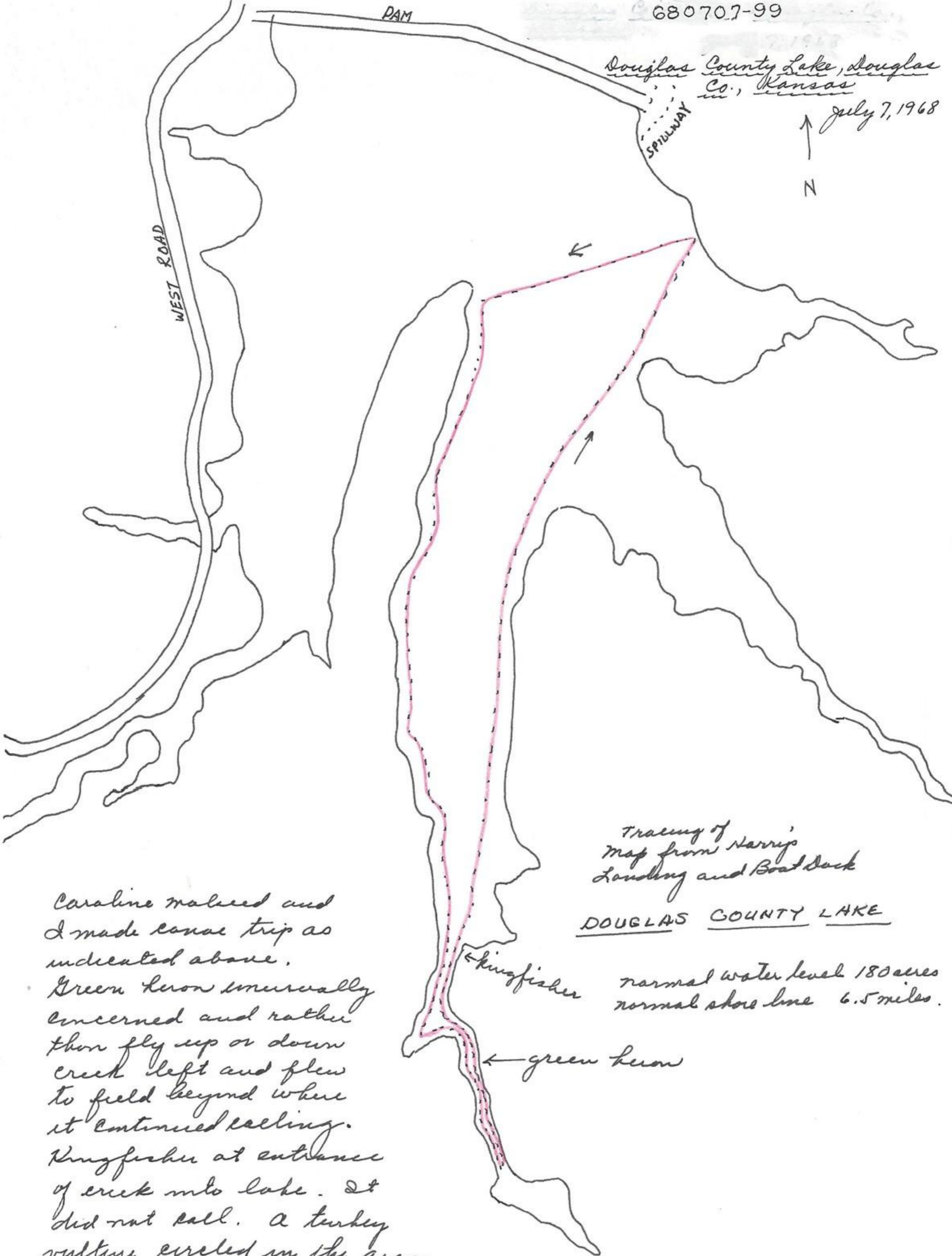


measurements of above shell and the *Quadrula* shell

	138 gms	75 gms	75 gms
weight	138 gms	75 gms	75 gms
length posterior ridge (outside curve)	153	102	103
umbo - posterior ridge (internal, diagonal)	144	83	83
width	21.3	23	23
height	69	75	75
length	171	98	98
center greatest height	90	46	47
height umbo	56	65	64
umbo from anterior edge	33	28	29
height from notch	66	62	62
notch to posterior edge	57	33	32
umbo - anterior wing	18	12	11.5
umbo - posterior wing	92	12.7	12.7
umbo - notch	82	39	39
lateral teeth - umbo	96	58	58
height lateral teeth (at notch)	7	5	5.5
ventral edge pseudocardinal - umbo	9	16	16.
ridge below umbo		8	11
height umbo	2.0	3.8	4
length anterior adductor muscle	16.5	15.	14.3
post basal swelling (from a line from end posterior ridge to point below notch)	8.8	0.	-1
ventral angle	153°	182°	183°
posterior angle	60°	86°	84°

Douglas County Lake, Douglas Co., Kansas

July 7, 1968
N



Caroline malsed and I made canoe trip as indicated above.
 Green heron unusually concerned and rather than fly up or down creek left and flew to field beyond where it continued calling.
 Kingfisher at entrance of creek into lake. It did not call. A turkey vulture circled in the area.

Tracing of Harris' map from Harris' Landing and Boat Dock

DOUGLAS COUNTY LAKE

normal water level 180 acres
 normal shore line 6.5 miles.

Sand Bar NW Eudora, Douglas Co., Kansas 680710-100

July 10, 1968

At a point 1 mi NW Eudora at a place 3/10 mi E of the NW corner of sec 5, T13S, R21E, collected the following Cicindelids

680710-1 to 680710-16 Cicindela

These beetles were on damp soils bordering the Kaw River and rare on the dry sands beyond. This form occurs in higher concentration than does the Cicindelid which it closely resembles and is found on narrow beach between the river and sandy cliffs elsewhere on the Kaw where it is solitary to small groups in community composition.

One of these beetles flew out to an island of rocks in middle of river some 60' beyond. All others would fly out over the water for some 10' and then back to land.

Small toads on sand and at edge of river ranged from 1/4 inch to 1 1/2 inches in length.

Being about sundown, many swallows arrived and flew over water for both feeding & drinking. Barn swallows dominated over bank swallows.

Lawrence, Douglas Co., Kansas

July 10, 1968

Noted 2 Cicada killers this afternoon. They are searching lawns.

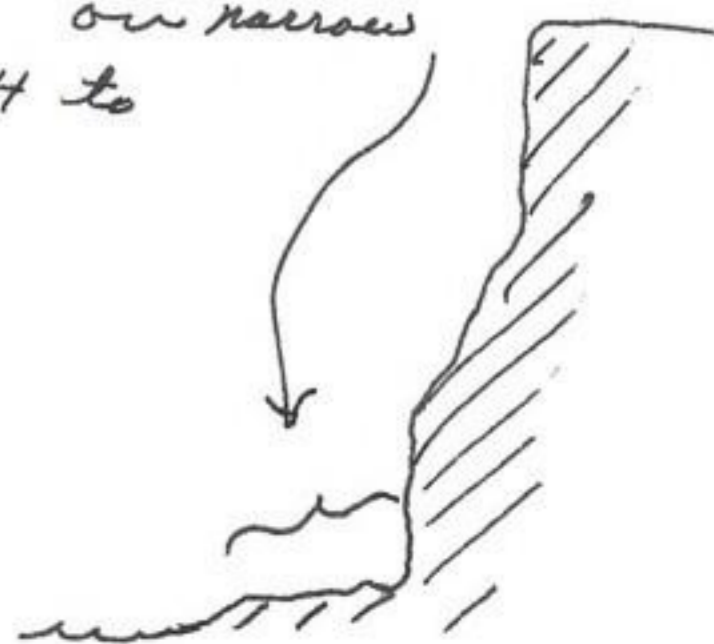
E Lawrence, Kaw River, Douglas Co., Kansas

July 11, 1968

At a point 3 3/10 mi. E and 4/10 mi. S Lawrence (P.O.), Douglas Co., Kansas collected the following insects.

680711-1 to 680711-10	<u>Cicindela</u>	_____
680711-11 to 680711-15	<u>Cicindela</u>	_____
680711-16 to 680711-17	_____	_____
680711-18 to 680711-19	<u>June</u>	_____ Toad bug.
680711-21	<u>Bufo</u>	_____ June beetle Toad.

The Cicindelids 680711-1 to 680711-10 were on narrow damp beach at base of cliffs. Beach about 4 to 8 feet wide. For some reason, they were most difficult to capture. One robber fly in area. Followed beach for approx. 1/10 mile and collected 10 Cicindelids and observed approx 10 others. Young Bufo ranged from



$\frac{1}{4}$ to $1\frac{3}{4}$ inches in length and occurred about 680711-101
1 per every 20. Some were copulating
The black beetles (Cicindelids; nos 680711-11 to 680711-15) were
from top of sand cliffs. The difference was amount of vegetation,
being more on top and dry drier conditions on top.

The food bugs shared same areas as Cicindelids on beach.
A green heron fed at edge of river on sandy beach. It
seemed more confiding than when encountered along creeks,
a few bank swallows and a pair of spotted sandpeppers in area,
a small natrix (18 inches long) was on damp sand under
a small piece of wood. It fought back and bit me on the
finger before it moved to the water and disappeared.

Carp in great numbers (some areas 10 per sq yard) were
gulping foam, some of which was extensively contaminated,
by opening their mouths and allowing the foam to enter.
One fish would continue this gulping action for several
seconds (10-20). In the course of 10 minutes a mass of
foam 2 square feet which had collected in an eddy
was completely consumed and in so doing contributed
immeasurably to the illumination of the contamination.

Lawrence, Douglas Co., Kansas

July 11, 1968

Collected the following insects at home, 1620 Tenn.

680711-28	_____	yellow, black, orange bug
680711-29	_____	fire fly.
680711-30	_____	angle wing butterfly
680711-31	_____	beetle

Lawrence, Douglas Co., Kansas

July 22, 1968

A Lasiurus borealis was captured in a building on campus
and when released at back of Snow Hall, flew to Potters Lake
and after flying among and over tops of trees returned to near point
of release and alighted. It was then picked off tree. Time 3:00 P.M.

Lawrence, Douglas Co., Kansas

July 26, 1968

Wakarusa to one foot of flood and water in fields on Lone Star
road paralleling river. 38 black tern in area. Mourning
doves about 9 per 150' on road with fields flooded on
either side. Elsewhere the mourning doves averaged 1
per 1/2 mile. These doves were definitely associated
with the river flooding.

Aug, 1968

Beetle from 1620 Tenn. and collected on screen at night 680801-1

Lawrence, Douglas Co., Kansas

July 30, 1967

Prepared for vacation to Utah. Items to go or be prepared for trip:

- 2 aluminum chairs
 - light for trailer
 - ketchis
 - shower facility
 - hatchet
 - hand saw
 - shovel
 - bucket
 - 5 gal jug
 - hydraulic jack
 - knee boots - shoes
 - car registration, credit cards
 - portable radio
 - binoculars
 - ref. books
 - butane
 - duplicate notes of petroglyphs
 - acetate + acetate pen.
 - look for screen door
- Collecting equipment
- | | | |
|--------------|--------------|-----------------|
| • cotton | • gum | • saw dust |
| • wire | • shells | • oat meal |
| • pins | • drying box | • rofidagraph |
| • labels | • insect box | • ink. |
| • scales | • mm ruler | pens |
| • pin boards | • mm tape | |
| • pins | • thread | |
| • jars | • needles | |
- journal + paper
 - folded note book
 - camera, film, exposure meter
 - traps 125
 - stakes 125
 - watch.

Lawrence, Douglas Co., Kansas
 Aug. 3, 1968

Left Lawrence for Provo, Utah at 1:30 P.M., mileage 11740. Chris & Pally will join us on Aug 18 after their Rouse trip in N. Minnesota. Will drive to Sylville Creek in Wyoming ^(via interstates to Denver then n.) at exit to E Skeridge for trapping in old transect area. Noted scissortail flycatcher. Short grass prairie begins about 15 miles E Hayes where grass are almost lowlike. Jackrabbits were first noted here ^{Riparian trees segmented as one goes W.} and continue west as far as our camp tonight. They average about 2 per mile and were most frequently observed in pairs. Birds uncommon because of high temperature. In late afternoon more birds active. Most common was western flycatcher during day & meadowlark in evening. 2 flocks (300 and 80 strutting). No blackbird flocks. Ducks about every 5th pond & teal size. Only 2 hawks & 4 crow on entire trip. Camped at 6 miles E of Granfield on Interstate 70, arriving at 9:00 P.M. just 5 minutes after sundown. Set 25 traps along fence row of 1 to 2 feet wide matted grass at 10' intervals. Covered 314 miles today. Salina was reached at 5:00 or 3 1/2 hrs from Lawrence. One badger road kill 10 miles E Hayes.

6 miles E Granfield, ^{Gove Co.,} Kansas.
 Aug 4, 1968

Rained all last night and high wind. Clear this A.M. From trap line along fence row collect:

	<u>680804-1</u>	<i>Peromyscus maniculatus</i>	152-66-17-14-20gms	♂ testes 10mm
SKI	<u>680804-2</u>	<i>Reithrodontomys</i>	127-60-15-12-10gms	♀ 2x2 emb 20mm

Left 9:00 A.M. mileage 12054 17.7 gas Granfield

Badger road kill 3 mi. W Goodland, Kansas.

12159 mileage at 10:15 A.M. at Kansas border. Census of mourning doves from Goodland to Kansas border was 2 individuals only. There are more birds in morning than in hot afternoons, but still birds are scarce. Crows calling in trees. Continued Interstate 70 to Denver thence N on Interstate 25. Eastern Colorado slightly greener than usual. Arrive Cheyenne 5:45 P.M.

Sybylle
 at Sybylle Creek Turn off Hi-Way 34 at
 mi. 2529.5 at 18 miles up road from 87 junction
 noted a prairie rattler (light and greenish grey) about 3 1/2 feet long
 It was along side of road & stretched. When approached immediately
 coils and started to rattle. A wet meadow was below and rocky
 sidehill above. ♂ mule deer with 10 spikes. Camped at 19.3 miles
 from highway 87 or 2 1/10 miles beyond bridge over South Sybylle Creek.

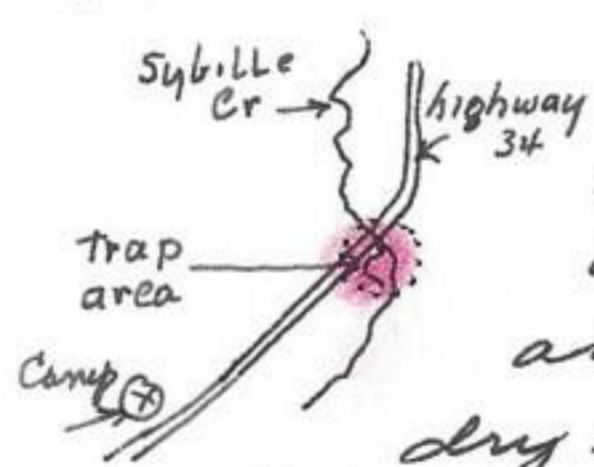
South Sybylle Creek, ^{19.1}~~21.2~~ miles from highway 87, Platte
 Co., Wyoming

Aug. 5, 1968

Collected following mammals from trapping area:

680805-1	<i>Microtus ochrogaster</i>	173-44-20-10-55	gms ♂ test. 14
680805-2	"	163-44-20-10-58	gms ♂ testis 15
680805-3	<i>Microtus pennsylvanicus</i>	156-44-19-13-33	gms ♂ testis 9mm
680805-4	<i>Microtus ochrogaster</i>	138-34-21-11-33	gms ♂ testis 5mm
680805-5	<i>Microtus pennsylvanicus ochrogaster</i>	131-33-20-11-20	gms ♂ testis 9mm
680805-6	"	130-34-20-11-28	gms ♀ ut. normal
680805-7	<i>Peromyscus maniculatus</i>	152-61-19-15-22	gms ♀ 2x2 emb 2mm
680805-8	"	153-64-21-16-20	gms ♀ 2x3 emb 3mm
680805-9	"	155-67-22-17-21	gms ♂ testis 9mm
680805-10	"	164-75-21-17-20	gms ♂ testis 8mm
680805-11	<i>Reithrodontomys</i>	144-64-17-13-10	gms ♂ test 9

Above animals from damp soils associated with cattails and
 watercress and surface pond weed. A carex bordering wet
 area. *Microtus ochrogaster* in drier area. This area is
 at bridge where highway 34 crosses the ~~soo~~ South Sybylle
 Creek.



The permanent, ^{lateral} creek that joins main
 creek is filled with watercress & bordered by
 sedges 2' high. Both *Microtus ochrogaster*
 and *Microtus pennsylvanicus* from this
 association. There is limited area between
 dry side & standing water of creek. Considerable
 actually along this drainage and would be an excellent
 place to trap for possible *Microtus montanus*. 50 trap
 yielded 11 animals.

A diptera, 680805-12 was captured at camp. Small grass-
 hoppers (1 inch in length) occur at about 40 per square yard
 in certain grass areas.

Magpie, song sparrow and goldfinch in area. Temp in trailer,
 at 1:45 P.M. 94°F and uncomfortable

Left this area about 2:30 P.M. and continued up canyon. For the
 most part, the area is the same as last trapped in 1948.

The main stretch of canyon is now occupied by a wild life experimental unit in which the floor of the canyon is fenced and elk are apparently being propagated. The vegetation has naturally changed but conditions are not overgrazed. The main meadow where *Microtus montanus* and *Microtus ochrogaster* were found, is about the same. The farm or ranch just to west is now abandoned. The canyon beyond this ranch is good for *Microtus* and the fields are extensive in wet sedges, perhaps the best fields for the two species of *Microtus*. The canyon beyond is owned by a Taylor Clark and the area is extensively grazed by cattle with grass in canyon grazed and trampled to soil. This is particularly true in the last upper reaches of the canyon where extensive groye dropping was done in 1948, now the cattle have eaten the luxuriant grasses and sedges to the a brownlike surface. The marsh or central part of the field look like the hummocky topography of northern Alaska. This is the field that was predominantly inhabited by *Microtus montanus* but the field that I judged to be the most western extension of *Microtus ochrogaster*, especially as would be the case in periods of high populations. As one comes up Lykille Creek, one can just about see and judge the plant communities suitable for *Microtus montanus* and *Microtus ochrogaster*. Continued to divide thence SW across Laramie Plains. These are most interesting but highly overgrazed. Jack rabbits, ^{roadkill} occur about one per mile. The lark bunting about 1 per 3 miles and increase to point where flat upland plains drop down into Laramie River valley. As one arrives at flat flood plain, the greasewood is present. The country from Bosler to Laramie is overgrazed and, to the east, ^{of road} almost uninhabited by man's buildings. At 14 miles N of Laramie, noted a red tail hawk, and 1 mile beyond, a prairie falcon. Continued to Laramie and purchased Cotton, thence W toward Centennial. Rained in valley but not to W on range. This storm remained in valley for an unusually long period of time. Continued up canyon from Centennial and camped at 2 mi. E of Barker Lake and set traps in canyon. At camp, a hairy woodpecker tapped on the bark of aspen and when insects left, the woodpecker would go to edge of bark. Two small birds profited by remaining near woodpecker & loitering insect as they left.

2 mi. E Barber Lake, Snowy Range, Albany Co., Wyoming.
 Aug. 6, 1968 approx. 8,800ft.

Collected the following from trap line:

680806-1	micratus	185-59-20-12-55 gms ♀	4x2 emb 20 mm
680806-2	"	178-61-20-13-43 gms ♂	testis 12 mm
680806-3	"	192-70-21-13-52 gms ♂	testis 13 mm
680806-4	"	176-58-20-13-46 gms ♂	testis 13 mm
680806-5	"	141-50-20-11-21 gms ♂	testis 5 mm
680806-6	"	134-44-20-11-20 gms ♂	testis 5 mm
680806-7	Peromyscus maniculatus	167-71-21-17-27 gms ♀	3x2 plac. scars
680806-8	"	155-66-21-16-21 gms ♀	ut normal
680806-9	"	143-58-20-16-19 gms ♂	testis 4 mm
680806-10	"	146-60-20-16-15 gms ♀	ut normal
680806-11	"	147-61-20-17-16 gms ♂	testis 2 mm
680806-12	"	142-61-20-15-14 gms ♀	ut normal
680806-13	"	146-66-21-15-15 gms ♀	ut normal
680806-14	"	150-66-20-15-16 gms ♀	ut normal
680806-15	Zapus princeps	228-137-30-14-19 gms ♀	ut. normal

The above mammals were taken from 3 variations of plant community. The zapus, microtus were from wet high plants in a channel bordering the main creek. The Peromyscus were mainly from bases of large ^{old} spruce, fir and other riparian vegetation, an area I would expect Clethrionomys. The dry area of hillside of yellow pine, fir, some spruce and ground cover of dwarf juniper yielded one or two Peromyscus only. Birds in area were hairy woodpecker, Clark Crow, a thrush, robin, chickadee and a large flycatcher. The golden-mantled ground squirrel, chipmunk and Tamiasciurus at camp. Prepared specimens and left camp at 1:00 P.M. and drove up to Hour-glass Lake. The trapping area is 1/10 mi. N of Hour-glass Lake, Albany Co., Wyoming. Set 125 traps in alpine meadows, along open creek and in forests.

1/10 mi. N Hour-glass Lake, 10,520 ^{Snowy Range} ft., Albany Co., Wyoming.
 Aug 7, 1968

From traps of last night collected:

680807-1	Eutamias	193-84-30-14-44 gms ♂	testis 5 mm
680807-2	"	192-87-31-14-41 gms ♀	ut normal
680807-3	microtus montanus	152-39-18-12-36 gms ♂	testis 11 mm
680807-4	"	134-39-19-12-24 gms ♀	testis 9 mm
680807-5	"	118-31-18-11-17 gms ♂	testis 6 mm
680807-6	"	114-31-18-11-17 gms ♀	testis 5 mm
680807-7	"	113-31-18-13-14 gms ♂	testis 8 mm
680807-8	"	114-32-18-12-15 gms ♀	testis 8 mm
680807-9	"	114-33-18-12-14 gms ♂	testis 8 mm
680807-10	"	132-40-18.5-13-17 gms ♂	testis 9 mm

680807-107

The following 3 microtus from willow meadow and with above may be same family still with adults.

680807-11	Microtus montanus	109-27-17.5-10-13 gms	♀	ut normal
680807-12	"	115-29-18-11-15 gms	♂	testis 5 mm
680807-13	"	119-33-18-11-17 gms	♂	testis 7 mm
680807-14	Eutamias	182-74-30-15-51 gms	♀	plac. scars, suckling
680807-15	"	194-86-31-15-51 gms	♀	ut. normal
680807-16	"	206-93-31-15-41 gms	♀	testis 3 mm
680807-17	"	178-64-62-15-54 gms	♀	plac scars, suckling
680807-18	Clethrionomys	137-43-18-12-19 gms	♂	testis 10 mm

SKi 680807-20 Thomomys 211-61-27-7-108 gms. ♂ testis 11 mm

The above mammals were taken from 125 traps set in two situations. The microtus montanus were from ^(50 traps) alpine meadow of 1 foot high dwarf willow, wet sedges and grasses with a 6" channel of water entrenched to about 6". Several flowers including the dominant elephantella. The water supplying these damp meadows were from springs which probably come from lobe above. It is



Conceivable that this area become dry in late summer or unusually dry periods.

The second line of traps ⁽⁵⁰⁾ were in spruce forests bordering the open marsh area and were set on dry clear sails beneath the trees. Clethrionomys & Eutamias from here. The spruce trees are apparently second growth as old spruce (some reaching 3 1/2 feet in diameter) are on the ground or standing as dead timber. It would appear that in former times this area supported larger trees than today. The old trees fell ^{pointing} to the east.

The dominant butterfly & flies were collected. The diptera are:

- | | |
|-----------|------------|
| 680807-21 | 680807-29a |
| 680807-22 | 680807-29b |
| 680807-23 | 680807-29c |
| 680807-24 | |
| 680807-25 | |
| 680807-26 | |
| 680807-27 | |
| 680807-28 | |
| 680807-29 | |

The dominant butterflies were:

- 680807-30
- 680807-31
- 680807-32

680807-33
 680807-34
 680807-35
 680807-36
 680807-37
 680807-38
 680807-39
 680807-40

680807-108

Birds in area were: red-shafted flicker, pine siskin, mt. bluebird, Clark's Crow, Audubon warbler, Cassin's finch, gray headed juncos. The pine siskin & bluebird were dominant on side hills and benchlands of open meadows & downed spruce trees. (to east)
 A macclard called from ^{mountain peaks} lake and probably has young on lake below.
 At 3:00 P.M. moved to Libby Flats at 10800 ft. Set traps to N about 2/10 miles from divide. All 125 traps in krummholz growth. Pipit & white crowned sparrow dominant. This is a relatively flat area with islands of dwarf trees in typical wind blown formation. At rock field to N. noted one adult & 4 young marmot & ⁽⁵⁾ several peka. A ^{large} weasel left one krummholz and ran along edge for 50' before reentering. This is at timber-line and tundra in characteristic

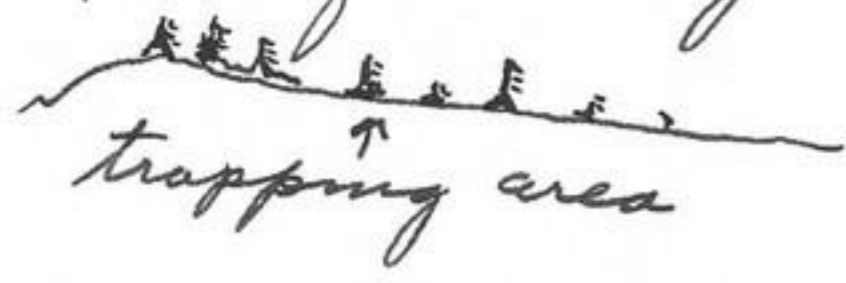
2/10 mi N Libby Flats, 10860' elev., Snowy Range, Albany Co., Wyoming
 Aug 8, 1968

From the run halcy collected the following mammals:

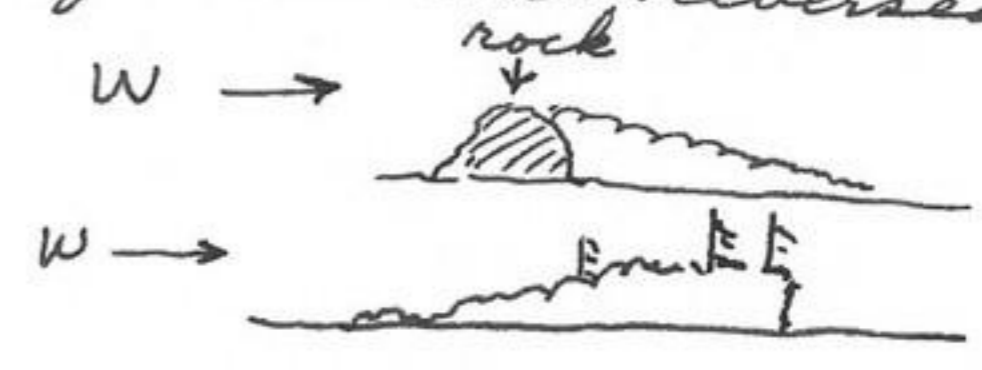
<u>680808-1</u> Sorex	98-42-12.5-7-6 gms ♀ ut normal
<u>680808-2</u> Sorex	100-43-12.5-7-8 gms ♀ ut normal
<u>680808-3</u> Sorex	112-41-13.0-8-5 gms ♂ testis 3.5 mm
<u>680808-4</u> Sorex	110-42-13.0-7-4 gms ♀ ut normal
<u>680808-5</u> microtus montanus	163-43-19-13-49 gms ♂ testis 11 mm
<u>680808-6</u> " "	174-58-21-13-34 gms ♀ ut. enlarged
<u>680808-7</u> " "	149-49-20-13-27 gms ♀ 4x0 emb. 7 mm
<u>680808-8</u> " "	148-48-20-12-24 gms ♂ testis 9 mm
<u>680808-9</u> " "	140-34-19-13-27 gms ♂ normal testis 7 mm (right) Left testis internal and also on right side and 14 mm. Adhesed and inflamed.
<u>680808-10</u> Peromyscus	152-60-19-17-23 gms ♀ suckling
<u>680808-11</u> Peromyscus	160-67-19.5-18-21 gms ♂ testis 7 mm
<u>680808-12</u> " "	151-61-20-17-24 gms ♀ 3x2 emb 16 mm
<u>680808-13</u> " "	148-60-19-18-19 gms ♂ testis 2.5 mm
<u>680808-14</u> " "	154-65-20-18-19 gms ♀ ut normal
<u>680808-15</u> microtus	123-30-18-11-20 gms ♀ ut normal
<u>680808-16</u> Peromyscus	152-64-19.5-17-20 gms ♀ vag. plug.
<u>680808-17</u> " "	142-58-19-17-20 gms ♀ 2x3 plac. scars.

The morning at camp on Libby Flat, the temperature at 6:30 A.M. was 48°F. There was a rapid warming. No dew on vegetation and soil dry. This is one of the characteristics of the alpine flats. The trapping area is krummholz on gently sloping terrain with tree island forming about 30% of surface. The average height of trees (spruce) is 8-10 feet with lower zone solid growth. This area is a very old one with some tree 2 feet in diameter. There is bare soil under protection of the dwarf spruce, some areas easily accessible, others impossible to penetrate. A gooseberry bush frequently surrounds the islands of spruce. Beyond is alpine meadow which is dry, in flower, and considerably disturbed by gopher diggings. Traps were set on bare soils in krummholz or as near this condition as possible. Interval of 20 feet (125 traps). The shrew, Peromyscus and Microtus were generally distributed. One trap place at edge of rock field at edge of grazing grounds of marmot and pika, yielded a Peromyscus.

Two white-crowned sparrows sang and approx. 30 others consisting of adults & young were in trapping area. One pair of pipit were concerned over one area. It is interesting to speculate why Clethrionomys was not present and why there was such a high percentage of Peromyscus & Microtus, the latter certainly out of place. In the alpine fields beyond, noted several old winter grass nests.



The wind from the west formed the tree masses. Beyond the general area, and in some instances among the regular krummholz, were large rocks, some 3 feet high in which the form of trees was reversed in that the trees were in reverse direction of the trees not having the barrier.



Some areas supported wind channels as if cut as a road or trail. The flat proper are characterized by bare rocks blown free of soil. Some wind blowouts present. at about 8:00 A.M. left camp and moved to Mirror Lake where we set up camp on S. side of lake. Prepared mammals all day. From experimentation found that skins of mammals when placed in airtight jar on ice will remain in good condition

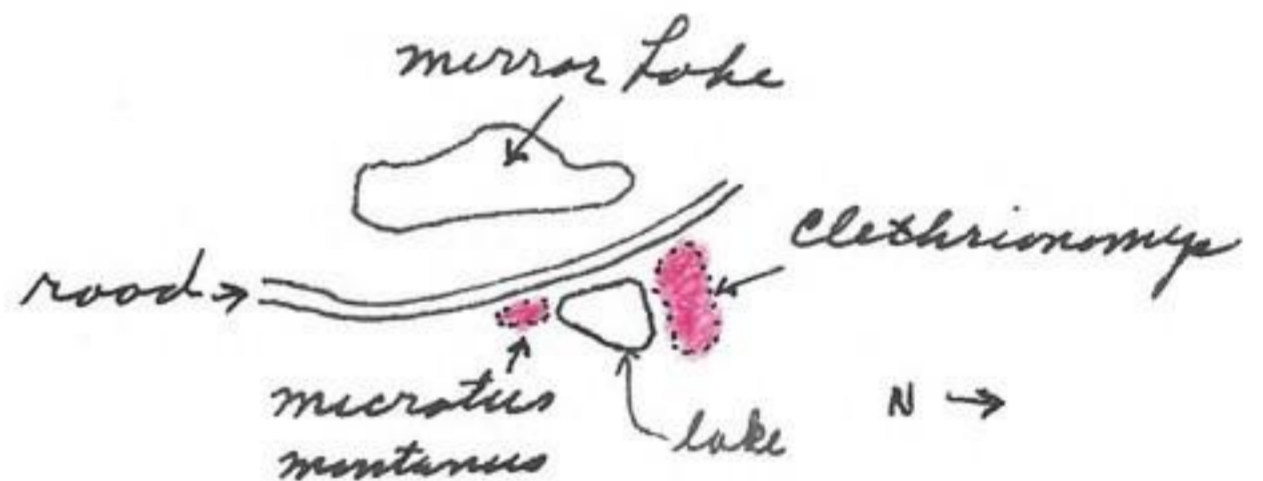
for 24 hours. Chipmunk skins become slightly more leathery but shows no deterioration. A Clethrionomys skin remained in good condition. Mammals placed on ice in plastic bags in direct contact with ice, providing they have been collected before the heat of morning, will remain in good condition for at least 8 hours, showing no sign of hair flipping.

at Mirror Lake, the Clark's Crow called continuously from at least that time we arrived at 8:15 A.M. to 7:00 P.M. They were associated with the lamp grounds at W end of lake. At 7:00 P.M. temp 51°F, water 58°F. Today has been variable sun & clouds with rain starting at about 8:00 and continued to at least 9:00 with clouds below top of mt. Set 60 traps in spruce forest of rocks & fallen logs and 10 traps in sedges at edge of lake.

Mirror Lake, 10,600 ft, Carbon County, Wyoming.

Aug 9, 1968.

From spruce forests (40-60' high) and ground cover of ^{large} rocks and fallen timber collected the following mammals (Clethrionomys) in 50 traps. 10 traps were set in a sedge and grass drainage channel west of the small lake S of Mirror Lake. Rained last night and clouds below peaks. All Clethrionomys sets in dry situations under logs, rocks or spruce trees. It is interesting that with a long and heavy rain, the areas under many large spruce trees are dry.



680809-1	Clethrionomys	142-41-18-13-25 gms.	♂ testis 12 mm
680809-2	"	136-40-17.5-13-25 gms	♀ 1x6 emb. 3 mm
680809-3	"	132-41-19-15-20 gms	♂ testis 10 mm
680809-4	"	135-38-19-14-31 gms	♀ 3x2 emb. 15 mm
680809-5	"	160-48-19-15-35 gms	♀ suckling 2x5 plac. seen
680809-6	"	115-34-18-13-14 gms	♀ testis 5 mm
680809-7	"	118-34-18-12-15 gms	♂ testis 7 mm
680809-8	"	118-32-18-12-15 gms	♂ testis 8 mm
680809-9	Microtus montanus	144-38-19-12-29 gms	♂ testis 9 mm
680809-10	Clethrionomys	131-40-19-15-21 gms	♂ testis 9 mm

Noted a rocky Alpine grasshopper in area. Left Mirror Lake at 1:00 P.M. with skies cloudy & rain and temperature 54°F. Continued to W to Saratoga and finally Rock Springs. In descending from

the Snowy Lauge observed that many of ⁶⁸⁰⁸⁰⁹⁻¹¹¹ the alpine fields down to upper montane were apparently free of sheep grazing and the wet sedges and grasses were high and extensive in comparison with 1948 when they were heavily grazed. This should permit a decided increase in microtines. The new road in lower stretches of Canyon is destroying the uniqueness of the country. Outside of National forest at pond before canyon gate ^{photographed the pond with shadows in foreground.} ^{♀ mallard left pond} Between here and the N Fork of the Platte River observed 6 sparrow hawk evenly distributed in the irrigated slopes. It was about 1 mile before reaching the Platte that we observed the first magpie. ^{and turkey vulture.} Rained all the way to Rock Springs with black clouds in regular sequence. Stayed at trailer camp this P.M. Noted that gas lamps burn brighter at Rock Springs than at Merrar Lake.

Rock Springs, Wyoming

Aug 10, 1968

Left Rock Springs 12:30 Temp 59°F at 8:00 A.M., now down to 54°F. Hard rain yesterday but soaks in rapidly. Continued to Green River, thence to Buckboard Crossing. This is a marina and is not associated with dynamic canyon lands but open valley type terrain. Gulls and Brewers blackbird here. Returned to Black Fork River crossing and camped. Set 60 traps on N side river ⁱⁿ first canyon to right of bridge. Traps in cliffs of overhang or under rocks and not exposed to rain. These cliffs are friable sandstones and carved by wind and water to produce overhangs. Many sandstone nodules in rocks.

A second set of 60 in greasewood, sagebrush, Chrysothamnus in flat of valley in slightly elevated ridge along a channel that carries water in extremely high water. This area is on S side river about 1/10 mi E of bridge. All this area had been affected by recent rains.

5 traps were set at base of rocks at bridge abutment.

Elev. 6040 ft.,
Black Fork River, Highway 530, Sweetwater Co., Wyoming

From traps set in cliffs ^{Aug 11, 1968} collected a series of *Peromyscus*. The traps were in protected places and not touched by torrential rains. This environment is dry at all times in contrast to sagebrush and greasewood flats where almost all traps were sprung and soils ^{damp} wet to standing water.

680811-1	Peromyscus	154-65-20-17-20 gms. ♂ testis 6 mm
680811-2	Peromyscus	170-73-19-18-24 gms. ♀ ut normal
680811-3	"	152-65-20-17-20 gms. ♂ testis 4 mm
680811-4	"	163-68-20.5-17-25 gms. ♂ testis 6 mm
680811-5	"	147-62-20-18-18 gms. ♂ testis 3.5 mm
680811-6	"	157-67-19-18-19 gms. ♂ testis 4 mm
680811-7	"	143-57-20-17-15 gms. ♀ ut normal
680811-8	"	148-63-19-17-19 gms. ♀ suckling
680811-9	"	148-60-19-17-17 gms. ♂ test 4 mm
680811-10	"	153-65-19.5-17-19 gms. ♀ suckling
680811-11	"	147-62-20-17-14 gms. ♂ testis 3.5 mm
680811-12	"	142-56-19.5-17-14 gms. ♂ testis 4 mm
680811-13	"	156-68-20.5-18-19 gms. ♂ testis 4 mm
680811-14	"	154-64-20-17-16 gms. ♂ testis 3.5 mm
680811-15	"	110-47-18.5-15-9 gms. ♂ testis 2.5 mm
680811-16	"	153-64-20-18-20 gms. ♀ suckling
680811-17	"	137-58-19-15-14 gms. ♀ ut. normal
680811-18	"	133-55-19.5-18-14 gms. ♀ ut normal
680811-19	"	137-56-19-17-14 gms. ♀ ut normal
680811-20	"	148-65-20-18-18 gms. ♂ testis 4 mm
680811-21	"	141-61-19-16-16 gms. ♂ testis 3.5 mm
680811-22	"	140-58-19-16-14 gms. ♂ testis 2.5 mm
680811-23	"	142-60-20-17-15 gms. ♂ testis 3.5 mm
680811-24	"	150-63-20-17-18 gms. ♂ testis 3.5 mm

From the set of 60 traps in valley floor collected.

680811-25	Peromyscus	155-63-20-18-25 gms. ♀ ut enlarged
680811-26	"	133-51-19-16-18 gms. ♀ ut. normal
680811-27	"	156-61-19-17-18 gms. ♂ testis 8 mm
680811-28	"	142-61-19-16-17 gms. ♀ ut enlarged
680811-29	"	152-71-20-17-16 gms. ♂ testis 6 mm
680811-30	"	141-56-20-17-16 gms. ♂ testis 5 mm
680811-31	"	136-55-19-17-16 gms. ♀ ut. normal
680811-32	"	158-73-19-18-19 gms. ♂ testis 8 mm
680811-33	"	144-61-19-17-15 gms. ♀ ut enlarged

From rocks near bridge

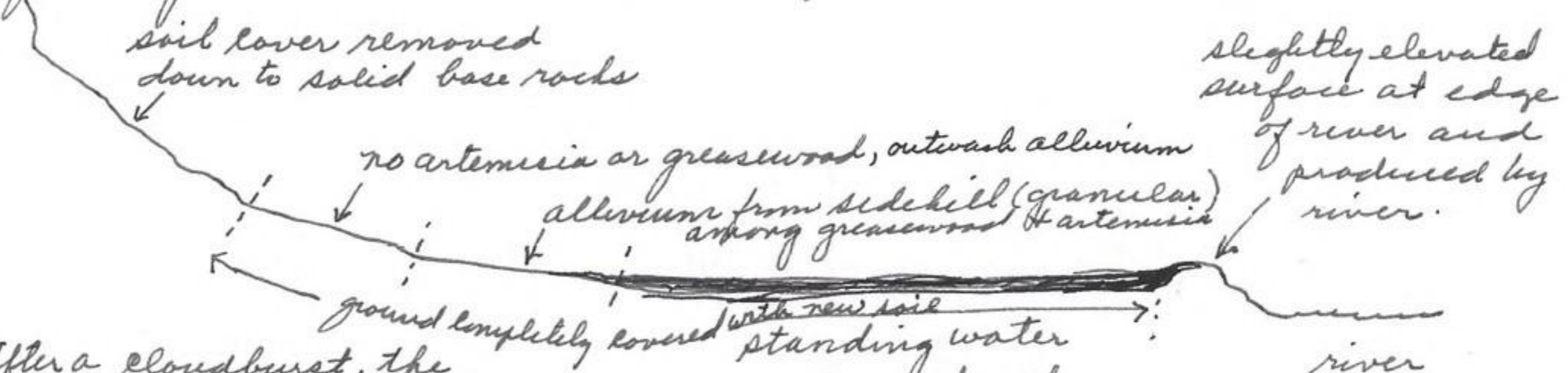
680811-34	Peromyscus	149-66-20.5-17-15 gms. ♀ ut normal
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while collecting traps noted the following birds: Spotted sandpiper, magpie, mourning dove, song sparrow, Brewer's sparrow, night hawk, meadow lark, shrike, ^{2 ducks flew down river,} sanderling or some other similar kind, gull together, cliff swallows & nests, song thrasher, rock wren, Brewer's blackbird, horned larks. The horned larks are on open fields cleared of all vegetation down to rocky soils. This denuded area had been created by highway construction. These birds were not observed in vegetative areas. at bridge across Black's Fork river, noted a king or gopher snake among rocks placed to protect bridge abutments

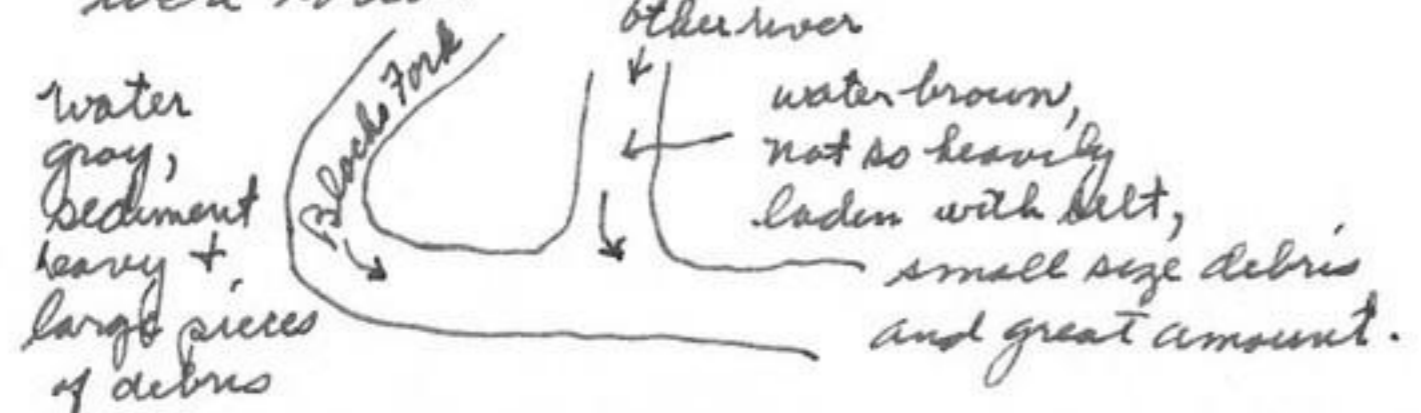
The snake was slowly moving among the rocks and did not seem influenced by our passing directly overhead (1 foot from feet). a cottontail rabbit used these rocks as a permanent den. On three occasions this rabbit was observed running to one specific spot in the rocks. Only one kind of butterfly noted in area, some moths

along the trapline in cliffs on N side of valley, observed 13 lizards. These were mainly on slopes facing the valley. Materna in evidence ^{among} most of the rocks and several houses were built under rocks and among crevices of cliffs. One set of coyote tracks were in soft mud in upper part of canyon at highest point where ~~rocks~~ ^{traps} were set and at about the point where rocks created a partial barrier and solid floor. The length of these tracks were 70 mm and the width 42 mm. In the direction of tracks were up canyon to barrier, thence down canyon for 20', thence up sidehill to E. In the evening 2 large bats were noted ^{flying} in the cliff area. They then moved into valley below and hunted over the greasewood and artemisia.

