

APPENDIX E

ANNOTATED CHECK LIST OF AQUATIC INSECTS OF GLEN CANYON

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The following report covers the aquatic insects collected on the 1958 ecological survey conducted in Glen Canyon by the University of Utah.

The importance of ascertaining the abundance and types of aquatic insect fauna found in the Colorado River and adjoining tributaries cannot be minimized. The survey of 1958 may have been the last opportunity available to discover and study the many varied aquatic insects found in this isolated region before inundation. Few previous investigations of aquatic insects of Glen Canyon have been made. The inundation of the canyon and tributary bottoms by the reservoir will obliterate many local ecological habitats and the indigenous aquatic insect fauna will be lost or modified.

A total of 2315 individual aquatic insects were collected and identified. Included are more than 91 species representing 73 genera, 41 families, and eight orders. Of the more than 91 kinds treated, 57 have been accurately determined to species. The remaining 34 are identified only by genus. The great bulk of aquatic insects was collected from tributaries; only 247 were taken from the river, and the bulk of these were at the mouth of tributaries. For habitat data and tabulation of insects collected, see Aquatic Survey Tabulation, Appendix A.

ACKNOWLEDGMENTS

In the identification of specimens and preparations of this list, the writer has had assistance from the following: mayflies, George F. Edmunds, Jr.; mosquitoes, Lewis T. Nielsen; caddiceflies, Gerald R. Smith; the aquatic moth, W. H. Lange, Jr.; two troublesome corixids, H. B. Hungerford; dytiscid beetles, Russell Anderson; elmids beetles, Ira LaRivers; two difficult dragon flies and damsel flies, Lenora K. Gloyd; the tendipedids, Selwyn A. Roback; and two difficult hydrophilid beetles, F. N. Young.

LIST OF AQUATIC INSECTS COLLECTED

EPHEMEROPTERA (order) Mayflies

Oligoneuriidae (family)

Homoeoneuria sp.

Three nymphs of this genus were collected in Escalante River approximately 1 mi. above its mouth. Apparently they burrow into the sandy bottom at a depth of 2 to 3 in. Exhaustive collecting failed to provide more specimens. This particular genus has not heretofore been recorded from the state of Utah, and is apparently a new species.

Lachlania powelli Edmunds 1951

This species was named from specimens taken at Hideout Canyon on the Green River (Edmunds, 1951) and was found to be relatively scarce in Glen Canyon. Only two nymphs and one adult were taken; the nymphs were from Trachyte Creek, the adult was floating among debris in the Colorado River at Music Temple.

Heptagenia elegantula (Eaton) 1885

Occurring throughout the Colorado River drainage, this species, although found in tributaries, was abundant in the river itself in Glen Canyon.

Baetidae (family)

Baetis sp.

The 18 specimens of this genus collected in Glen Canyon were distributed in both river and tributaries.

Callibaetis sp.

Members of this genus were common inhabitants of rocky pools in the tributary canyons. Although specimens were taken from only a limited number of streams they were observed in almost every tributary investigated. Indeed, at Lake Canyon, where the stream was very shallow and flowed over the sandstone bedrock, the larvae of this small mayfly occurred in such abundance in the shallow depressions as to give the stream bottom a distinct grayish-black color.

Leptophlebiidae (family)

Traverella albertana (McDunnough) 1931

This very common species of Glen Canyon was found in greater concentrations in the river than in the tributaries. Several hatches were observed and many adults of this species were collected as they swarmed over the sandbars.

DRAGONFLIES

^{Tri}
tricorythidae (family)

Tricorythodes sp.

Six larval specimens, four from the Colorado River and two from the Escalante River constitute the only records for this genus in Glen Canyon, although the genus is widespread throughout the Colorado River drainage.

ODONATA (order) Dragonflies and Damselflies

^{Gom}
gomphidae (family) Dragonflies

Gomphus borealis MacLachlan 1873

The gomphid nymphs are burrowing forms, seeking concealment in the sandy and muddy bottoms of slow moving streams. Six small, immature specimens were found in a small canyon confluent with the Colorado River in exactly the habitat described above. They are rather widespread in Utah and perhaps more extensive collecting in Glen Canyon would reveal its presence in greater abundance.

Gomphus intricatus Hagen 1858

This species was the only representative of the genus Gomphus found in the Glen Canyon region. Only one specimen was taken in a shallow pond on an island in the middle of the river. One other large gomphid was observed moving off a sandbar in shallow water in the river proper and may have been this species.