It is interesting to note the extensive diggings of the badger but no sign of tracks in the muds and soft ground produced by the rain of last night. It was evident that the rain had raised the river to near flood plain level the day before we arrived or earlier, and the river had then receded to normal low level. Last night the cloudburst again raised the water to flood stage (base of rocks under bridge). These rains had placed water on all surfaces in valley and N side of valley. A profile of valley slopes ^{is} as follows:



After a cloudburst, the sidecanyon flood almost immediately then subside. The main valley river then gradually increases and floods these lateral side-canyons with mud. Large bushes of greasewood & artemisia are dislodge. by lateral canyons & removed to river. River changes in regard to Indian soap, debris & larger pieces of wood. At convergence of Blacks Fork River and a river entering from the E (about 410 mi upstream from bridge) these differences were noted: Lateral canyons show elevated floor



aug. 12, 1968 7220 ft., Uintah Co., Wyoming

From trapline of last night:

<u>680812-1</u>	<i>Sorex palustris</i>	151-71-20-4-12gms	♀ ut normal
<u>680812-2</u>	<i>Sorex vagrans</i>	118-44-12.5-7-6gms	♀ ut normal
<u>680812-3</u>	" "	108-43-13-7-5gms	♂ testes 3mm
<u>680812-4</u>	" " (sp.?)	107-43-13-7-5gms	♂ testes 2mm
<u>680812-5</u>	<i>Microtus</i>	178-58-21-14-40gms	♂ testes 13mm
<u>680812-6</u>	"	184-67-21-14-42gms	♀ 2x3 emb 15mm
<u>680812-7</u>	"	171-60-21-14-40gms	♀ suckling
<u>680812-8</u>	"	171-61-21-14-31gms	♀ 3x2 emb 9mm
<u>680812-9</u>	"	180-65-21-14-34gms	♂ testes 11mm
<u>680812-10</u>	"	192-68-21-14-53gms	♀ suckling
<u>680812-11</u>	<i>Peromyscus</i>	163-72-22-16- 15 ²⁰ gms	♂ testes 5mm
<u>680812-12</u>	"	164-70-20.5-19-20gms	♀ ut normal
<u>680812-13</u>	"	172-70-20.5-18-20gms	♀ ut normal

Trapline of last night set was from edge of sloughlike creek and springs bordered by riparian vegetation of willow, hawthorn type of plant community. Adjacent to this riparian growth were fields of native grasses cut annually and other smaller areas grown to undomesticated sedges, Carex, grasses and flowering plants. At this time of year these enclosures were in beautiful red Indian paint. The main streams of this broad alluvial slope from the Uintas influence this area by bringing conifers, aspen and other montaine kinds of plants & animals down from the higher elevations beyond. This area is used mainly for grazing and harvesting of the native grasses. The soils are superficial and are underlain with great depths of rocky alluvium. It is an area that is most productive of small mammals of many kinds and an area that should be examined on a transect basis from ^{the} high Uintas to the deserts to the north. Stations, wherever justifiable, could average about every 5 miles or more. Noted evidence of beaver, muskrats, many gopher diggings, ^{Wilson snipe} and the mule deer. One large buck left edge of riparian growth and ran out into opening surrounded by meandering creek. It stood there for about 2 minutes & then left deliberately, almost as if a tamed animal. Several bedding sites ^{of the deer} were noted among the willows. Mosquitos surprisingly few in evening in what I would consider favorable for their propagation. Temperatures cool in this area. Left area and drove to Butterfly Lake in the Uintas. Grade unusually gradual to divide

Butterfly Lake, 10300 ft., Duchesne Co., Utah

Aug. 13, 1968

From last night's catch prepared the following; (outflow creek from Butterfly Lake among flowing creek vegetation among large spruce).

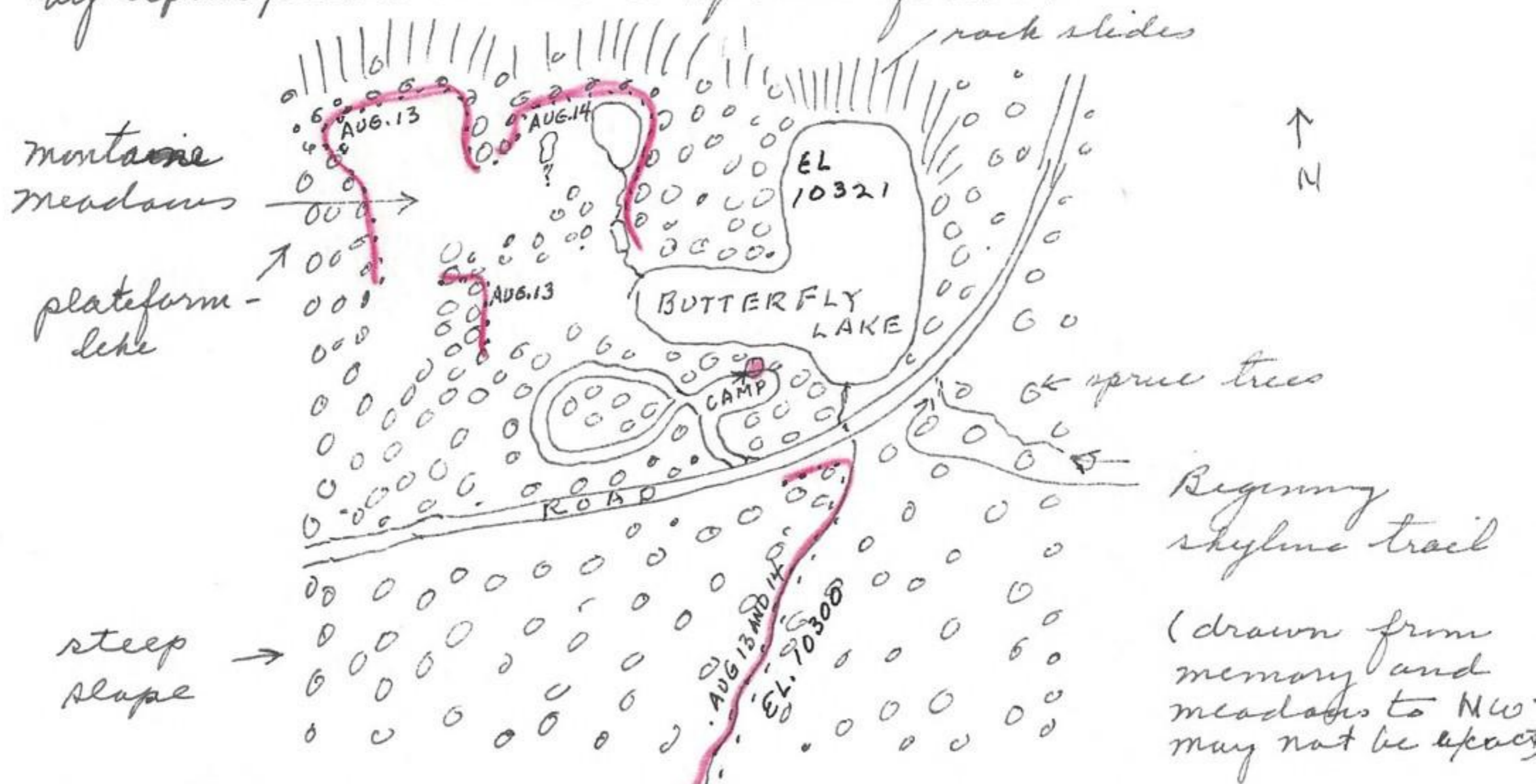
680813-1	<i>Microtus longicaudus</i>	230-79-26-14-	101 gms	♀	3x3 plac scars
680813-2	"	192-63-25-13-	60 gms	♀	2x2 emb 5 mm
680813-3	<i>Clethrionomys</i>	138-38-18-13-	24 gms	♂	testes 10 mm
680813-4	<i>Phenacomys</i>	107-22-17-12-	15 gms	♂	testes 4 mm, white
680813-5	<i>Sorex navigator</i>	150-75-19.5-6-	10 gms	♀	suckling
680813-6	<i>Sorex vagrans</i>	107-45-13-7-	5 gms	♂	
680813-7	"	104-42-13-7-	4.5 gms	♂	
680813-8	"	"	"	"	"

From traps in spruce forest and edge; (elevation 10321)

680813-8	<i>Sorex vagrans</i>	100-42-12-7-	4.5 gms	♂	spruce gum on feet
680813-9	"	109-46-13-7-	5.5 gms	♀	ut. normal
680813-10	"	103-43-12-7-	4.5 gms	♂	
680813-11	<i>Phenacomys intermed.</i>	107-24-17-12-	17 gms	♂	testes 5 mm., white
680813-12	"	109-24-17-13-	16 gms	♀	ut normal.
680813-13	<i>Clethrionomys</i>	132-36-19-13-	21 gms	♂	testes 10 mm
680813-14	"	145-38-19-13-	31 gms	♀	5x3 emb 3 mm
680813-15	<i>Microtus montanus</i>	164-48-25-13-	40 gms.	♀	ut normal.

Skull only

Trap lines of last night were set in two different plant associations; one at edge of meadow and upper montane forests, the second along steeply flowing creek bordered by alpine plants within a spruce forest.



The traps at contact of forests and meadows were generally at base of spruce trees or prostrate conifers at

base of conifers. The meadows of sedges, Carex and other grasses were in either ^{on} supersaturated soils or in standing water. As a result of this condition there were rarely evidence of trails of microtines in these particular meadows. The forests were climax spruce with many old trees, most of them on the ground. Rock slides were well developed and extensive in distribution. The conifers beyond the platform of the meadows graded into krummholz at higher elevations. Several biological associations reminded me of the arctic, especially the hummocky terrain at the N end of one of the meadows and of the deeply eroded runways of microtines (caused principally by water erosion) in some of the drier parts of the meadow. The lakes or ponds were filling in and one could move several sq. yards of vegetation by jumping up & down on the bog area. Low lying conifers and shrubs bordering the meadows offered overhead protection of meadow dwelling forms. The two *Phenacomys* (680813-11 and 680813-12) were from base of spruce in fairly sparse understory cover. Sorex mainly from among dwarf willow at edge of meadow. *Clethrionomys* from forests & edge. At Butterfly Lake at N end the sequence of vegetation is sedge & grasses in standing water - grazed short grasses (from *Ochloa*?) and - dwarf willow - spruce. The wet sedge were too wet for microtines and the grazed grass too short, leaving the willows the only suitable habitat for ^{meadow} microtines. Birds in area: pine grosbeak, gray headed junco, Canada jay, green tailed Towhee, Audubon warbler, Mt. Chickadee, robin, white-crowned sparrow, flicker, spotted sandpiper, crossbills?. The spotted sandpiper seemed more at home among spruce at edge of meadow than around lake. It acted as if it had young and was more aggressive than I have seen it elsewhere. In the evening small bats started to fly at 9:00 P.M. when fog was ^{thick enough to} obscure the other side of the lake & temperatures were 47°F. Fog starts to develop over water of lake at about twilight. Pine grosbeaks (1 to 5) fed in the meadow at camp from early morning to late twilight. (as late as 8:15 P.M.!). One of them allowed me to approach to within 6 inches and then only move a few feet beyond.

photos 680814-19 vantage Point near Mt Baldy overlooking upper Provo drainage, River to W.
" 680814-20 " " " " " " " " " " " "

Butterfly Lake, 10321 ft, Duchesne Co., Utah

Aug 14, 1968

From trapline at edge of meadows & spruce forests:

680814-1	Eutamias	228-102-32.5-18-59 gms	♀ ut norm
680814-2	Eutamias	210-102-32-18-48 gms	♀ ut norm
680814-3	Eutamias	180-73-30-16-38 gms	♂ testes 5
680814-4	Clethrionomys	126-34-19-14-20 gms	♂ testes 10 mm
680814-5	Clethrionomys	128-37-19-14-19 gms	♂ testes 10 mm
680814-6	Peromyscus	134-60-20-18-13 gms	♂ testes 2.5 mm
680814-7	Sorex vagrans	108-42-12.5-7-5 gms	♂
680814-8	Sorex vagrans	110-46-13-7-4.5 gms	♀
680814-9	Sorex vagrans	102-43-12-7-3 gms	♂
680814-10	Sorex	97-39-11-5-4 gms	♀ suckling

From stream below Lake: (elevation 10300 ft.)

SR. only	680814-11	microtus	201-65-26-14-51 gms.	♂ testes 7 mm
	680814-12	Sorex palustris	151-73-19-8-10 gms	♂
	680814-13	" " "	155-75-20-8-10 gms	♂
SR. only	680814-14	Clethrionomys	135-40-18-13-18 gms	♂ testes 9 mm
sk. only	680814-15	Sorex vagrans	114-44-12.5-7-7 gms.	testes 5 mm
sk. only	680814-16	" "	116-45-13-7-8 gms.	♀ suckling.
	680814-17	" "	108-46-12.5-5-5 gms	♂

The trap line of last night similar to trapline of previous night. The traps ⁽⁵⁰⁾ at contact between forest and meadow were extended along similar associations. The traps (50) along stream were reset in the upper 1/2 of old line and two traps were placed opposite each other, on either side of the stream. This was an attempt to collect the ♂ of the large microtine. The rain of last night and ^(see on ponds) snow this A.M. (7:00) before collecting traps had an influence on numbers collected.

Of unusual interest was a group of 4 pine grosbeaks that fed in a meadow (80' x 40') surrounded on 3 sides by spruce and the 4th side by the lake. One of these birds allowed one to approach to within 1 foot and as ~~less~~ ^{few} as 6 inches before it would move beyond for a few feet. It was definitely in jeopardy by being stepped upon. The other 3 birds were more normally alert and would fly to trees when approached to closely. The tame bird was not injured or incapacitated in any way. This group of birds have been seen in another meadow 1/10 mile away. They fed on seeds. This afternoon left for Mt. Baldy. Enroute stopped at Mirror Lake and photographed lake 680814-18 from some spot of a photo taken when James Robert was a baby.

- Photo 680815-31 Divide, SE mt. Baldy to NE (Agassiz)
 680815-32 " " " (Agassiz to R, Hayden to left)
 680815-33 " " (Agassiz) Annette in foreground.
 680815-34 Vantage Point, overlooking upper Provo River drainage
 680815-35 " " , Car, trailer, mt Baldy in background.

Mammals from S slope Bald mountain in Krummbolz.

680815-1	Peromyscus	172-76-21-18-23 gms	♂ testes 10 mm
680815-2	"	178-82-21.5-19-26 gms	♀ suckling
680815-3	"	155-65-19-17-21 gms	♂ testes 9 mm
680815-4	"	145-60-20-17-16 gms	♂ testes 2.5 mm
680815-5	"	143-56-19-17-20 gms	♀ 3x3 emb 6 mm
680815-6	"	166-77-21-18-19 gms	♂ testes 4 mm
680815-7	"	163-72-21-18-21 gms	♂ testes 8 mm
680815-8	"	154-65-19-18-17 gms	♀ ut. normal
680815-9	"	146-66-19-18-12 gms	♀ ut. normal

From spruce forests directly below above and to the E at approx 10,750 ft.

680815-10	Peromyscus	152-64-20-18-21 gms	♀ suckling
680815-11	"	160-61-20-18-23 gms	♂ testes 9 mm
680815-12	"	162-71-21-19-31 gms	♀ 2x4 emb 15 mm
680815-13	Clethrionomys	145-43-18-13-30 gms	♀ 3x3 emb 12 mm
680815-14	Sorex rogersi	103-42-13-6-7 gms	♀ suckling
680815-15	Clethrionomys	133-36-18-13-17 gms	♂ testes 2.5 mm
680815-16	"	138-37-18-13-21 gms	♂ testes 8 mm
680815-17	Peromyscus	147-63-19-17-14 gms	♀ ut. normal
680815-18	"	142-64-19.5-17-13 gms	♀ ut. normal
skinny 680815-19	"	135-57-17-17-10 gms	♀ ut. normal

The above mammals were from two sets of traps (50 each), one from traps set in Krummbolz on S side of Bald Mountain at elevations between 10900 and 11,000 ft. Most traps were set just in from edge of prostrate conifers. A more typical stand is higher and on W side of mountain which should be tested for true Krummbolz. The trap line from ^{open} spruce forest was on divide just east of base of Bald Mountain at approx 10,750 ft. The trees are normal in height. Traps at edge and at base of trees among dense growth of basal conifers. Last night it snowed at camp and on Baldy to depth (at camp) of 2 inches and temp. of 31°F in early A.M. Traps difficult to find. Noted a hummingbird at base of Bald Mountain. Several photos recorded near camp. ~~the first two taken yesterday afternoon:~~

680815-21	Base mt. Baldy. car, trailer & snow.	680815-27	Surde, ^{SE} mt. Baldy (agassiz)
680815-22	" " " " " " "	680815-28	" ^{SE} " " "
680815-23	mt. Baldy, E foot face	680815-29	" NE " " (agassiz)
680815-24	Divide, SE mt. Baldy. (to NE) Hayden	680815-30	" " " " (agassiz Peak)
680815-25	" " " " (" ") "	Left in afternoon and arrived in Annette in forge.	
680815-26	" " " " (" ") Annette and Hayden Peak	Provs in evening. Dead oak trees E of Hayden.	

680819-119

Mouth Rock Canyon, 5600 ft., Utah Co., Utah.

Aug. 19, 1968

Set 50 traps along base of Pre-Cambrian-Cambrian contact from near floor of canyon at eastern extension to near valley contact above and to the west. For the most part the settings were under overhanging protection and soil dry and powdery. At one point the recess of an overhang supported standing water, mosses and other shade-water types of vegetation. These areas should be checked for Indian habitation. In one of these overhangs collected a Tadarida mexicana, no 680819-1. It was dead and being consumed by 12 yellow wasps. It measured 106-39-10-14-9 gms. Other bats were flying in canyon at late twilight. Another Tadarida mexicana was found dead on window ledge at 255 E 1st So in Provo.

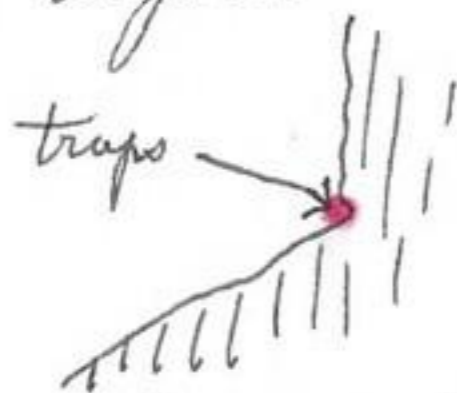
Mouth Rock Canyon, 5600 ft., Utah Co., Utah.

Aug. 20, 1968

Collected mammals from trapline set last night:

<u>680820-1</u>	<u>Peromyscus maniculatus</u>	175-82-20-17-33 gms	♀ suckling
<u>680820-2</u>	<u>Peromyscus boylii</u>	192-94-23-24-24 gms	♂ testis 10 mm
<u>680820-3</u>	<u>Peromyscus boylii</u>	181-93-24-25-24 gms	♂ testis 10 mm

A third Peromyscus boylii had been stunned by the trap but when approached ran into rocks at base of cliff. It was gray in pelage. The cave at highest point of pre-Cambrian tillite and Cambrian has standing water at back of cave and green vegetation. This cave is a vantage point for view up canyon as well as down canyon & valley beyond. All traps were set at contact with slopes and perpendicular cliffs. There are other cliffs at higher elevations and also at contact with canyon floor higher in Rock Canyon.



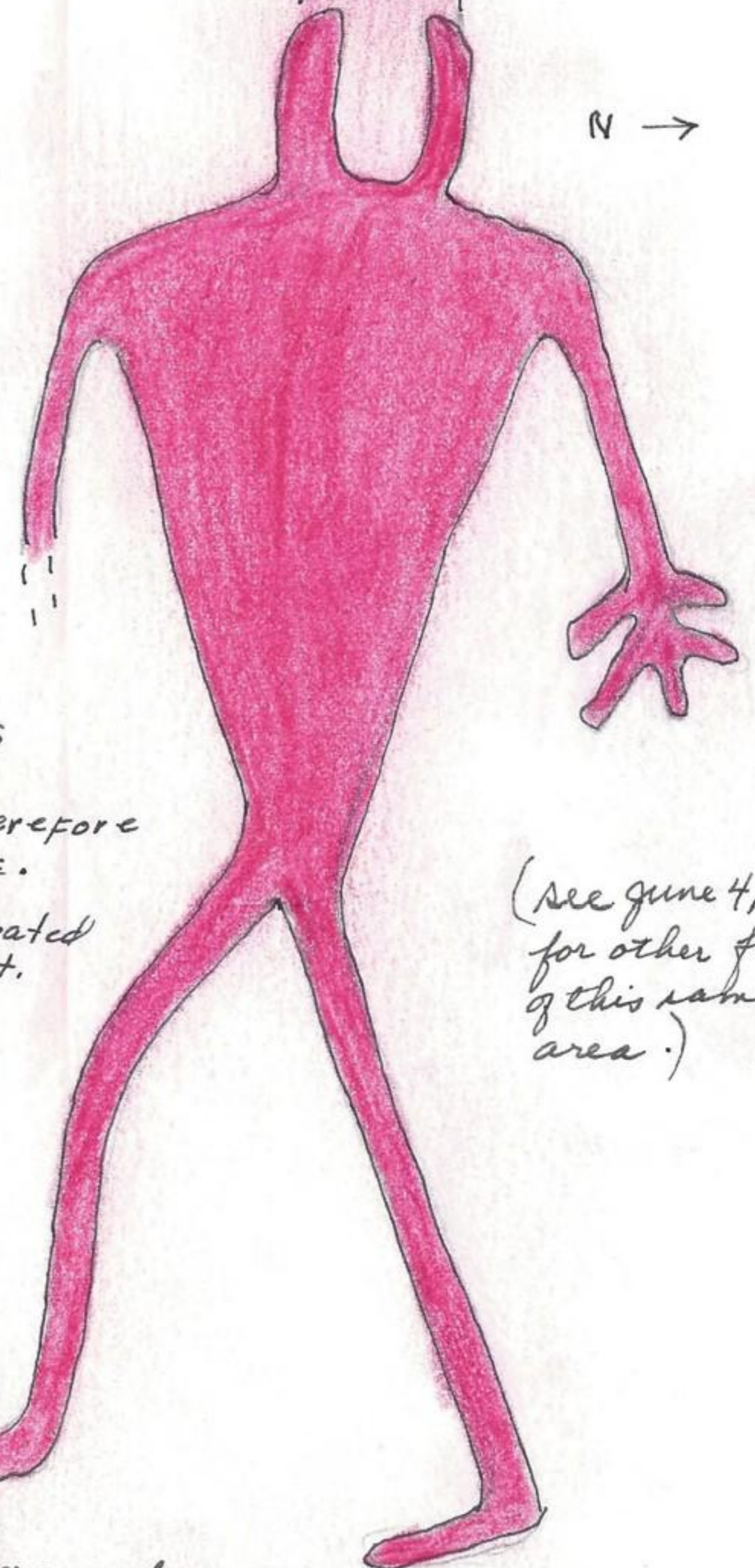
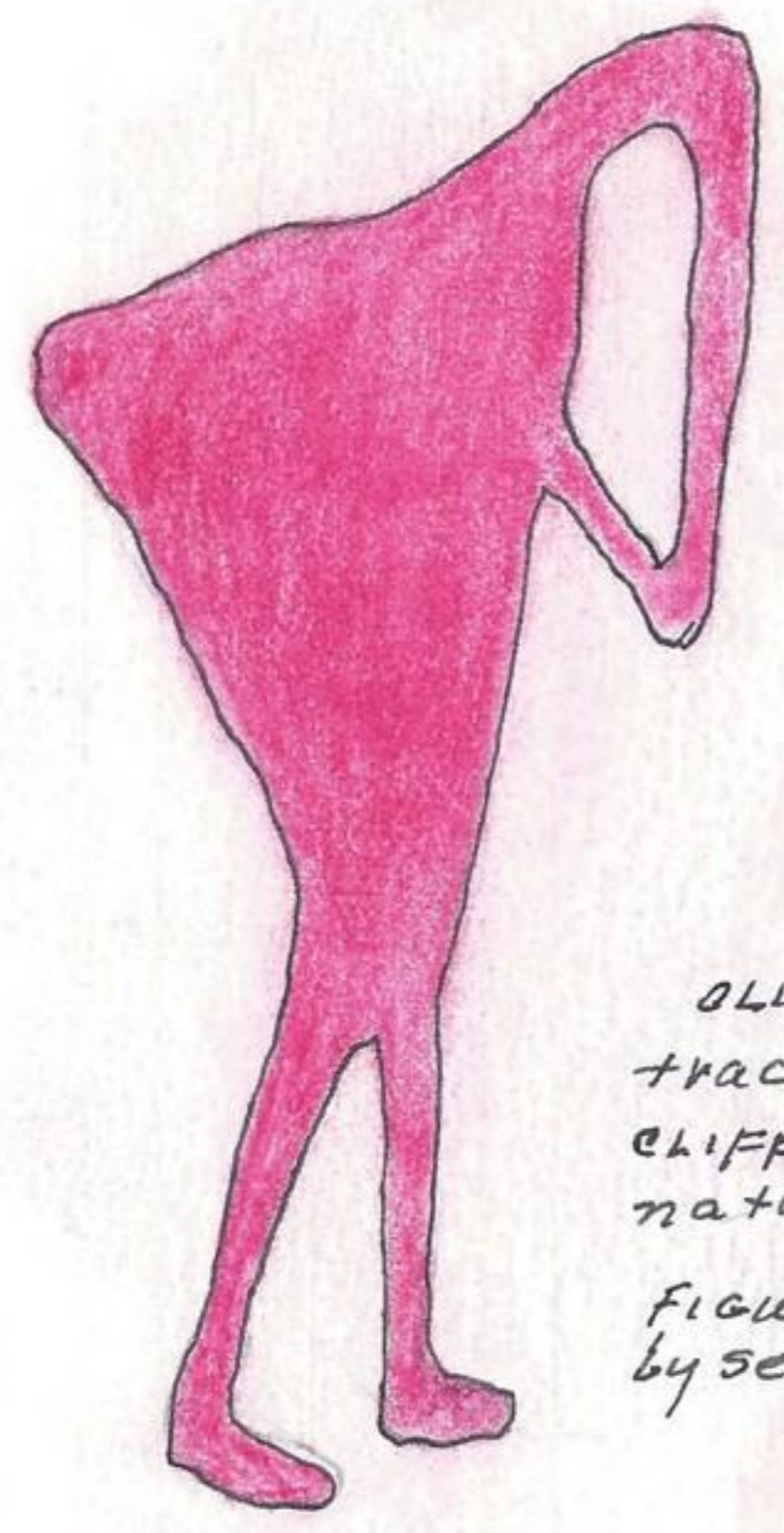
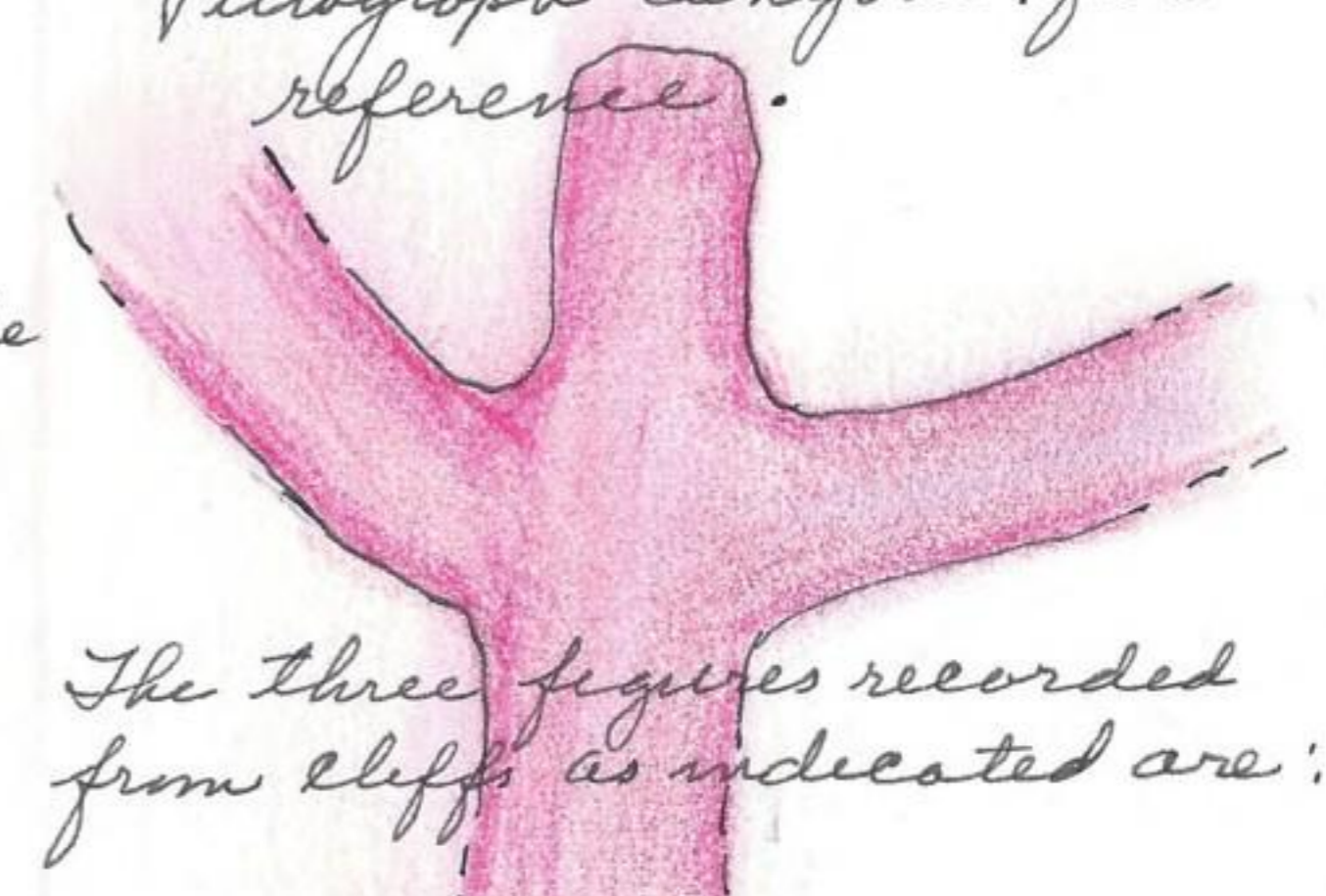
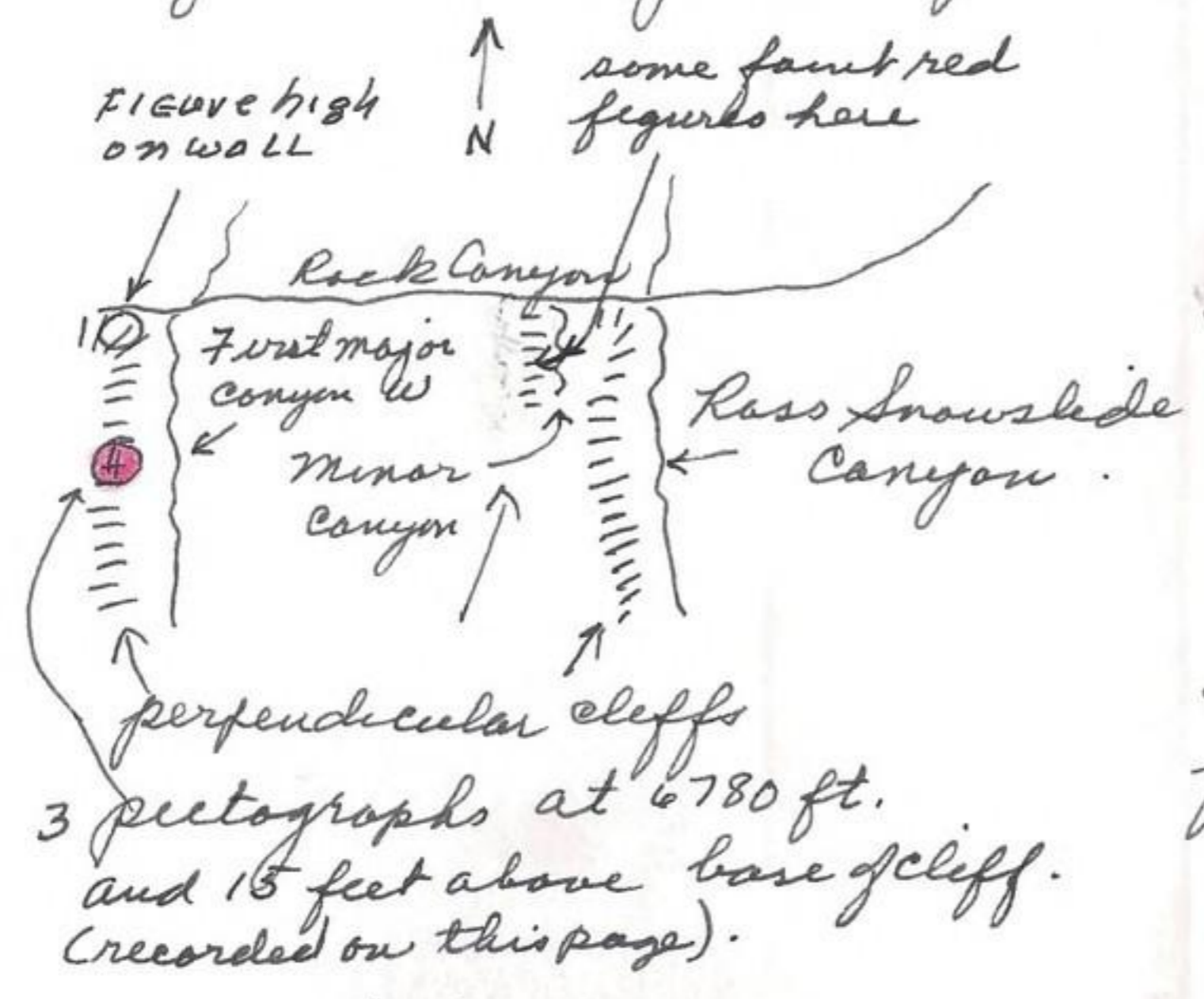
Seven Steller's jays in one group in scrub oaks on N side of canyon below cliffs. They remained in area. Several hummingbirds at mouth of canyon, especially near base of cliffs above canyon floor. The elevation at mouth of canyon where cliff converge on floor is 5270 ft.

Rock Canyon, 5780 ft., Utah Co., Utah

Aug. 20, 1968

James Robert, Annette C., Mary, Annette P.M. and I hiked up Rock Canyon to check on extent of pictograph writing on walls

of the canyon. The pictographs are on the east facing walls of perpendicular cliffs. The canyon is the first major slide canyon w of Ross Snowslide Canyon. and shall be known as Pictograph Canyon for reference.



ALL FIGURES TRACED FROM CLIFFS AND THEREFORE NATURAL SIZE.

FIGURES SEPARATED BY SEVERAL FEET.

(see June 4, 1939 for other figures of this same area.)



figures are faint because of covering of calcium carbonate. wet surface shows fig. best.

Aug. 23, 1968 ^{Utah}

Mary, Annette C and I investigated Clark Crow nesting area and cave on S side Slide Canyon. Left base of Y mountain at 11:32 A.M. altitude at top of Bonneville level and at high voltage power lines at 5160 ft elevation. Will follow regular trail and record complete observations. This trail has been modified for vehicle passage and does not, at all places, conform to the old foot trail. Beyond the Y the trail is the same as of earlier observation (20 years ago). At base of trail (5160') noted 2 sparrow hawks and one Steller's jay. Day cool and sunny.

11:45 first switchback, sparrow hawk. 11:42 hummingbird passed by. 11:52 second switchback. 11:58 3rd switchback
12:03 4th switchback, 2 hummers. 12:05 5th switchback, trail damp, bees 1 per 40' but variable number, sometimes 5 or 6 at one spot. grasshoppers in greater numbers and average 1 per 25'. 12:08 6th backswitch, hummer. 3 turkey vultures soaring at point above Clark crows nesting area. 12:14 7th switchback, magpie flew S along face mt. 12:17 8th switchback.
12:21 9th switchback. Eutamias (hummer) and rock squirrel up slope.
12:24 10th switchback (left road and continued to Y on old trail.

The open areas support more grasshoppers than scrub tree area. I have not observed an increase or decrease of these insects with altitude. There does seem to be a slight increase in bees and these insects are on all slopes. Y (base) at 12:30, elevation at base is 6035. Elevation at top of Y 6205 or a difference of 170' elevation. We arrived at top of Y at 12:43, and continued. 12:48 hummingbird flew by. There seems to be more hummingbirds than I remember. 12:52 Rock squirrel. Grasshoppers seem to be increasing but this may be a factor of habitat.

Arrived Eagle Gate at 1:00 P.M. Elevation 6435 ft. 3 Steller's jays in conifers below and across canyon. They remained in this area. Left at 1:10 There are definitely more flies on the S exposure of Slide Canyon than on the front exposure of Y mountain. Observed first lizard at 1:15. Continued up canyon beyond next promontory and then on a level, cut across to S side of canyon at 12:20. Continued up thru conifers to base of prominent cliff, thence W around end by conifer, thence up passed second cliffs to 3 set of cliffs. This is the only way to reach this area except by next canyon to E. Arrive base of cliffs SE Clark Crow nesting tree at 1:50 and had lunch. Air temp in shade 60°F at 6792 ft. while here noted 2 red shofled flickers and a redtail hawk that soared by from E-W at about the height of Clark Crow tree. Three Turkey vultures ~~flew~~ ^{soared} by later from W to E at about 200' above area.

Examination of the Clark Crow nesting tree did not reveal a nest and tree considerably larger than when nest was placed there originally. Tree bent with ground weight of snow



This tree is approx. 80 feet down slope to N from a cliff that has an Egyptian-like face. From nesting area continued SE up steep slope among cliffs to E ridge, thence down over main cliffs. Inspected base of these cliffs to E to canyon and then return to NW along same set of cliffs. The cave was discovered at a point almost at ridge. This cave could be easily by-passed (see photo). Vegetation grew at entrance of cave and no trails led into cave. The exposure is N side. A dead conifer had fallen across cave entrance but above, no movement of air or odors at entrance. One main rectangular entrance just big enough for entrance and 4 or 5 minor holes between the rocks that had lodged at entrance.

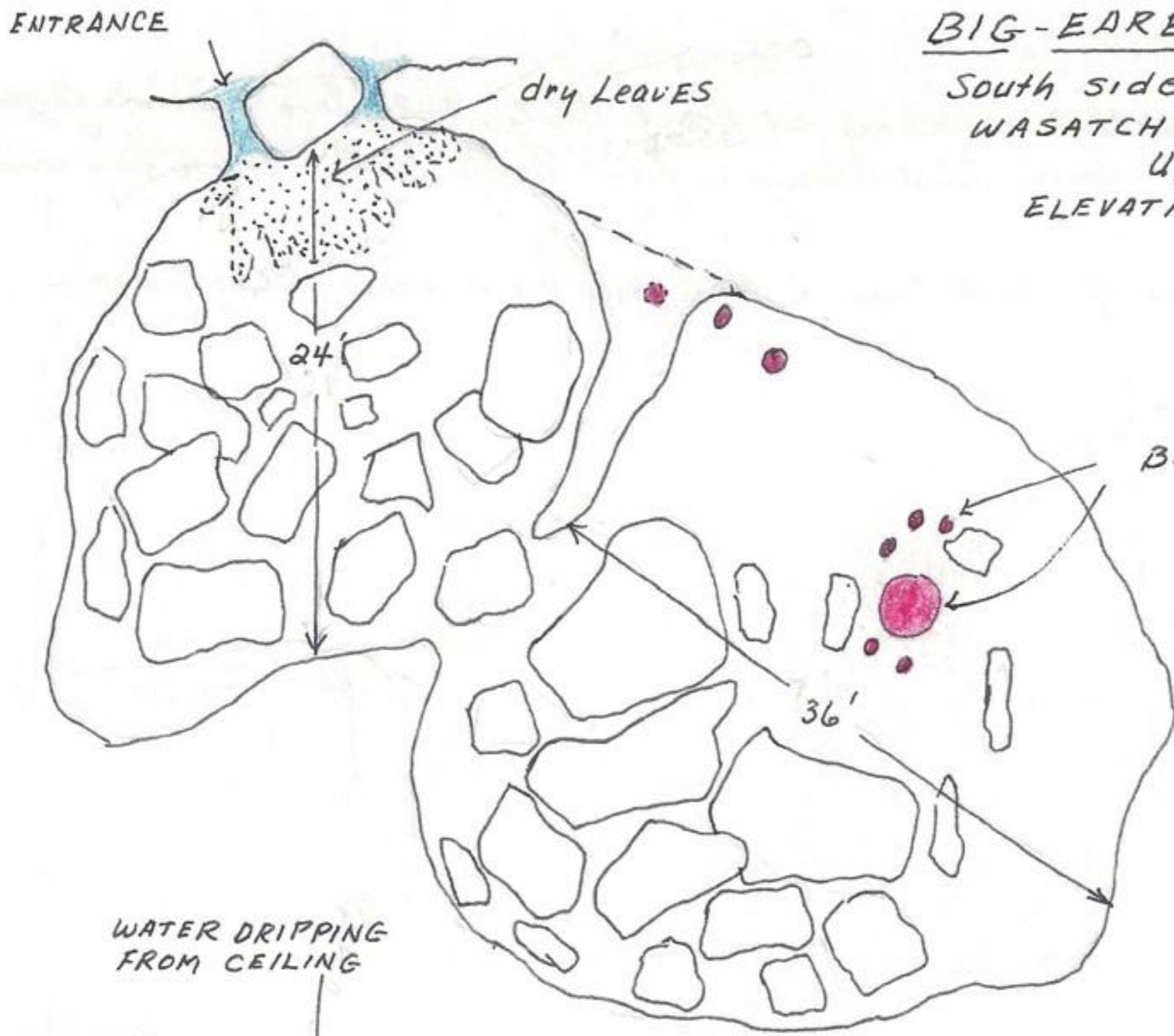


Dry leaves and film of dirt on rocks on inside nearest entrance. Light in first chamber but too dark in second chamber to see details. Some of the larger flat rocks had sign as if nestoma. One bat flew from second chamber to first around large boulder then returned by way. It repeated this on 3 occasions. Two other bats circulated after colony of 28 were captured in net. The holes of the entrance were covered with coats, jackets, backpacks and a mist net placed over main hole from inside but not bats were captured or escaped. The deepest part of second chamber had damp soils and flat as if accumulation was by water. The cave was apparently on a fault line and principally a solution cave with subsequent falling of rock slabs from sides & ceiling. If this is a result of Wasatch faulting the fault could be dated by getting organic material covered on original floor of cave. The following are photos at ^{or near} cave:

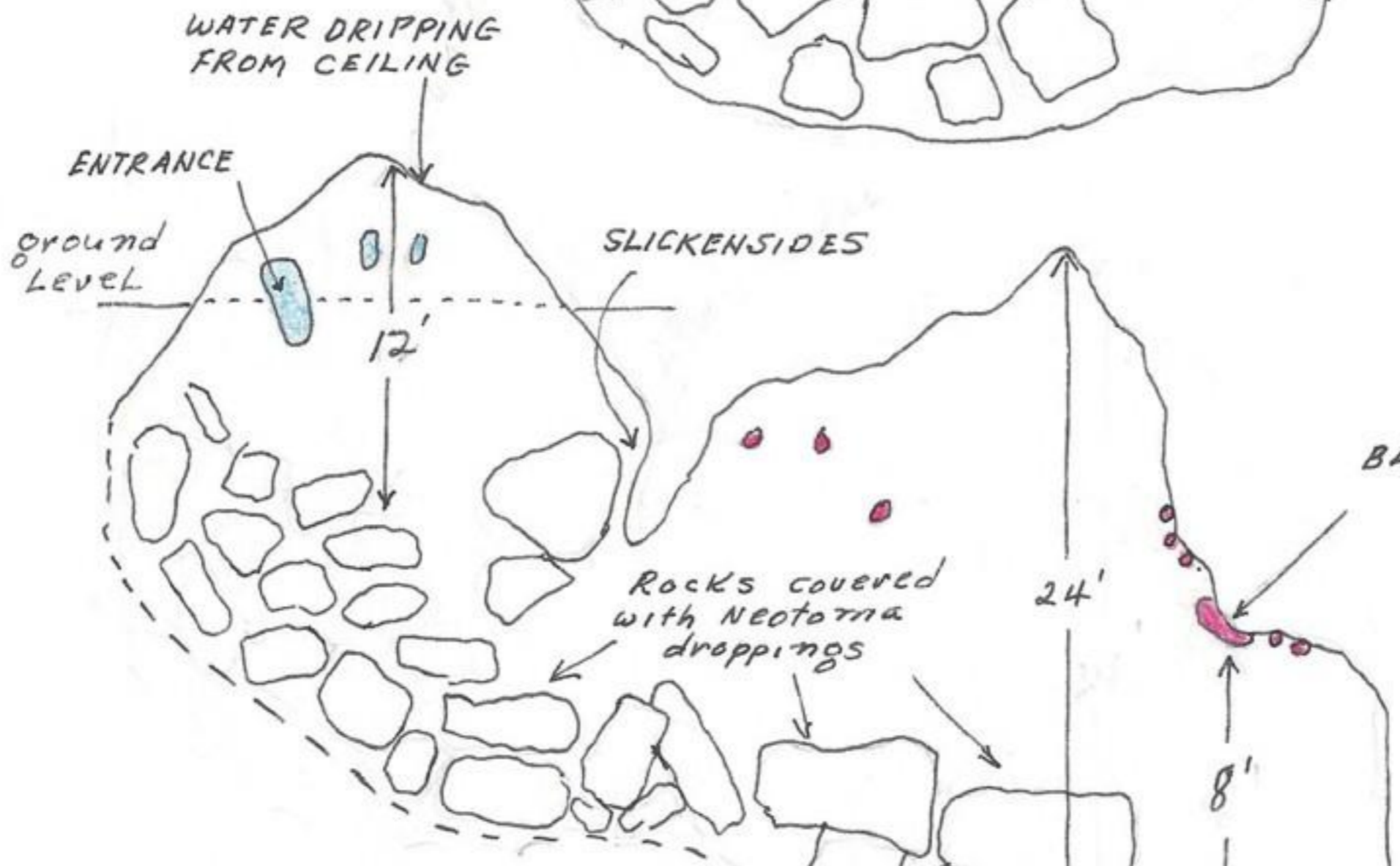
- (nos. 0 to 30 - see Aug 23, 1968) tree lower left
- 680 823-31 near Clark Crow nest tree, in lower left. BYU campus in background.
- 680 823-32 Annette C and Mary near Clark Crow site. (SE) (can see Mary & Sons home)
- 680 823-33 Entrance to Big-eared Bat cave from inside
- 680 823-34 Entrance to Big-eared Bat Cave. Annette C & Mary (Annette in entrance)
- 680 823-35 Annette C and Mary at entrance Bat Cave
- 680 823-36 Bat cave setting. Annette C & Mary & Mary sitting at entrance. Note dead tree fallen over entrance
- 680 823-37 Cave entrance. Annette & Mary
- 680 823-38 at entrance at about knee level.
- 6808 23-38 Entrance of cave.

BIG-EARED BAT CAVE

South side SLIDE Canyon
WASATCH RANGE, UTAH CO.
UTAH
ELEVATION 6930 FT.



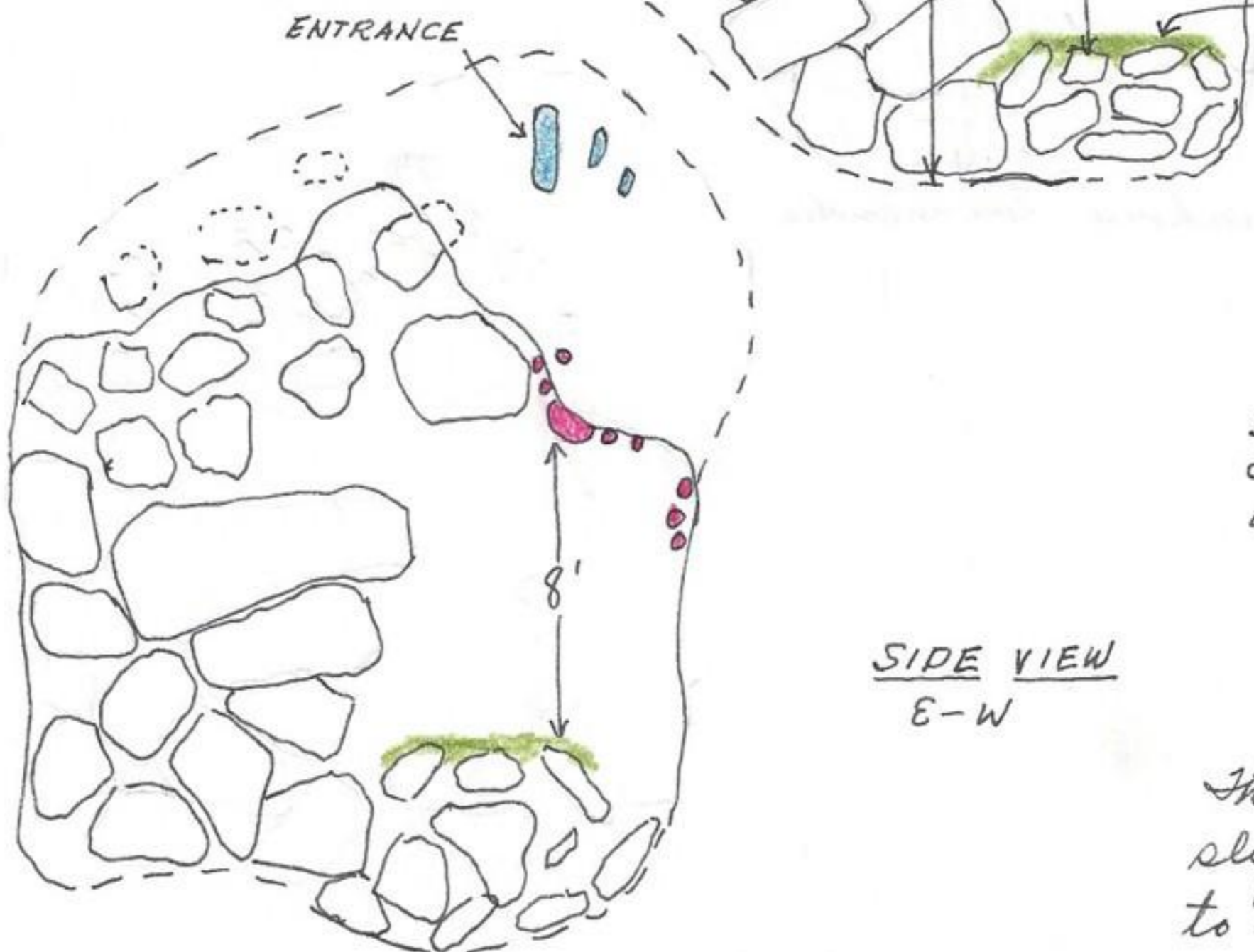
AREAL VIEW (FLOOR)



BATS (*Corynorhinus townsendii pallescens.*)

SIDE VIEW

N-S



GUANA (1 to 3" deep), course and dry.

SIDE VIEW

E-W

Some stalactites and calcium carbonate on walls.

The strongest odor is bat, slight neotoma but no odor to turkey vulture.

Photo

- Photo 680823-39 Annette C & Mary at Eagle Gate. Note two animate figures.
- " 680823-40 view down Slide Canyon from Eagle Gate. Provo Bay visible
- " 680823-41 " " " " " " " " " " " "
- " 680823-42 view of Clark Crow & Bat Cove on S side Slide Canyon.

- Photo 680823-45 *Corynorhynchus townsendii*
- " 680823-46 " "
- " 680823-47 " "
- " 680823-48 " "
- " 680823-49 " "
- " 680823-50 " "
- " 680823-51 " "

Left cave at 5:00 P.M. At Clark Crow ⁶⁸⁰⁸²³⁻¹²⁴ ^{next recorded elevation} of 6730'. On way down noted considerable use of conifer area by mule deer. Nearly all of the larger conifers in isolated spots had resting grounds at base. Conifers distributed more uniformly had many trails and also bedding areas. The best route down is as approach but instead of crossing higher in slide, cross at bottom of gulch and work around base of cliffs to trail. At Eagle Gate ^{5:40} noted a hummer that descended in undulating flight on the order of the flight of a flicker with wing movement and glide ^(see photo on opposite page.) Approx. 150' beyond Eagle Gate noted a rock squirrel in trail about 20' ahead. It remained there for about 1 minute before leaving. At Y recorded altitude measurements again to see how they varied from earlier this morning:



at 12:30 at base of Y = 6035
 at 5:55 at base of Y = $\frac{6090}{55}$ higher
 at 12:43 at top of Y = 6205
 at 5:50 at top of Y = $\frac{6255}{50}$ higher

Barometric pressure had changed between late morning & evening to make the difference of 50-60' higher altimeter reading and elevations should be so corrected.

Arrived Bonneville Level at 6:25 P.M. at altitude 5235 ft or 75' correction. Arrived car 6:30 P.M. Bats travelled in ^{butterfly} net in compact group with leaves for shade. There was remarkably little noise reaction and only 3 cases of bleeding by neighbor depredation and then only enough to equal 2 sq inches of blood on net and sack. Each bat at home was placed in separate plastic bag & place in refrigerator (ice box in trailer) Only 3 in direct contact with the ice died. The rest remained torpid. Upon taking bats from the refrigerator, the ears are arranged so:



The tragus is always extended forward and never folded back under forearm as is described by Allen. Photo 680823-43 is of number 680823-27 bat and photo 680823-44 is of a ♂ number 680823-29. ^(see photos on opposite page) It is interesting to note


that a bat from the refrigerator will have folded ears and when killed by heart pressure will still remain in fold or slightly extended condition but in the act of skinning and mounting on the drying board, the ears will finally assume full upright extension. Active bats can willfully extend or contract ears rapidly. In skinning there is an artery that bleeds when ears are severed from the head. no other skinning manipulation causes bleeding.

680823-125

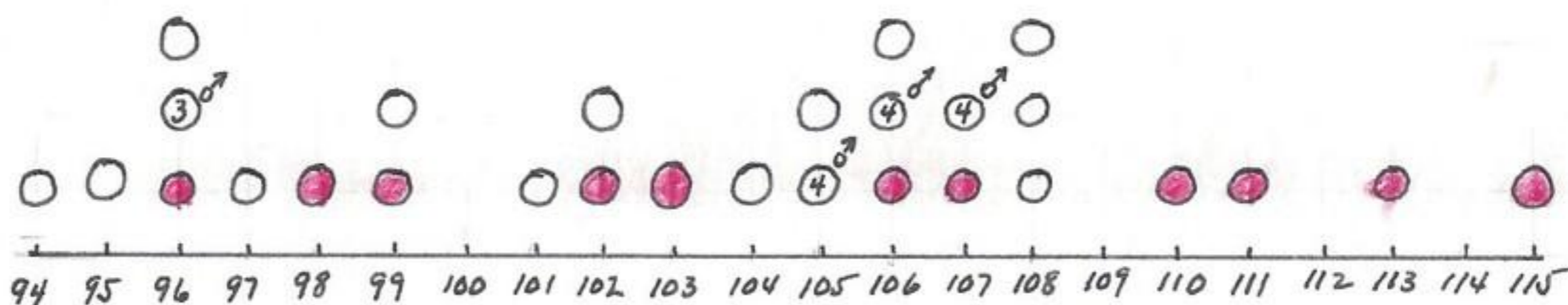
Slide Canyon, 6870 ft., Wasatch Range, Utah Co., Utah
 Aug. 23, 1968 (continued)

Collected the following bats from the above locality:

Number	Species	Measurements	Weight	Sex	Reproductive Status
680823-1	<i>Corynorhinus townsendii pallasi</i>	98-46-11-35	7 gms	♀	ut. normal
680823-2	"	103-50-11-38	8 gms	♂	testes 3 1/2 mm
680823-3	"	108-51-11-36	10 gms	♀	ut. normal
680823-4	"	107-51-11-35	9 gms	♂	testes 4 mm
680823-5	"	106-50-11-36	8 gms	♂	testes 4 mm
680823-6	"	96-45-10-36	7 gms	♂	testes 3 mm
680823-7	"	113-53-11-36	12 gms	♀	lactating
680823-8	"	108-48-11-37	9 gms	♀	ut. normal
680823-9	"	101-49-11-36	7 gms	♀	ut. normal
680823-10	"	107-50-11-37	10 gms	♀	lactating
680823-11	"	110-53-11-37	10 gms	♀	lactating
680823-12	"	106-50-11-37	8 gms	♀	ut. normal
680823-13	"	105-49-11-38	8 gms	♀	ut. normal
680823-14	"	99-45-11-35	9 gms	♀	lactating
680823-15	"	111-54-11-36	10 gms	♀	lactating
680823-16	"	97-46-11-36	8 gms	♀	ut. normal
680823-17	"	99-47-11-36	8 gms	♀	ut. normal
SKIN ONLY 680823-18	"	102-49-11-35	7 gms	♀	ut. normal
680823-19	"	94-46-9-34	7 gms	♀	ut. normal
680823-20	"	98-46-11-35	9 gms	♀	lactating
680823-21	"	106-49-11-37	10 gms	♀	lactating
680823-22	"	96-43-10-35	9 gms	♀	lactating
					one mammary gland 15 x 12 x 4, 1/2 gm weight.
680823-23	"	104-51-11-36	9 gms	♀	ut. normal
680823-24	"	96-44-11-35	6.5 gms	♀	ut. normal
680823-25	"	95-46-10-35	5 gms	♂	testes 5 mm
680823-26	"	103-48-11-36	9 gms	♀	lactating
680823-27	"	102-44-11-36	9 gms	♀	lactating
680823-28	"	115-53-11-36	10 gms	♀	lactating and suckling
680823-29	"	105-49-11-35	7 gms	♂	testes 4 mm
680823-30	"	108-51-11-36	8 gms	♀	ut. normal

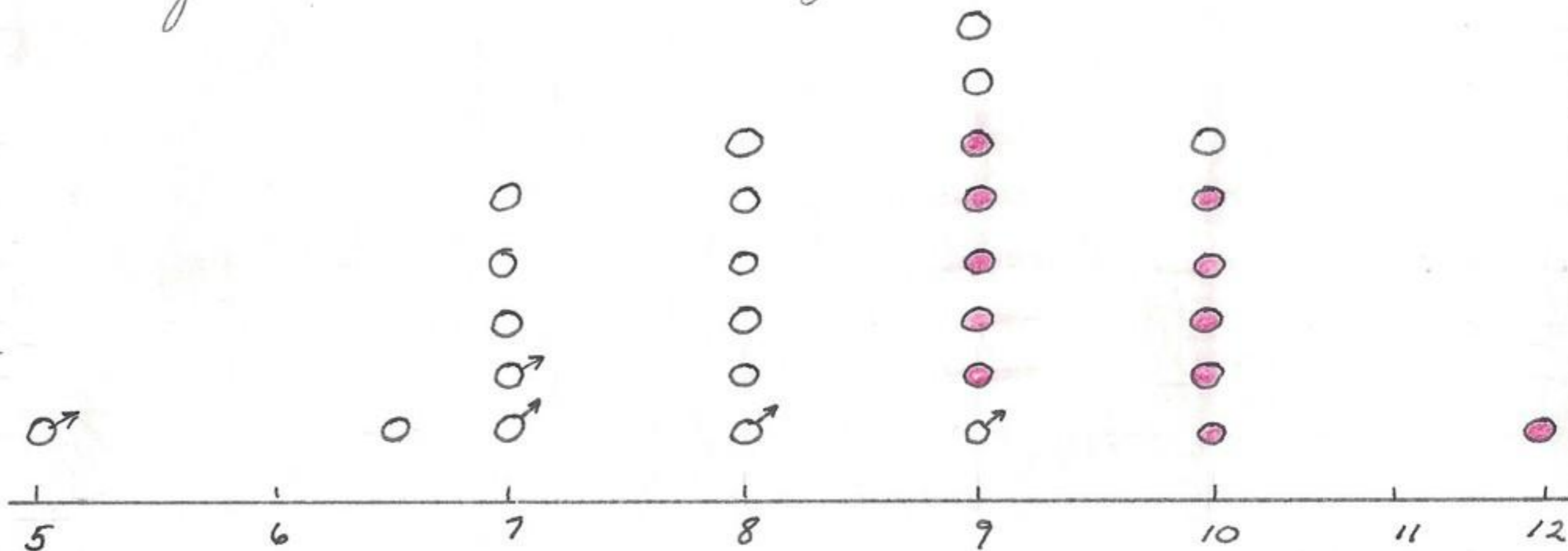
nos 680823-1 and 680823-2 were separated from main group by 8 inches; all the remaining bats, (except 6) (28) were in one closely arranged group (12 inch diameter) which fit within the diameter of an insect net () when placed over the bats. The 8 other big-eared bats were separated from the main group of 28 by distances of 8" (2), 20" (3) and 15" (3). The condition of the reproductive system was:  = normal; lactating = mammary glands present and enlarged; suckling = mammary glands enlarged, nipples prominent and hair worn around nipples. Young bats were not associated with ♀♀ or elsewhere in cave. Group of 28 bats consisted of both males and females. The mammary glands were either well developed (see 680823-22) or absent. It is questionable if these ♀♀'s are nursing young as there were no young in this cave. Only one female (680823-28) had enlarged nipples.

A colony of 18 Corynorhynchus townsendii arranged according to total length, weight and wing spread.



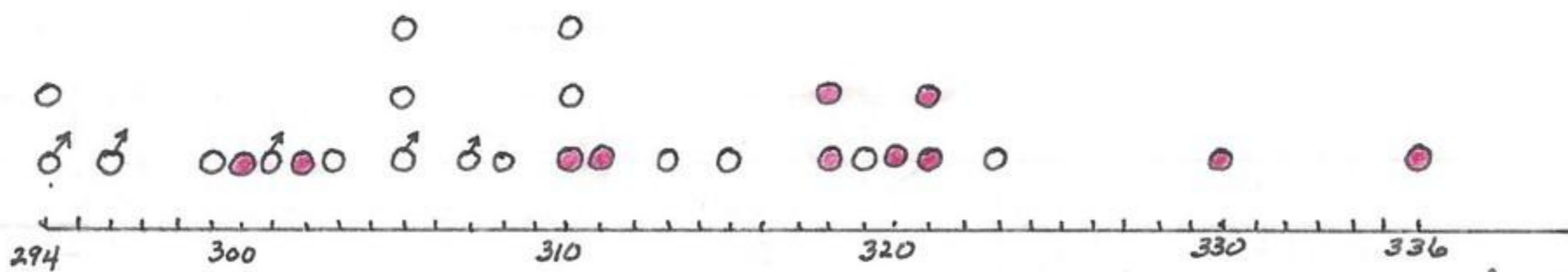
The 18 *Corynorhynchus townsendii* arranged according to total length in mm. males indicated. The colony does not segregate into age groups and lactating ♀♀ are distributed throughout the size range.

● = lactating



● = lactating

The 18 *Corynorhynchus townsendii* arranged by gram weight. The lactating ♀♀ with enlarged mammary glands would naturally shift to the right.



● = lactating

The 18 *Corynorhynchus townsendii* arranged according to wingspread. The distribution is similar to the graph for total length. Note that the ♂♂ have shifted to left. They apparently have smaller wings per body length.

Homestead, Heber Valley, Utah.

Aug 25, 1968

Had dinner with Mary and Don at Homestead. Recorded the following photos: Mary P, Annette C, Annette P.M, Grace, Jimmy & above were there.

680825-1 Don and Mary Jensen at the Guest House where they had been resting since Mary returned from Europe.

680825-2 From top of hot pot showing area to N and west. This area of many hot springs and permanent marshes should be investigated for relicts of small mammals as this habitat has been in existence since end of Pleistocene. The Trower-tine deposits might shed some light upon post Pleistocene times, especially as is recorded in the increment of deposit on the larger hot pot. A ^{drill} sample from top to bottom should produce some rather revealing information. Algae may ^{be} preserved as semi-fossil.

680825-3 From top of memorial hill NE of Charleston. This is not a hot spring deposit but an outlier or remnant of glacial ^{or water} erosion. Heber valley, Deer Creek & ^{Cascade mts.} Timp ⁱⁿ background.

680825-4 Same as above but with sunflowers in foreground. Early photographs of this village of Charleston may be used with comparison of the recent condition of the valley. Timp ⁱⁿ background.

680825-5 Swimming pool at Homestead. Mary, Annette and Jimmy in or near pool.

Provo, Utah Co., Utah

Aug. 26, 1968

Left Provo at 5:00 P.M. at mileage 13674. Will stop in Provo Canyon and record petroglyphs that were not recorded on acetate last year.

Stranded Valley Petroglyph Site, Provo Canyon, Utah Co., Utah

Mary, Annette & Annette P.M.

Aug 26, 1968

Left car and trailer at R.R. bridge at Canyon Glen. This bridge is approx 5000 ft elevation and petroglyphs were given altitude reading on the basis of this figure at the bridge. Climbed sidehill to site and recorded the following. The numbers were given last year at the time the general area was surveyed.

680826 - 12	is of petroglyph rock no 670815-16
680826 - 15	is of petroglyph rock no 670815-13
- 14	" " " " " 670815-12
- 17	" " " " " 670815-29
- 20	" " " " " 670815-14
- 21	" " " " " 670815-28
- 23	
- 27	
- 28	
- 29	

- 680827-7 Photo of petroglyph no.
- 680827-8 " " rock to show etfoliation.
- 680827-9 " " petroglyph no 670815-3
- 680827-10 " " " " 670815-5
- 680827-11 " " " " 670815-4

With remaining sunlight made the following 35 mm color photos:

~~680826-1~~ of petroglyph no.

~~680826-2~~ of " "

~~680826-3~~ " " "

~~680826-4~~ " " "

~~680826-5~~ " " "

~~680826-6~~ " " "

~~680826-7~~ " " "

~~680826-8~~ " " "

~~680826-9~~ " " "

~~680826-10~~ " " "

~~680826-11~~ " " "

light too poor

Two deer were noted on E side of canyon about 50' from road. At twilight returned to Canyon Glen and continued up Provo Canyon to Bridal Veil Falls where we camped for the night. It was reported that a snowslide had cascaded over these falls last winter. Water ouzel on river.

Bridal Veil Falls, Provo Canyon, Utah Co., Utah

Aug 27, 1968

Returned to Stranded Valley Petroglyph site and recorded the following petroglyphs.

680827-1 of petroglyph no. 680815-20

680827-2 " " " 670815-21

680827-3 " " " 670815-17

680827-4 " " " 670815-18

680827-5 " " " and Mary at side with outlier of a mule deer (recent) petroglyph no 2 (east side)

680827-6 Mary & Annette C at petroglyph site. Cascade in background.

Completed photographing at 10:00 A.M. and then made check of west ridge which is an upward continuation of the ridge we had recorded the petroglyphs. There were no petroglyphs on this ridge although Dad recorded a crosslike figure from a rock. Search among the scrub oak in hopes of finding evidence of these trees having grown over petroglyph rock but unsuccessfully. On next trip west, it is the intention to proof read the recordings, describe individual rocks as to surface & shape, place all rocks in relationship to each other whether used for petroglyph or not, extend search beyond limits of site, check springs to canyon east for possible camp sites and investigate caves in limestone cliffs just beyond spring canyon. Returned to car & trailer at Canyon Glen and then continued up Provo Canyon to Heber, Echo, Evanston to Sinclair where we camped in city park. Noted two large land slides in Echo Canyon from rain damage on new highway surfaces.

Sunclair, Wyoming

Aug. 28, 1968

continued east this A.M. Left main interstate highway and travelled S to Saratoga. There were 26 roadkill jackrabbits between the turnoff (Interstate) and Saratoga, most of them in the northern part of the route. Several groups of antelope also observed. Continued south to Encampment, thence S along the wide corridor to Colorado. This is an unusual valley and is now extensively used for grazing. At a point just S of Willow Creek divide photographed a debris of rock 680828-1 (elev 8100ft). Many beaver dams along this creek. Continued S to Berthoud Pass where two photos were taken nos 680828-2 and 680828-3 at pass with range to N. Gophers active at this elevation. Roads and trails are scarring mountain slopes. Continued down Loup to Denver (highway 6 to Interstate is the fastest and more scenic route. At E end of Denver airport the girls recorded several shots of incoming planes (1000 see end 2.4 stop). These photos are 680828-4 to 680828-6. Continued E to Limon, thence E to Colby Kansas where we camped in a roadside park.

Colby, Kansas

Aug. 29, 1968

Continued E on Interstate to Lawrence. I have never seen the country-side so green as this year. This condition continues all across the country from Provo to Lawrence. Western Kansas supports better grasses & vegetation than any previous trip I have made and color is more on the greenish-gray than the dead colors of burnt out vegetation of normal years. The long grass prairie is luxuriant with grazing field high in feed rather than the overgrazed grasslands of brown of normal years. The budlife did not seem to be of unusual numbers nor mammal road-kills. Arrived Lawrence about 5:00 P.M. First order of business was to ~~find~~ empty freezer of food and mammal-bird specimens that had been unrefrigerated for about a week. There was no possibility of salvaging these specimens, even to an accountability. The odor was impossible.

Lawrence, Douglas Co., Kansas

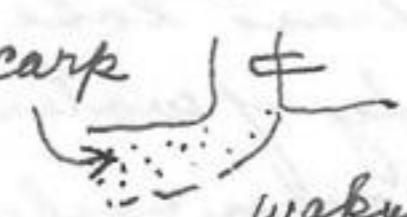
Sept 2, 1968

Collected a green diptera from freezer in backyard 680902-1. It had been attracted by the odor of the freezer.

680907-130
Wabarusa - Kaw River from Dingmans Crossing to Linwood,
Douglas & Leavenworth Cos., Kansas

Sept 7, 1968

mary & left at 10:50 A.M. Evidence of last high flood.
Spotted sandpiper, 2 pewees. many old trees now dislodged,
many mud flows. 10:55 red-bellied, 2 chickadees. 11:00
red bellied, 3 chickadees. many damselflies on log jams.
Banks still muddy. Day clear, 20 miles per hour wind. Temp ^{air} 78 F ^{water} 69 F
^{and rascals} Beaver tracks & great blue heron tracks. 11:05 ♂ cardinal calling
11:05 4 young & 1 ♀ woodduck, all together. ♀ left then 2 young followed
in 20 seconds by 2 remaining young, flew down stream. They called
as they left. Pewee. I would estimate that 70% of banks is
in mudflow. 11:08 2 blue jays, 2 redbellied, 3 goldfinch, 3
chickadees. 11:11 6 blue jays, 2 cardinals. 11:16 5 min. thru fallen
tree (elm). 11:17 drainage from right & rapids beyond. 11:18 second
drainage right. 680907-1 butterfly _____ from here
on rocks at rapids. ^{G. Blue Heron, 1, 2 young.} Left 11:30, 2 blue jays. Cicadas active
Directly below rapids is a large elm & blackberry across river
Side banks to 5 warm smooth & perpendicular. 11:35 elm tree barrier,
thru 11:48. Chickadees. 11:54 south end of bend. Maple tree barrier,
family of wooducks, pewee, 2 chickadees. 12:00 cliffs, unusual amount
green. 2 Phoebe in overhang. G. blue heron flew up to loose
then turned around & flew down river. Fox squirrel here. 12:08
maple nearly down to water. Beaver at base of roots & gave good
water disturbance. Harry & 3 chickadees. 12:09 G.H. owl. pewee.
family wooducks left water & flew arched down stream. called once.
5 blue jays chased owl. 12:14 log jam at bend. (field road to this point.
goldfinch ♂ on sands. Log jam open to W but usually to east.
5 carp have jumped so far. First mourning dove. 12:17 maple partially
over river. Spotted sandpiper flies about 200' and stops 12:18 second
set cliffs, green as were first. spotted sandpiper reversed direction & flew up river.
Blue jay & 5 chickadees. Some of the large rocks displaced down
stream from cliffs but near. 12:26 G. blue heron, 3 jay, chickadees
12:30 3rd set cliffs. Muskrat, 8 wooducks ^{one on bank & left when canoe opposite, flew} in one group, sp. sandpiper
flock goldfinch, 2 jays. A solitary sandpiper rested on one leg
on rocks and a spotted fed 2 feet away. The spotted left first, then
solitary. Between rocks & ledge and pilot black swan from W to E across
river on surface & when on land stopped. when touched returned to water
and swam back. did not dive but stopped as soon as out of water.
12:41 bridge. 3 jays, pewee. Only a few leaves in water, 1/3 of
which are green. Large black & yellow monarch, first one observed. ^{3 mourning doves.}

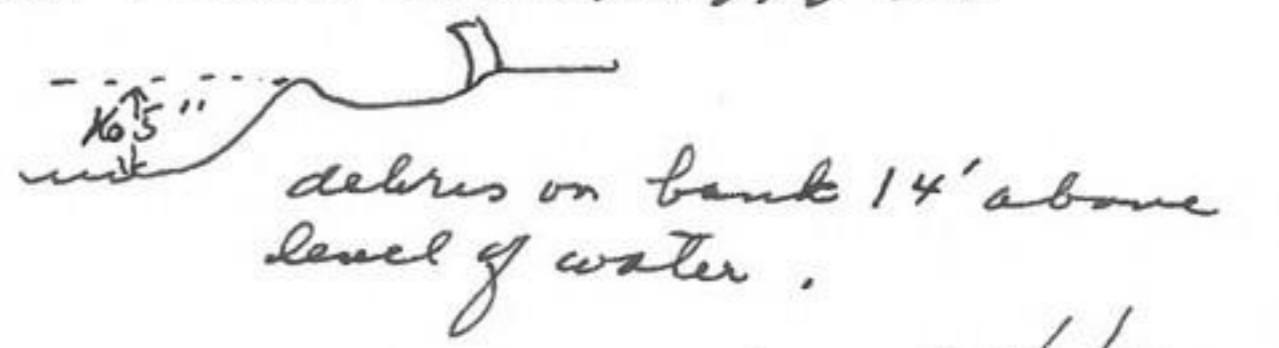
12:58 Cuckadees. 12:59 R.R. bridge 1:03 ⁶⁸⁰⁹⁰⁷⁻¹³¹ There is ^{4 woodchuck} more than ^{3 flew} one ^(different) family
ones), down river above trees. and probably 3 different ones. 12:07 muskrat active. 1:10 3 wood-
ucks. 80 Starling in one flock & first observed. 5 mourning doves
around old dead tree, 3 bluejay. 1:13 Robin, 2 cardinals, 3 jays
Acadian flycatcher?. 1:25 Eudora bridge. cardinal. 1:35
Eudora sewer outlet. approx 30 large carp surfacing with mouths open
carp  they remained until we placed larvae almost
wakarusa. over them. 3 cardinals in area. 1:40

green heron. 1:50 4 jay. 1:55 mouth Wakarusa. wind about
15-20 mph. from S. active muskrat. Kaw muddy, Wakarusa
relatively clear. Crossed to sandy point to n & had lunch.
Collected Cicadellids on lee of sand behind willows and caught
the following in three sweeps of 30' each. 680907-5 to 680907-23.

Left 2:50 P.M. air temp 82°F, water 75°F.
wind blowing sands. used umbrella to rest turn with wind from back.
3:00 2 g.w. heron left & flew to n. bend, 3 killdeer. Sandbar
to right that held large masses of drift wood of large trees now
clear. R.R. tracks at bend at 3:13. Covered distance in 23 min.
3:18 spotted sandpiper. Under utility line at 3:25. Bluejay. approx

1/10 mi up stream on S bank measured a coarse barked cottonwood at
185 inches or 15'5" in circumference.

Left utility lines at 3:46. 8 grackles
on shore in lee of wind & in shade.



4:00 NE bend at mouth drainage and beginning cliffs of sand. 3 gb heron
on sand to S, probably same group as at NW bend. 4:25 end of sandy
cliffs & into large cottonwoods. Collected 2 Quadrula

680907-31 and 680907-32 from black clay. Cliff moved back.
Luna pipiens & bluejay (small) one per 50 feet. Spotted sandpiper on
bank and had difficult time to leave against wind. no other
birds observed along this stretch. 4:47 S end bend at arched R.R.
bridge just beyond main drainage from right. Redtail hawk flew from
S to N across river. 5:00 swallow colony. all lower nests gone
and 2/3 upper. 5:18 2 killdeer. 5:20 mouth Stronger Creek.
wind at back. Arrived bridge of Linwood 5:30. Kaw has a
prominent water mark at approx. 3 feet above present level. This same
level extends up Wakarusa River.

Lawrence, Douglas Co., Kansas
Sept. 7, 1968

Chimney swifts flew fast and erratic with the wind. Night hawks deliberate and
into the wind. Swifts left the air at 0 reading on Weston exposure meter at
8:00 P.M. approx. 10 min. previous, sky 0 reading on meter pointed to sky.

Lone Star Lake, Douglas Co., Kansas

Sept. 10, 1968

at twilight, heard a whip-poor-will calling from ridge
NE of the E end of dam. It called from three different
positions. at about the same time a Canadian goose
flew S across the lake and 5 ducks (small) crossed dam
from the north and without deviation flew S across lake
and beyond at about 50' above water. The body of water
did not influence these ducks. A spotted sandpiper worked
and called from rocks on dam. The whip-poor-will was
heard about this time of evening on ^{the} previous week Sept.
3.

Sept 14, 1968

Left 9:30 A.M. Sky clear, slight breeze. Air temp 70° water temp 70°. all temps in shade. ^{Complete census} 9:35 8 blue jays. 9:45 4 blue jays. 9:52 spotted sandpiper. 9:55 2 jays, 2 mourning doves. 10:00 sewer outlet from right and producing terrible contamination on S side river. This contamination in sight & odor continues down river for 1/2 or more miles. 10:15 2 killdeer, 2 spotted sandpipers, in mud flats. Continued down S side and just enough water for clearance. Many turtles & large fish in slow backwaters. 10:18

3 grackles, 2 chickadees, 1 flicker. 4 blue jays. 10:29 3 jays, redheaded woodpecker, 8 grackles. Birds occur in flocks with long intervals of no birds. Sewer contamination still terrible with contamination caught on branches in water. 10:30 g. h. owl. 10:38 high voltage power lines across river. 3 spotted sandpipers on log jam. 3 blue jays on one side river, 2 on N side. mourning dove. Beaver tracks in mud. 10:43 drainage from right. 2 spotted sandpipers. Flock 300 redwing blackbirds in cottonwood trees on right (250 redwings & 50 starling). Fox squirrel to within 3 feet of water. 10:55 Considerable bank erosion with several large trees in water. 5 spotted sandpipers on log jam at water level. 10:57 old bank swallow


nest not affected by recent flooding. Wind increasing. 11:12 track area and like old city dump. This is a type of contamination that should be stopped. First dead tree, no general garbage. Last flood did not remove large bails of paper. 11:23 Copsey Point. Considerable erosion along this area. On opposite side river, a ♀ prairie and a ♀ bluewing standing within 2 feet. They left together. A small sandpiper (western?) associated. Approx. 40 barn swallows feeding over water in this more open part of river. 11:26 Swallow holes intact but erosion on either side extensive. 5 monarchs so far. 5 more on sand bar N side. Top bar with blowing sand general but not over 5 inches high. One bar a beaded appearance. 4 great blue heron on N side opposite Percy Channel (11:35). Wind approx 10-12 miles per hour. Log jam & beaver on N side Mouth Channel. A fifth of blue heron in tree just beyond. 11:45 opposite mouth Mud Creek. Water high enough to exclude sand bars in this area except large one on N side river. One bail of paper had started to move down Percy channel 11:46 now to E. 11:48 spotted sandpiper. 11:58 4 chickadees. Crows calling all along. 12:00 Continuing on right side of river because of wind. at this point 3 great blue heron (small) left tops Cottonwood trees. 2 wood ducks left bank 9 feet high. 1 spotted sandpiper. This area receives less disturbance from man because of its separation from

from the mainland by the piracy channel. 680917-133
 Muskrats with imprints on bank and all perpendicular, ^{Beaver active.} having
 climbed the bank regardless of degree of incline. Willows beyond mouth
 channel at 12:10. A black monarch butterfly continued down
 bank for 300'. main island to left in river seems to be getting
 larger from year to year. 12:50 middle bend near point. 2
 g. blue heron resting in large cottonwood. increment at base would in-
 dicate considerable use of this tree for resting. Redtail to N. 12:57 2
 mourning doves on sand beyond point. This area should produce
 interesting artifacts from erosion of deep muds of point. 8 goldfinch
 1:15 double drainage & tree island on bank. 1:18 spotted sandpiper
 left bank 6 feet high (on bank) and flew down to log in water. 1:36 2
 large Rana pipiens with 10' of each other and only frogs of this size
 observed today. Small Rana about 1 per 100 mi. 1:40 just
 rock barrier left. Spotted sandpiper. Arrive Eudora Bridge 2:15



Placed Conae & 2 paddles on E side of road about 10
 feet down from shoulder and 100 feet from bridge. Mary &
 I then went to K.C. to get cells repaired. On return at

approx 5:45 P.M. the Conae was gone. Talked to Mr John Schopper
 of Eudora who was cutting corn in field to W of road. He & his father?
 were repairing the equipment and they made the following statement:
 At about 4:00 P.M. or 4:30 a two tone car (something like the Mercury) arrived
 from the N and stopped at Conae and ^{a man, wife and 3 children} inspected the Conae. They then
 drove E to Schopper and asked him if he owned the Conae and Schopper said
 no. The car ~~drove~~ turned around and drove back to Conae and although
 Schopper did not see the man take the Conae he was ~~so~~ sure that he
 took it although the car had no rack. The car then drove ~~west~~ north.
 Another buslike car with rack on top also showed an interest in the
 Conae. Mary & I then drove to Eudora and reported the loss to a patrol
 car policeman that took my name & phone number. We then contacted
 N and questioned a man who was working in farm yard (2 mi or so N
 buddy). He said there were 2 homes broken into recently and that there
 is considerable ~~theft~~ robbery of homes & machinery in the area. will
 advertise in local papers and report to County law enforcing agencies.