^{Aesh}
aeshnidae (family) Dragonflies

Anax walsbyi MacLachlan

A species common to other parts of Utah, only two large nymphs were found in large pools of small tributary below Lake Canyon.

Aeshna palmata Hagen 1856 (?) or umbrosa Walker 1908 (?)

One of the more common dragonflies, this form was encountered in almost every tributary stream, preferring large pools and quiet waters. The nymphs varied from first to last stage instars. The relative paucity of adults seemed to indicate late emergence of this dragonfly in the canyon.

^{Libellulidae}
libellulidae (family) Dragonflies

Libellula gonanthe Calvert 1907

These were encountered in the majority of the tributary streams, although collected from only a few. Most of the nymphs are immature, and accurate determination to species was difficult. This form is closely related to L. saturata and with further study may prove to be the latter.

LIST OF AQUATIC INSECTS COLLECTED

Libellula saturata Uhler 1857

These are hairy, squat nymphs, adapted for burrowing into the soft mud and ooze in stream bottoms. Superficially, they resemble the comanche. The adults of this species, large brilliant red, like the dragonflies, were very abundant in the side canyons.

Tarnetrum corruptum (Hagen) 1861

Found only in southern Utah, two nymphs were taken in two small tributary streams. No other specimens were encountered. This insect is known to winter in the adult stage.

Paltothemis lineatipes Karsch 1890

Another species indigenous to southern Utah was found to be rather scarce. Only two specimens were collected, from Sevenmile and Warm Spring creeks. Perhaps more extensive collecting would have revealed its presence in greater abundance.

Pantala hymenaea (Say) 1839

A very common inhabitant of rock pools and depressions in most of the tributary canyons, this species appeared to be very abundant. Several adults were observed in the area around Hite. The last three species mentioned prefer stream bottoms in which the water has formed shallow depressions filled with a shallow layer of ooze. They are definitely accustomed to warmer water than are most of the other dragonflies.

Lestidae (family) Damselflies

Archilestes grandis (Rambur) 1842

This damselfly was by far the most abundant representative of the Odonata in Glen Canyon. Nymphs occurred in almost every tributary stream, preferring shallow depressions and rock pools. The vast majority of the specimens taken during July are last stage nymphs reaching lengths of over 40 mm. A post-expedition collection made in September contained no nymphs of this species. Only one adult was taken during the survey in July. Apparently the period of emergence must occur during late August and early September.

Coenagrionidae (family) Damselflies

Argia emma Kennedy 1915 (?) or Hyponeura lugens Hagen 1861 (?)

This damselfly represented by two immature nymphs, was the only species taken from the Colorado River. These were taken from riffle areas which seem to be its most favorable habitat.

Argia vivida Hagen 1865

A very common damselfly, found in almost every tributary sampled.

BUGS

Angitia pedula (Hagen) 1861

This species was found in very small numbers in a few of the tributary streams. Prior to this survey, it had not been reported from Glen Canyon.

Enallagma spp.

Members of this genus are represented by seven specimens, all nymphs, from four different tributary streams. Close examination proved the presence of at least two different kinds, although specific determination of these is impractical for lack of adult material.

HEMIPTERA (order) Bugs

Psephenidae (family) Waterboatmen

Psephenus abdominalis (Say) 1832

This large species of water boatman was one of the most abundant forms of aquatic Hemiptera encountered in the tributary streams. Large rock pools, depressions filled with water, and deep slow moving stretches of stream constitute its most favorable habitat.

Coriscella tarsalis (Fieber) 1851

One adult female of this species was collected approximately 2 mi. upstream from the mouth of West Canyon. No other specimens were encountered.

Noto

Notonectidae (family) Back swimmers

Notonecta kirbyi Hungerford 1925

A common inhabitant of pools and still water, this large robust back swimmer found throughout the state of Utah was encountered in almost every tributary stream in Glen Canyon.

Notonecta lobata Hungerford 1925

This species, represented in Utah by only two adult male specimens from St. George, is represented from Glen Canyon by three specimens. Two adults and one nymph.

Notonecta undulata Say 1832

Three specimens, all adults were collected in Bullfrog Creek, Lake Canyon, and West Canyon. This species is sometimes confused with N. unifasciata but the white hemelytra with a black undulate band across the apices of the corium and rounded mesotrochanter are distinctive.