The Lone Star permit is 128, ^(187?) and 241. The mast base is bronze and
 added; the posterior thwart is dented; OWC label right bow. one of the
 center rib broken & repaired with aluminum angle iron ; rivets
 and top border gray, rest Conae (Drumman 17' Conae) without paint.
 On Wed 18th a Mr. Powers of Eudora called and reported he had
 the Conae.

Lawrence, Douglas Co., Kansas

Tropidoclonion Sept. 19, 1968
 Collected a ~~Thamnophis~~ on sidewalk of Chancellor's residence,
 Campus of Univ. Kansas.

680919-1 ~~Thamnophis~~ Lined snake
 Tropidoclonion l. lineatum (Hallowell) body 240, tail 50mm, wt 9gms.

Lawrence, Douglas Co., Kansas

680919-134

Sept. 19, 1968

This evening photographed Mary Pauline, no 680919-1 and James Robert no 680919-2. Photos of Don Olsen & James were given to Don.

Lawrence, Douglas Co., Kansas

Sept. 23, 1968

Adult cardinal (♀?) was feeding and a juvenile. This behaviour was also observed one week ago.

Wakarusa River, Richland to Elk Creek, Douglas & Shawnee Co., Kansas.

Sept 28, 1968

Complete census from S end proposed Clinton Dam. at 9:15 A.M. Day clear, slight breeze, no clouds, temp 29°C. Colors in trees for last week. Melence 18.8. shrike. 20.2 weeds grown across Rock Creek, m. dove. 21.2 mdove. 21.3 mdove. 21.7 2 mdove. 22.3 m. dove. 22.7 Clinton 23.0 6 m. doves. 23.6 8 bluebirds 24.7 flicker. 25.2 Belvoir budge. 5 blue jays. 25.5 shrike. 27.6 sp. hawk. 27.9 red-tail, mdove, 2♂♂ ♂♀ equal red-wing blackbirds, 28.5 mdove, now to S

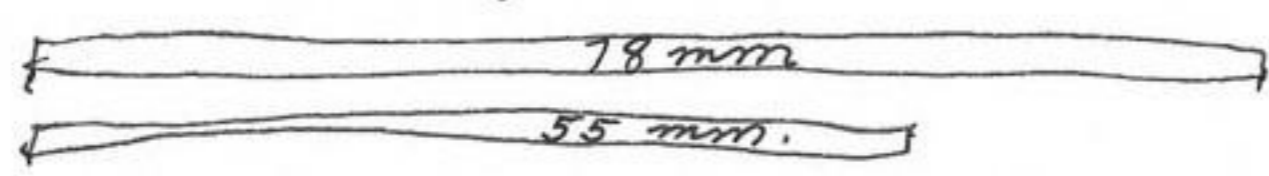
28.8 3 m. doves. 29.6 to W. 30.6 Shawnee Co line. 10 bobwhite young 3/4 size. 32.3 to S. 33.0 m. lark 33.6 Richland 34.1 blue jay. 34.9 put sonae in river. 9:55 Left 10:25 5 blue jay, 2 red-bellied, 3 chickadees at put in area. Considerable new mud on banks. 34.9 turtle (bur) & 6 bobwhite in road. red-headed woodpecker. 35.9 2 m larks, killdeer. 36.4 26 bobwhite in one group. 36.7 Elk Creek budge. 3 turkey vulture 2/10 mi to S. 4 blue jay flew across open field 37.3 stop & car about 2/10 mi. S budge 10:36. will take back to sonae along base or edge of S side valley. Left 10:40

red breasted woodpecker calling 10:50 4 blue jays, 1 red bellied, 10:52 Crossed Elk Cr on log. 8 Luna pepses into water. Cardinal & yellow-billed cuckoo. Elk Creek flowing. 10:00 Point of ridge. unusual number spider webs. 680928-1 + 2 small yellow butterfly 10:10 first canyon W. red bellied spiders webs almost a lizard and have never seen such numbers. Large ones in corn retreat to top tassel for security - mosquitos numerous. 11:15 S end prairie channel

Some pool of water with greenish algae
felling in with mud! narrowest channel 6 meters of

11:20 blue jay, 3 chickadees. Spider are ⁶⁸⁰⁹²⁸⁻¹³⁵
+ yellow with black spots, legs brown ^{1/2 inch diameter (abdomen)}
11:25 Mosquitoes annoy -
11:26 end forested area, 16 young and 3 adult bobwhites
left edge. Some young about 1/3 size adults and not too far
from learning to fly. 3 vultures. Good redtail nest in old
tree on hillside at base. 3 blue jay 11:39 road up hill. Jay,

2 chickadees. Blowed grasses at debris now with spiders and ground
webs of 1 per 6 feet all along in shade of trees. Redbellied, ⁶⁸⁰⁹²⁸⁻²
spotted butterfly _____ Excellent meadow run -
ways in drainage W of road to end of field. End field 11:47
2 Cardinals. Now into forested area. Deer tracks along edge of
hill at base and thru deciduous riparian forests. 11:52
redbellied, flicker, chickadees. Two sizes deer tracks are:



12:00 G. B. Heron Colony. Fox
squirrel + redbellied.

red-headed woodpecker depositing acorns under bark. Fewer spiders
in dry forests, mainly in moist one. 12:10 open field. 2 red-
bellied woodpecker, redtail over open field (in good grass). Many
yellow butterflies but butterflies rare in forests. Black walnut feeding
⁶⁸⁰⁹²⁸⁻⁵ swallowtail butterfly _____ ⁶⁸⁰⁹²⁸⁻⁶ yellow
butterfly _____ 12:20 end of grassy contoured field
and now to bench field below. 12:25 end field and into deciduous

at edge collected a monarch feeding on thistle flowers. ⁶⁸⁰⁹²⁸⁻⁷
3 red bellied woodpecker. 12:30 Bewick wren
chased 2 redbellied woodpecker out of tree. The wren gave
2 sharp notes of its call. 12:40 end field. a 3 1/2 inch
Rana pipiens & a small Aesop or Pseudoesop some 150' from
water and in weed field. Arrived Conroe 12:50. Air
temp 26 C. water 18 C. 3 jays, 2 redbellied calling at
Conroe. Left 1:00 P.M. will travel at current speed ⁶⁸ redbellied

2 chickadee calling. 1:19 3 jay, 1 redbellied. A fox squirrel
worked down thru root system of tree to water. as it touched
water it made a audible bark. upon each contact of water
this bark was given. Drinks by laying 90° to limb or root.
1:28 major drainage left (150' rapids below) and with clear water. This
is at W end of curve. 1:42 log jam + portage. Fox squirrel on log
Challenged me like a marmot, with three barks. Ordinarily these
squirrels are ultra timid and escape by running as soon as they
see one approach. In front of jam is brown debris & followed
by Indian soap of today. Leaves in Indian soap 1 per
2 inches. Apparently leaves are falling ^{in good numbers} today for fruit
time. Redbelly at jam. 1:55 over log jam. Over jam 2:20.
major drainage right just below log jam. 3 jays 1 redbellied

redtail & g. horned owl here. white breasted 680928-136
 both sides. 2:24 G. Blue heron colony. ^{nests called from} 4 nests in large tree, 3 in
 smaller trees to E. 5 jays. Continued straight thru. 2:25
 flicker & 4 redhead woodpeckers. 2:38 East bend, now to W.
 Raccoon tracks all along way, some g. b. heron tracks & some beaver
 barbed limbs in water. Both black & red damselflies all
 along way. 2:43 2 redbellied, ^(first heard today) 2 crows, 4 bluejays. Frogs about 1
 per 100 sq ft. 2:46 ♂ & ♀ wood duck left & called. 2:50 W end
 curved or bend. 2 redbellied woodpeckers. Considerable degging of
 bank by raccoon. Bullfrog 5 inch in body length 2:53 major

drainage left & water flowing. Pewee-like call. 2:55 log jam
 over at 2:59. G. Heron. 3:05 log jam, over 3:10. Log
 jam 3:14, over 3:16. 2 redbellied woodpeckers 3:24 Log
 jam, over 3:30. 4 jays. 3:34 log jam 3:37 over
 3:38 log jam new trees as if tornado. Over 3:42 2
 redbellied, Chukadees 3:45 major drainage left. 3:48
 bend to left, high bank, drainage on right. 2 woodducks
 and could be same as first ones observed. 3:58 6 woodducks,
 4:00 percy channel. North wall about same. Log
 jam about same. S wall of channel has change some.



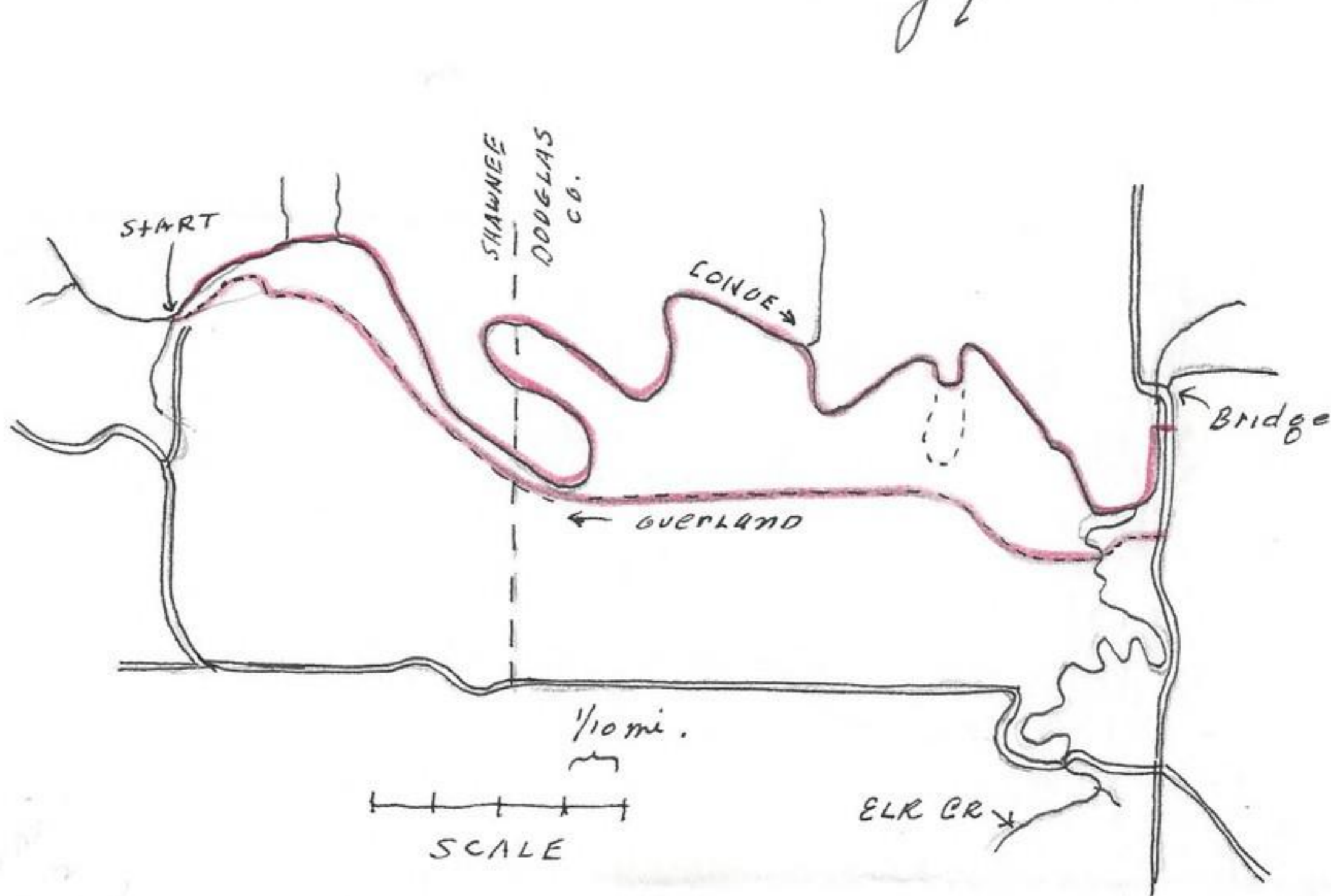
← N.
 old tree that had been on S side
 barberry old stump 6' high & 28" diameter.

water level below falls 32 inches below
 - water of smooth water above, no fish.
 mud more eroded but about same. 2 red-
 bellied woodpeckers. Barrier of old channel 3 ft high

Left 4:30. flicker. 4:35 2 consecutive log jams, then
 4:55. 2 redbellied, hairy, Chukadees 4:57 major drainage
 right. redbellied. 5:04 2 log jams. Elk Creek 5:07
 Bridge 5:12 having crossed another log jam. Left

5:50. well follow river road. mileage 37.4 redheaded
 woodpecker. 38.0 now N at bend, light redtail. 38.1 MP.
 bank, 38.4 bend at river. 8 crows. 38.6 now E. redtail
 39.0 cement bridge, shrike, 39.5 horned lark. 39.8 Wahanna
 bridge. 4 jays 40.1 3 horned larks 40.4 4 corners now to E
 41.0 now to N. dark redtail. 41.4 redtail, 2 mdoves.
 41.6 6 mdoves, m. lark. 41.9 now road but cont. N.
 42.8 Dry Creek, ^{aluminum in field} 43.9 shrike #3, 1 redtail. 43.6 now E. 6 blue-
 birds. m. dove. 44.5 Deer Creek, 2 mdoves

45.3 7 bluebirds, 1 Starling. 45.7 Coon Creek. 46.0 meadowlarks.
 m. dove. 46.6 m dove 46.7 Scout Camp. 47.3 Doves
 47.3 now to S. 47.7 2 sp hawks, 48.1 2 crow, 1 m dove
 Rollinsville Point. 48.7 now to E. 50.0
 N end dam. 50.7 Y m road. Strike. 51.8 Sigel School
 redtail end census 6:45. Sky still clear



In the 2 $\frac{8}{10}$ mi. of Wakarusa River from point marked start to the bridge, so marked, there were 15 log jams. These jams completely obstructed passage by canal except by portage over the log jam. Some barriers were as high as 9-10 feet and as long as 100' of river bed. These barriers generally extended up slope to the upper erosional level and portage was actually easier to pull canal over main barrier rather than portage to upper erosional level and then around to other side. These log jams seemed solid and were easy to traverse. This river had many log jams this spring, more than usual for this section of the river but the log jam of this month (later part of Sept) had increased many fold. (See account of April 20), over the spring period. Many trees (large elm, maple, sycamore) were dislodged at all levels of the slope and many were down across river but did not constitute a barrier of logs. ~~but only single trees, many were~~ ^{were} ~~not~~ ^{at an} angle and ~~not~~ ^{not} constituting a barrier but not yet prone or on water level. Other accumulations of logs were on slope of banks but not obstructing water way. These ranged from high erosional level to near water level. The large log jam in oxbow remains about the same, as did the open channel below the log jam.

Wakarusa River, near Elk Creek, Douglas Co., Kansas

Sept. 29, 1968

Checked piracy channel on Wakarusa River and made several photographs to show changes since high water of this summer. Made complete census route, starting at the south end of proposed Clinton Reservoir dam. at mileage 68.6. Day clear, temp 88°F, slight wind. 2:10 P.M. 68.9 mourning dove. 70.0 cuckoo, Fall color changes noticeable for last week. On side of valley on hillside the dominant color is the usual green of summer. Less than 50 per cent is yellow from individual trees. Red trees are rare. The riparian growth along river has changed less than hillside growth. 71.0 mourning dove. 72.4 Clinton. 74.8 Belvoir bridge. 3 bluejays 75.6 now to S. 75.8 2 sparrow hawks. 76.5 now to west. These roads, this year have grass and weeds growing on road, in some place where in tire tracks. Grasshopper common on road, and on windshield about one every 10 seconds. 77.1 4 corners and continuing W. 77.9 red bellied woodpecker. birds scarce today. 77.8 2 bluejays, 1 cardinal. 77.9 red headed woodpecker. 78.4 top of hill. 78.5 pond on left with water. 78.9 young red-headed woodpecker. 79.2 4 corners on side of hill & now to S. 79.8 Walnuts common on road wherever this species borders road. Continued to bridge over Wakarusa at 80.4. Left car 2:25 P.M. flicker calling, mourning dove. 2:41 now leaving field and entering forest. 2:38 red bellied woodpecker. Spider webs pull leaves on side of trail when pushing thru them. Along river noted two sets deer tracks trending down stream. Continued to piracy channel where several photos were recorded:

680929-1 photo from N side of channel showing the large elm tree now eroded out of the bank and lying across the channel. This tree was 10' from original bank. A hackberry now is the marker at edge of S side of channel. Part of falls to right and in upper right-hand corner is the log jam that caused the piracy. Water from last flood (in Aug?) flowed over the ridge that now supports the channel but did not do unusual damage except to turn weed vegetation in direction of flow. This area N of channel however should eventually erode thru.

680929-2 photo from about 30' N of channel, (showing upstream) showing large

logs against trees in the direction of the water flow at the highest level.

680929-3 from n side of channels showing cascade and fallen elm tree across eroded channel.

680929-4 from SW side showing ^{fallen} elm tree and cascade.

680929-5 from S side down thru channel showing elm, falls and maple tree that is also downed from last flood.

Debris beyond is reorganized from last flood.

680929-5a buried upright logs or trunk of tree on S side

680929-6 Photo at S end of ok bar showing mud filling in abandoned river channel. water from spring or seepage.

680929-7 Photo at S end of ok bar showing hummocky effect of invertebrate activity. The mounds of dirt are thrust up at the junction between standing water and green algae and the soils on slope just above the supersaturated soils bordering the water. This may be a way in which hummocks are formed.

680929-8 Photo of log jam down stream from peracy channel around first bend. This is one of two in this stretch of the river. Debris piles high on each side and makes canoe passage difficult.

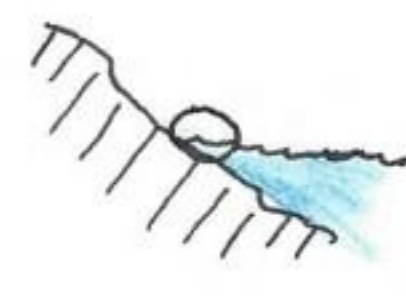
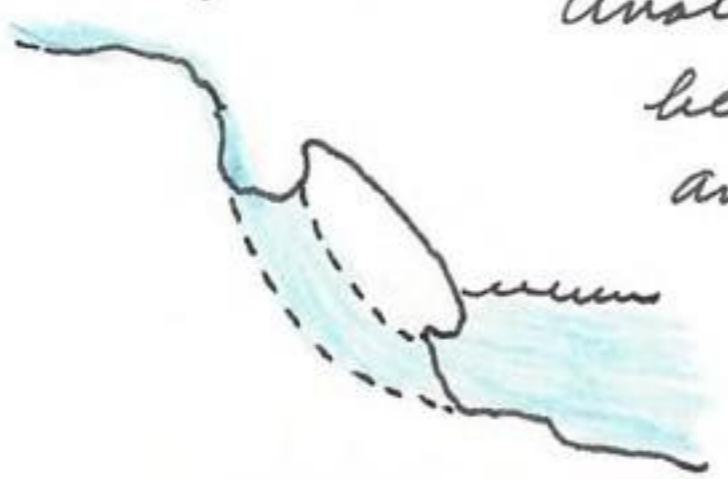
680929-9 Photo from E side channel showing general view of channel from S side showing cascades.

680929-10a Photo from N side showing cascades proper. These can be compared to shots taken earlier in April this year. The crayfish, 680929-11, were climbing these cascades, 12 in view at one time. These crayfish used edges between contact of water and land

keeping as much ^{but mainly out of water} in water as current would permit. Most attempts were not successful. Feeding with antennae and chela in climbing.

One started up a dry channel and left water and damp soils to a distance of 3 feet before it started up stream toward water. At this time I moved toward this animal and it immediately vibrated its telson + tail to move it quickly down slope toward water but was captured before it gained the water edge. 6 others, when they noticed my movement, immediately left and returned to the water where they remained out of sight.

Another trap was a hole that dropped 2 feet to below water level. They would gain edge of hole and rather than bypass the trap would fall into the hole and be flushed down to base level again.

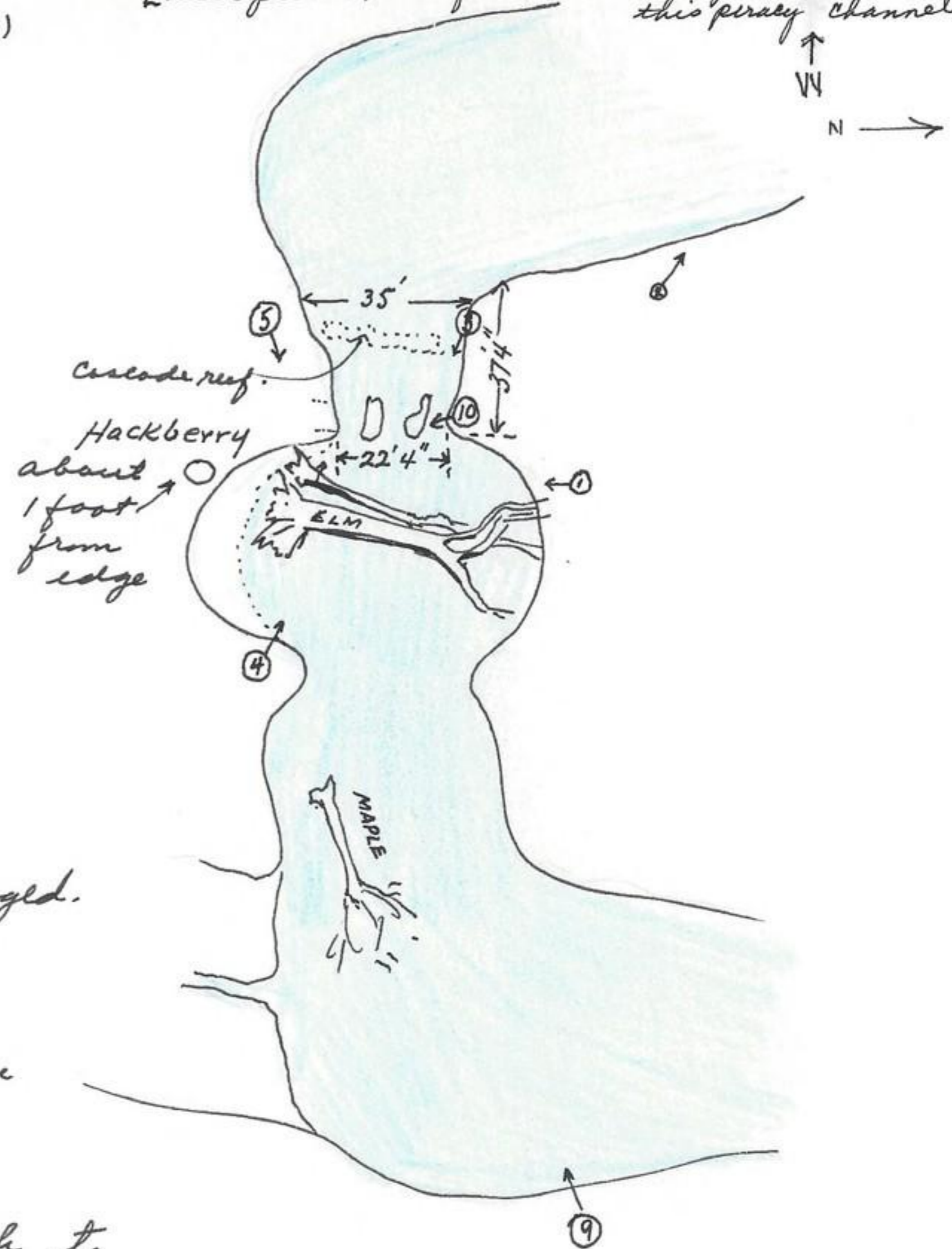


13 and 14 Photo 680929-12 of this species of crayfish

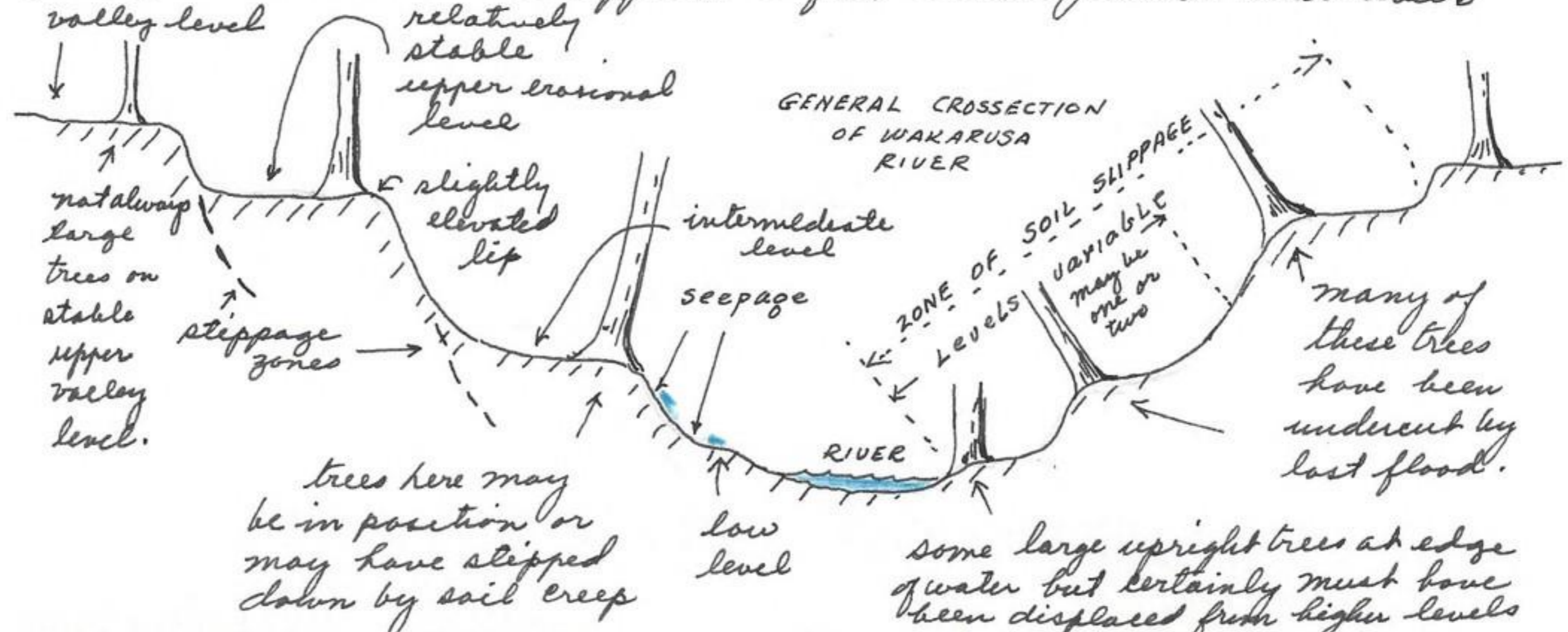
It is a question how these holes are made. noted three that climbed against current moving backwards successfully

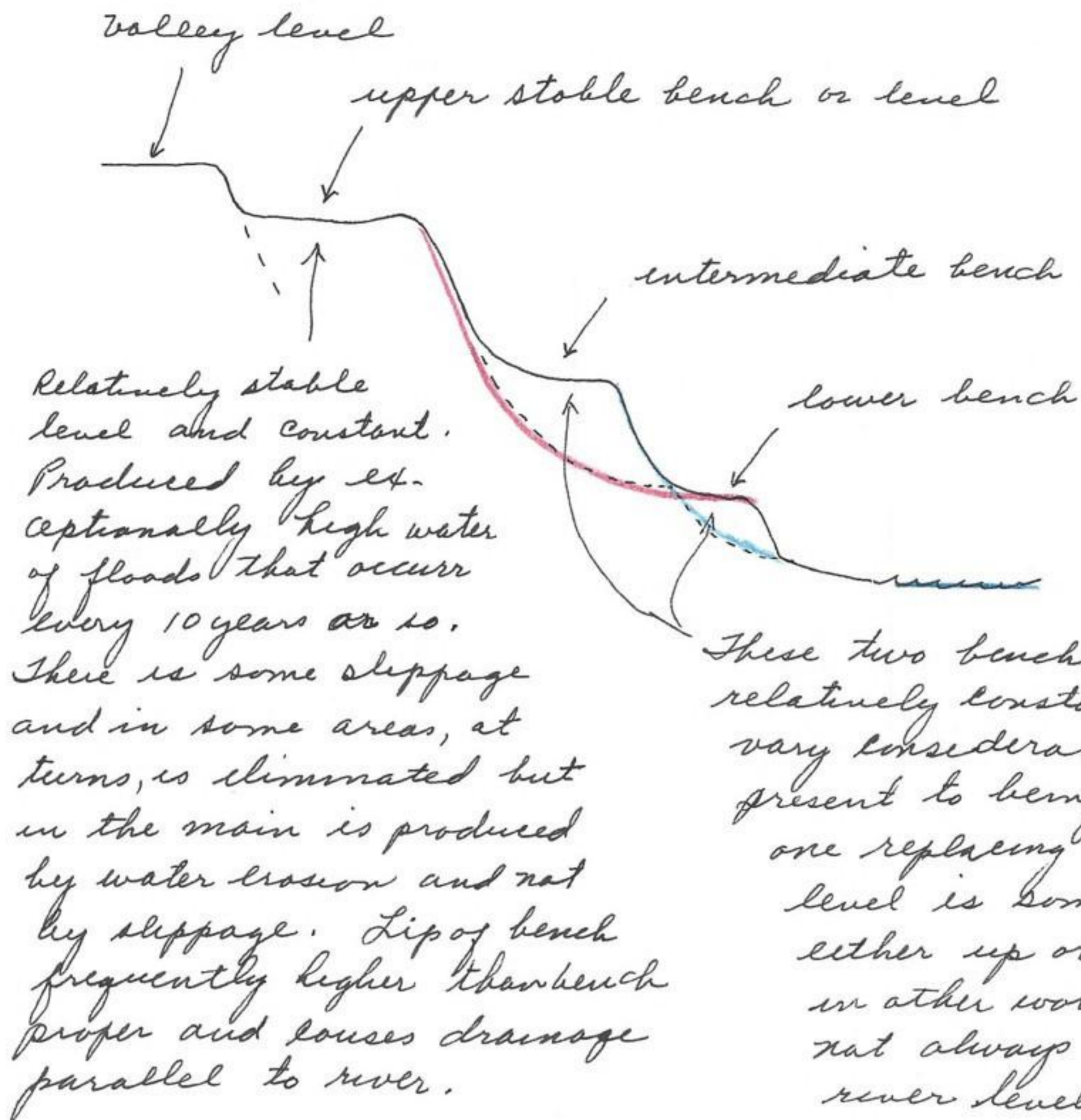
The first circular basin below falls is much as this spring in April (28th) but S side has soil slip increase from the elm displacement. There is less water now than in spring and edge of cascades exposed. These islands show channel or tunnel formation of circular formation. Crayfish may have made these channel and then water enlarged. A reef above cascade can be navigated with knee boats. The maple tree that was standing in April is now down.

[see April 28, 1968 for addition information on this piracy channel]



The water is low enough to permit seepage drainage from abandoned limb of old bar to enter as a narrow 1 1/2 foot channel. Mud in this old drainage channel, except 2 crossings, is too deep for crossing and when attempted ones become secured in mud and boats cannot be extracted except to step out of them and then build up platform to extract boats. The barrier across entrance to old channel is now approx. 3 feet above present water level & valley level.






These two benches or levels are relatively constant but can vary considerably from being present to being absent or one replacing the other. The level is sometimes graded either up or down stream, in other words they are not always horizontal to river level. These irregularities are caused by soil slippage but are basically formed by intermediate and the more frequent ^{low} flooding of channel.

This year of erosion has been the greatest in the 20 years of observation. Several dynamic changes have occurred, mainly the slippage of banks, the felling of large trees on all slopes and the great number of extensive log jams. This has resulted in a widening of the river, ~~the~~ valley and the narrowing (only temporary) of the river channel proper from displaced soils from above. It would appear that in unconsolidated soils, erosion & widening of river channels is produced principally by soil slippage from supersaturated soils and heavy overhead weight of large trees. Some slippage masses will almost form a barrier across stream. Some areas, generally on lower levels, form seepage and are supersaturated. These areas

are soft and are eroded by large mammal ~~such~~ as deer
algae are frequently associated. Many of the slippages
are from deep muds deposited on slopes in high water, but
most of them are the unconsolidated native soils.

It would be of significance to study the log jams,
especially those that remain in same area from year to
year and treat them as a special ecological community.
The log jams must certainly effect aquatic organism and
I would judge, some terrestrial forms. ~~such~~ as wrens.

The sycamores are the best adjusted trees and are
some of the largest trees on the lower levels. Their root
systems are well suited for supporting the trees. I would
judge that many of them are white they are because of
soil creep, bringing them down to lower levels. Big
Cottonwoods are mainly on upper level or valley level.
many of the trees that have been uprooted or bent are
trees (maples, hackberry, elm,) that have green leaves and
are still being nursed or drying leaves and must have
been displaced by floods of August.

Before leaving made one observation that small holes
and channels  are extensive and generally
oriented in direction of stream flow. Also that in
portage, ^(pulling) canoes over log jams and in pulling them out of
bank, they will completely turn over.

As hazy skies and clouds were interfering with
photography, left peracy channel and returned to east.
and left Wakarusa bridge (first one below Elk Creek) at
5:18, mileage 80.4. will keep complete census. Cardinal
a 2 redbellied woodpeckers at bridge. will follow valley
road. 80.9 Turkey vulture on limb of dead tree on top ridge
to S. a marsh hawk circled over field like a redtail.
It had a mouse in talons and after circling flew S to top of
ridge or beyond. 2 crows. 81.1 Shrike left top of dead
tree & flew to top of another dead tree. First flight after leaving
a post is with fast vibrating of wings. 81.3 now to E at river
edge. Chickadee. 8 crows in field to SE. 82.9 bridge over
Wakarusa, 2 blue jays. 83.3 4 corners now NE (or E) 83.7
2 shrikes, 83.9 now to N. 84.0 2 m. doves. 84.4 2 flickers
on uplands. 84.6 mockingbird. 84.8 main road, now to E,
roads very dusty this time of year. 85.6 Belvoir budge.

680929-143

5 bluebirds. 86.1 Shrike, 2 bluebirds. 86.4 to left thru deciduous forest. Chickadees. 86.5 2 bluejay 87.1 now to E. 2 bluejays. 67.2 mourning dove, bluejay, red-headed woodpecker. 87.5 Patton Bridge and now to N. 87.7 redheaded woodpecker surrounded by 7 lowbirds in treetop. 87.9 redheaded woodpecker. 88.5 Coon Creek bridge, Cicada calling. 88.8 2 mourning doves. 89.4 2 yellowthroated flickers. 89.6 Boy Scout Camp drainage. 90.2 now to S. 4 bluebirds. 91.0 Rattlesnake Point. 91.6 to E. 92.8 N. end proposed dam. 92.9 3 bluejay. 93.6 Y in road. 94.7 sparrow hawk. and 94.7 Sigel School and end of complete census.

Lawrence, Douglas Co., Kansas
~~Lawrence, Douglas Co., Kansas~~
Oct. 3, 1968

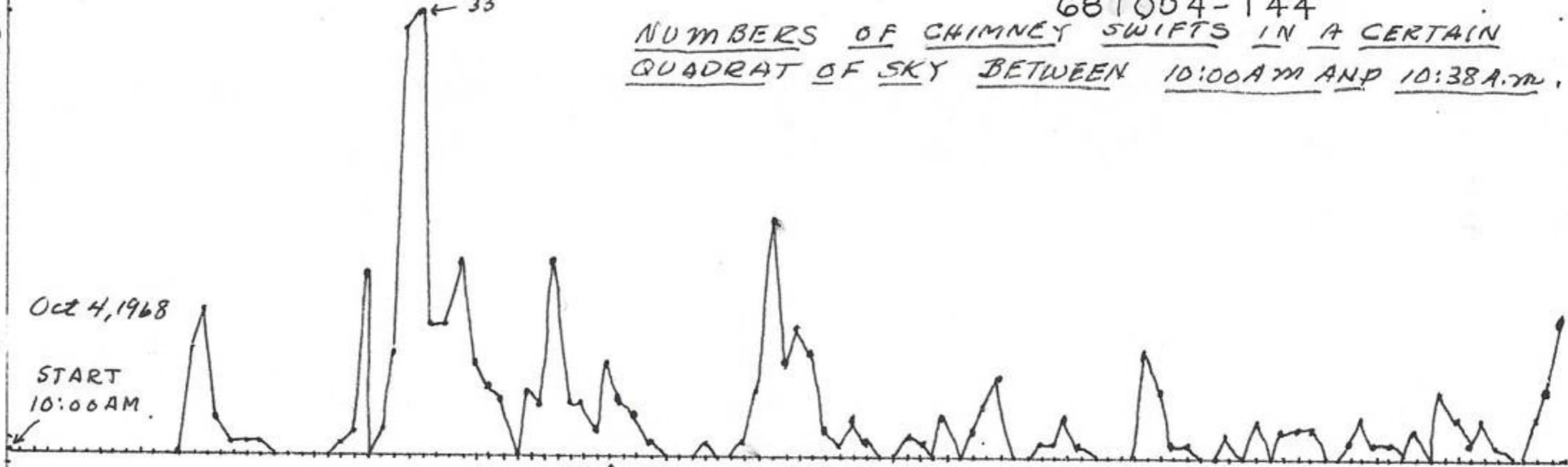
Chimney swift in area in usual numbers. Frost predicted for tonight for first time this season.

Lawrence, Douglas Co., Kansas
~~Lawrence, Douglas Co., Kansas~~
Oct 4, 1968

At 10:00 A.M. or a few minutes before, noticed an unusual aggregation of chimney swifts (*Chaetura pelagica*), there being approx. 1500 or more in an ^{horizontal} area of 200' x 200'. They were circling, sometimes in reverse or 2 directions at different levels. The more compact they formed the more noticeable and faster the circular movement. The trend at this time was to the S but this same group, at least equivalent number, moving in circular motion to the north. It is my estimation that these birds were aggregates of the local populations and were foraging in all directions, especially north and south but remaining in the general area of this part of Lawrence. It is apparent that these birds are collecting in larger numbers at this season of the year as these numbers have never been witnessed in this immediate area of 1620 Tennessee street. The main movement, ^(N-S) seemed to be about 1 block W of Massachusetts Street. Birds were preceding individual cloud groups and their numbers would build up to the great aggregate and then the numbers seemed to drop off abruptly. Rain fell during entire period of observation. A count is as follows;

681004-144
NUMBERS OF CHIMNEY SWIFTS IN A CERTAIN
QUADRAT OF SKY BETWEEN 10:00AM AND 10:38A.M.

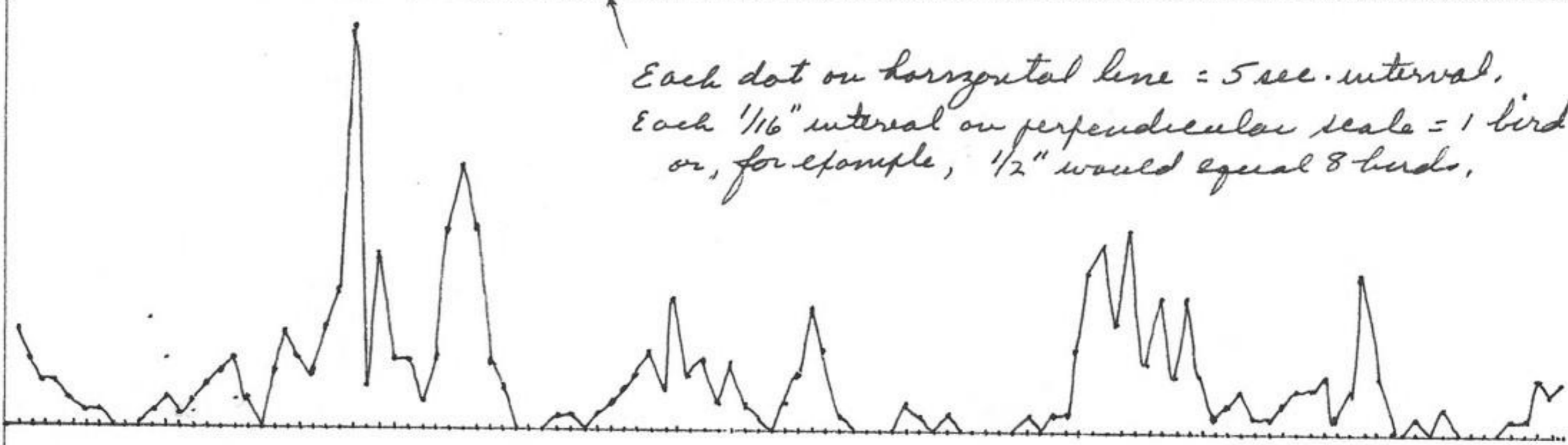
Scale:
 $1/16'' = \text{one in number}$



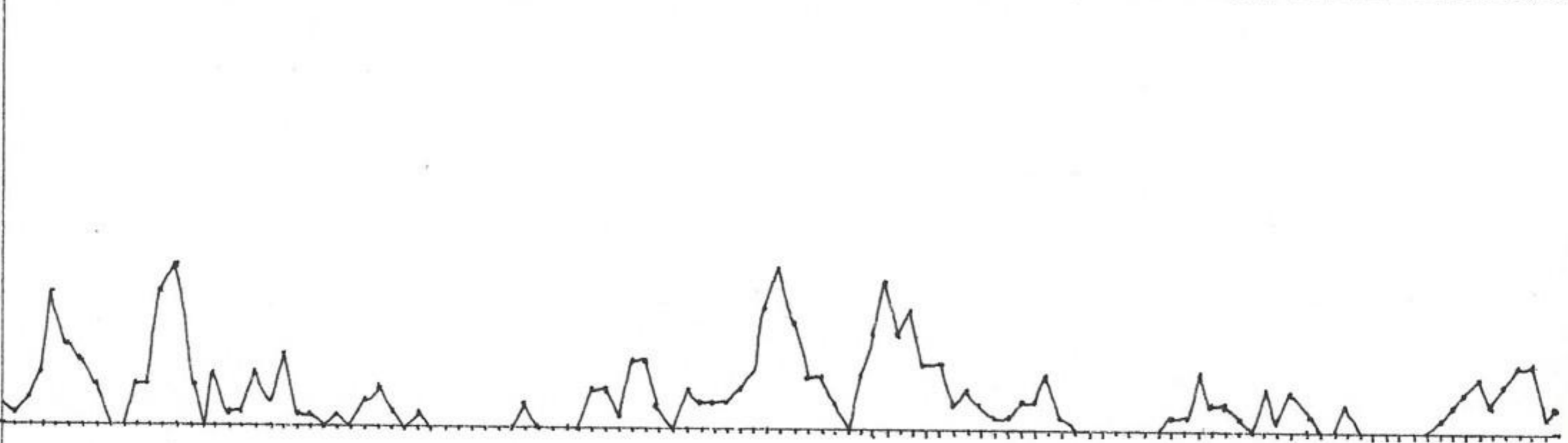
Oct 4, 1968
 START
 10:00 AM

Each dot on horizontal line = 5 sec. interval.
 Each $1/16''$ interval on perpendicular scale = 1 bird
 or, for example, $1/2''$ would equal 8 birds.

$1/16'' = 1$

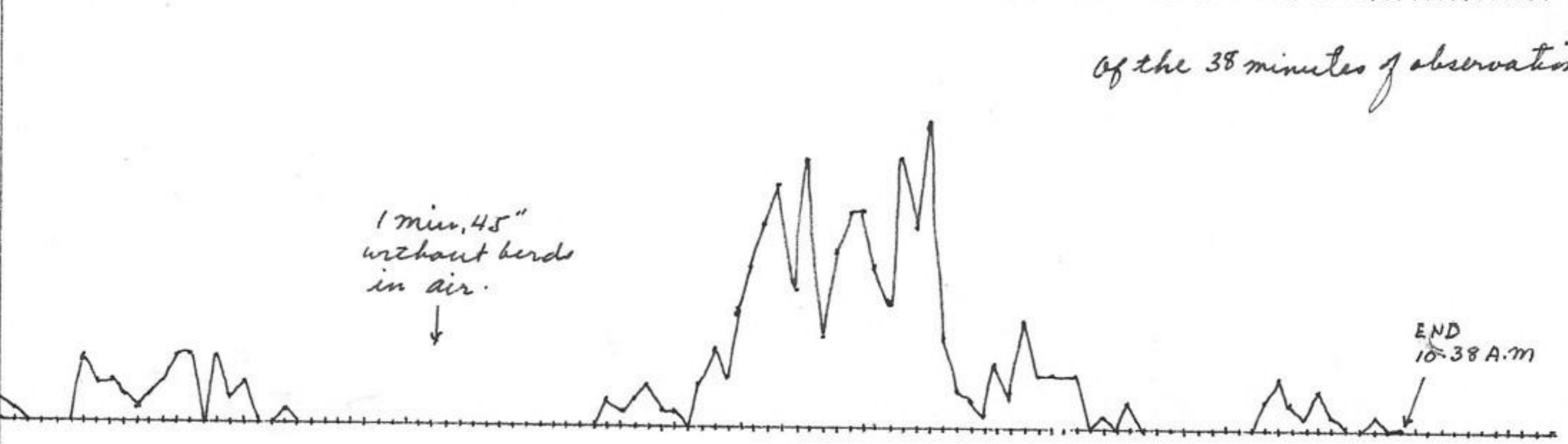


$1/16'' = 1$



of the 38 minutes of observation

$1/16'' = 1$



The above graph is numbers of Chimney swifts counted as they flew across a quadrat (2' x 3' window panel) at 4 foot ^{distant} interval. Day cloudy and raining with faint clouds (distinguishable) moving north. Rain proved to continue all day. Birds appeared to be moving in all directions but mainly N+S with neither direction dominant. The larger groups preceded the cloud formations. A large flock in area of approx. 200' x 200' was approx. 1500 birds. The count above did not represent entire

flocks but only parts of the flock as they passed (in part) the quadrat. Flight pattern general linear but the bigger the flock the more circular the flight

681012-145

Wakarusa Valley, Clinton area, Douglas Co., Kansas
Oct 12, 1968

made census across valley from Sigel School House (or
n end of proposed Clinton Reservoir dam) to a point on
Lone Star road. Route will be indicated. made
complete census. Slight rain but not enough to make roads
wet. Skies completely clouded. 9:35 A.M. 31.8 Sigel. 5
meadowlarks. 32.5 Crow in top willow. 33.0 Wakarusa
bridge. water muddy and above normal. 33.2 redbellied
woodpecker. Approx. 60° of riparian growth along
Wakarusa shows yellow color in leaves. On hillside
to S the yellow is about 80° with some dull reddish. The
true red may come in later. Hillside yellow is result
of individual yellow trees. 34.4 Collins intersection and
centering S to fork road west. 34.7 flicker. 35.9 7 meadow-
larks in one group. 38.0 4 meadowlarks. 36.2 Rock Creek
bridge. Thunder frequently but no increase in rain. 36.9
top hill to S. 37.1 5 bluebirds. 37.3 2 blue jays. 38.0 8
starlings associated with farm cattle pens. 38.4 meadow-
lark and 1 mourning dove. 38.7 Lone Star Road and
end of census. Continued to Lone Star Lake. A mocking-
bird called several times. At dam caught a dozen
or so perch and sunfish. They feed best as winds blow
debris against dam. While fishing a Natrix swam
E about 10 feet out from edge of dam. When opposite
I place line leader and fly about 5' in front of his
direction and when the snake swam over the leader I
pull the fly in and caught the snake on the venter
side. Broke pole but captured specimen. It swam to
rocks on dam and partly lodged itself so securely
that I was almost impossible to extricate. This
specimen is no:

681012-1 Natrix sipedon. 590 mm body, 162 mm tail, 178 grams.

Took 3 photographs of this snake.

681012-2 of ventral scales midpoint

681012-3 head, dorsal.

681012-4 general view ventral coloration.

Water snakes are difficult to capture when in water
but this system may be of some usefulness when
employed from a boat or from bank. The best method
on bank is to check rocks, boards or other protective
coverings near edge of water.

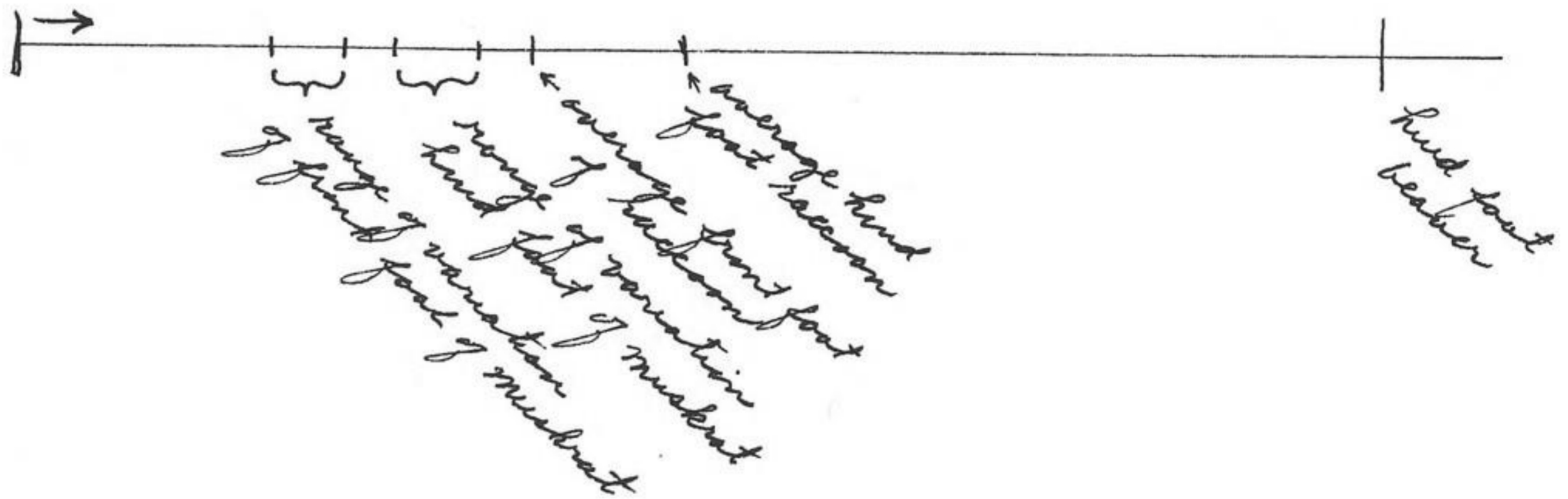
Kaw River, Lawrence to Eudora, Douglas Co., Kansas

Oct. 13, 1968

made canoe trip from bridge at Lawrence to mouth of Wakarusa River and thence up Wakarusa to bridge N of Eudora. Day starting with complete coverage of sky with clouds (20% rain predicted) and wind from SSW, with a velocity enough to ripple water but not sufficient to cause waves. Navigation without difficulty. Water higher than usual for this time of season. Left 9:50 P.M. 10:10 great blue heron left bank and flew down stream. This bird was exceptionally large. 10:12 redtail hawk resting on utility pole of lines that cross river. 3 crows calling. Bluejay, chickadees on banks. 10:20 single gadwall left right bank, swam out 8 feet and then flew down river. 10:40 high voltage lines cross river. The large great blue heron left bank and continued down river. Spotted sandpiper on bank. The black-capped chickadee is the most common bird along river. 8 redwings flew by. 10:43 redtail hawk. 10:45 major drainage to right. water green in contrast to brown water of Kaw. First redbellied woodpecker called from here. The large great blue heron joined two smaller ones just beyond drainage. Approx 50 chimney swifts circled over trees. 10:55 passing first bank swallow calling on right. 11:00 sandpiper feeding on green caterpillar at junction of sands and vegetation line. 11:05 2 myrtle warblers feeding in cottonwood. Have heard others this morning. The riparian growth along river is predominantly green of summer with slight fusion of yellow. This yellow cast is not produced by individual yellow trees as will occur later. No reds except virginiana creepers. These trees of cottonwood, willow, tamarisk, sycamore are exceptionally green in contrast to hillside forests and city trees which are near their maximum in color change. 11:15 3 killdeers. 11:18 Capsize Point. 11:25 greater yellow legs flew NW at about 600' high. 11:35 Channel to E. water continuous from Kaw. Cottonwoods on W side channel are unusual in that they have turned yellow in contrast to green trees elsewhere. Redtail & killdeer at mouth of this prairie channel. 11:43 across from Mud Creek. Have followed

681013-147

South bank of Kaw River so far and will continue to do so to minimize wind drifting. 12:12 Have observed only one monarch and 1 black swallowtail so far. Air temp 74°, water 66°. There is a condensation on bottom of canoe and up to water line which is result of cool water, high temp + humidity. This condensation is a factor in using boats as sleeping facilities. 12:20 mouth pervey Channel. From here to approx 2/10 miles down stream checked tracks in mud at edge of water. The width of tracks are variable but are constant enough to indicate species difference. These differences are:



Muskrat tracks are about 90° to edge of river and lead to upper slopes of bank, sometimes as a definite trail, more frequently as dispersed tracks of slope investigation. I have not investigated the upper extent of their movement but it is obvious they have penetrated the upper level of vegetation beyond the sand + muddy limits of the bank. Steepness of the bank, to a certain limit, does not influence the trail systems. The raccoon in contrast, travels parallel to the water with short deviations only. The beaver, is more like the muskrat in travelling 90° to edge of water. Of the numbers of tracks along the ^{entire} Kaw, would estimate that 90% are muskrat, 7 percent are beaver and 3 percent are raccoon. At one point along above area. three muskrats inspected me from base of ^{partly} submerged stump. they returned to this stump each time they observed my actions, just the head and ears were above water. Turtle tracks (average 3 1/2" wide track) more common on low sandy profiles along river. 1:10 great blue heron. Major

681013-148
drainage from left across river. 1:50 passing rock island, a kingfisher on limb among rocks. 1:12 spotted sandpiper
Redtail hawk flew across river. 1:55 apex of bend, Kildeer
The sharp bend makes more water noise than other bends. Water
is swift on concave bank. 2:02 Point of bend that
then turn east. Stopped at angle where concave bank
leaves eroded slope and checked sand bar for Indian
artefacts. Butterflies more numerous than earlier. A
vicerey alighted on canoe and in comparison to monarch
is not as fearful of man. Yellow butterfly dominant
but only occasionally observed. Left 2:25 at point
of river channel that angles to E noted
unusual fish activity, especially carp. These
angles on major bends are always the most favorable
bodies of water for fish activity. An area that could
be easily seined. From this position crossed river
to north or left side and continued on toward Eudora.
At 3:20, along steep cliffs, noted grasshoppers and a black
beetles (1 inch long) attempting to gain top after inadvertently
falling or jumping off the top. This occurred at about
1 per 10 feet. I am wondering what mammal would
use this source of food, perhaps the raccoon would pick
them up and the washing act is to eliminate the sand or
mud picked up upon capture. The source of food
might more appropriately be utilized by birds than
mammals because of the inaccessibility to mammals.
3:25 first rock barrier on left. Fresh cut willows, ^{at edge of water} were
associated with muskrat trails leading into willows. A
great blue heron track measured 8 inches in length. These
tracks are easy to measure and would be useful in
determining size fluctuation of birds throughout the season.
3:54 great blue heron left bank. Kingfisher flew across
river and then back again. Arrived Eudora bridge at 4:15
and picked up Annette C. We continued down to mouth
of Wakarusa, arriving at 4:30 P.M. The bank on right side
of Kan was supporting a yellow caterpillar which had dropped
down from top of bank and was unable to crawl back. I
was estimate there were 1 per every 10 feet, sometimes 5 or 6
together. This is another source of food for birds or mammals.

It is interesting how these ^{species} fluctuate ^{from one place to} another according to kind of crop on the uplands. 681013-149
at mouth of Wakarusa continued up stream to bridge N of
Eudora. One of the first things noticed in Wakarusa was
the presence of leaves on the water. Also that the hillsides
beyond the riparian growth are in red & yellow color in
contrast to the greens of the riverside. There was one ex-
ception to the greens of the riverside in one maple tree that
had slipped into the river and the root system was in
contact with water. This tree was in beautiful red and
yellow at what I would consider the maximum color
brilliance. The answer to this abnormality could be
that the colder water supporting the tree caused the color
change and that earth temperatures rather than air temp-
eratures cause leaves to change color. Arrived bridge N
of Eudora at 5:00 P.M. Pulled canoe to field above and
a large 3 inch Rana pipiens had been a stow-away and
when released (100' from edge of field), moving directly
to water. It would be interesting to take large numbers
of frogs and release them one at a time to determine
whether there is a homing instinct for water.

1620 Tennessee, Lawrence, Douglas Co., Kansas

Oct. 14, 1968

Chimney swifts still present in area and inhabiting chimneys
not used on previous or usual sites.

Oct. 16, 1968

Strong winds from S all day and temp. warm. Produced some
drying of leaves. Chimney swifts in area [last day ^{swifts} observed at
this season in the area].

Oct 17, 1968

Strong winds from N and coldest day we have had this season.
Did not see chimney swifts this P.M.

Oct 18, 1968

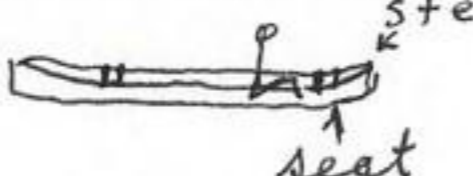
Day clear and slight wind but cool. The leaves of conifers
on the 15th of October were approx. 30% dry & dead and generally
mixed among the green leaves. This applied to white pine, Scots
pine and ponderosa pine. After the two days of hard winds
(Oct 16 & 17) these dry leaves (90% of them) were blown from
tree and onto ground below. The ground before the wind was
relatively free of these leaves but after the winds the ground
was covered with a blanket of these leaves. ^{Some of the} The maples
and some oaks have reached their maximum color and
as a result of winds, are losing the brilliant intensity of their

leaves. The maples are the first to reach the brilliant colors of autumn and change while other trees are still green. I would estimate that the brilliant colors were reached in the last day or two and are now on the downgrade. The other trees have been predominantly green with a gradually yellow change in the last day with a more dried appearance than previous days. Some trees are yellow, some trees have lost leaves, but in the main the leaves are nearer the greenish side than the yellow side. This condition applies to the city and is not to be compared with the native deciduous forests of the surrounding area. These native forests are more advanced in color change. No chimney swifts in air

Dingman Crossing, Wakarusa River
Lawrence, Soldier Creek, Kaw River, Douglas -
Leavenworth Co., Kansas

Oct. 19, 1968

Made canoe trip from bridge (Dingman's Crossing) on the Wakarusa to Soldier Creek (Linwood) on the Kaw River. Chris drove me to starting point. Left from bridge at 9:50 A.M. Day with cloudless sky, no wind, air temp 75°F, water 77°F. This day has possibilities of a beautiful day without wind. Wakarusa about 4 feet higher than normal and result of rains of a few days ago. River has been to within 5 feet of flood stage or approx 5 feet higher than present level. The high water mark is about 1/2 way between level of river and top of bank. The new mud on banks below high water mark is new and soft. This new mud has evened out irregularities of the pre-flood banks. With sun reflecting off of mud, especially among large trees produces a most unusual and beautiful sight. 9:53 muskrat dove and reappeared at edge of partly submerged log with head just above water. They always reappear at edge of protruding branches or logs. 9:54 redheaded redbellied woodpecker, chickadees, 2 blue jays, 3 crows calling from fields to S. Current of river fast enough to float without paddling and river from start to highway bridge W of Eudora without use of paddles. The best system is to float canoe

backwards and set on bottom of cones anterior to rear seat.  direction downstream. The front


of the cones should be unloaded. This system may not work in a wind. The surface of the water has an air foam which demarks the main center current. This foam is confined to center of stream and does not encroach upon the sides as one might expect. With binoculars one can look down stream and see these air foam patches moving in a meandering pattern, especially in straight courses of the stream. This foam and mud on banks refracts a high intensity light when sun angle is just right, especially

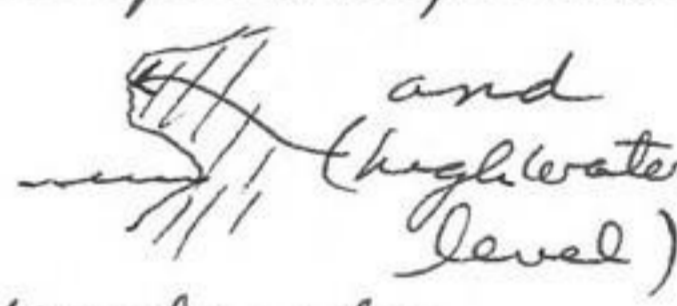


when sun is beyond line of vision. Even on the concave side of curves where one would expect the foam to push over to bank, there is an interval of clear water between the centerline of foam and the bank. 10:00 3 red bellied woodpecker, chickadees, 2 blue jays, fox squirrel. 10:02 red bellied woodpecker, blue jays. 10:06 great horned owl left river bordering tree and flew 100' beyond to near top of another tree. A ♂ + ♀ wood duck called and swam down stream keeping ahead. 10:07 red bellied woodpecker, chickadee, white breasted nuthatch. 10:08 Larry woodpecker. Crows calling in fields to S. 8:11 Chickadees calling. 8:13 red bellied woodpecker, 2 gray squirrels left top of elm tree and ran down to two separate holes about 20' above ground. 10:18 yellow-shafted flicker, red bellied woodpecker, black-capped chickadee, black goldfinch. 10:22 Can hear fox squirrel chewing on nut shell approx. 200 feet downstream. 10:23 ♂ + ♀ wood duck still ahead and they called twice but did not fly. red headed woodpecker. 10:28 major drainage from right. no ripples because of high water, yellow shafted flicker, blue jay. 10:30 Curve that turns to left and W. The banks on this curve have always been smooth. High water mark 1/2 way between present water and top of bank. 8 blackbirds flew past, red bellied woodpecker, white breasted woodpecker. A Carolina wren sang 5 or 6 times in it's loud call, 3 yellow shafted woodpeckers together, 1 robin. Other than air foam on water there is only an occasional leaf. 10:36 around bend & now to W, 10:37 great horned owl left a tree that was over a fox squirrel who was

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digging in dry leaves. Beyond can see the two ducks beyond. They called twice and then swam to side of river ^{wood} where they partially hid among small trees in water. At one time the male waded up slope of soft mud for 2 feet and then returned. They then returned to center of river and after calling left by flight. A cardinal and robin harassed the great horned owl.

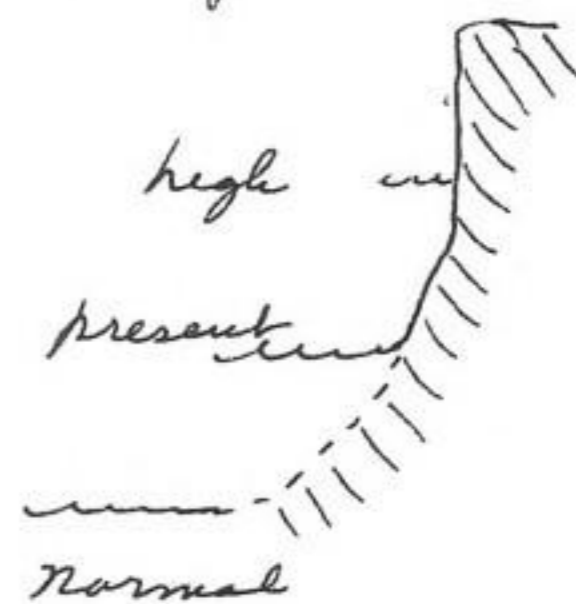
10:45 the two woodducks sighted again & they left by flight. 2 blue jays. 10:47 hairy woodpecker called, goldfinches called. 10:49 apex of bend, now toward E. flicker, redbellied, chickadees, fox squirrel low on bank. Kinglet called. 10:53 fox squirrel. 10:55 the male and female wood duck flew upstream just above water and when they saw me swerved up and out thru tops of trees at a great speed, one to right and one to left. 10:57 a fox squirrel crossed river via maple and elm contact. a second fox squirrel remained on same side and move up bank. 10:58 2 brown creepers, 4 blackcapped chickadees, fox squirrel. The squirrels seem more confident this A.M. than usual, permitting the cones to pass within 20-30 feet or so. 11:04 first set Tongonopic sandstone cliffs. High water mark at top of "RAY" on cliffs. Present level at center of concavity  of overhang. No ripples in this area. Here were 2 flickers, 3 blue jays, 2 chickadees, 2 redbellied woodpeckers, 2 robins. At cliffs the oaks on E side are green to brown while on the left or W side the maples are green. 11:10 2 cardinals, 2 blue jays, goldfinches. 11:52 redbellied woodpecker. On a limb some 30 feet above water was a dead cottontail in its entirety, obviously placed there by a hawk or owl. 11:18 2 redbellied woodpeckers, 4 yellow shafted woodpeckers, 2 titmice. 11:24 8 chickadees, Carolina wren singing, fox squirrel, 36 redwing blackbirds, 18 robins, 8 starling, all calling from trees. Trees along river mainly green, some yellow. 11:30 4 chickadees, 2 titmice, 2 blue jays. A large maple tree has just recently fallen into water as leaves are still green and firm. 11:33 redbellied woodpecker. 11:35 light phase red tail. 11:36 Carolina wren singing. 11:38 redbellied woodpecker, chickadees, goldfinch, cardinal. Some stretches of river absolutely quiet and without bird call. 11:44 goldfinches. Because of deep fresh mud on sides of river, there are no frogs. These amphibians must have moved into higher ground. Snakes ^(low uplands) may, in turn have moved

into the vegetation to follow these animals ^{I have} also observed that there are no sandpipers or other animals that normally inhabit the edge of the water but find the soft mud impossible! 11:47 11 mourning doves sunning on bank among small trees. 2 chickadees & 1 redbellied woodpecker here. The river is slower than previously lower above but fast enough to float without paddles. It is unusual low canoe keeps in middle of river. 11:48 3 flickers feeding low on maple trees at edge of river. 11:49 2 blue jays, 1 redbellied woodpecker. Day almost windless. 11:56 great horned owl left tree and flew down river to bend and alighted about 8 feet from top of high oak tree (green leaves). A redtail which was sunning in another tree 100' beyond left post & flew to top of oak to inspect the owl. The hawk then left and circled above. This tree is the large one at first part of cliffs. The owl then left and flew back to about where it left originally but on opposite side of river. Birds at cliffs were, redbellied woodpecker, chickadee, Cliffs at 12:00. water at concavity  and fern above concavity. 12:01 redbellied woodpecker, flicker. 12:07 bee hive in hole of sycamore leaning over river. 2 or 3 bees at hole at all times, sometimes 2 or 3 seconds without a few. Bees leaving hole go fast while those entering go slowly. 12:12 yellowshafted flicker, redbellied woodpecker, gray squirrel and fox squirrel in some sycamore tree. So far have seen about 30 fish jump or turn in water. 12:22 2 redbellied woodpeckers, yellowshafted woodpecker, 4 blue jays, chickadees. First frog (*Rana pipiens*) observed today. It jumped down from high cliff bank. There have been no river barriers today, in contrast to several the last time down river. 12:24 5 blue jays, 4 robins, 1 redheaded woodpecker, ^{gray} fox squirrel. The blue jays were calling with a soft call (intimate chatter). As a result of the high water recently covering the maple tree branches, the soaking has produced a formaldehyde-like odor 12:27 fox squirrel in low maples. 12:28 3 robins, 4 chickadees, redbellied woodpecker. 12:30 2 redheaded woodpeckers and 1 fox squirrel, 3 blue jays. 12:35 sloping cliffs to right now

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Covered except upper 1/2 foot of upper level. 3 bluejays, 4 robins, 2 redbellied woodpeckers, 2 redheaded woodpeckers, 4 myrtle warblers, 2 eastern bluebirds, Carolina wren (singing), 2 yellowthroated flickers, 4 chickadees. Have only observed 4 yellow butterflies so far. No clouds in sky. Arrived highway bridge W of Eudora at 12:43. 6 English sparrows at bridge. Up to this point I have not used paddles but floated with current. Because the current is slow will paddle to mouth of Wakarusa. 12:48 3 bluejays, 2 robins. 12:55 old RR bridge abutments. flicker, chickadees, redbellied woodpecker. 1:00 RR bridge, 2 blue jays, redbellied woodpecker, 2 titmice. Old piling below bridge covered with water. 1:15 drainage from right. 2 young woodpecks flew down river then returned and flew overhead. 2 bluejays. 2 titmice (these birds have not called today), redbellied woodpecker. Birds have been scarce since highway bridge. 1:30 2 redbellied woodpeckers, chickadee, fox squirrel. 1:35 Eudora bridge N of town. 2 bluejays. P.44 Eudora drainage outlet being absorbed by flood waters. Level river at floor of tunnel of R.R. bridge (N end). bluejay, redbellied woodpecker, fox squirrel, chickadee. First damselfly (red at base of wings) a large yellow butterfly flaps wings in a different fashion than smaller cabbage or alfalfa butterfly. 1:50 maple that was red on last trip is now faded and leaves wilted. Maples on bank are green, 2 bluejays. 1:58 blue jay, there is considerably more fish surface activity here than on river covered so far. 2:04 a flock of 52 snow geese and 16 blue geese flew S in a mixed flock. There was a tendency for blues to aggregate in flock. 2:08 mouth of Wakarusa. On Wakarusa side of water contact temp water 60°F and on Kaw side 58°F. The muddy water of Kaw boiled into clearer water of Wakarusa. Air temp in shade 64°F. Downy woodpecker called. End of complete census. Will continue down Kaw and record all waterbirds, hawks & owl, crows and those birds associated with water proper. Riparian birds will not be given complete census control. About 100' beyond Wakarusa-Kaw contact a large adult beaver slide down fresh mud of bank to edge of water and remained with head, tail & back above water. The slide is slow and noiseless. 2:27 old cottonwood on right bank now undermined and next high water should topple it into water as has occurred with 2 or 3 other large cottonwoods there. An American Coot left bank and dropped to water by flight and continued 50' before air borne.

The last rock pile barrier on right side is 3 feet above water. The one above (up river) is now separated as an island and 30' from bank which has eroded away from rocks. The erosion of these banks beyond have left a covering of willow for beaver consumption. Certainly tree cutting will not be required this season! 2:50 W end of bend. Yellow billed cuckoo among willows. 3 loat on bank at bend. 2:57 passing under utility line at axis of bend. 3:00 great blue heron left right bank, flew across river & then upstream at tree top level. 3:04 ♂ mallard, now crossing to left side. 3:05 N side at sandy cliffs. 13 bluewing, 10 shovellers swam from left to right across river and then left upstream. Temp along cliff (from canoe) 67°F. It seems much warmer along cliffs. Wasps on upper 4 feet of cliff and average 5 per 10 ^{linear} feet of cliff. They concentrated at old bank swallow nesting colony. Grasshopper trapped on slope about 1 per 10 feet. The high water level was on perpendicular cliffs. The present level on steep slope. This slope is smoothed off and covered with mud and even surfaced sand. In some areas the cliffs are perpendicular to water and old clays are nearer the line of the perpendicular cliffs. 3:25 at log jams. 3:40 am. Coot on bank & took 50' on water to gain air borne flight. 3:43 across from arched R.R. bridge. 3:45 am. Coot on bank 2 feet above water & ran on water 30' before airborne. 3:55 2 coots on bank 2 feet above water. These coot fly to middle of river & alight. 4 crows. The spider webs that are commonly circulating in air today are alighting on water & land. These aggregates of white fibers in dimensions of 1/4" to 1/2" x 3" in segments  alight on water and shrink 2/3 length upon contact with water. A flat green turtle left bank by sliding on soft mud. No frogs on banks. 4:02 On mud bar counted 24 individual entrances onto the mud, no one going beyond 3' from edge of water. The tracks (greatest width  90 mm. A great blue heron left here. 4:05 3 small beavers about 28" in length silently glided down the muddy bank (3 foot glide) to edge of water where they remained



with tail on mud and body and head in water. 4:06 bend & now to NE. 4:20 ♂ & ♀ mallard, a flock of geese passing S and about same number but higher in sky. 4:26 mouth Soldier Creek, am coast-left bank. Arrived bridge at Linwood at 4:30. Where Chris picked me up in car. Kaw fast today and no barriers on Waharusa or ripples

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they

Today there was a noticeable lack of frogs, sandpipers, killdeers & kingfishers. The former 3 animals were involved with a condition of fresh mud of banks and lack of sandbars, because of high water.

Summary of birds and mammals from Dingman Crossing to mouth of Waharusa River:

woodchuck 2-2-	reddheaded woodpecker 1-2-2-
Cardinal 1-2-1-	brown creeper 2-
fox squirrel 1-1-1-1-1-1-1-1-1-1-	black capped chickadee {4-(4)(4)(4) paren - approx
gray squirrel 1-1	blue jays 2-2-3-2-2-2-4-5-3-3-2-2-2-1-2-1-
Rana pipiens 1-	great horned owl 1-1-
muskrat. 1-	redtail hawk 1-1-
redbellied woodpecker 1-1-2-1-2-1-1-1-1-	Carolina wren 1-1-1-
myrtle warbler 4- 1-1-1-1-2-1-2-1-	starling 8
kinglet 1-	grackle
mourning dove 11-	redwing 36-
robin 1-2-8-4-3-4-	crow 3-
yellowshoofed flicker 1-2-4-3-1-1-1-	hairy woodpecker 1
titmice 2-2-2-2- 2-1-	goldfinch (groups) 1-1-1-1-
Eastern bluebird 2	Cottontail 1-
downy woodpecker 1	English sparrow 6
	snow geese (passing over) 52
	blue geese " " 16

Summary birds on Kaw from Waharusa to Soldier Creek: (only large birds or water birds along Kaw are accounted as complete census)

beaver 1-3-	blue wing 13	snow geese (approx 50)
am. coast 1-3-1-1-2-1-	shovelbills 10	blue (approx 20)
great blue heron 1-1-	crow 4	
mallard 2-2-	turtle 1-	

Birds along bank but not complete census:
yellow billed cuckoo, redbellied woodpecker, chickadees, blue jays, fox squirrels, myrtle warbler, yellowshoofed woodpecker, goldfinch


Lawrence, Douglas Co., Kansas
Annette Christine painted oil painting (number) of one of two matched paintings (oriental)

Considerable blending of colors by Chris resulted in a more creative work.
This painting is number 691019-1 (Garden of the Ming Tree)

681020-157

How River, Leecompton to Lawrence, Douglas-Jefferson
Co., Kansas

Oct. 20, 1968

Made canoe trip from Leecompton Bridge to Lawrence Bridge. First half with Annette and second half with Chris, changing at eastern extension of road past Bruner N of Lakeview. Left 11:10. Day clear, cool and slight wind from SW. Will follow N side to Bruner. 11:20 2 Kingfishers. Crows calling from hills on S side river. 11:30 Large great blue heron left side of river, length of foot 180 mm. Carolina wren calling. These wren are singing more at this time of year than in spring. 11:56 great blue heron from N side. track measured 185 mm. 12:03 a ^{large} hawk (redtail) left top of cottonwood tree and circled to W. This bird seemed larger than a redtail and flew slightly different.  ventral side
This distribution of dark feathers was redtail-like. 12:30 Six bluewing teal and 1 shoveller on water. They left the N side and flew out into the center of the river, which at this time is receding from flood conditions and the water is from bank to bank. Crow have been calling from hillside to S. A large and smaller great blue heron left and are not the same ones as previously noted. 12:40 16 bluewing teal swimming out into middle of river. They finally flew upriver. 12:43 at point where river leaves the hillside and trends more to the N. 12:52 major drainage to left. This drainage has widened considerable since first observed years ago. Some trees had floated into bay during high waters. 12:55 2 American coots on bank approx. 1 foot above water. They remained although we passed within 18' of them. Usually they fly out onto water, paddle for 30-40 feet and then fly to middle of river. They were in the shade of an overhanging small tree. 1:13 Killdeer. 1:25 G. blue heron, could be one previously observed. Spotted sandpiper left bank. 1:32 pull into major drainage to left. 2 beaver left bank under dense protection of limbs & roots and entered water with considerable commotion. Two greenwing teal in ^{seclusion} of this drainage system. They left by flight after swimming.

along ^{edge of} bank for about 20 feet, ^{left this area 1:35.}
 1:45 redtail left-top tree. 2:00 2 great blue heron. These
 could be same as previously observed. Arrived Bruner 2:10
 and left 2:22. Annette drove car home & Chris continued
 on. 2:45 Kansas Power Plant. The river channel is now
 forming in old water channel to plant and is gradually
 shifting its course to the S of its normal channel. I am
 wondering if major shifts are made by small flood channel
 enlarging. Spotted sandpiper here. 2:55 a large and
 small great blue heron left bank. The large imprint
 measured 182 mm. 3:00 a yellow-crowned night heron
 was in willow at edge of river. It ^{left} flew landward and
 fumbled among the willows as if injured. The first
 aggregate of excrement was observed at this point, and
 particularly where this heron was flushed from willows.
 The tracks of this bird measured 130 mm. and were found
 as far as 100' on either side of where it was perching. It
 undoubtedly was an injured bird and was confined to
 this area. A viceroy butterfly alighted upon the
 canoe and was considerably more territorial and confident
 than ^{is} the monarch. The latter has been noted flying S
 across the river at about 1 per 2/10 mile. 3:12 small
 area of about 10' x 10' of cut over willows (3/4 to 1" diameter)
 by beaver. A short distance beyond a large beaver
 left bank under dense protection of a fallen ~~to~~ tree and
 glided into the water. Air temp 65°, water 59°F. 3:25
 2 great blue herons, 2 killdeer, 1 kingfisher. 3:45.
 Turnpike bridge. 4:15 bridge at Lawrence, considerable
 activity by Corp of Engineers on N side of river in the Lawrence
 area.

Kaw River, Lawrence to Linwood, Douglas - Leavenworth
 Co., Kansas

Oct 26, 1968

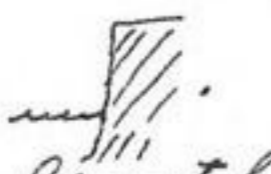
Made canoe from bridge at Lawrence to Stranger Creek
 at Linwood. Left 8:42 A.M. Slight breeze from SSE. No
 clouds. Air temp 46.5, water 53.6°F. Water higher than last trip and
 about 1 foot below highest level produced by this last rain. Fog low
 in valley in restricted area. River steaming. The steam from
 river is gradually disappearing and is now confined to eddies,
 (in sunlight)

and in shadow of riparian growth on south side of river water at first part of trip extending from bank to bank with minimum exposure of sand bars. At 9:20 noted a black-legged Kittiwake flying up river about 30 feet above the water and 80 feet from the conae. As it passed the conae it circled about me twice and then continued up stream for approx 50' where it circled again and made a rapid descent to near the surface as if to pick up some item of food but without success. It circled one more time at which time it extended its legs and shook them as if to illuminate water. It continued upstream. With binocular I was able

to determine that the bird was indeed a Kittiwake and the some species I had been accustomed to in the Arctic. The black of wing was to end of primaries uninvolved and sharply demarked. The undersurface was white & the upper surface gray. The feet were black. Except for a dark grayish mark on back of neck, the head was light. It is this mark on head that may not conform to the adult plumage of the Kittiwake. In all other respects, even its flight, was Kittiwake in character. There ~~is~~ is always the chance that this bird could be a Franklin gull but I know of no plumage of the Franklin gull that would qualify for the plumage of this Kittiwake.

9:27 passing under high voltage electricity lines. Birds on shore include, junco, flicker, redbellied woodpecker, mourning dove, blackbirds (redwing & grackles), Crow, ^{blue jays} robin, song sp. blackcapped chickadee, downy woodpecker, goldfinch, Carolina wren (singing). ^{blue jays} These birds are not included in complete census of larger birds.

The riparian growth has changed as follows (N side river): high Cottonwoods 60° green, 40° yellow with intergrades. Some are bright yellow but the general appearance is green. Some are without leaves. The willows as base and adjacent river are a greenish yellow but mainly green. Their color is more uniform than Cottonwoods. 9:32 major drainage from right. The last of fog has just disappeared. It remains longest in shaded part of river on south side and conforms essentially to shade on water. Air temp. at this time is 50.8°F.

9:42 at first bank swallow colony on S side. all hole intact but cliffs now perpendicular from erosion of slope below.  10:00 Great blue heron track measured 198 mm total length (including claws). Kildeer tracks average 30 mm. muskrat (rear) 35 mm. Capsize Point 10:05. Up to this point have assisted conae by paddling. From this point

will rise current for movement Redtail.
blue heron flew up stream, conforming to edge of river. 3 killdeer.
10:23 stopped on sandbar to check tracks. measured several great
blue heron tracks measuring 198-172-184 and 196. Some tracks
from same bird will vary 5-6 mm. Deer tracks all into sands
100 from edge measured 65 and 54 mm (2 sets). Coyote 63 mm.

killdeer average 30. Raccoon 70 hind and front 50. The hind
foot varies according to imprint of heel. Horned larks on sand.
Left 10:38 Crossed river to Channel on S side and missed
by 15 feet and was all I could do to paddle against the current
to enter channel. This channel is now carrying a good flow
of water and I am traversing this piracy channel for the first
time by canoe. at 10:55 at about 1/2 way thru stopped
and measured several tracks: straddle of turtle tracks
62 and 64. Several great blue heron tracks measured:


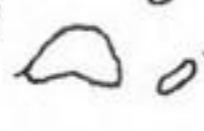
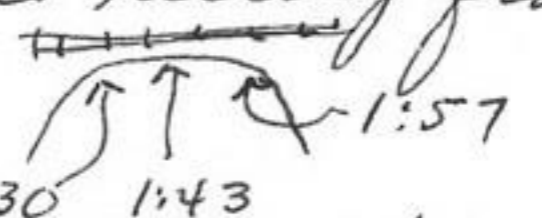
188-195-178-200-180-210-184 and 173. Some of these were
probably from the same bird. The 210 mm track is undoubtedly
from a large bird. These tracks are from those well formed
in the right consistency of mud and or sand and length include
front & rear claws. These tracks are the easiest and most
reliable to measure. Deer tracks of two sizes, 70 and 60 mm.
Coyote 80 and 72 (probably front foot). The raccoon tracks
are: hind foot 90, front foot 65, 90 and 70; one set well
imprinted were hind foot 60, front foot 58. The
front foot is most reliable

measurement but is generally covered by hind foot. The
hind foot varies according to extent the foot is used in the
plantigrade position. The width varies according to extent of
forceful implant of the foot. Length of front foot is therefore the
best measurement. The muskrat foot measured: hind
foot 48, front 36; 42-32; 74-34 (in this one the hind foot was
fully imprinted and is a register of a typical imprint in soft mud.
When a muskrat and a raccoon cross mud, the former is
shallow, fingers slender and claw marks the most conspicuous. The
raccoon in contrast sinks deeply into the mud. Here again the
front foot is the most reliable because of the variability of the hind
foot. There were small tracks of this species. The opossum
measured: 58 front, 40 back, 46-42. The front foot is the most reliable
because of variation of opposable thumb which extends the length
in some positions.

variable constant → hind foot. There were smaller tracks
of this species.