Notonecta unifasciata Guerin 1857

One specimen, taken from Lake Canyon, is now the only record of this species in Glen Canyon. Elsewhere in Utah, specimens are quite abundant and more extensive collecting may prove this to be the case in Glen Canyon.

LIST OF AQUATIC INSECTS COLLECTED

Naucoridae (family) Creeping water bugs

Ambrysus mormon Montandon 1909

Already known from Bridge Canyon, San Juan County (R. G. Woodbury, 1950) this species was observed and collected in almost every tributary stream investigated. This species prefers clear flowing, well oxygenated waters, especially those with pebbly or rocky bottoms, although they do invade the margins of pools and large ponds.

Belostomatidae (family) Giant water bugs

Lethocerus americanus Leidy 1847

This large and interesting water bug was found in large pools and quiet waters where the algae and other aquatic vegetation was abundant. Although only 12 specimens were collected, they were observed in at least half the tributary streams investigated and the cast skins of previous instars could be found entwined within the algae.

Gelastocoridae (family) Toad bugs

Gelastocoris oculatus Fabricius 1798

These squat, compact, bizarre insects were found on the sandy and muddy shores of small pools and ponds. Their mottled color pattern renders them very inconspicuous against their normal background; it was with difficulty that they were actually observed and collected.

Gerridae (family) Water striders

Gerris remigis Say 1832

This common water strider was observed on the surface of every tributary stream encountered, in quiet backwaters of the river itself, and small ponds and rock pools. Collections were made from only three sites to obtain a representative sample. The great majority of the specimens were last instar nymphs and only a few adults were observed.

Veliidae (family) Small water striders

Microvelia americana Uhler 1884

Although only collections from West Canyon and Kane Creek yielded any representatives of this species, they were observed in other areas of the Colorado River and in other tributaries adjoining the river. As in the case of the Gerrids, the bulk of these specimens proved to be last instar nymphs, with only one adult recorded.

CADDICEFLIES

MEGALOPTERA (order) Alderflies, dobsonflies, fishflies

Corydalidae (family) Dobsonflies

Corydalis sp.

Four larval specimens of this genus were taken in the Colorado River. The riffles and fast water at the mouths of streams appeared to be the preferred habitat. Representatives of this family are comparatively rare in Utah, and were known previously only from the Virgin River drainage of Southern Utah. The specific affinities of the specimens from Utah are at present unknown.

TRICHOPTERA (order) Caddiceflies

Phlebotamidae (family)

Chimarra sp.

Specimens of this genus were taken from Ticaboo Creek and Warm Spring Creek, although they probably occur in other tributary streams.

Psychomyiidae (family)

Polycentropus sp.

This genus was represented by one small larva from Warm Spring Creek.

Hydropsychidae (family)

Hydropsyche sp.

Next to Helicopsyche, members of this genus proved to be the most abundant of the caddiceflies encountered. Clear swift running streams seemed to be the preferred habitat.

Potamvia sp.

The most abundant caddicefly in the Colorado River, this genus was found in considerable numbers at two sites, one near Lake Canyon, the other near Hole-in-the-Rock. No specimens were encountered in the tributary streams.

Hydroptilidae (family)

Neotriconia sp.

This genus is represented from the Colorado River by three larvae and three empty cases. Several empty cases of caddiceflies in this family were found in Warm Creek, but were not further identified.

LIST OF AQUATIC INSECTS COLLECTED

Limnephilidae (family)

Hesperophylax sp.

Members of this genus, largest of the caddiceflies served and collected, appeared to be widely distributed in many tributary streams of Glen Canyon.

Brachycentridae (family)

Brachycentrus sp.

One small larva from the San Juan River and one empty case from the Colorado River are the only representatives encountered.

Helicopsychidae (family)

Helicopsyche sp.

Members of this genus were the most abundant of all the caddiceflies encountered. This small caddicefly, enclosed in a case similar in shape to the shell of a snail, was observed and collected in almost every tributary stream investigated, although none were taken from the river itself. At Smiths Fork, 160 specimens were taken from an area about six feet in length, where hundreds were observed. A total of 107 specimens was taken from Warm Spring Creek but the numbers collected in other tributaries were much smaller.

LEPIDOPTERA (order) Butterflies and moths

Pyralidae (family) Snout moths

Paragyra kearfottalis (Dyar) 1906

Two larvae from Warm Spring Creek and one from Lake Canyon were the only representatives of the aquatic moths encountered.

COLEOPTERA (order) Beetles

Haliplidae (family) Crawling water beetles

Peltodytes simplex (LeConte) 1952

Four specimens of these small crawling water beetles were found in the tributary streams.