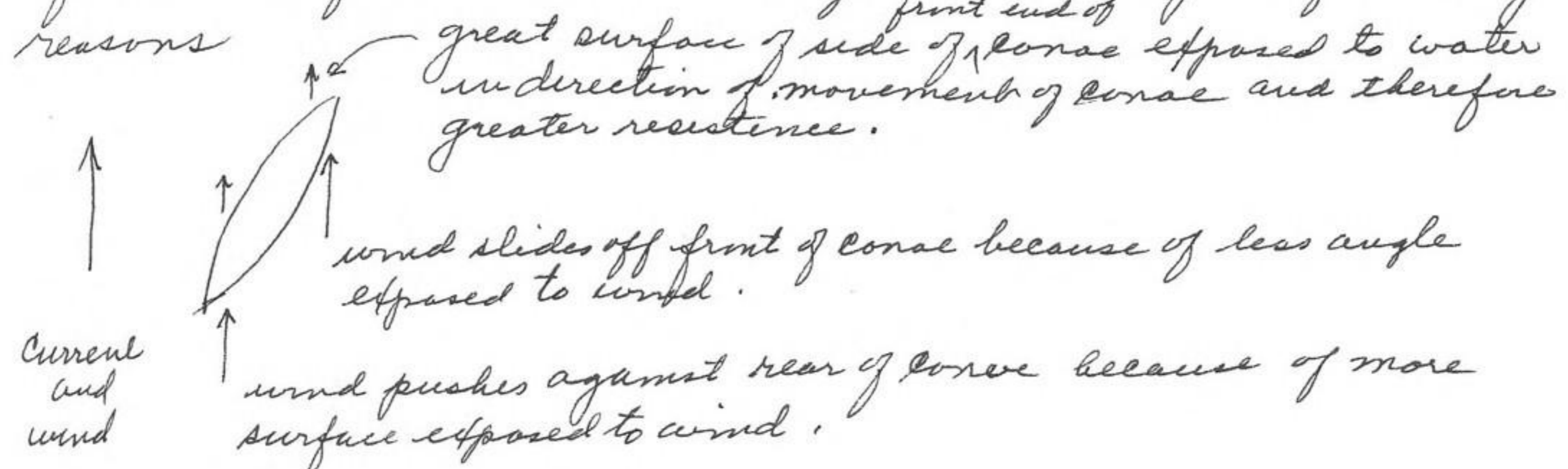


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a mink track?  indicated an animal that fed along the bank,  going first into water and then onto land. The tracks were catlike but with claw marks showing 5 claws and fingers. A squirrel (fox) and rabbit were also recorded in same area. Coyote tracks 80 and 72 (some set as previously recorded). Left 11:04 Temp. 62.6°F. From ^{upper} bank measured a horsetail stem of 40 mm circumference. 11:15 mouth this channel. 11:30 marsh hawk flew across river from right to left. 2 redtail hawks circled over oak on hillside. Another roughleggedlike hawk circled but moved out of area. It frequently hovered. 11:45 spotted sandpiper. a hind foot of a beaver measured 190 mm. 11:53 apex of bend. 11:55 point of abrupt turn. great blue heron. 2 yellowthroated flickers from across river and carried on a behaviour suggesting spring nuptials. 12:10 double drainage & island of trees. G. blue heron. Water temp 53.6°F. 12:42 Eudora bridge 1:00 Wakarusa River. 1:20 redtail calling from tree but did not leave. 1:30 bend of river to N  1:57 and greatest amount wave action from wing blowing from SW. Have noticed that when animals & birds walk over ^{the} mud on sand, the mud sticks to the feet of these animals and exposes the sand beneath. This track, if preserved as a fossil, would be difficult to interpret. No monarch butterflies and only 10 yellow ones so far. Noted a fox squirrel feeding 2 feet from edge of water. The slopes of the river are rarely used by birds or mammals, except those aquatic forms or those that follow the edge of the river. 1:57 start of cliffs and drainage from left. 2:07 8 killdeer and silently feeding. 2:17 cow or buffalo skull. 2 angle wing butterflies so far. at this time inspected mammal & bird tracks on sand bar. Some measured are: raccoon 88 x 52, 105 x 62, 80 x 40, 60 x 45. muskrat 40 x 30, 52 x ?. A turtle left sand. Its straddle measured 90 mm. Left 2:45 temp 71.6 mm. Arched bridge (RR) at beginning of bend just beyond Captain Creek at 3:25. Raccoon (back foot) 49, another 53 x 42. 3:56 The entire swallow colony on S side gone from cliff erosion. The current is fast 20' from cliffs but slow immediately adjacent 4:03 rock barrier just beyond old bank Swallow colony. 4:20 13 lesser scaups, a baldpate, 38 bluewing teal left from center of river. The scaup flew directly overhead. 4:20 stopped

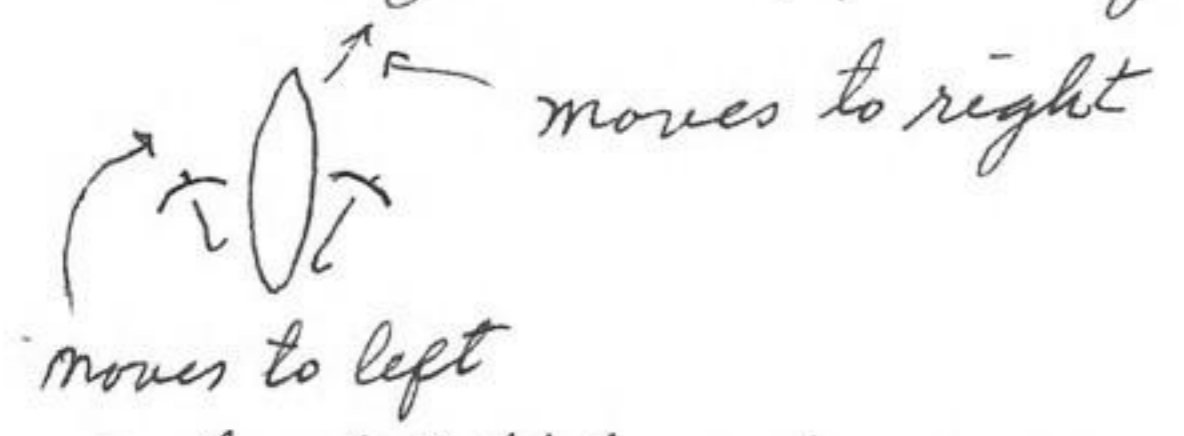
on sand bar on W side river 2 killdeer, 1 greater yellow legs ^{40 mm front.}
 Several sets of great blue heron tracks were: 172, 196, 192, 190, 188 mm. Straddle of a turtle measured 70. Coyote 80 x 70.
 opossum 50 x 50 Peromyscus, rabbit and fox squirrel also on sandbar. A turtle left this mark
 were 37 x 30, 42 x 22. Raccoon 102 x 52, 72 x 64
 90 x 60, 80 x 54, 60 x 50. When right & left feet apposed measured 150 mm. Noted the first and only dead minnow a thin white-silvery one with large eyes. Craw measures 90 mm. Left 5:13. 5:23 mouth Soldier Creek, Knifefisher. temp 68°F. Arrived bridge at 5:30 P.M. Same

factors of canoe handling in wind were recorded: When canoe becomes broadside to wind or 90° in current. It is difficult to change position back to orientation with wind or current. This is caused by a differential in air friction of canoe surface and the change is made by the following reasons



Providing canoe at stern and bow are of the same size in surface exposure the canoe will finally come to rest at 90° to the flow of current and direction of wind.

A log ^{below surface} flows parallel to current so other orientation is produced by above water surface factors. When an umbrella is used the canoe can be guided by placing the umbrella to right or left of canoe

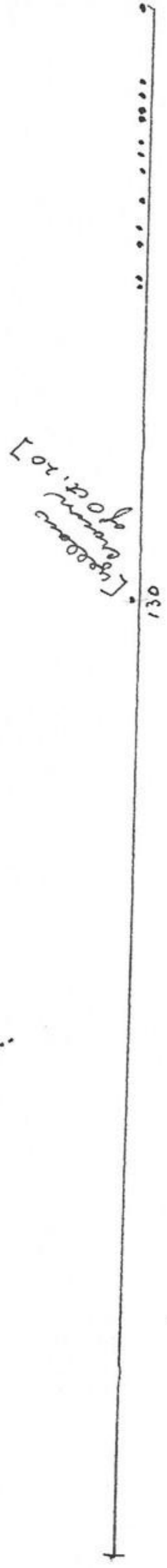


This has a limited guiding control but once the canoe goes beyond the directional nearly parallel with wind the umbrella has no control.

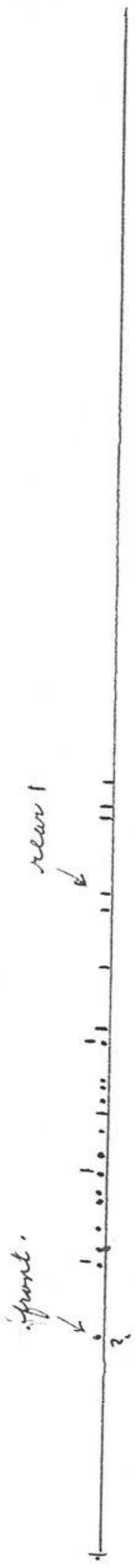
a bucket tied on front rope will keep canoe from shifting by wind either laterally or back up stream if the wind is against the current. If there is no wind one can keep canoe in proper position by sitting on floor of canoe in front of back seat & face the stern. The front end must be unloaded or otherwise a procedure for solo slight ones.



Muskrat



G. blue heron



racoon



opossum



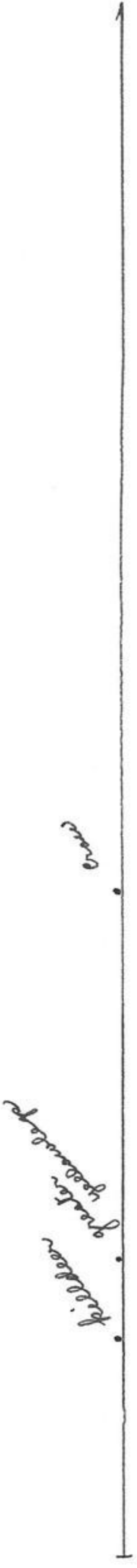
deer



coyote



beaver



killdeer
greater yellowlegs
crow



turtle
(straddle)

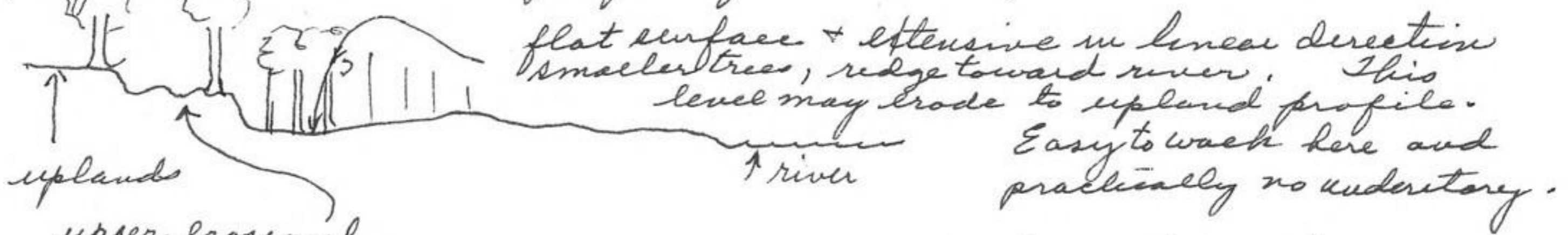
length in mm. (actual size)

4 8/10 mi. E Lawrence (P.O.), Douglas Co., Kansas

Oct. 27, 1968

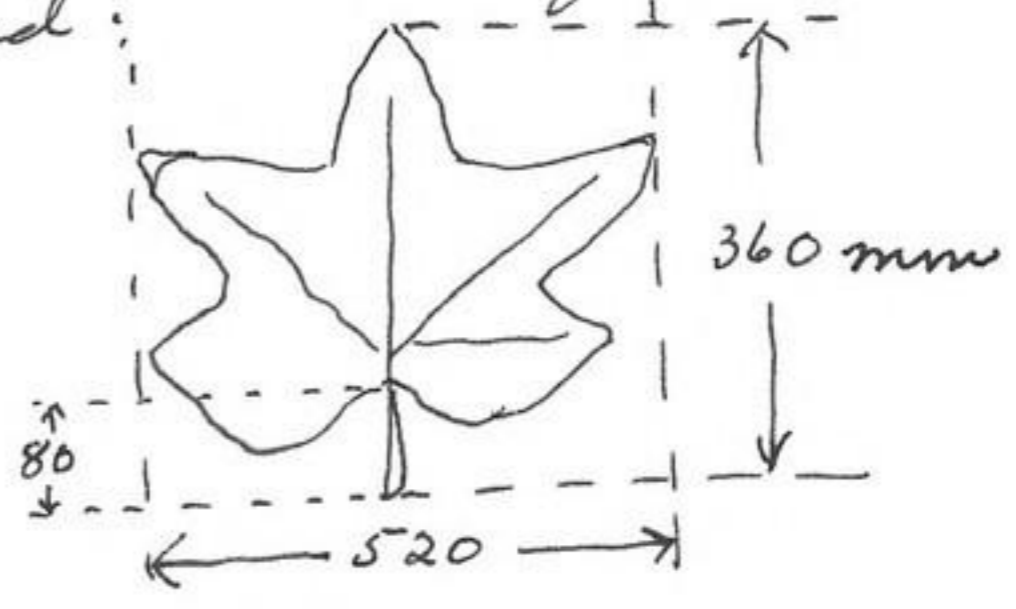
(valley flood plain)

At the mouth of this small drainage as it leaves the uplands, into the river valley, measured a hackberry tree as 10' 10" at chest high. This tree has an extensive root system. Approx. 200' S of here measured a cottonwood as 13' 6" circumference. A fox squirrel left a corn patch and crossed 40' of open field to get to trees. The profile of river valley here is:



upper erosional bench hummocky and channelled and large trees

One sycamore leave from here measured:



at a point 4 6/10 mi E and 1/2 mi S of Lawrence (P.O.) noted 5 marsh hawks hunting a field of foxtail grass in an area between the two N-S roads. They remained in same area for 1/2 hr at which time I left. (approx 5:00 P.M) High wind + cold temp.

The last few rains in the Lawrence area have produced a revival of color and brightening of green in a leaf

that was otherwise destined to desiccation from winds and dry weather of autumn. Some maples have passed maximum color and their leaves have been dropped. Other, are in full color at this time. The green of unchanged leaves, because of rain, has been prolonged this year. Many trees however, have shed their leaves and others are yellow + fading. It has been a season of a double autumn color change.

Kaw River - Wakarusa River, Douglas - Leavenworth Co., Kansas

Oct 31, 1968

Bee Mary and Diana Meller made canoe trip from Dringman's Crossing on the Wakarusa River to Linwood on the Kaw. On the Wakarusa they noted a horned owl, 3 woodchucks and one great blue heron. On the Kaw they saw 3 Canada geese, 3 lesser scaup, and a greater yellowlegs. The trip took 6 hours with a SW wind. On the sandbar on W side of river approx 3/10 mi. up stream on Kaw from the mouth of Stranger Creek measured the following tracks:

Raccoon 58 front, 62 back.
52 " 55 "
50 - 90 "

Great Blue heron 202 (claw to claw of hind & middle toe)

greater yellow legs? 47 mm

Crow 88 mm

beaver 176 hind foot.

Lawrence, Douglas Co., Kansas

Nov. 1, 1968

Color of trees of residential area when viewed from campus of K.U., is predominantly yellow with some green trees and other isolated ones of reddish yellow of maples and dark yellow golden & reddish brown of oaks. Color of hills beyond valley are darker in general tone than city trees and show more reds, brown and gold, all of which are at their peak in color although many trees are bare of leaves. The rains have revived and maintained the green color of trees which ordinarily fade with dry weather and the strong winds from the south or north. It would estimate that the colors are at their maximum in intensity.

Kaw River, Lawrence to Linwood, Douglas - Leavenworth Cos., Kansas

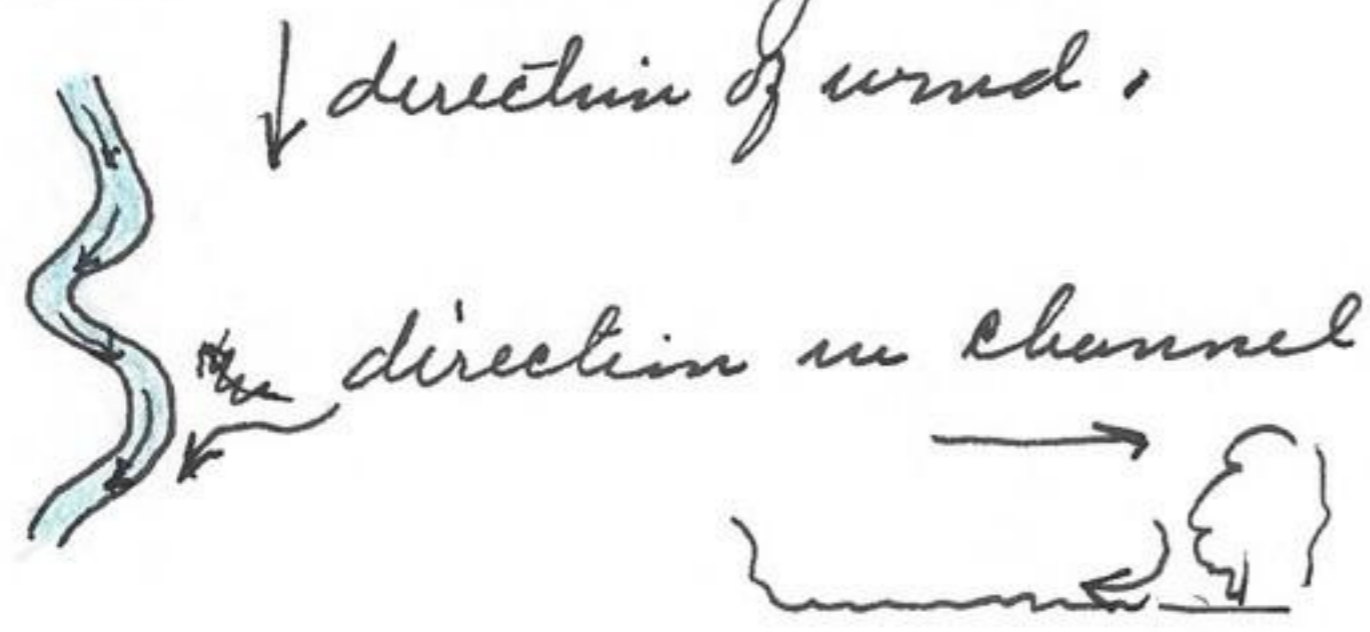
Nov 3, 1968

Made solitary trip by canoe from bridge at Lawrence to R.R. bridge on Soldier Creek at Linwood. Left 8:35 A.M. Day clear except few low ones in E. Wind from NE to ENE. Temp of air 45°, water 55°F. Yesterday rained from 11:00 A.M. to midnight. Wind moderate but directly opposed to my movement. The trees on north bank of river for approx 2 miles are of the following condition: Cottonwoods of high stature are 20% green, 58% in yellow leaves and 40% leafless. The lower leaves on trees remained green & with leaves longer than upper parts of the trees. The willows of the lower story and nearer the river are now approx 50-50 yellow & green, the colors remaining distinct rather than blending.

681103-166

9:22 A.M. 3 crows. 9:26 passing under high voltage
utility pole & lines. great blue heron left bank and
flew across the river. 9:30 major drainage from
right. 9:42 bank swallow nests and all still in con-
tact. Spotted sandpiper preceded me down stream
and after alighting 3 times left for N side of river.
10:18 collected horse jaw from eroded sand bank.
10:20 Capsize Point. 5 killdeers, red-breasted mergou-
ser, redtail and flock of 60 horned larks & all associ-
ed with sandbar bar area on N side river. 10:35
channel to E is now disconnected from main main
by a 5 inch high sandbar across mouth. Redbellied
woodpecker, 2 crows & redtail here. Young stands
of cottonwoods are leafless with occasional yellow tree.
Birds observed along riparian community are: bluebird,
flicker, bluejay, downy woodpecker, starling, goldfinch,
juncos. 10:45 mud creek. 11:03 middle of
island and following along E side to evade the wind.
This side is windless and there are some damsel
flies of about 1 per 200 feet. 11:06 passing E end of
peracy channel. Temp now 56°F. Have not observed
butterflies so far. 11:15 ♂ & ♀ mallards, left bank
and flew up river. 11:33 2 ♂♂ and 6 ♀♀ mallards
in water at end of sandbar. They left, gained high
elevation and moved E. 11:40 apex of bend 11:44 bend
to E. 11:45 across from creek on N side. 12:00
double drainage & the island (in land) 16 meadowlarks
and 3 flickers flew along edge of upper bank in field.
Beautiful oak sidehill as one looks up stream from
here. This area of sand soil & oaks should be checked
for *Synonymus* & *Perognathus*. 12:11 first rock barrier
beyond sand cliffs (left side). 12:13 a great blue heron
alighted on small branch striking ^{out} of water and attained
perfect balance. 12:30 Eudora bridge. Temp 52°F.
The temp. varies from warm (57°) to cool (52°F) according
to whether taken in protected places or on windy
exposures. I am of the opinion that the cool
temps are reflecting the temp. of the water, as the wind

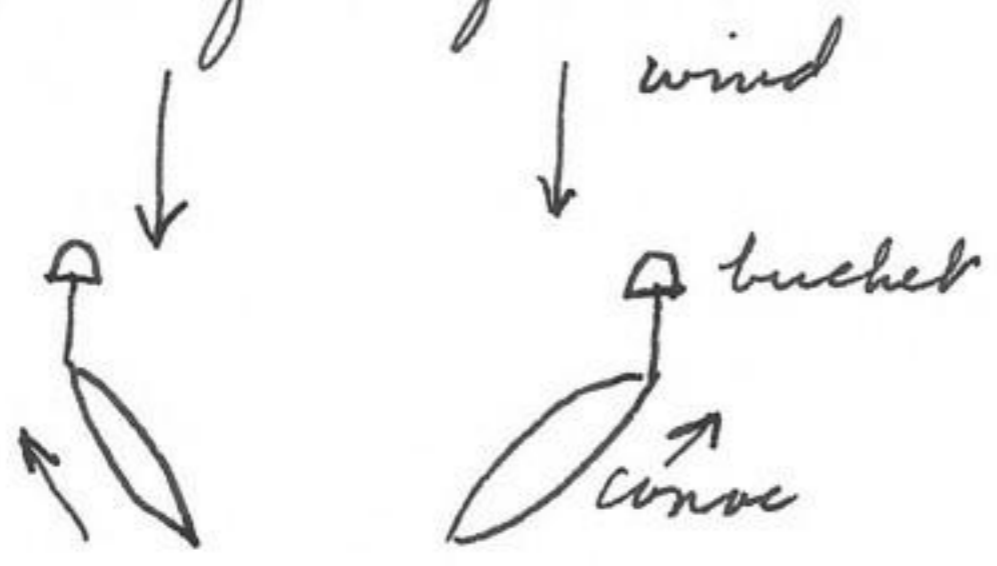
picks it up and blows it up or down the river channel. It is remarkable how the wind is channeled down or up this river, depending on whether from the E or W. Today it was from the E and regardless of the position on the river, with few exceptions the wind seemed to blow against the movement of the canoe.



The trees at edge of river would also reflect or deflect the wind back into the river channel against the main direction of the wind.

12:55 a woodchuck left bank and flew down to a log jam and disappeared from sight. 1:00 mouth of Wakarusa River. 120 4 lesser scaup, 14 greenwing teal, 1 godwail in or group. As they left river and flew by collected 1 ♂ greenwing. 1:30 Reached sandbar. Left 2:00 P.M. 2:25 first bend of large bend to E. 2:42 passing under utility line. 3:10 white sand cliffs. The main E W channel was windy and with waves, but 10 feet bordering shore was with fewer waves. 3:20 along sand cliffs on left side estimated 1 wasp per 200 ft. Temp. 58°F along cliffs where wind is minimized. 3:27 end of sand cliffs and of pure sands below stratification. 3:30 first of large cottonwoods and ready to fall into river. 4:00 S end of bend at Arch bridge of R.R. 4:35 first rock barrier and end of sand cliffs. (deer antlers + jaw, approx 1/10 mile up stream from rock barrier) One been floating with current

and interacting wind drift by dragging a bucket on rope at front of canoe.



If the canoe is taken off direct center of wind and directed to left, the canoe will tack to the left. If to right, will move in that direction. The combination of the action of

the bucket and the wind against the canoe keep it directed to the right or left and will move in that direction.

Air temp in windy stretch 54°F . ⁶⁸¹¹⁰³⁻¹⁶⁸ Wind dying down from earlier this afternoon. This is generally always true as sun nears horizon. 4:55 kingfisher.

5:05 mouth Soldier Creek. R.R. bridge 5:15 P.M. Heard a frog call from mouth of hole 5 feet up bank. It was not the usual call of frogs or toads that I am acquainted with.

Kaw River, Lawrence to Linwood, Douglas, Leavenworth Cos., Kansas

Nov. 9, 1968

made solitary canoe trip, leaving bridge at Lawrence at 8:42. Temp of air 31°F (air temps are always taken at shaded side of canoe approx. 2 feet above water), water temp 43°F (always taken on shaded side of canoe at about 3 inches deep). Sky 90% in clouds in organized formation and clear deep blue between cloud masses. Wind from S and moderate. The clouds, in turn, are moving to the NE. A short distance down river noticed that I had 16 gauge shells for the 12 gauge gun so stopped at Snow's residence on N side of River (Charles L Snow, 876 Oak St) and called Chris. Because of complication and misdirection I was not able to leave until 11:55. Mr Snow claims that fishing is not as good as it was 20 years ago (in Kaw) and that sewage from Lawrence (south side of river) prevented them from setting trout lines because of contamination material covering lines. During the last floods 1952 (1951?) the levee (now ~~now~~ naturally formed by Kaw) protected his home. Water come in on first flood about one foot, whereas in those home to north ^(200' beyond) the water was half way up windows. At the FMC plant the water was 8 feet deep. Mr Snow claims that in early days the meandering channel in valley was 20 feet deep in some places. He informs me that Indian artifacts have been dredged from the sand operations at the Sand Pits NE of Lawrence. He also said that acid is eliminated at the outlet drainage from FMC. In winter when the hot water from the outlets forms an open channel into the Kaw River, the carp will be 'side to side' through out the entire open channel. After Chris delivered the gun, I left at 11:55. Utility lines across river at 12:10. A great horned owl left trees on S side & flew N across river, alighting in cottonwood tree about 1/2 way up. 12:35 bank swallow colony to right and still no erosion of cliffs at this site. Air temp 38°F

On north side of river the Cottonwoods are 85% bare of leaves. 20% are green and 13% yellow. Willows at base of Cottonwoods are 50-50 green + yellow, still color separated but more dead leaves (brownish) and more leafless than previous week. 1:00 redtail hawk circling above Cottonwoods but not calling. 1:13 Caspary Point. 1:26 great blue heron left edge of bank just beyond Piracy Channel and flew π across river to alight at edge of river. 1:27 Piracy Channel and barrier across entrance. 1:30 Mud Creek. 2:15 E end Piracy Channel. Spotted sandpiper left bank. 2:54 axis bend to left. 2 killdeer feeding quietly. 3:54 80 crows flew π across river and seemed to enjoy circular gyrations as a flock in the air. They called in flight. This is an unusual aggregation of crows for this area. 4:10 Eudora bridge. Today has been characterized by the steel blue reflection of water from cloud masses. no frogs noted. Because of the wind, it would have been difficult to have reached Linwood. no ducks noted.

Lawrence, Douglas Co., Kansas

Nov. 14, 1968

Irregularity of heart beat from 5:30 to 7:00 PM. Every 8th to 10th beat missing. Occasionally a heavy strong beat followed by interval. Physical activity normal ^(preceding) today. The last irregularity was the evening of our arrival at Provo, Utah, Aug 15, 1968. This was of a more severe degree and duration (extremely irregular and about 1 1/2 deep) and resulted from fatigue of 1 1/2 day weeks of vigorous vacation activity.

Kaw River, Lawrence to Linwood, Douglas - Leavenworth Cos., Kansas

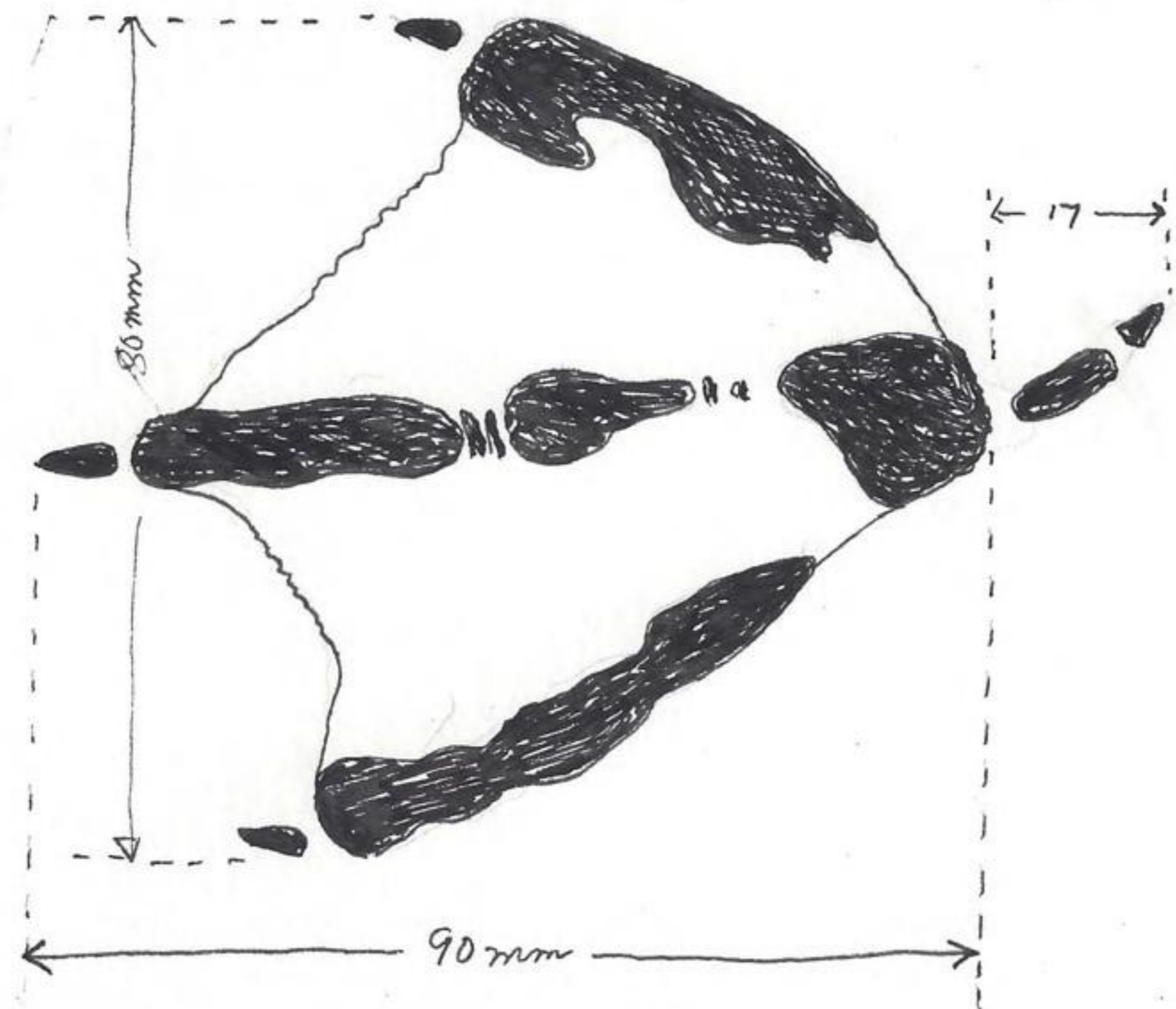
Nov. 17, 1968

Made canoe trip from bridge at Lawrence to R.R. bridge on Soldier Creek at Linwood. Chris accompanied me to Eudora and Annette from Eudora to Linwood. used electric motor for first time today. Left 10:00. wind moderate from π and interfered with course. air temp 43°F, water 44.5°F. 10:33 going under utility lines. Cottonwoods 99% bare, some dry colorless leaves. Willows like last trip but more brown + dead leaves and missing leaves. 10:35 drainage from right. 10:43 bank swallow nesting site on right side, no bank erosion. 11:10 Piracy Channel to right. no water flowing. 11:15 Mud Creek. 11:30 passing E end Piracy Channel. 11:33 drainage from left. 11:50 axis of bend, 6 woodchucks left base of high bank. Did not call.

redtail circling above trees. 3 crows flew across river from R to L.
11:57 double drainage & tree island (this landmark is not an island surrounded by water but an area between the two drainages as they enter the river). 12:01 redtail. 12:20 Eudora. While waiting for Annette to arrive, Chris & I checked small alluvial fans of soils as they encroached on the sands. These could be measured and classified. Cicynellids (tiger beetles) coverage 1 per 3 feet on junction sand & willow)

Annette arrived and we left Eudora bridge at 1:20. 1:30 mouth of Wapakarusa River. 1:35 6 mallards flew up river. 1:50 3 crows after a great horned owl. 2:22 axis of N bend and under utility lines. 2:25 redtail hawk. Birds on bank not included in complete census are: juncos, blue jay, sparrow hawk, meadowlark, redwing, grackle, chickadee, cardinal, goldfinch. The cardinal is unusually scarce this season. 2:50 large log jam on left side river. A spotted sandpiper left the front of this log jam. Continued down left hand channel. This relatively new channel, to S bend, is characterized by swift moving water. 3:00 a large blue goose left bank and swam out into the water about 150' ahead of us.

This bird was collected and measured: total length 670 mm, exposed culmen 56 mm, wing 400 mm, wing spread 1390 mm, tarsus 96 mm, tail 130 mm, weight 4 1/2 lbs. The area of the head between the eye & the bill both above & below was a dirty yellow color. The black stripe of feathers of the dorsal part of neck extended almost to bill on top of head. The left foot imprint measured 107 mm total length. Continued to S bend, arriving at arched RR bridge at 3:12. 2 red-tails circled above the trees on the N side of the river. They gained altitude and then returned to lower elevations. These redtails are frequently observed in this general area.



Continued to S bend, arriving at arched RR bridge at 3:12. 2 red-tails circled above the trees on the N side of the river. They gained altitude and then returned to lower elevations. These redtails are frequently observed in this general area.

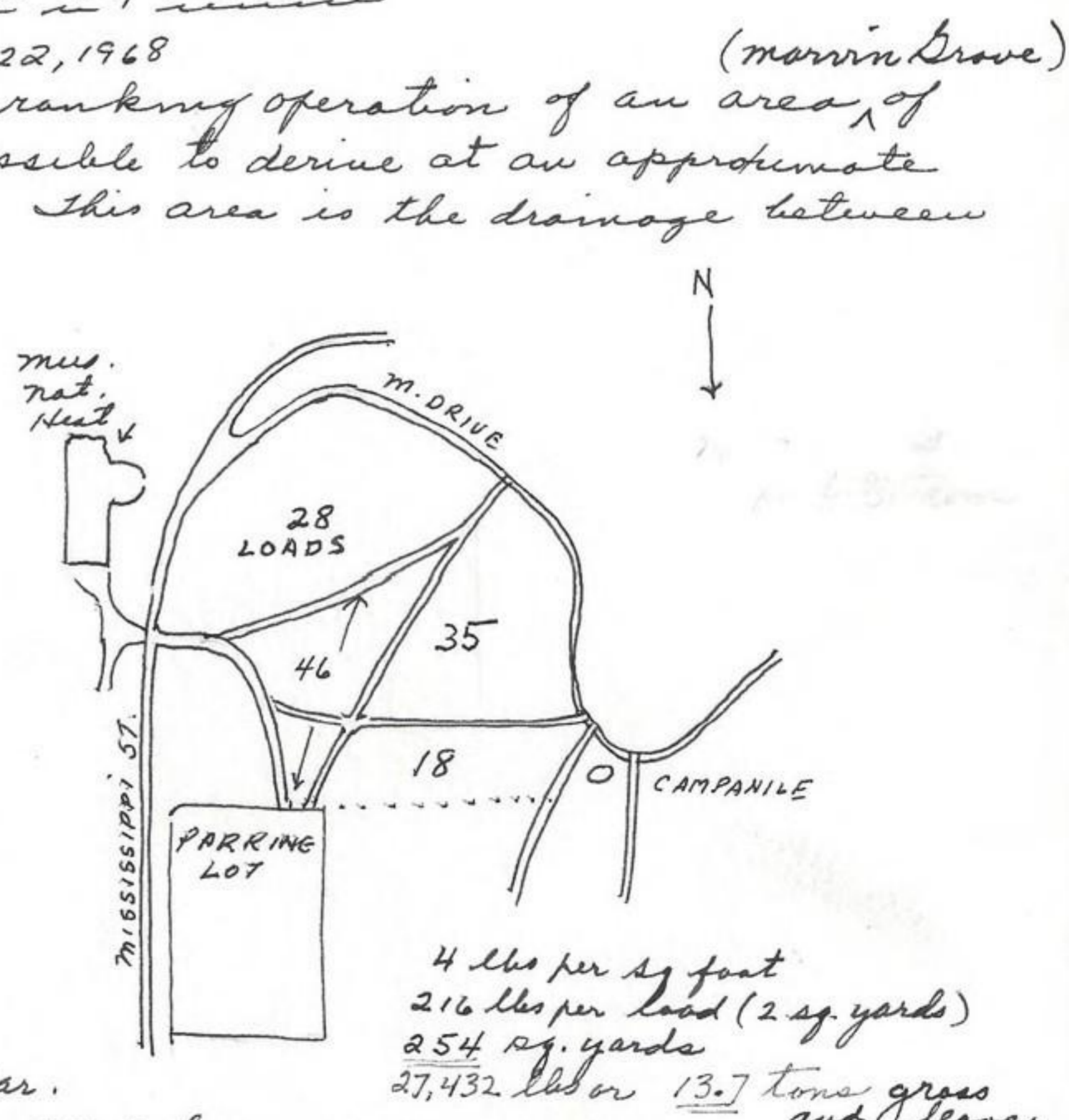
3:25 Collected a shoveller from N side of river. It measured: total length 500 mm, exposed culmen 66 mm, wing 240, tarsus 47, tail 81, wing spread 792, weight 1 1/2 lbs. This bird had a dark mottled grayish brown neck & head. 4:00 mouth Stranger Creek. 4:10 bridge. Wind strong and difficult to move up creek. The day has been one of progressively more clouds, deep blue sky & steady wind. The electric motor was used continuously (slow speed) for 5 1/2 hrs. At about 4 hours the power shows signs of weakening and at 5 1/2 hrs the propeller moves only slowly. 12 volt battery used.

University of Kansas, Lawrence, Douglas Co., Kansas
 Nov. 19, 1968

approx 80
 The robins have been on campus for the last month. They are most frequently noted in area S of Hock Auditorium among the ponderosa pines. The solid and dried crab apples are used as food, especially the raisinlike dried ones that are sweet in taste. Other ornamental shrubs and their berries also contribute to the lingering of robin on the campus.

University of Kansas, Douglas Co., Kansas
 Nov 22, 1968

On the basis of leave-raking operation of an area of known dimensions it is possible to derive an approximate figure of the leaf biomass. This area is the drainage between Mississippi St and the Campanile and the Memorial Drive and parking lot. Leaves were collected by a special leave collector in which a brush sweeps up the leaves into a box, both drawn by a tractor. The leaves, 75% (mainly green) and grass, 25% (both approximate figures) of one load was approx. 2 sq yards. All trees had shed leaves except approx 22 oaks still with leaves and yellow to golden brown in color. This area had not been raked of leaves this year.



On the basis of known area, weight of leaves, volume of leaves, size of trunk (diameter) it is possible to determine the biomass per unit area. This figure is as follows: (also see Nov 18, 1974 for comparison)

LIBRARY

CAMPANILE

9913X
X9917

X
9948

X
995.8

X
993.1

X
993.0

Parking

X
1017.5

BAILEY ANNEX

1010

1000

DRIVE

X
990

980

X
975

960

35
LOADS

18
LOADS

28
LOADS

46
LOADS

950

X
940

X
941.5

19 LOADS

X
997.2

X
991.8

GREEN HALL

DYCHE
MUSEUM

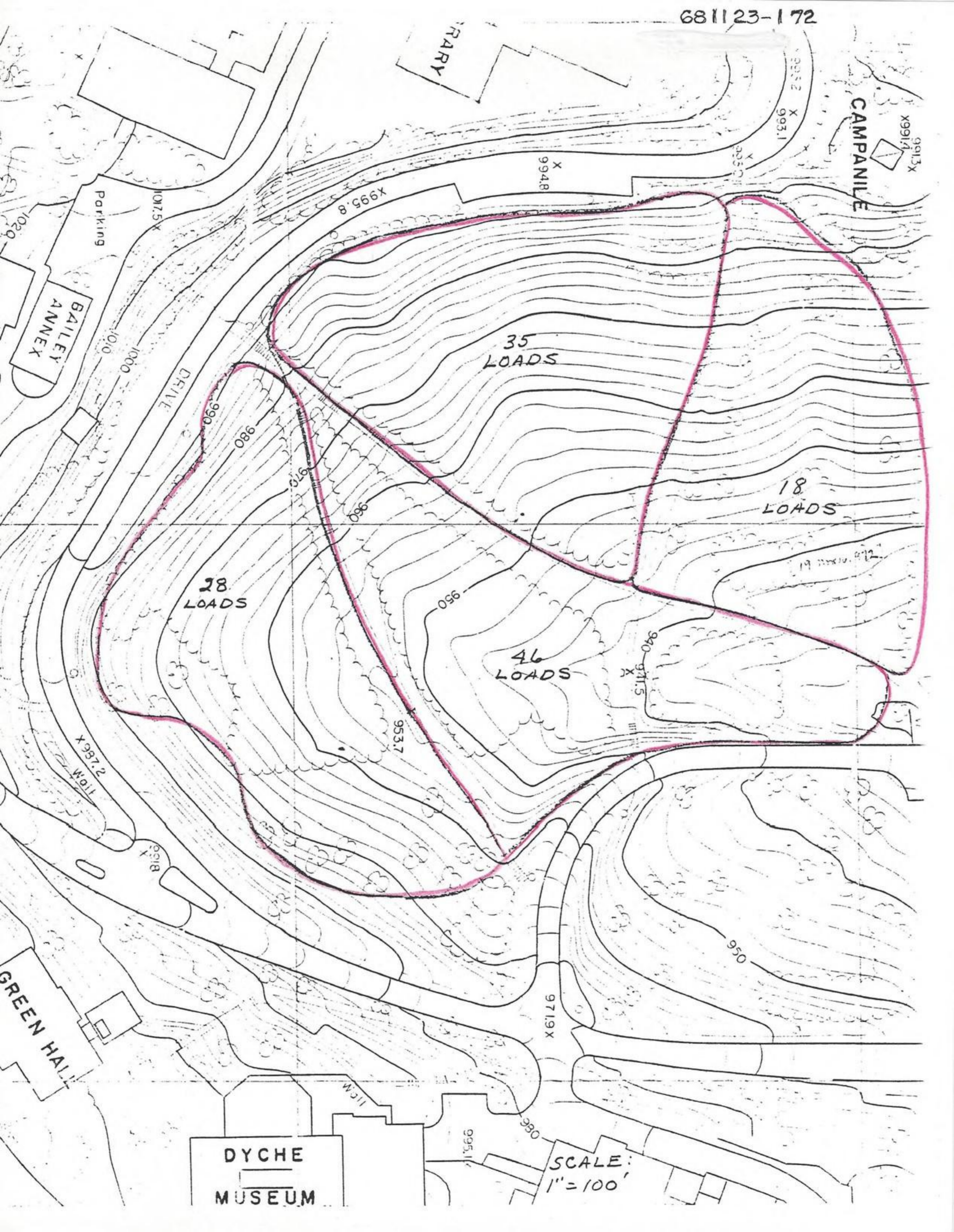
X
995.1

990

X
971.9

950

SCALE:
1" = 100'



681123-173

Kaw River, Mud Creek to Linwood, Douglas - Leavenworth Cos., Kansas
Nov. 23, 1968

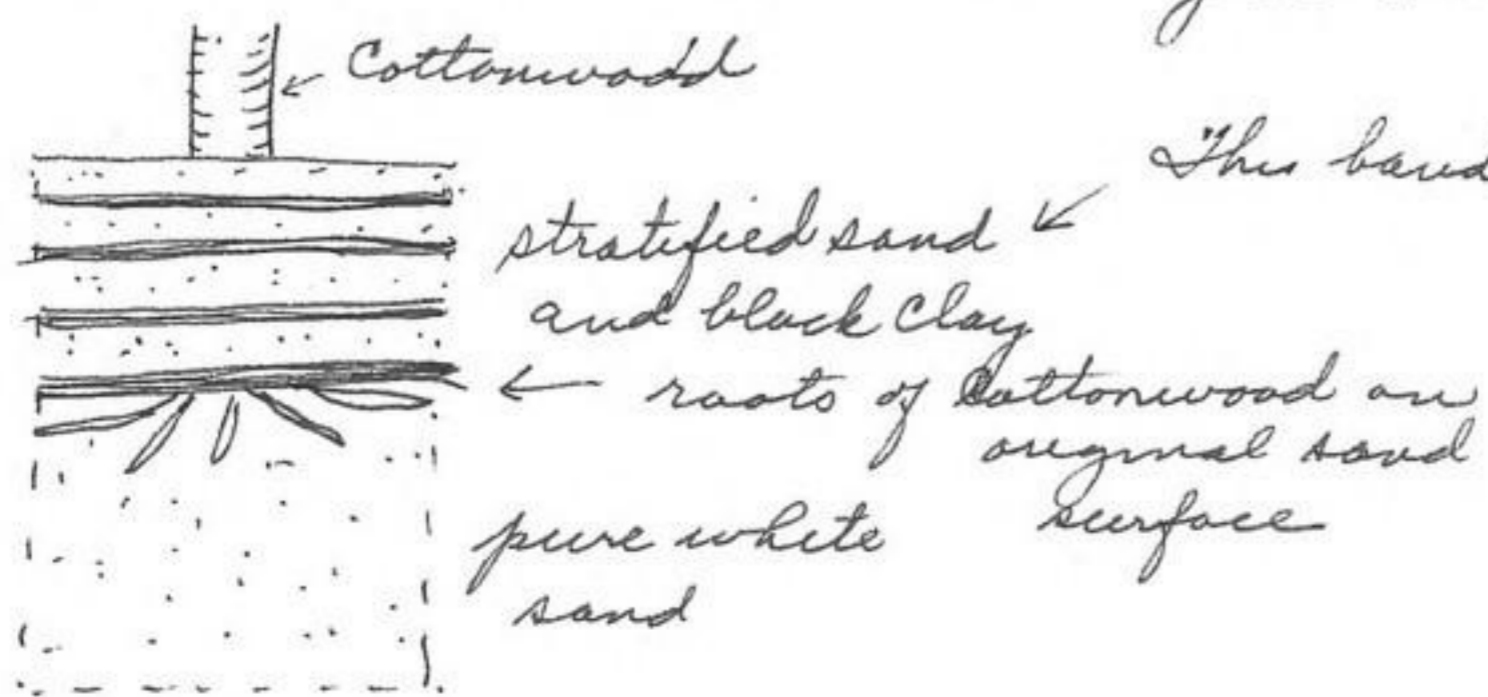
made solitary canoe trip from a point approx 1/10 mi down stream from convergence of mud Creek and the Kaw River on N side of river. Day perfect for canoeing. Some clouds of a cold front just arriving from the west and N and passing to the east. Air temp 56°F, water 46°F. Left at 8:38 A.M. 8:55 ♀ mallard left from right and flew up stream to mud Creek. Photo 681123-1 ^{and 681123-1a} down stream showing conditions of wind, sky and general atmosphere 9:00 opposite east end of Piracy Channel. Clouds now about 80% and rest a blue sky. River high for this time of year and good current. Will float entire trip. 9:08 redtail left tree on S side and flew to tree on north side river. From here it flew directly N almost out of sight. This bird was dark and my judgement was that it was a Harlequin but on basis of its direct flight would be inclined to say it was an American Kowaleg. 9:10 photo 681123-2 and 681123-3 of river and one with canoe. Clouds of cold front now becoming solid and sun passing under clouds which proved to be complete for the rest of the day. 9:12 major drainage to left. Windless on river and almost absolutely quiet, so much so that one can hear soft calls like the bluebird at some distance from the river. Call of birds in riparian communities very clear & distinct. This condition of a windless channel, quiet day and good river current produced the most

ideal canoeing day. These days are exceptional and are generally associated with the passing by of a mild cloudy cold front or between the changes of a high to a low pressure center. Clouds have moved in to just west of north. Taking all factors into consideration would say that the presence or absence of wind makes the difference between an enjoyable and effortless trip and one that is aggravating and exhausting. especially if the wind is against you. Birds heard so far are: robin, bluejay which are most active, bluebird, goldfinch, wren, singing. 9:30 temp 54 or 2 degrees lower than when clouds were fewer and there was more sun. This change of temp. may be associated with the actual passing of the cold front. Slight breeze from NE. which may be channel influenced. 9:33 passing by rock island just before main bend to left. Canoe slightly being forced to south bank. male mallard left bank and gained high elevation, thence down stream. 9:47 end high bank at concave side of curve. Kingfisher in down tree just beyond curve. 10:00 tree island (trees on bank between two drainages and not an actual island. This is a landmark of previous notes). It is a good idea to establish landmarks for position. Killdeer on S ^{low} side on sands. These birds are quiet for the most part, at this time of year. The greatest change of foliage this trip is the loss of leaves of willows. The willow now show defoliation at the lower levels of their branches

or stems and colored yellowish-brown leaves at ^{the canopy level.} If the leaves are not defoliated they are dead and brownish. This condition is reversed in the cottonwood, which today are practically all leafless, but earlier in the season loose leaves first in the upper story. 10:15 first rock barrier on N side. More Robins than usual. 10:37 Eudora Bridge Have used current all the way. A bucket tied on to front rope of canoe keep canoe from drifting and properly oriented. If there is a wind it is less effective. Eddies keep canoe away from bank and into main stream current, again, providing there is no wind. 10:50 redtail. Temp 54° and maintaining constant level since cloud mass passed overhead. The cold front is a continuous mass of clouds without character. 10:58 mouth Wakarusa river. Leaves on wakarusa from lack of current. 10:30 at end of bend at point where large cottonwood of old homestead is almost undercut by stream, a lesser scamp was noted at edge of a log jam. It remained until I was within 100 and then moved in toward jam and dove. It swam under water toward the center of the stream where it resurfaced, stood up and flopped its wings. His full body was exposed with head high. As I pursued this duck it remained on surface for shorter periods of time and when ^{it surfaced} within 30 or so feet would immediately dive again and when resurfacing would only extend head & part of neck. It finally disappeared

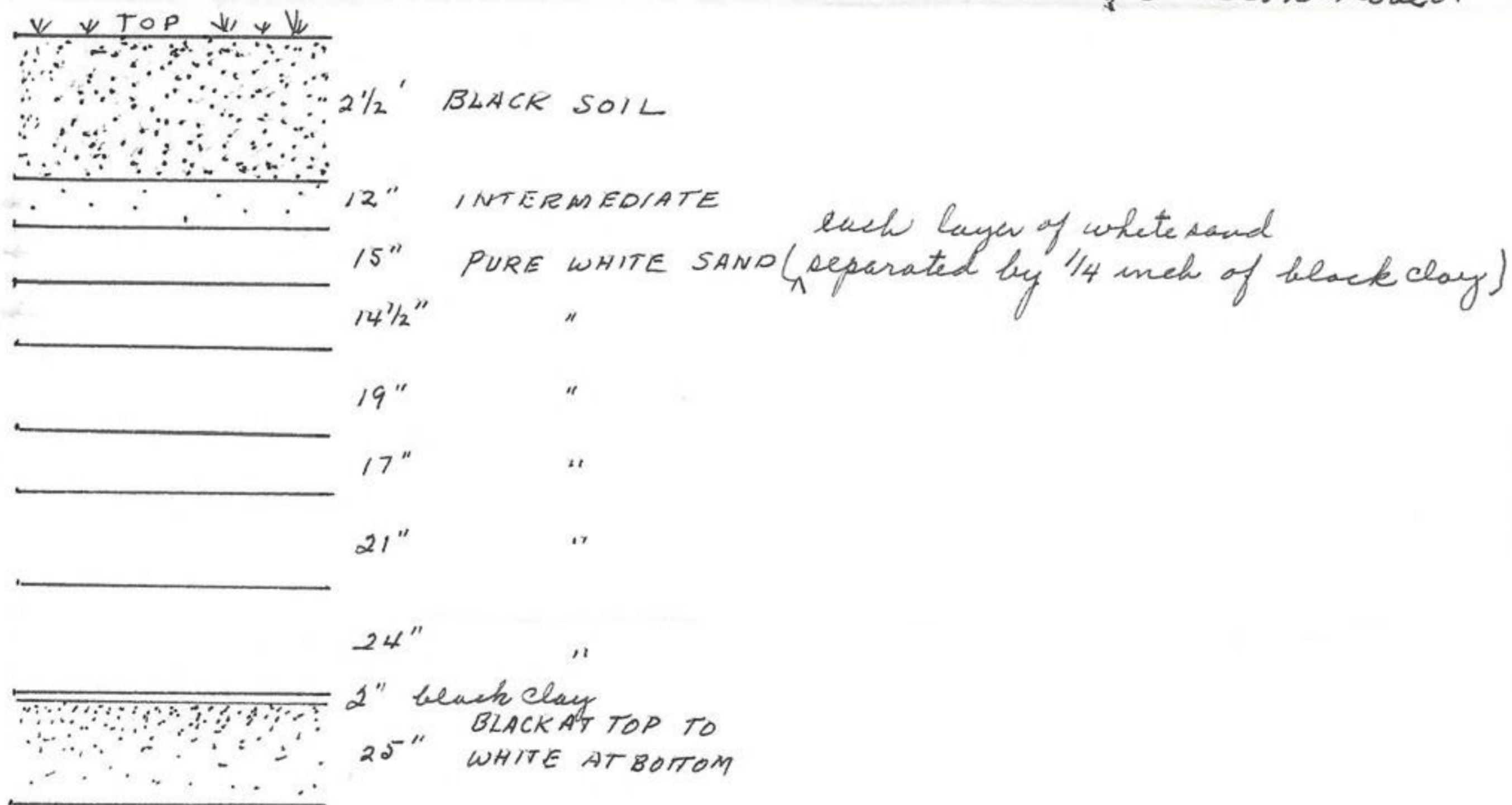
And I believe it again took refuge among the log jam. 11:40 temp 54°F. 12:02 temp 54°F. 10:30 mouth of creek (left) at beginning of bend to E. 12:48 passing under utility line. Redtail flew from S side to oaks on hill to N. Observed first Cardinals (2♂♂). Considerable jay activity in hills to N (oaks). Crows calling from 2 directions to N. 1:12 E end of bend and beginning of sand cliffs. Redtail (or roughleg) to N. Passing by sand cliffs and noticed that there are many holes just below top (2-4 inches) and others down to 12-18 inches, probably mole and gophers. These holes are generally distributed and where grouped are about every 1-2 feet. Clean surface of cliffs show good structural profiles. 1:32 end of exposed sand cliffs. The first

cottonwood trees on bank beyond show their buried condition



This banding is continuous to NW up stream on N side river - but slightly displaced toward river. It would appear that the sand cliff profile is old and that the stratification above the ^{pure} sand is after the growth of the cottonwoods

This tree is the first of the Cottonwoods on bank above log jam + side channel. Log jam 1:37. Traversing left side of this channel. It is believed that this new channel is being developed as the main channel as the current is much faster than main river to south. Temp 55°F. No sun since this morning before front started. 1:56 ♀ mallard on S side channel and under cover of a few branches at edge of river. It remained there until approached by Conae at which time it left and flew up river. 2 ♂♂ mallards were on bank on N side about 200' down stream from ♀. This area between the island of sand + willows and the mainland to the north has always been a place favored by ducks. The blue goose recently collected (see notes of Nov. 17) was from here. Besides being remote from man's activities, this area is characterized by relatively narrow channel and fast moving water. The river just beyond here is about as wide as I have seen on the Kaw. 3:10 arched bridge to right. 3:15 axis of bend. Great horned owl calling from land to left (N) at an average of 4 calls per minutes. 2:45 measured cliffs on S side river about 1/10 mi upstream from ^{first} rock barrier. From general appearance this sandy cliff looks like a cement block wall with regular intervals of seams. I know of no other profile of this character. This is the area of the large bank swallow colony 400-500 nests, all gone except 2 holes. The rest have been eliminated by erosion of wall.



8 feet to level of water (hidden by talus). At approx 1 1/2' from level of water is a layer of mud balls covered with large sand (gravel). This layer supported deer antler of last week's collection. (Nov. 3, 1948)

681123-176

Left sand cliffs at 3:10. Passed rock barrier at end of cliffs at 3:13. at 3:35 stopped on sandbar in river, set out a decoy and remained until 4:30. at sand bar heard 2 great horned owls, one on north side of river (to west of my position) and a second one on south side of river (NE of my position). The one to west called at the rate of 4 calls per minute while the one on my left called approx. 1 call per minute. These owls called from at least 3:15 when the one on the N side was first heard up river to 4:30 when I left area. There were intervals when they did not call at the regular interval. Photo 681123-6 of cones and late afternoon skies. at 3:45. Large commercial jet planes passed low under clouds on their way to Kansas City airfield. These planes arrived from the west in clear skies and when approaching cloud mass of cold front that passed over today, descended to make a long low approach under the clouds. This clear area at this time is just visible to the far west. at 4:10 5 mallards flew by at high elevation to N and at about the time they approached the curve of river near Saldier Creek, a train passed and the ducks reacted by climbing higher and turning west away from their general northern course. They finally turns and with set wings descended from their high position to that section of the river to the west where 3 mallards were observed earlier on this trip. Left 4:30. 4:50 arrived mouth Saldier Creek. 5:00 RR bridge at Linwood. Kingfisher flying about bridge as if trying to locate there for the night. Sky to W a brilliant red as sun shone from clear area west of the tail end of the cold front onto the underside of the ^{cold} front mass.

Lawrence, Douglas Co., Kansas
Nov. 24, 1968

Mary Pauline returned from Cheyenne Bottoms with Ross biology club. She reports the following interesting birds observed the area:

golden eagle
hooded merganser
pelican
falcon (sp.?)

buffle head
baldpate
coot
roughleg
yellow crowned night heron

Univ. Kansas, Lawrence, Douglas Co., Kansas
 Nov. 26, 1968

A tenebrionid beetle (*Tribolium*) is increasing in dermestid colony at the expense of the dermestids. The present arrangement of gallon jar on a shelf with a 40 watt light under shelf is not a satisfactory arrangement. Apparently the heat is too great and the chamber too dry for egg laying. In the last month the young larvae have developed to adults but adults have not laid eggs.

Kaw River, Lawrence to Eudora, Douglas Co., Kansas
 Nov. 27, 1968

made solitary trip by canoe from Lawrence bridge to Eudora bridge. Left 9:06 A.M. but returned to starting point and finally left at 10:20 A.M. Temp 40°F 11:06 redtail.
 11:17 utility lines across river (these lines are the second set of lines and are the ones always referred to in the notes).
 11:30 redtail. 11:35 great horned owl left trees on south side and flew low across river to north side, alighting about 1/2 way up cottonwood trees and with challenge by other birds. Sun excluded by clouds this A.M. There are no leaves on trees on south side of river but some on north side as follows:
 all leaves off large cottonwood trees
 willows have 50% leafless or brown
 40% yellow leaves
 10% green leaves.
 The yellow and greens are in clones or definite groups and not a general mixture. Wind from NNW. 11:50 Capsize Point. Approx. 1/10 mi down bank from Capsize Point are 80 nest holes of the bank swallow, preserved by influence of a rock barrier. 12:13 mouth mud Creek. The last stretch from Capsize Point to mud Creek was against wind and moderate size waves. This is the most difficult stretch of water on the entire river and may contribute to the erosion of the area in the Capsize Point curve. 12:14 2 redtails crossed river from N to S, one with prey in tow and the second one in pursuit. Sun breaking three clouds. 12:28 E end Piracy Channel. Drifting with wind only.
 1:00 atis of bend. Redtail, 2 crows. 1:12 Noticed that one can see Eudora bridge for first time. Arrived Eudora bridge at 1:38. Unloaded on rock barrier on S side just above bridge

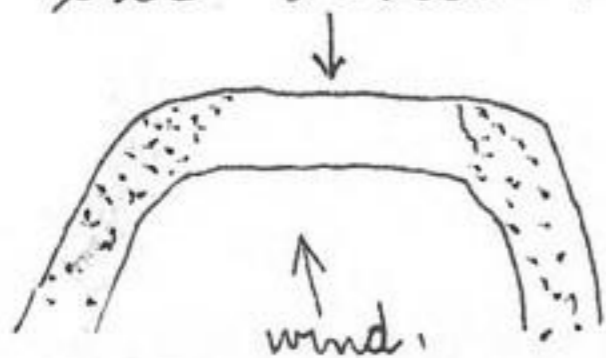
681127-178
which is convenient for this purpose when banks are muddy otherwise.

Lone Star Lake, Douglas Co., Kansas
Nov. 29, 1968

All leaves gone from hillside deciduous forests except dark reddish brown leaves of oaks. No fish surfacing^(sundown) on lake in areas where normally the water churns with activity. No fish were caught along dam where ordinarily one can catch 20-30. One mallard flew S across lake after sundown.

Kaw River, Mud Creek to Linwood, Douglas-Leavenworth Cos., Kansas.
Nov. 30, 1968

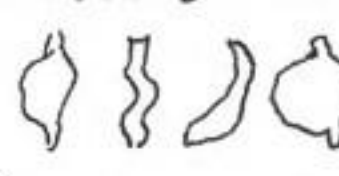
10:20 AM.
Left from point approx 1/10 mi. down river from Mud Creek. 20% high clouds, wind from SE but not enough for wave action. Water temp 39°F, air 35°F. Used electric motor for substantial part to first major curve to NE. 11:23 redtail; 2 crows. 11:33 killdeer silently feeding and left by flying immediately above water until out of sight. 12:18 Eudora bridge. 12:50 mouth Wakarusa River. Crows calling to S. Temp 38°F. Ice of protected beaches on S side river between Eudora bridge & mouth Wakarusa River, not much, perhaps averaging 2 inches surface area. At 1:45, just beyond curve of river at beginning of long sandbar, stopped and checked sand bar for artifacts. One potsherd no. 681130-1 from here. No 681130-2 a possible fat scraper or knife with thumb depression and 681130-3 a possible percussion hammer. 681130-4 a tooth from some animal. Left 2:05. 2:25 a sharpshinned hawk was observed hunting up river along beach by hopping over snags and brush growth along the bank. It alighted opposite me some 40' away and then continued up the beach in its characteristic hunting pattern. 2:30 mouth creek and beginning of bend to E. Kingfisher on old tree on right side at bend. 2:45 redtail hawk. The river between the bends is like a mirror with perfect reflection of trees. The water was agitated by wind beyond bends in both directions. The redtail observed at 2:45 flying high over river is now below tree





681130-5
(outline)

level in same area. Birds on bank so far include: slate-colored junco, tree sparrow, flicker, redbellied woodpecker, bluejay, song sparrow, chickadees, downy woodpecker, meadowlark, horned lark, starling, bluebirds, mourning dove. No robins noticed today.

2:52 passing under utility pole. 3:12 beginning of cliffs at turn and passing mouth of creek. 3:13 deer tracks going down river, on beach to first impassible barrier and then returned. Raccoon tracks almost always present on beach along the river. Muskrat tracks unusually few compared to earlier in season. At base of cliffs about 1/2 way down noted that concretions like forms were confined to one layer at about the present water level. This zone of sandy-mud shows the concretions as perpendicularly oriented  and generally distributed within the zone.

Collected a complete *Quadrula quadrula* (681130-5) from black mud or clay level at water level. This specimen was in position in clay and compared in color to the clay matrix. Another half shell, ^{*Q. quadrula*} 681130-6, from same area but epidermis a brown rather than black color. The epidermis is very delicate on these specimens and although complete, it peels off readily. I would guess that these shells of have antiquity. Temp 45°F. 3:56 clay (basal) layer ends abruptly as if faulted. The concretionlike objects have collected on sandy beach in unusual aggregations. 4:04 first cottonwood on left bank. 4:10 log jam forming island. 4:40 axis of bend (S) 5:05 Stranger Creek. Have used high speed of electric motor since 4:40. Sundown about 5:00. 5:08 RR bridge at Linwood. Temp 38°F. For most of trip have used current for navigation. Some factors of wind on Conae are: (for checking bank)



↓ moderate to weak wind factors of wind on Conae are: (for checking bank)

best position with front of Conae at rear, or contact with bank and paddle controlling position + movement on sandy bank, at rear of Conae.

second best position with Conae in reverse position and contact and control with paddle contacting bank. or by paddle in water

if Conae turns out beyond axis of wind, the Conae will assume a position 90° to bank and, almost impossible to bring around again.

a combination of eddy + current will change position of Conae

wind bouncing off cliff will drive Conae away from bank.

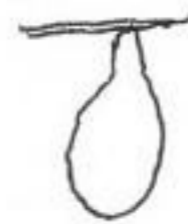
681207-180

Lawrence (mud Creek) to Linwood, Douglas - Leavenworth Cos. Kansas
Dec 7, 1968

Left mud Creek (1/10 mi. down stream from mouth Cr.) at 9:00 A.M.
Wind from n nw. Temp 28°F, water 36°F. Mary and a friend miss
Shot accompanied me to Eudora bridge. 9:05 Kingfisher. 9:23
passing drainage to left, ice covering creek to near edge of river.
9:26 Raccoon on bank at water level. 9:28 stopped to check
small birds. From cones at edge observed the following: black
Capped chickadee, goldfinch, tree sparrow, purple finch (12), flicker,
redbellied woodpecker, winter wren, slate-colored junco, bluejay,
song sparrow, red breasted nuthatch. These birds were in one
group. Another group a short distance beyond included:
mourning dove, bluejay, flicker & redbellied, a group consisting of
larger birds. 10:20 30°F Arrived Eudora 11:00. James R
picked up Mary & Shot and I continued down river leaving
bridge at 11:50 12:45 2 ♂♂ mallards. They swam out from
right bank and continued across river. I followed and passed
by them at about 150 feet. During hunting season (now one week
past) these birds would have left area long before they reacted this
date. 1:20 west end bend. Strong wind with whitecapp on
the previous stretch. 1:35 E-W part of bend on n side relatively
quiet. 1:35 under utility lines. 2:00 beginning of sandy cliffs
at E end of bend. 2:40 end of basal clay at fault line.
Sands show movement from saturated condition. These sandy flow
down ^{from} banks of river. On the dark clay bands of cliffs
are algae deposits and leakage from ^(clay) underground waters. This is
surprising as I presumed they were impervious to water. 2:50
first large cottonwoods, redtail. Rock island in middle of
river covered but interfering with water flow. This has been a
day when ice forms on obstacles in or near water. The peculiar
feature is that the 'ice forms' when found are large, conspicuous
and well developed as if it had taken considerable time to
develop but the 'ice forms' are ~~widely~~ distributed at with
long intervals of no ice forms. The ice is in the form of
hang drops, much on the order of a chandelier crystal and
are suspended from the soil on the bank or from twigs. Twigs
about 6 inches above the water have several ice crystals or only
one



Typical form is:



and ~~most~~ about
30 mm in height

On talus slopes on S bank of E-W curve are globular to football shaped masses of surface soils (black) that have been dislodge from top of bank and formed into spheres by water and rain action. 4:05 cliffs of even stratification. 4:15 first rock barrier on S side near bend to NE. Have noticed that water in ~~boats~~ boats on land ~~are~~ is frozen solid (4" thick in some places, whereas there is very little evidence of ice associated with the edge of the river except a thin layer 1/2" on beach in protected places. 4:30 air 30°F, water 36°. 4:35 Kingfisher. 4:47 Stranger Creek, Loung moved since 4:15 by electric motor. In from mouth of river by 75' was a band of ice, ^(20') ^(1/2" thick) completely across river. Conae brake ice by weight. Beyond the center of Stranger Creek open but sides in ice. At a point 150' from R.R. bridge, ice (15mm thick) covered river and stopped navigation. This thickness of ice is just a little too thick to brake by conae or paddle. Made 20' advance into ice in 15 minutes. Arrived at this ice block at 5:00 P.M.



University of Kansas, Patters Lake, Douglas Co., Kansas
Dec. 9, 1968

Patters completely covered with ice.

Dec 10, 1968
Patters Lake still completely frozen. Army Engineers have set this date as the last day for navigation of barges on the missouri River, probably because of formation of ice or lowering of water.

Dec. 12, 1968
Patters Lake completely open. Yesterday, last night and this A.M. has been consistently 60°F and strong wind & clouds from the S. Condensation on streets and walks to standing water in some places, mainly on N exposures. This condition has caused many car accidents in the area. Because of strong winds I struck one ankle with the opposite foot twice while walking across campus. Widely placed legs may be adaptations to windy situations or ankles of animals may be adapted to accommodate such Wakarusa Valley, Clinton Area, Douglas Co., Kansas punishment.

Dec. 12, 1968
Censuses along main road from south end proposed dam to Richland turnoff. Mileage 69.6 S end dam. 73.5 Clinton. 74.7 meadowlark, 75.9 Belvoir bridge. 76.0 Crow. 76.7 now to S. 77.6 4 meadowlarks and now to SW. 8.2.9 Richland

turnoff and end of census. Approx. time in field 3:00 P.M. ⁶⁸¹²¹²⁻¹⁸²
High wind from S and gusts up to 40-50 miles per hour.

Lawrence - Omaha, Kansas & Nebraska,

Dec. 15, 1968

Followed 75-73 from Topeka North. Started census at
3:00 P.M. at Halton, Kansas. (day cloudy, temp 15°F)

roaccoon roadkill. no wind noticeable

meadowlark 1-1-2-3-15-1

starling 16-30-50-3-1-1

American roughleg ? 1

redtail hawk 2-1-1-1-1-1-1-1.

skunk roadkill

sparrow hawk 1-1

loggerhead shrike 1

juncos 2-1

Eng sp 1-3-8-15-2.

Fairview 3:35 (first sign of snow on N exposure)

marsh hawk

redtail 1

kingfisher 1

juncos 4

starling 1

Lebetha 3:45

meadowlark 3-1

Eng sparrows 60

skunk roadkill

Nebraska - Kansas State Line . 3:52

juncos 4

meadowlarks 1-1

Dawson 4:05 (end census; sundown approx. 5:00 P.M.)

Omaha 6:15 P.M.

Dec. 16, 1968

Attended Robert Bee's Priesthood ordination yesterday evening.
Left Omaha at mileage 17894.0 from western motel at Dodge
and approx. 80th W. Continued to Nebraska City arriving at
10:39 at 17947.1 mileage. Day clear, temp 34°F Census
starting at Nebraska City.

sparrow hawk 1-1

Eng sp. 1-60-1-4

blue jay 1

juncos 1-3

shrike 1

starling 1

Auburn (11:27)

Eng sparrow 80-1-1-6-8
 skunk (stripped) roadkill 1

Cottontail roadkill 1
 yellow-shafted flicker 1
 eastern bluebird 2
 starling 1

Dawson (11:48)

Eng sparrow 5-2-1-2
 loggerhead shrike 1
 Kansas-Nebraska Line (State) 12:00
 redtail 1

Lebetha

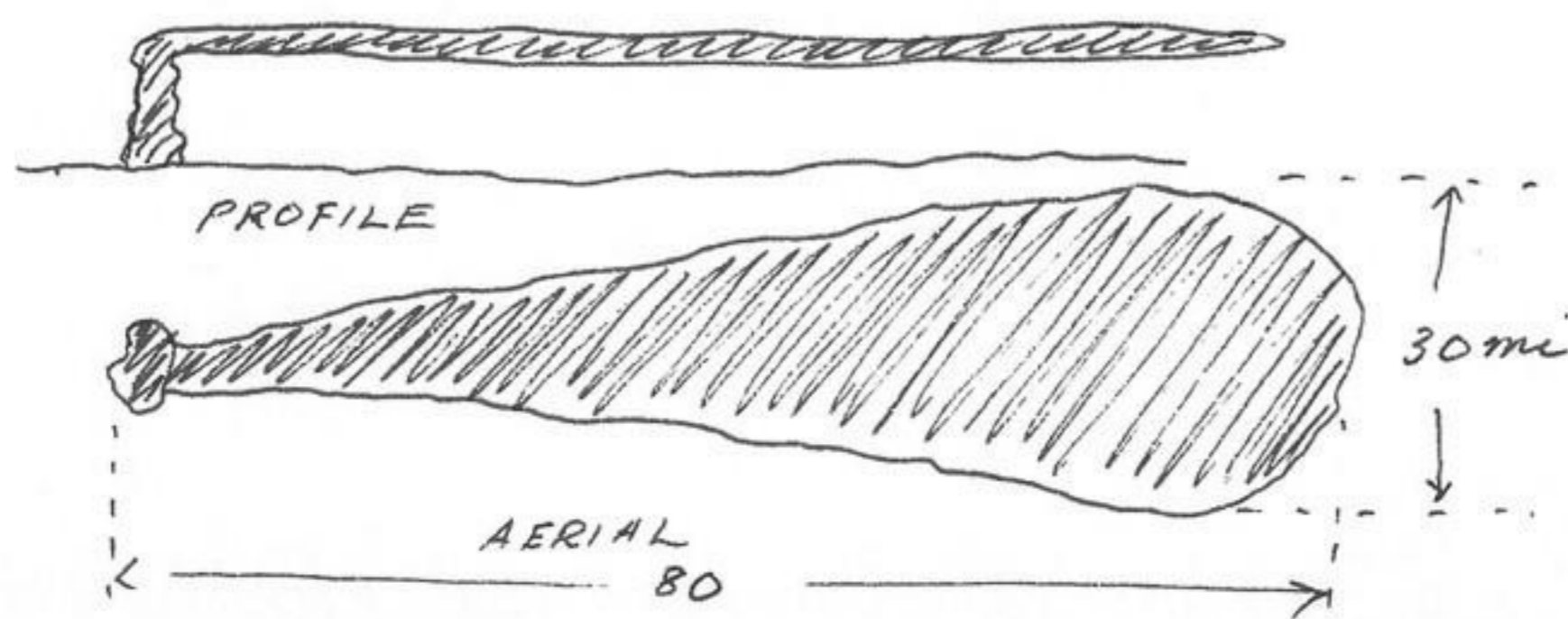
redtail 1-1-1-1-1-1-1-1-2-1-1-1-1-1
 redheaded woodpecker 1-1-1
 shrike 1
 starling 4-6
 striped skunk roadkill 1-1
 Eng sparrow 4-2-6
 meadowlark 1-5-1
 starling 2

Holden 12:50 (Left 1:20)

redtail 1-1-1-1-1-1-1-2-1-1
 starling 1-2-1-1-1-6-3
 Eng sparrow 1-6
 juncos 1-2
 cardinal 1
 striped skunk roadkill
 shrike 1
 sparrow hawk 1-1-1
 meadowlark 1-6-1-1-2-1-1-14

Highway 24 (2:00)

at a point along highway between Halton and the Kaw River valley (highway 24) at what I presume to be the open ^{dense} refuge pit for Topeka, noted a column of smoke up to approx 1000 feet and thence NNE for approx 80 miles (30 miles + more wide)



The material being burned was rubber tires, drums of oil and small gallon cans of questionable material. The smoke was dense black

Census from Meriden Road on highway 24 to Lawrence is:

- redtail 1-1-1-1-1-1-1-1
- starling 3-1-1-6-10
- meadowlark 2-8
- sparrow hawk 1-1-1-1-1
- yellow-shafted flicker 1

Lawrence outskirts and end of census.

Lawrence at 1620 Tenn. mileage 18119.0, 42°F, 3:10 P.M.
distance from Lawrence to Omaha 225 miles.

At Perry made side trip to Perry dam. 2 redtails at dam. The valley behind dam is foreign in appearance with broad valley, no trees, reddish shrub or weed growth and isolated ponds and meandering river. It is rather a pretty sight.

A comparison of numbers of redtails between Halton and Sebetha on two consecutive days but at different times of the day is:

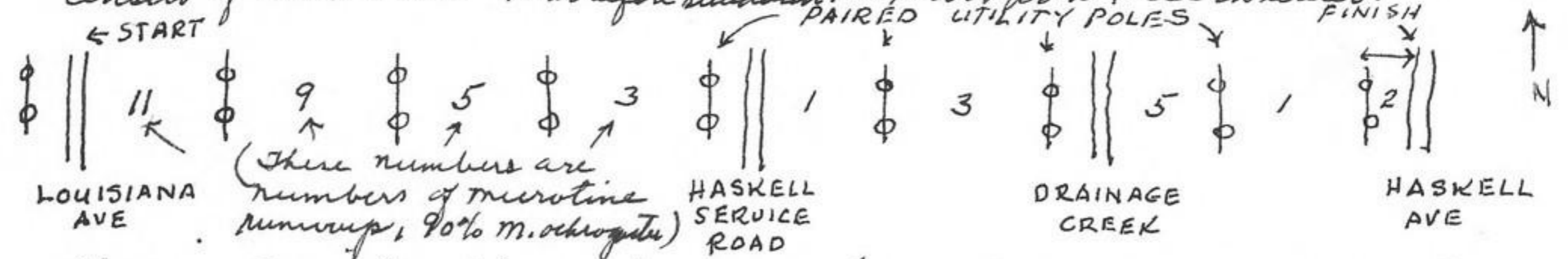
- Dec 15, 3:00 to 3:45 10 redtails
- Dec 16 Approx 12:05 to 12:50 16 redtails

An unusual distribution of redtail was noted in that on the return trip from Omaha to highway 24 W of Topeka, ~~at~~ there were no redtails noted between Omaha and the Kansas State line and 28 were observed from the Kansas State line to Highway 24, the increase in numbers being rather abrupt at State line. As the topography and climate is similar, I am wondering if the distribution is correlated with ^{the difference of} predatory control programs of the two States. A general broadcast of poison food in Nebraska could decimate the hawk population.

Haskell Bottoms, S Lawrence, Douglas Co., Kansas

Dec 20, 1968

Made mammal census in a transect between Louisiana Street and Haskell Ave at utility line that cross the Haskell Bottoms from W to E. See previous census of this area. 1/2 hr before sundown, temp about 33°F, see in water.



There is considerable water along transect, especially or nearly always in NS drainage lows. As a result of this water there is an unusual number of crayfish generally distributed. This year there has not been grazing and grass is unusually well developed but weeds & young elm trees have kept normal grass development down. Birds noted: 1 marsh hawk, 1 meadowlark, 1 sparrowhawk, 18 tree sparrows, 1 song sparrow,

Lawrence, Douglas Co., Kansas

Dec 22, 1968

Preparation for Christmas vacation to New Orleans and gulf coast. Check list:

- | | | |
|-------------------------|------------------------|----------------------|
| vitamin capsules | • 5 sleeping bags | fry pan |
| ice | • extension cord | sauce pan |
| butter | • binoculars | cake pan |
| sugar - saccharin | • sun glasses | dish pan |
| cakes - tarts | • recorder & tapes | Coffee pot |
| cereals | • flashlight's | knife - fork - spoon |
| instant pastern | • batteries | spatula |
| bread | • first aid | matches |
| peanut butter | • ear syringe | cups - plates |
| jelly | • aspirin - pills | thermos bottle |
| prebs - coffee | • bandaid | thermoses - |
| soft drinks | • burn sox | dish detergent |
| kash | • shower | dish cloth |
| dry milk - | • light for trailer | soup |
| eggs | • hatchet - saw | Sos pads |
| | • shovel | Collecting equip. |
| | • bucket | • cotton |
| | • 5 gal jug | • wire |
| | • hydraulic jack | • pins |
| | • knee boots | • labels |
| warm clothes - caps | • car registration | • scales |
| dress clothes | • credit cards | • pins |
| rainwear | • drivers licenses | • gun - shells |
| swim suits | • radios | • dry box |
| warm weather ware | • ref. books | • mm ruler |
| cheque 255-388-710 (10) | • butane | • mm tape |
| 428-456-855 (5/20) | • watch (fix strap) | • thread |
| | • camera, film | • needles |
| | • exposure meter | • saw dust |
| | • cleanet | • oat meal |
| | • movie camera - film | • rapidograph |
| | • eye specs. | • ink |
| | • alarm clock | • poly. bags |
| | • 12 heater & gasoline | • journal paper |
| | • extra blankets | • rate book |
| | • pillows | • traps |
| | • sheets | • cap |
| | • trailer spare tire | |
| | 6.50-13 | |

Lawrence, Douglas Co., Kansas
Dec 23, 1968

Left Lawrence from 1620 Tenn at mileage 18293, 3:15 P.M.
Temp. 32° F. Day clear and wind from NW, will keep complete
census. ^{20 mi.} Opasun rd hill water higher (3 ft) than usual,
Eng sp. 6, starling 3, meadowlark 3, Pleasant Grove 18302 Ponds & water frozen. redtail 1-1-1-1; meadow

lark 1-1-1- starling 1-4. marsh hawk 1
Eng sp 8 loggerhead shrike 1- titmouse 1
Othawa 18320, temp 26°, 3:46 P.M. black-capped chickadee 1

Starling 3-6- Eng Sp 1-6-26-3
sparrow hawk 1- meadowlark 1-
marsh hawk 1-1- redtail hawk 1-1-1-1-

~~Eng sparrow 3~~
Richmond, 18337, 4:15, temp 28° F
Eng sparrow 1-13-3- starling 6-8-1-2-18-1-
loggerhead shrike 1- sparrow hawk 1-

Some ponds with open water.

Garnett, 18347, 4:30. (Lake S of town open), and oak Lawrence
vegetation more scrubby & more grass than
starling 3-6- loggerhead shrike 1-
meadowlarks 5-1-4-3-2-4- 6-4-6-1-1-1-8-4-1-1-16-1-
redtail 1-1- marsh hawk 1-

starling 400-1- Eng sparrow 3

Lone Elm, 18362, 4:50, temp 28° F.
meadowlark 1-4-6-1- redtail 1-1-1-1-1-1-
starling 2-8- Eng sparrow 1-

Mildred, 18371, 5:00,
redtail 1- meadowlark 1-6-1-

5:10 P.M. sun now down beyond horizon.
Moran 18378 28° F end of census because of fading lights.
arrived Joplin, 18488, 9:00.

Joplin, Missouri
Dec. 24, 1968

Left 8:45 A.M. Temp. 18° F
no clouds, slight breeze from W.
crow 1-

Temp at 7:00 AM = 17° F.
Birds in area include crow and bluejay.
Eng sparrow 1-1-

(Shovel Creek vopouzing.)
Eng sparrows 6-2-1-10-12-
blue jay 1-2-1-1-1-1-2-
redtail 1-1-1-(rd kill)-1-1-1-1-
meadowlark 1-
fox squirrel 1-
mockingbird 1-1-
at 18533 more juncos

starling 1-1-1-1-4-30-30-4-5-1-2-1
crow 2-1-1-9-3-2-1-1-
raccoon rd kill 1
sparrow hawk 1-
cardinal 1-1-
chickadee 1-
kingfisher 1-

Arkansas Line, 18537, 9:53.

Starling 1

meadowlark 18-

Bella Vista 18543, 10:05.

starling 4-2-35-2-2-5-12-2-
1-11-2-

crow 1-

Eng sp 2-6-1-6-

bluejay 2-1-

Rogers, 18557, 10:55,

starling 6-1-33-20-20-6-6-4-
18-1-4-2-1-2-2

meadowlark 3

Springdale, 18569, 11:15, 34°F

starling 2-1-18-4-4-4-18-

Fayetteville, 18578, 11:30.

meadowlark 1-1-

raisettae for first time.

mockingbird 1-1-

bluebird 1

sparrow hawk 1-

Wurslow 18602, 12:00

Clear Creek Run 18617, 12:38

mockingbird 1

Mountainburg 18619 12:30

redtail 2-1-1-

mockingbird 1-1-

Van Buren 18639, 12:56

Drunwood ~~18663~~ 18663, 2:07

mockingbird 1-1-

downy woodpecker 1-

meadowlark 1-

Huntington 18675 2:21

Mansfield 18677 2:23

turkey vulture 1-1-

mockingbird 1-1-1-1-3-

robin 1-

Waldron 18699 3:01

starling 5-13-

ketzet meadowlark 1

flicker 1

possum Rdkill

Boles 18713 3:30

on highway 71. Temp 27°F
crow 4

meadowlark 1-

sparrow hawk 1-

cardinal 2

Eng. sparrow 2-2-2-2-

bluejay 1

Eng sp 6

See on ponds. (Census from airport)

starling 1-1-18-

crow 1-1-

(Willow green & yellow in damp places
at 18592.) Considerable ice on
cliffs.