Dytiscidae (family) Predaceous water beetles

Laccophilus decipiens LeConte 1852

This small species was abundant in the tributary streams, although none were found in the river.

BEETLES

Bidessus sp.

Members of this genus were abundant in the filamentous green algae present in the tributary streams, particularly those in which pools and large ponds comprised the bulk of the habitat.

Hygrotus sp.

The small representatives of this genus were fairly common in the tributary streams, although only a few were actually collected.

Deronectes sp.

A small unnamed tributary stream yielded 37 specimens of this genus, although it was not found as abundant in other streams.

Oreodytes sp.

This genus was encountered in only two small unnamed canyons, but more extensive collecting might demonstrate a wider distribution.

Agabus sp.

One adult female was found in a small unnamed canyon at river mile 101.5. Male specimens are needed for accurate determination to species.

Agabus lucens LeConte 1852

Adults were encountered in only three tributary streams, but they occurred in large numbers in one of them.

Rhantus alsonychus (Crotch) 1873

One adult, taken at Kane Creek, is the only representative of this species encountered. The elongate claws of the front tarsi of the male distinguish it from R. binotatus which it superficially resembles.

Rhantus binotatus (Harris) 1828

By far the most abundant dytiscid encountered, this species was widely distributed in almost every tributary stream investigated.

Thermonectus marmoratus (Hope) 1832

Almost as abundant as Rhantus binotatus, this large dytiscid was encountered in the large deep pools in tributary canyons, but was not encountered in the river. The number of larvae observed and collected was almost equal to that of the adults.

Gyrinidae

(Family) Whirligig beetles

Gyrinus p. niger LeConte 1852

These unusual aquatic beetles, commonly known as whirligig, waltz-beetles and scuttle bugs, were very common members of the aquatic insect fauna of most of the tributary streams. These are the only aquatic beetles which regularly take advantage of the surface film for support, and if present at all, are readily seen and easily collected with a wire screen or dip net.

Hydrophilidae (family) Water scavenger beetles

Berosus punctatissimus LeConte 1852

This small water scavenger beetle was a very common member of the aquatic beetle fauna found in the tributary streams. Specimens were encountered in large numbers in shallow pools and ponds, where they were often concentrated. When taken out of the water, they emitted a distinct, audible clicking sound.

Berosus maculosus Mannerheim 1853

Specimens of this small hydrophilid were taken only in Sevenmile Canyon and a small unnamed side canyon.

Berosus styliferus Horn 1873

One adult only was collected in Sevenmile Canyon.

Hydrochara lineata LeConte 1855

One adult, collected at Ticaboo Creek, was the only member of this species encountered. It is doubtful that more extensive collecting would yield a greater number of specimens, for these are large hydrophilids and should have been easily found.

Hydrophilus triangularis Say 1823

Six adults and two larvae, of this large hydrophilid were encountered in five of the larger tributaries investigated. The adults were found in large ponds, usually hidden underneath the overhanging banks. The two larvae were found in a shallow pool at Trachyte Canyon foraging among the filamentous algae.

Tropisternus ellipticus (LeConte) 1855

Adults of this species were found in great abundance in almost every tributary stream investigated. Several larvae were collected. It was encountered in the same habitat as many of the larger dytiscids. The swimming motions of this species are quite erratic compared with the even strokes demonstrated by other dytiscids.

Laccobius ellipticus LeConte 1855

Eleven specimens of this small hydrophilid were obtained in the tributary streams; none were encountered in the river proper.

Enochrus obtusiusculus (Motschulsky) 1859

A fairly common hydrophilid, members of this species were encountered only in the tributary streams and not in the river. They resemble very closely the members of the genus, Berosus, but are much smaller.

Dryopidae (family) Long-toed crawling water beetles

Helichus suturalis LeConte 1852

Not formerly known from Glen Canyon, collections at Warm Spring Creek yielded the only specimen obtained, an adult.

FLIES

Simuliidae

nidae (family) Riffle beetles

Microcylloepus similis (Horn) 1870

Sixteen adults and nine larvae were found crawling over submerged debris and rocks in both pools and riffles in Warm Spring Creek.

DIPTERA (order) Flies

Tipulidae

Tipulidae (family) Crane flies

Polorusia sp.

The tipulids or crane flies were represented by only two specimens collected at Warm Spring Creek. None were found in the river.