(no birds over Boston Mt.)

Cardinal 2-

River greysk - green.

meadowlark 2-6-

shrike 1-

starling 14-

Cardinal 1-

Crow 1-

Turkey vulture.

(no birds)

meadowlark 1-1-

crow 2-

bluebird 2-

turkey vulture 2-

bluebird 3-

Cardinal 2-1-

meadowlark 2-1-6-6
 Cardinals 5-
 bluebirds 3
 starling - 6-2
 Mina 18737 4:04 45°
 Hatfield 18749, 4:30. temp. 48°F. Creek up all thru Arkansas
 mockingbird 1-
 Cove, 18754, 4:38
 mockingbird 1-
 weches 18766. 3:50 temp 42°F
 mockingbird 1- starling 21-6-
 Grannie 18771 4:57.
 sharp-shinned hawk.
 De Queens 18787. sundown 5:15³⁵ end complete census.
 Birdlife unusually scarce in Arkansas area.
 Arrived 3 mi n ^{Couchhatta} at 10:15 A.M.

3 miles n of Couchhatta Louisiana
 Dec 25, 1968

Left 9:25 A.M., temp 40°F, miles 18972. Birds at camp
 slate-colored junco, white-throated sparrow, Carolina chickadee,
 robin, ruby-crowned kinglet, mockingbird, red-breasted
 nuthatch, cardinal, ^{common} grackle, crow,

Couchhatta, 18975

starling 2-30-15-15-1-6-	Cardinal 3, 2,
2-1-1-2-4-18-6-1-1-	shrike 1-
vulture 1-	grackle 3-
blue jays 2-1-1-1-1-	Armodella woodpecker .
meadowlark	brufishes 1-1-
meadowlark 1-3-6-2-1	redtail 1-1-
Clarence 19002 10:10	grackle -1
reeddeer 1-1-1-	vulture 2-
mockingbird 1-1-	starling 1-2-6-4-2-
blue jay 1-	vegetable gardens in green
crow 1-	From last place mainly three
Montgomery 19017, 10:25.	crow 1-1-
pine forests,	sparrow hawk 1-
blue jay 1-	grackles - 80-4-3-6-
cardinal 2-1-	mockingbird 1-1-1-
bluebird 3-	starling 60-6-24-8
turkey vultures 5-	kingfisher 1-
shrike 1-1-	woodcock 6
shrike + opossum woodpecker.	

Boyce, 19042, 11:05 via detour.

mockingbird 1-1-1-1-1-2-
crows 3-2-
blue jay 1-

blue jay 1-1
starling 6-3-2-1-
shrike 1-

Alexandria 19066, 11:40, Temp 55°F

starling 1-1-1-1-1-2-4-4-4-
turkey vulture 1-6-1-
grackle 1-
bluebird 6-

Eng sp 1-8-12
mockingbird 2-1-1-1-1
crow 3
meadowlark 1-

Cherryville, 19090 12:05

starling 1-3-4-2-2-6-1-
Eng Sparrow 8-4-18-
mockingbird 1-1-1-1-1-1-2-1-1-1
turkey vulture 1-2-
sparrow hawk 1-

Trees characterized by short
and high straight branches
kingfisher 1
killdeer 1



Lebeau, 19121, 12:45, temp approx 58°F

mockingbird 1-1-1-

starling 40-
cardinal 1-

Eng Sparrow 6-
Krotz Springs

Opelousas, 19142, 1:10 P.M., 60°F.

Informant said: Cold weather
last of Jan to 1st of March.
Snow rare, see here.

crows 2-
mockingbird 1-1-1-1-
turkey vulture 1-
starling 2-18-6-130-2-6-
shrike 1-
sparrow hawk 1-

redtail ??
blue jay 3-2-
redtail 1-1-1-
black vulture

Mississippi River, 19179, 2:10. 56°

(no census there city of Baton Rouge)

Goodbee, 19249, 4:25. 54°F

mockingbird 1-
cardinal 1-

crows 300-130- (fruit flock + flyings)
starling 400

Covington, 19255, 4:31. 52°

Crossed 29 mi bridge across Pontchartrain Lake at
about sundown. approx 30 gulls (Herring gulls) and some
ducks.

New Orleans, Louisiana

Dec 27, 1968

Left 10:30, 19388

Wat Lake Outlet, 19498, 2:30, 73°F, high winds

starling 500- (at channel area) 1-
herring gull 2-1-3-2- (at river)

boat tail grackle 4-
common
bronze grackle 3-

Centerville, 19504 2:40

Franklin 19509 (end census) 2:50

Baldwin, 19515, 3:06 start census again. Sugar cone being harvested & new about 1 1/2 feet high

Joanette 19526, 3:30

starling 1-5-

skunk noddle

grackles 18

high wind maybe keeping birds down.

New Iberia 19538. 3:50

crows - 100

Common cowbirds } 800 - 400 - 300

starling } 800 - 300 -

blackbirds } 6000, 8000.

starling } mileage of abuse about

19549

rusty + Brewers

Decumbe 19551, 4:10

mixed R.W. blackbird, starling, grackle flocks etc. 200, - 3000 - 2000 - 800 -

Abbeville 19560, 4:25

These flocks were observed beyond to Koplau but in decreasing numbers. All flocks flying to S and against a strong south wind. Crows and flocks of blackbird seem to form large groups and move S in late evening. Continued to Interoceanic waterway arriving about 6:00 A.M. Rained up to midnight, catbird here.

Interoceanic Waterway, Highway 82, Louisiana.

Dec 28, 1968 almost clear sky.

Left 7:45, mileage 19593, temp 40°F, wind from NW. Continued to Pecan Island arriving at 19605. Birds in this area are: flocks of bronze & boat-tail grackles, starling & redwings but nothing compared to flocks of yesterday afternoon and evening. American egret, snowy egret, white faced glossy ibis, black night heron, ring-billed gull, ^{robin} coot, mallard, shoveller, white ibis, meadowlark, ^{crowned} forster tern, nutria, striped skunk, rabbit, red-tail (at Pecan Island). Continued on to S & west, pied-billed grebe, shrike, gadwall, ^{gray} heron, reddish heron?, king rail, blue-winged teal, killdeer, sparrow hawk,

Grand Chenier, 19626, 10:07, 50°F

sparrow hawk 1-1-1-1-1-

meadowlark 1-1-1

shrike 1-1-1

redwing 1-1

mockingbird 1-1

blue jay 2-

snowy egret 1-1

glossy ibis 4

Am egret 1

starling 1-1-3-1-1-6-

b.t. grackle 3-3-2-

woodpecker 1-

19632

Rubyfeeler

Refuge

hedgehog

grater

at Rockefeller Wildlife Refuge. Fulvous tree duck & whitelake deer
 census from here west. 19633-10:35- clear day
 redwing 6-8-1-1-1
 starling 3-2-6-25-1-600-1-
 grackle 6-6-2
 mockingbird 1-1-1-1-1-1-
 American egret 1-1-1-1
 snowy egret 1-1-1-3-4-1-
 shoveler 3-8-10-10
 robin 6-
 ducks 400-300-300-150-
 striped skunk rdhill 1-
 white faced ~~fox~~ dog 6-

sparrowhawk 1-1-1
~~kingfisher~~
 ring-billed gull 2-1-1-
 Coot 6-8-2-30-2-40-20-1
 meadowlark 1-1-1-2-
 shrike 1-1-1-1-1-
 kingfisher 1-1-1-
 b.t. grackle 1-1-
 black crown night heron 1
 redtail 1-
 yellow-crowned night heron 1
 common gallinule 2-1

mermentau River 19646 - 11:08 - Cacti on W side river

starling 6-18-6-18-2-6-
 kingfisher 1-1-1-1-
 b.t. grackle 6-2-
 snow egret 1-1-4
 mockingbird 1-1-
 Coot 2-

sp. hawk 1
 Am egret 1-1-1-1-
 shrike 1-1-1
 redwing 3-1-6
 opossum rdhill

Junction 82-27 19653, 11:20 Temp 52°F sky now 40% clouds

b.t. grackle 2-3-3-2-3-5-6-2
 starling -6-400-6-30-15-1-2-1-1-1-
 redwing 1-2-2-3-10-1-
 ducks 30-
 Am egret 1-1
 robin 3

mockingbird 1-1-1-1-
 shrike 1-1-1-1-
 redtail 1-1-1-1-
 sparrowhawk 1
 kingfisher 1-
 ring-billed gull 1
 snowy egret 1-1-
 cowbird 6 (in Cameron)

Cameron, 19666, 11:38.

Calcasieu Pass 19668, 11:47 at bridge noted: Ring-billed gull,
 Laughing gull, Bonaparte gull, b.t. grackle, black tern,
 forster tern, Am pelican. Well keep census beyond; (left
 12:45.

Am egret 1
 pied-bill grebe 1-2-1-1-1-4-2-1-
 g.b. heron 1-1-1-
 Coot 6-2-8-2-6-8-2-2-2-2-
 ring-billed gull 1-1-1

snowy egret 2-1-1-1-1
 Am egret 1-
 killdeer 1-
 ducks 60-
 cormorant 1

Holly beach 19678 1:00. Photo 681228-1 and 681228-2 of
 Chris & Pauly at Gulf. no birds except 3 killdeer
 Starling & grackle only bird in Holly beach.

went west & returned.

Haley Beach at 19684, now to n via 27. 1:30

- Coots 6-6-2-1-1-1-3-1-1
- red bill 2-2-2-2-3-
- am egret 1-1-1-1-
- snowy egret 1-1-1-1-1-1-1-1-
- gadwall 1
- redwing 8-6-
- sparrow hawk 1-
- g. b. heron 1-1-1-1
- grackle b.t. 1-
- kingfisher 1
- kingbird 1

Sabine Wildlife Refuge 19689 1:38

- red bill 1
- sp. hawk 1-1-1-1-1-1-
- Coat 1-1-
- starling 2-1-3- 3-
- shrike 1-1-1-1 1-1-
- marsh hawk 1-
- am egret 1-1-1-1-1 1-1-1-1-1-1-
- snowy egret 1-1-1- 1-1
- kingfisher 1-1-1 1-1-1
- b.t. grackle 1-1-5 1-1-3-6-5-
- redwing 1-1-2-
- rook and redbill 1- 1-
- ducks 40-40- 20-10-
- gallinule 2-
- gadwall 2-
- snow geese 3
- blue geese 2
- shoveller 1-
- little blue 1-1-1-1-1-1
- great blue
- merganser hooded
- curlew
- white eye
- forster tern
- w face glossy ibis 8-15-80
- meadowlark

headquarters 19696
1-1-1-

End wild life Refuge
19699

64 ← 6 (little blue)

End Wild Life Refuge 19699 2:05

- am egret 1-1-1-1-1
- snowy egret 1-1-1-1
- meadowlark 1-
- g. b. heron 1-
- Louisiana blue 1-1

- shrike 1-
- sparrow hawk 1
- b.t. grackle 1
- mockingbird 1-
- shrike 1

Hackberry, 2:20, 19704, 440F

19710 first lesser yellow legs and first group sandpipers
of approx 1000 - western sandpiper size shorebirds. 5
striped skunk road kills

Interstate 10, 19722, 2:55,

coot 1

starling 2-6-18-6

redtail 1-

crow - 2 -

~~Saline River~~

~~Black Bayou~~ 19745, 3:20

Saline Pass 19786, 4:40

opossum redhill 2-1-1

nutria "

raccoon "

hawk redhill 1

(top bridge is Texas State Line)

[Compare
with
refuge
areas]

Continued along gulf to
mileage 19800 and camped on beach. Enroute the

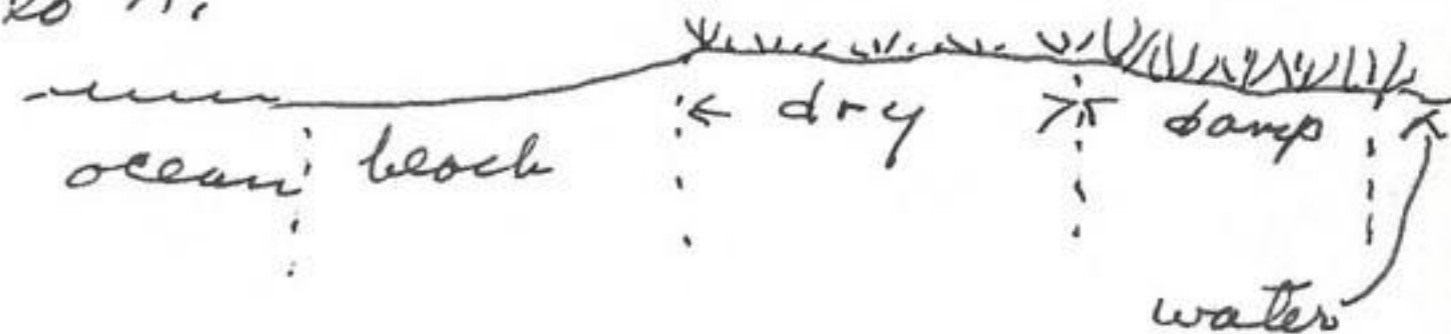
birds limited and habitat not as ideal as in Louisiana
with short, burnt over grazing lands and short form

vegetation of flat coastal flats to gulf beyond. Usual
birds. At camp on beach noted 12 great blue heron

flying by after sun down ^(5:23) and a group of 30 sandierling
feeding on beach. ¹⁸ Ringed bill gulls, ^{and 8 killdeer} on beach before
sundown but left shortly after. 6 scaup ducks

alighted in gulf waters. Set 50 traps from edge
upper edge ^{sandy + shell covered} beach to water to N.

Beach of sand and numerous
marine shells. 207 miles today.



Beachcamp
14 mi. SW Saline Pass, on highway 82, Texas
Dec. 29, 1968

Shortly after sun-up noted ring-billed gulls (8), willet (3), black-bellied
plover (2), sandierling (6), killdeer (12), great blue heron (1), forster
tern (4), scaup ducks (flocks of 5 to 100 and approx 500 all told),
grasshopper sparrow, meadowlark, savanna sparrow, laughing gull (2)
From dropline of 50 traps collected.

temp sun up 40°
at 10:00 air 56, water 51° F
high humidity

m. only 681229-1 Sigmodon

m. only 681229-2 "

681229-3 Peromyscus

m. only 681229-4 "

SKU 681229-5 Reithrodontomys

m. only 681229-5a Sigmodon

212-90-30-18-61 gms ♀ ut normal

210-86-28-18-55 gms ♀ ut normal.

160-75-18.5-12-20 gms ♂ testes 6 mm

152-66-18-12 gms ♀ ut normal.

115-50-15-11-7 gms ut normal. ♀

181-86-25-13-21 gms ♀ ut normal ^{small}

681229-11 feet of Chris & Polly m.

Photos 681229-6 Chris & Polly.

" 7 trailer

" 8 Chris & Polly

" 9 Annette

" 10 ray, crab, shells

Left 10:05, 19800, ^{water} 4, ^{and dry} perisits on beach. Nearly gurgled to 72.

681229-22 photo of fish.

- sharp grasshopper sparrow 1-1-1-1-1-1-1
- marsh hawk 1-
- sparrow hawk 1-1-1-1-
- shrike 1
- Baldpate 6-
- am egret 1-
- herring gull 1-
- meadowlark 1-2-1-1-
- crowbird 4
- redwings 8
- striped skunk rdkill.
- barn owl rdkill (16" total length)
- opossum rdkill 1-
- Royal tern 1-1-

[census at 19817 for one mile along beach

- blue bellied golden plover 1-1-1-1
- tuldeer 1-1-1-1-1-1-1
- sanderling 4-1-6-2-4-3-1
- laughing gull 1-1]
- Herring gull 1-1-1-1
- pipit 1-1
- tern small 1-1
- tern large 1

continuing above census since 19800 but starting at 19818 and exclusive of beach, as before became beach barrier excludes view of beach for most of the time.

- redwing 2-
- grass brown but some flowering plants out.
- shrike 1-
- marsh hawk 1-
- grasshopper sparrow 1-1-1-1-1

Jefferson Co line. 19823, 11:55. Clear day. Temp 62°F

Junction 124, 19826
sparrow hawk 1-1-1-

redtail 1

Gilcrest, 19833, 12:05 (beyond is a series of resort areas and not like area to E).

- meadowlarks 16-2-1-1-1-1-1-1-3-1-3-
- shrike 1-1-1-1-1-1-1-1-1- (some large)
- sp. hawk 1-1-1-
- starling 9
- pelican 18
- gulls 100
- redtail 1-
- am egret 1-

Crystal Beach, 19843-12:25,

- shrike 1-1-1-1-1-1-1-1-1-1-1-1-
- area of offshore bar like travelling across Kansas (no water).
- sp hawk 1-1-1-1-1-1-1-
- snowy egret 1-
- swallow sp? (tree)
- butterfly (first observed)
- long-billed dowitcher 1-
- meadowlark 1-1-1-1-1-
- opossum rdkill.

End 19855 1 mile before ferry. 12:43

at Ferry 19855,

- pelican (2)
- herring gull 1%
- laughing gull 98%
- cornorant (18)
- Boisfort gull
- ringed bill gull .1%
- royal tern
- Forster tern
- approx 200 at boat.
- Photo 681229-23 laughing gulls on ferry
- Photo 681229-24 ibid and other kinds of gulls.
- Photo 681229-25 ibid

In Galveston Temp 68°F

Left at 19861, 1:35, 68°F

Some marshes n of Galveston, with usual aquatic birds including am egret, snowy egret, great blue herons, etc. 3 redtails to S limits of Gilbert. Area of Houston too commercialized for census. visited Nassau. On to Huntsville via highway 45 and 75. and too highly developed for census, even thru forested area. Arrived Huntsville about 6:00 P.M. & had new bearing in left rear wheel. Camped at Huntsville State Park at mileage 20013. Frog & Crickets calling. Temp at 8:30 = °F. As usual bird life is scarce thru forested area. 213 miles today.

Huntsville State Park, Texas (Walker Co.)
Dec. 30, 1968

Left 20013, 9:15, Temp 60°F
Birds at camp.

Crow
Mallard
Pileated woodpecker
Pine siskin
Goldfinch
Bluebird
Song sparrow
Robin
g. horned owl
Sharp-shinned hawk
Cared grebe
Kingfisher
Red shouldered hawk.
Carolina wren
White tailed deer

Spanish moss on trees.
White-breasted nuthatch
White crowned sparrow
Green winged teal
Carolina chickadee
fox squirrel
Red bellied woodpecker
Flicker
Downy
Myrtle warbler
Hairy
Cardinal
Brown creeper
Ruby kinglet
Golden crowned kinglet
Yellow bellied sapsucker
Slate colored junco
Pine warbler

Continued census along ^{Interstate} highway 45-75 north. Drizzle rain
Forest-savanna
Sparrow hawk 1-
Crow 4-1-2-1-1-1-3-3-1-1-
Starling 300-2-4-2-2-
blue jay 1-1-1-1-
meadowlark 1-3-
redtail 1-1-1-1-

Madisonville, 20051, 10:10, Temp 61°F (Country flat & isolated trees
(cascadum) or groups)
Crow 2-1-2-2-
Sparrow hawk 1-1-
Blue jay 1-
Starling 3-
meadowlark 1-1-4-
redtail 1-1-1-1-1-1-
mistle thrush still in trees

Centerville 20074 10:37 Temp. 60°F.

Drizzle & clear
most of way this
A.M. no wind

Following along old road.

sparrow hawk 1-1-
kingfisher 1-
starling 1-3-150-1-
blue jay 3-1-2-2
eng sparrow 6-

crow 1-2-
redtail 2-1-1-
robins 6-
meadowlark 1-1-3-

Buffalo, 20093, 11:00, 60°F

bluebirds 3-3
sparrow hawk 1-1-1-1-
kingfisher 1-

sky clearing + up to 62°F
starling 2-2-
redtail 1-
eng sp. 3

Dew, 20103, 11:13, 64°F

meadowlark 1-1-1-
starling 80-4-1-1-
sparrow hawk 1-1-
eng sparrow 1-2-

blue sky showing
crow 1-
bluebirds 2-

Fairfield, 20113- 11:24, 64°F

turkey vulture 2-1-1-1-8-
sparrow rdkill 1-1

(with clearer skies - more wind)

Highway 45 (Interstate) 20127,

sparrow hawk 1-1-1-
starling 3-300-8-1-4-16-1-
turkey vulture 1-1
crow 1-1-

eng sp 2-
redtail 1-1-1-
11:40, 68°F.

Ellis Co line, 20163, 12:30, temp ⁶²/~~68~~°F. (just before Alma)

turkey vulture 1- End complete census.

1:45 PM - V 45° - M 2246 - Turkey Vulture V-40°

~~Sanger~~ 3:30-40°F 20263 - " "

Sanger 20264, 3:31, temp 40°F

Wilson's snipe 1-

meadowlark 1-1-2-8-2-1-1-
4-2-4-2-6-3-6-1-3-4-4-8-1-

starling 8-4-2-7-2-2-

sparrow hawk 1-

spotted skunk rdkill 1-

Valley View (outskirts) 20274, 3:40

Valley View no city limits, 20276, 3:43, temp. 36°F

meadowlark 2-1-1-7-1-5-2-1-

starling 3-200-

raccoon rdkill 1-2-

Elm Fork Trinity River, 20284, 3:52

redtail hawk 1-

North Gainsville city limits, 20290, 4:25, temp 33°F

sparrow hawk 1-1-

starling 15-

raccoon rdkill 1-1-

crow 4-

Red River , 20295 , 4:32 , temp 32°F

Oklahoma border, US. of A.

marsh hawk 1-

meadowlark 0-1-2-6-1-

blue jay 1-

starling 26-1-18-5-2-

striped skunk rdkill 1-

~~Marietta , 20312 ,~~

Marietta , 20312 , 4:53 , temp 28°F

starling 30-30-

Hickory Creek , 20320 , 5:02 , temp 26°F

grackle 10 - starling?

ponds open & end of census

NE 1/4th St.

Camped at mileage 20460 after visiting Gayland Giller in Norman.
First snow in Norman, only in protected places.

Approx. 16 mi: n Oklahoma City (center of town)

Left 8:00 A.M. at mileage 20460. ^{see 31, 1968}

Sky clear, wind from n,

Crows 5-7

Trailer, 80°F upper bunk, 60°F
lower bunk, floor 20°F, outside -2°F

Coffee Creek Road, 20462, 8:07, temp -2°F

crow - 1-3-3-

starling 4-

blue jay 1-

Logan Co. line. 20467 8:15, temp. 0°F. Ponds & water frozen

crow - 1-4-1-2

starling 3-2-3

meadowlark 1-2-6-3-1-3

redbellied woodpecker 1-

junco band 20484

Eng sp 3-

Snow increasing but only as drifts.

Cymarew River 20488, 8:50, temp 2° river frozen

crow 1-1-2-

meadowlark 1-3-2-3-2-3-5-2

Wade Co., 20502, 9:30, temp 5°F (snow now drifts on all surfaces)

meadowlark { 1-1-1-2-6-2-1-5-1-3-1-1-1
2-1-1-2-1-2-1-1- Crow 1-1-1-
1-1-3-2-3-6-1-1- }

redtail (2 about 8 inches apart) - 1-1-1-1-
on limb & facing sun

starling 1

Eng sparrow 1-2

12 mi per hour

Bellings turn-off. 20531, 10:10, temp 5°F, clear skies, slight ^{wind}

meadowlark 2-1-2-1-2-

bare in places

Kay County 208 20535, 10:18. Ground with general snow but

meadowlark 1-2-1-7-26-5-1-

starling 30

6-4-2-7-4-1-1-2-4-3-1-1-

redtail 1-1-

Eng sparrow 1-

marsh hawk 1-

horned lark 4-

Kansas State 20566, 10:55, 4°F, more ground surface snow

meadowlark 8-1-4-3-2-13-3

redtail 1-1-1-1-

6-4-2-4-3-2-

crow 1-2-

Hawks low in trees.

Eng sp 4-

Wellington, Kans 20587, 11:25, temp 50F (Turnpike Gates)
meadowlark 2-1-2-1-1-1-7-
2-4-1-2-1-
sparrow hawk 1-
redtail 2-1-1-1-1-1
Crow 1-2-1-2-1-1-
starling 30
striped skunk rdhell 1-

junction 81 at ^{wichita} ~~wichita~~, 20, 612, 12:12, (end census)
Towanda Service Center, Turnpike, 20637, 1:30, temp 18, Begin census

redtail 1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-
striped skunk rdhell 1-1-1-
meadowlark 30-
marsh hawk 1-1-1-1-
crow 1-3-2-1-1-
American roughleg 1-1-1-
[20660 (most above between here and Towanda, will keep census continues thru 20660 and out below.)] (a restricted area between 20637 and 20660 definitely a winter population of hawks)

Matfield Green Service area 20672 2:20, temp 14°F
redtail 1-1-1-
marsh hawk 1-1-1-
crow 1-
horned larks 4-

Cattle Pens (Bazaar Cattle Crossing) 20687, 2:40, temp 16°F
snow on ground but grass projecting. Elev 1575 ft.
roughleg 1-
meadowlark 2-

Pike Township Road (Bridge 144) S of Emporia, 20698, (now out of hills)
2:55, temp 21°F
redtail 1-1-1-1-1-
meadowlark 4

Cottonwood Ln 20703, 3:00 (end of census thru Emporia)

Neosho River 20708, 3:05, 22°F
redtail 1-1-3-1-1-1-1-1-1-
sparrow hawk 1-
sparrow hawk 1-

Admire 20727, 3:30, 26°F
redtail
marsh hawk 1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-
roughleg 1-
meadowlark 6-1-
crow 1-
marsh hawk
redtail 1-1-
bobwhite 1-
sparrow hawk 1-
red-headed woodpecker

Wanamaker bridge 20754, 4:05, temp 21°F
starting 150-80-
blue jay 2
mourningdove 2
red-headed woodpecker 1
20°F

White Lakes on Turnpike 20761- 4:21, (less snow here than to S)
meadowlark 4-1-1-
Eng sparrow 12
marsh hawk 1-
cedarwaxwing 8
redtail 1-1-1-1-1-1-1-1-1-
Harris sparrow 12
starling 1-6-9
tree sparrow 15-6

Lawrence, W gate 20788, 4:48, temp 19°F, End census

Birds observed on trip Dec 23, 1968 to Dec. 31, 1968.

- | | |
|------------------------|-----------------------------------|
| horned lark | white-faced ibis |
| house sparrow | black-crowned night heron |
| starling | ring-billed gull |
| loggerhead shrike | American Coot |
| marsh hawk | mallard |
| redtail | pintail |
| titmouse | shoveller |
| black-capped chickadee | white ibis |
| sparrow hawk | Forster Tern |
| meadowlark | pieb-bill grebe |
| crow | gadwall |
| blue jay | Louisiana heron |
| mockingbird | king rail |
| cardinal | blue-winged teal |
| Carolina chickadee | yellow-crowned night heron |
| belted kingfisher | common gallinule |
| downy woodpecker | laughing gull |
| turkey vulture | Bonaparte's gull |
| robin | black tern |
| eastern bluebird | American ^{white} pelican |
| yellow-shafted flicker | double-crested cormorant |
| sharp-shinned hawk | great-blue heron |
| slate-colored junco | snow goose |
| white-throated sparrow | blue goose |
| ruby-crowned kinglet | little blue heron |
| red-breasted nuthatch | hooded merganser |
| common grackle | lesser yellowlegs |
| killdeer | western sandpipers ? |
| black vulture | sanderlings |
| herring gulls | lesser scaup duck |
| boat-tailed grackle | willet |
| red-winged blackbird | black-bellied plover |
| rusty blackbird | grasshopper sparrow |
| cow bird | Savanna sparrow |
| Brewers blackbird | water pipit |
| catbird | baldpate |
| American egret | barn owl |
| Snowy egret | royal tern |

- long-billed dowitcher
- tree swallow
- cattle egret
- pileated woodpecker
- american goldfinch
- song sparrow
- great horned owl
- eared grebe
- red-shouldered hawk
- pine siskin
- white-breasted nuthatch
- white-crowned sparrow
- green winged teal
- red-bellied woodpecker
- myrtle warbler
- brown creeper
- golden-crowned kinglet
- yellow-bellied sapsucker
- pine warbler
- Wilson's snipe
- American roughleg hawk
- bobwhite
- red-headed woodpeckers
- mourning dove
- Harris' sparrow
- tree sparrow
- cedar waxwing
- redheaded woodpecker

Mileage at localities on trip between Dec. 23, 1968 and Dec. 31, 1968.

Locality	Mileage	Count	Locality	Mileage	Count
<u>Lawrence</u>	18293	27	<u>Wax outlet Lake</u>	19498	243
<u>Pleasant Grove</u>	18320	17	<u>Centerville</u>	19504	6 } 11
<u>Richmond</u>	18337	10	<u>Franklin</u>	19509	5 } 11
<u>Garnett</u>	18347	15	<u>Baldwin</u>	19515	6
<u>Lone Elm</u>	18362	9	<u>Jeanerette</u>	19526	11
<u>Mered</u>	18371	7 } 16	<u>New Iberia</u>	19538	12
<u>Moran</u>	18378	110	<u>Decombre</u>	19551	13
<u>Joplin</u>	18488	49	<u>Abbeville</u>	19560	9
<u>Arkansas line</u>	18537	6	<u>Grand Chenier</u>	19626	66
<u>Belle Vista</u>	18543	14 } 20	<u>Rockefeller Refuge Hdq.</u>	19632	6
<u>Rogers</u>	18557	12	<u>mermentau River</u>	19646	14
<u>Springdale</u>	18569	9	<u>Junction 82-27</u>	19653	7
<u>Fayetteville</u>	18578	24	<u>Cameron</u>	19666	13
<u>Winslow</u>	18602	15 } 17	<u>Calcasieu Pass</u>	19668	2
<u>Clear Cr. River</u>	18617	2 } 17	<u>Hollybeach</u>	19678	10
<u>Maintainburg</u>	18619	20	<u>Hollybeach</u>	19684	6
<u>Vaw Buren</u>	18639	24	<u>Sabine Wildl. Ref.</u>	19689	5
<u>Greenwood</u>	18663	12 } 15	<u>End of " " "</u>	19699	10
<u>Huntington</u>	18675	3 } 15	<u>Hackberry</u>	19704	5
<u>Mansfield</u>	18677	22	<u>Interstate 10</u>	19722	18
<u>Waldron</u>	18699	14	<u>Sabine River</u>	19745	23
<u>Bales</u>	18713	25	<u>14 mi. SW Sabine Pass</u>	19800	55
<u>Mina</u>	18737	12	19817	19817	17
<u>Hatfield</u>	18749	5 } 22	19818	19818	1
<u>Cove</u>	18754	12 } 22	<u>Jefferson Co. line</u>	19823	5 } 15
<u>Wiches</u>	18766	5 } 22	<u>Junction 124</u>	19826	3 } 15
<u>Grannis</u>	18771	16	<u>Dilcrest</u>	19833	7 } 15
<u>De Queene</u>	18787	188	<u>Crystal beach</u>	19843	10
<u>Corshatta</u>	18975	27	<u>1 mi. E. Ferry</u>	19855	13
<u>Clarence</u>	19002	15	<u>Galveston</u>	19858	3
<u>Montgomery</u>	19017	24	<u>Huntsville State Park</u>	20013	155
<u>Boyce</u>	19042	24	<u>Madisonville</u>	20051	38
<u>Alexandria</u>	19066	24	<u>Centerville</u>	20074	23
<u>Cheneyville</u>	19090	31	<u>Buffalo</u>	20093	19
<u>Lebeau</u>	19121	21	<u>Deer</u>	20103	11
<u>Krotz Spring</u>	19142	37	<u>Fairfield</u>	20113	10
<u>Mississippi R.</u>	19179	70	<u>Interstate 45</u>	20127	14
<u>Goodbee</u>	19249	6	<u>Ellis Co. line</u>	20163	36
<u>Covington</u>	19255		<u>Sanger</u>	20264	101

Valley View	20275	
Elm Fork Trinity R.	20284	9
(City Limits)		
North Gainesville	20290	6
		5
Red River	20295	15
Marcella	20312	8
Nickony Creek	20320	40
16 mi N Okla. City	20460	2
Coffee Cr. Road	20462	5
Logan Co. line	20467	21
Cimarron River	20488	14
Table Co. line	20502	29
Bellings turnoff	20531	4
Kay County line	20535	31
Kansas State line	20566	21
Wellington	20587	25
Junction 81, Wichita	20612	25
Tawanda Ser. Center	20637	25
20660	20660	12
Matfield Green Ser. C.	20672	15
Bazaar Cattle Crossing	20687	11
Pike Township Rd. 144	20698	5
Cottonwood River	20703	5
Neosho River	20708	19
Admire	20727	27
Wanamaker Bridge	20754	7
White Lakes on Turn Pike	20761	27
Lawrence	20788	

9 }
6 } 20
5 }

2 }
5 } 7

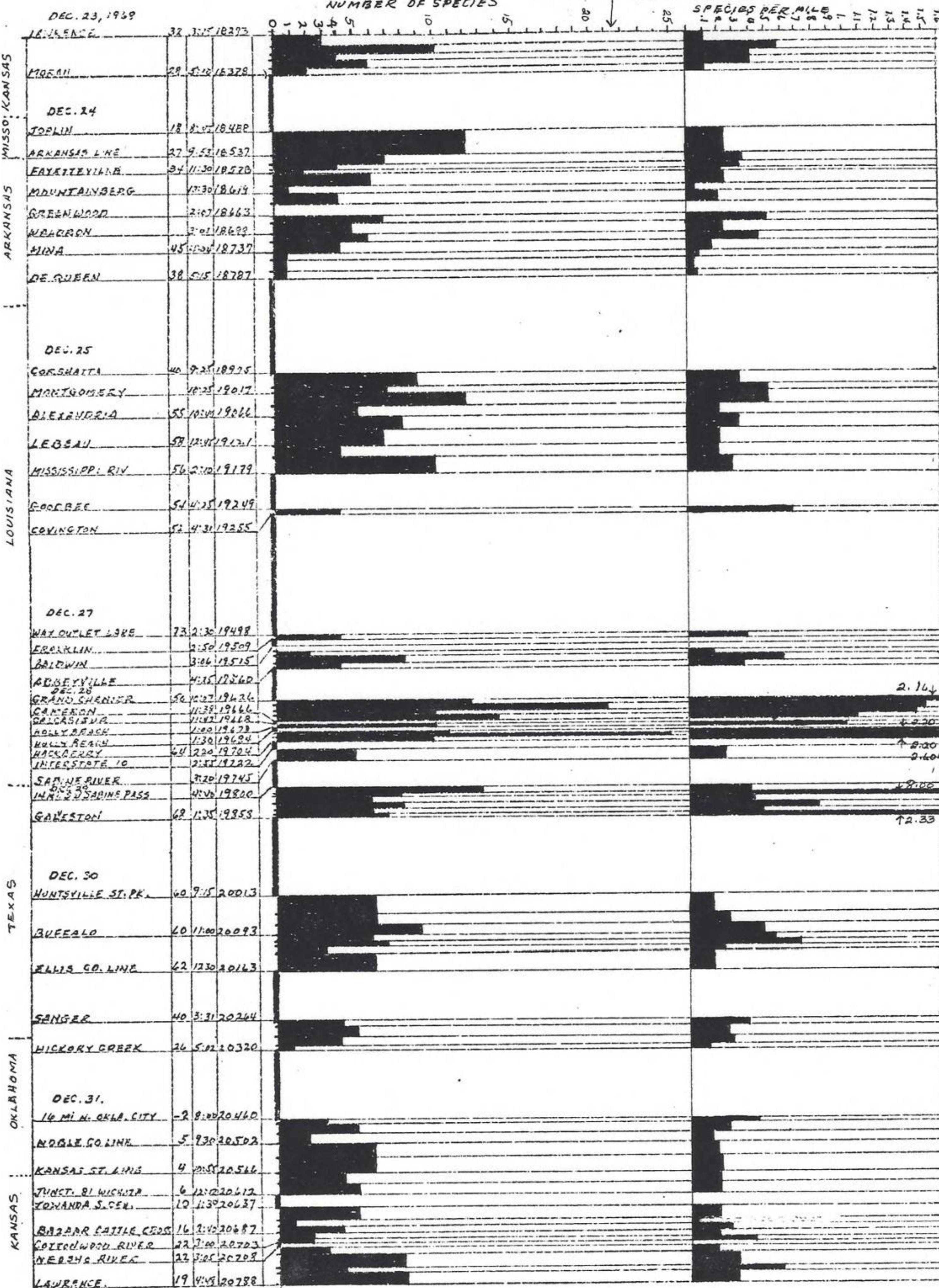
29 }
4 } 33

DEC. 23, 1969

NUMBER OF SPECIES

18 = 15 SPECIES 68 | 231 - 203

SPECIES PER MILE



SCALE OF DISTANCE
1 MM = 10 MI

DEC. 23, 1968

PER MILE
0 1 2 3 4 5 6 7 8 9 10

MISSOURI KANSAS
 ARKANSAS
 LOUISIANA
 TEXAS
 OKLAHOMA
 KANSAS

LAWRENCE	32	3:15	18293	
MORAN	28	5:10	18378	
DEC. 24				
TOPLIN	18	8:45	18468	
ARKANSAS LINE	27	9:53	18527	
FAYETTEVILLE	34	11:30	18576	
MOUNTAINBERG	42	30	18619	
GREENWOOD	2	07	18662	
WALDEON	3	01	18699	
MINA	45	4:24	18737	
DE QUEEN	38	5:15	18797	
DEC. 25				
CORSHATTA	40	9:25	18775	
MONTGOMERY	48	25	19017	
ALEXANDRIA	55	10:30	19066	
LEBEAU	58	12:45	19121	
MISSISSIPPI RIV	56	2:10	19179	
GORDLEE	54	4:25	19249	
COYINGTON	52	4:31	19255	
DEC. 27				
WAX OUTLET LAKE	73	2:30	19499	
FRANKLIN	2	50	19509	
BALDWIN	2	06	19515	
ABBEYVILLE	4	25	19560	
DEC. 28				
GRAND CHENIER	50	10:07	19626	
GAMERON	11	38	19666	
GALCASKRUM	11	42	19668	
HOLLY BEACH	1	00	19678	
HOLLY BEACH	1	30	19684	
HACKBERRY	64	2:20	19704	
INTERSTATE 10	2	55	19727	
SABINE RIVER	3	20	19745	
DEC. 29				
HAMILTON SABINE PASS	4	50	19800	
GARRESTON	68	1:35	19858	
DEC. 30				
HUNTSVILLE ST. PK.	60	9:15	20013	
BUFFALO	60	11:00	20093	
ELLIS CO. LINE	62	12:30	20163	
SANGER	40	3:31	20264	
HICKORY CREEK	26	5:12	20370	
DEC. 31				
16 MI N. OKLA. CITY	-2	8:00	20460	
NOBLE CO LINE	5	9:30	20502	
KANSAS ST. LINE	4	10:55	20566	
JUNCT. R1 WICHITA	6	12:50	20617	
TOWANDA S. CEN.	10	1:30	20637	
BAZAAR CATTLE CROSS	16	2:40	20687	
COTTONWOOD RIVER	22	3:40	20703	
NEOSHO RIVER	22	5:05	20708	
LAWRENCE	19	4:48	20788	

SCALE OF DISTANCE
1MM = 10 MI

TOTAL 139 REDTAIL
TOTAL 72 MOURNINGBIRD

DEC. 23, 1968

681231-205

MISSOURI	KANSAS	LAWRENCE	32	9:25	18293	
		MORAN	28	5:10	18378	
DEC. 24						
ARKANSAS	TOPLIN	18	8:45	18488		
	ARKANSAS LINE	27	9:53	18537		
	FAYETTEVILLE	34	11:30	18578		
	MOUNTAINBERG	41	1:30	18619		
	GREENWOOD	48	2:07	18663		
	WALDRON	51	3:01	18699		
	MINA	45	4:00	18737		
	DE QUEEN	38	5:15	18787		
DEC. 25						
LOUISIANA	CORSHATA	40	9:25	18975		
	MONTGOMERY	46	10:25	19017		
	ALEXANDRIA	55	10:40	19056		
	LEJEUNE	58	12:40	19121		
	MISSISSIPPI RIV	56	2:10	19179		
	GOOD BEH	54	4:25	19249		
	COVINGTON	52	4:31	19255		
	DEC. 27					
	TEXAS	WAX OUTLET LAKE	73	2:30	19498	
		FRANKLIN	71	3:50	19509	
BALDWIN		69	5:06	19515		
ROSEYVILLE		67	4:35	19560		
GRAND CHENIER		59	10:07	19626		
CAMERON		57	11:59	19666		
CALCESCIVUR		56	11:42	19668		
HOLLY BEACH		55	1:00	19678		
HOLLY BEACH		54	1:30	19685		
HACKBERRY		64	2:20	19704		
INTERSTATE 10		63	2:55	19722		
SABINE RIVER		62	3:20	19745		
14 MI. S. SABINE PASS		61	4:40	19800		
GARRESTON		68	1:25	19858		
DEC. 30						
OKLAHOMA	HUNTSVILLE ST. PK.	60	9:15	20013		
	BUFFALO	60	11:00	20093		
	ELLIS CO. LINE	62	12:30	20163		
	SANGER	40	3:31	20264		
	HICKORY CREEK	36	5:01	20320		
DEC. 31						
KANSAS	16 MI. N. OKLA. CITY	-2	8:00	20460		
	NOBLE CO. LINE	5	9:30	20502		
	KANSAS ST. LINE	4	10:55	20566		
	JUNCT. 81 WICHITA	6	12:12	20612		
	TOWANDA S. CEN.	10	1:30	20637		
	BAPPAAR CATTLE CROSS	16	2:40	20682		
	COTTONWOOD RIVER	23	3:00	20705		
	NEO SHO RIVER	22	3:05	20708		
LAWRENCE	19	4:05	20788			