Culiseta

Culiseta (family) Mosquitoes

Anopheles franciscanus McCracken 1904

Larvae and pupae of this mosquito were fairly common, although collections were made at only a few of the tributary streams investigated.

Culiseta incidens Thomson 1868

Collections made in a small pool adjacent to the main stream in Lake Canyon yielded the only specimens, four larvae and eight pupae, encountered during the expedition.

Dulex tarsalis Coquillett 1896

Nine larvae were collected in a small stagnant pool immediately adjacent to the Escalante River approximately 1 mi. upstream from its mouth.

Dulex sp.

Larvae of this genus were found in both Lake Canyon and West Canyon. They may be a new species, although this cannot be verified until adult specimens are obtained and studied.

Simuliidae

Simuliidae (family) Black flies

Simulium sp.

Three young larval specimens of black flies (sometimes known as buffalo gnats or turkey gnats) were found in the Colorado River. Specific determination could not be made.

Simulium virgatum Coquillett 1902

Both larvae and pupae were found adhering tightly, in large numbers on rocks in clear water streams flowing swiftly over large rocks, pebbles and sandstone ledges of such tributary streams as Warm Spring Creek, Hidden Passage and others.

LIST OF AQUATIC INSECTS COLLECTED

Tendipedidae (family) Midges

Anatopnina near johnsoni (Coquillett) 1902

This particular midge was encountered only at Lake Canyon.

Euriefferiella near similis (Coetz.)

Collections made in both the San Juan and Colorado rivers yielded several larvae belonging to this species. None was encountered in the smaller tributaries.

Paratendipes sp.

Two larvae were taken in Cedar Canyon. No other specimens were encountered.

Paratendipes albimanus (Meigen) 1818

Larvae of this species were found in pools, shallow ponds, and slow moving stretches of stream in Ticaboo Creek.

Microtendipes caducus Townes 1945

Larvae of this species were also collected only in Ticaboo Creek.

Tendipes sp. (thummi group)

Larvae of this midge were encountered only in Lake and Aztec canyons.

Polypedilum sp.

Members of this genus, i.e. the ones unidentifiable to species, were found only in the San Juan River, but are no doubt found in the Colorado River also.

Polypedilum possibly convictum (Walker) 1856

Larvae of this species were encountered in a small unnamed canyon, Ticaboo Creek and Warm Spring Creek, but probably occur in many of the other tributary streams.

Polypedilum near scalaenum (Schrank) 1803

Four larvae of this form were found in a small shallow backwater on an island in the Colorado River.

Tanytarsus sp.

These particular midges were found only in a small unnamed tributary canyon at river mile 101.5.

Tanytarsus near obediens (Johannsen) 1905

Five larvae, of this species were collected in a small unnamed tributary stream at river mile 44.4.

Calopsectra sp. (Group A)

A single larval specimen of this midge was obtained in a small unnamed tributary stream at river mile 104.7.

Calopsectra exigua (Johannsen)

This species was encountered only in the Colorado River; none was found in the small tributaries.

FLIES

Stratiomyidae (family) Soldier flies

Euparyphus sp.

Collections at Ticaboo Creek and a small unnamed tributary yielded a total of six larvae of this particular soldier fly. Larvae are easily recognized in the field by the shagreened surface of the body.

Stratiomys sp.

These large larvae were encountered in small shallow pools in Navajo Creek (Long Canyon) and Warm Spring Creek. Since no adults were available, specific determination was not attempted.

Tabanidae (family) Horse flies, deer flies and allies

Chrysops sp.

A single larva was obtained at Sevenmile Creek.

Tabanus sp.

Members of this genus were widespread throughout the tributary stream. Their large size revealed their presence in many small pools and slow-moving sections of stream. For lack of adult material, as in the case of many other aquatic Diptera, specific determination was not attempted.

Empididae (family) Dance flies

Hemerodromia sp.

One larva of this genus was obtained in the Colorado River near Gretchen's Mine. No other specimens were encountered.

Ephydriidae (family) Ephydrid flies

Brachydeutera sp.

One larva, found in a small unnamed tributary at river mile 44.4 was the only representative of this genus encountered. The ephydrid adults are commonly found around salt and alkaline ponds, marshes, and thermal springs. In General, the larvae are usually found in or on the leaves and stems of aquatic plants.

Sciomyzidae (family) Marsh flies

Dictya sp.

The marsh flies are represented by only one larval specimen obtained in a small unnamed tributary at river mile 101.5. No adults were collected.