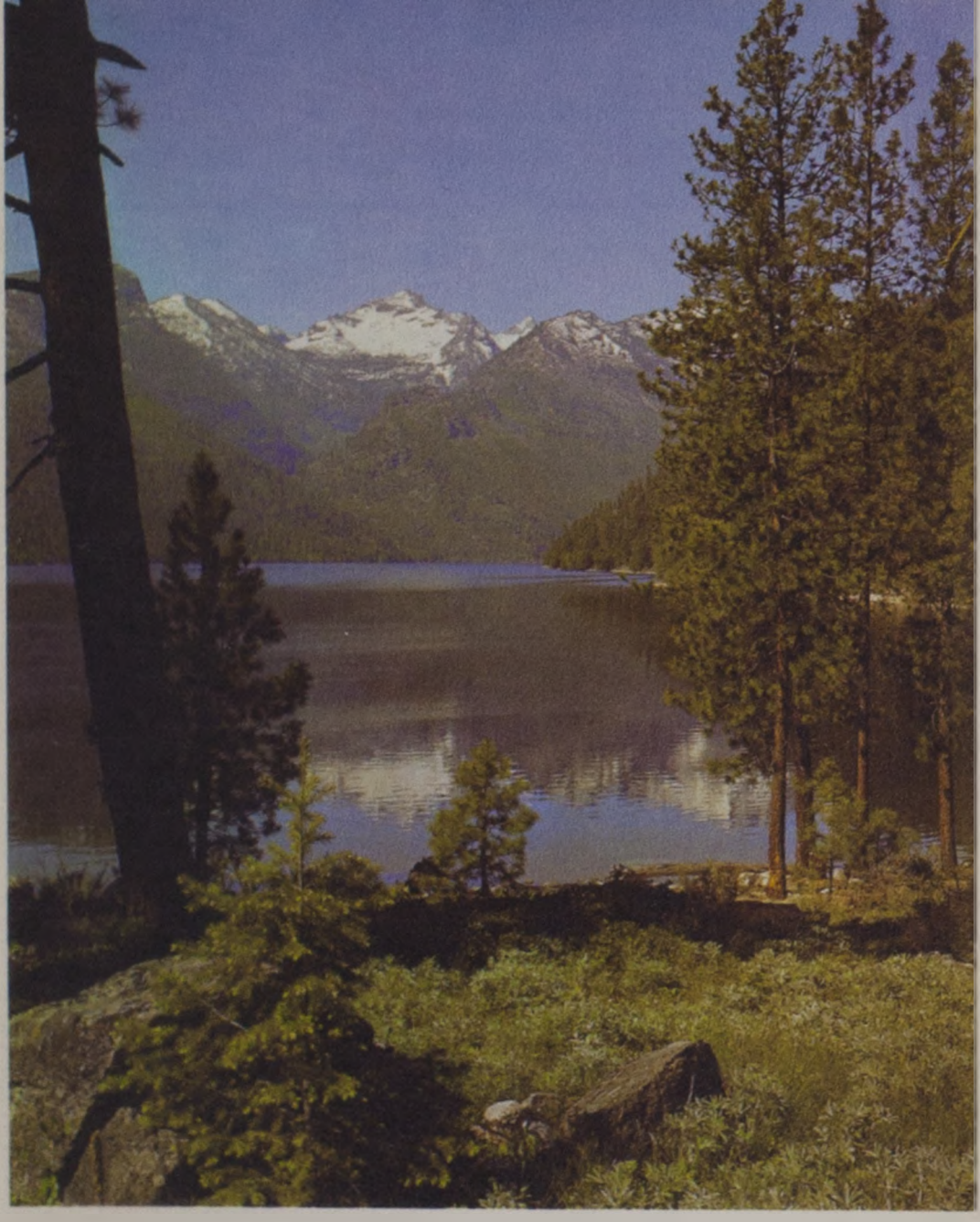
1971

Biological Station Summer Session, 1971

University of Montana (Missoula, Mont. : 1965-1994)

Flathead Lake Biological Station



1971

SUMMER SESSION

University of Montana

Missoula, Montana

BIOLOGICAL STATION

FLATHEAD LAKE, MONTANA

JUNE 27 - AUGUST 21

No. 536 UNIVERSITY OF MONTANA January 1971

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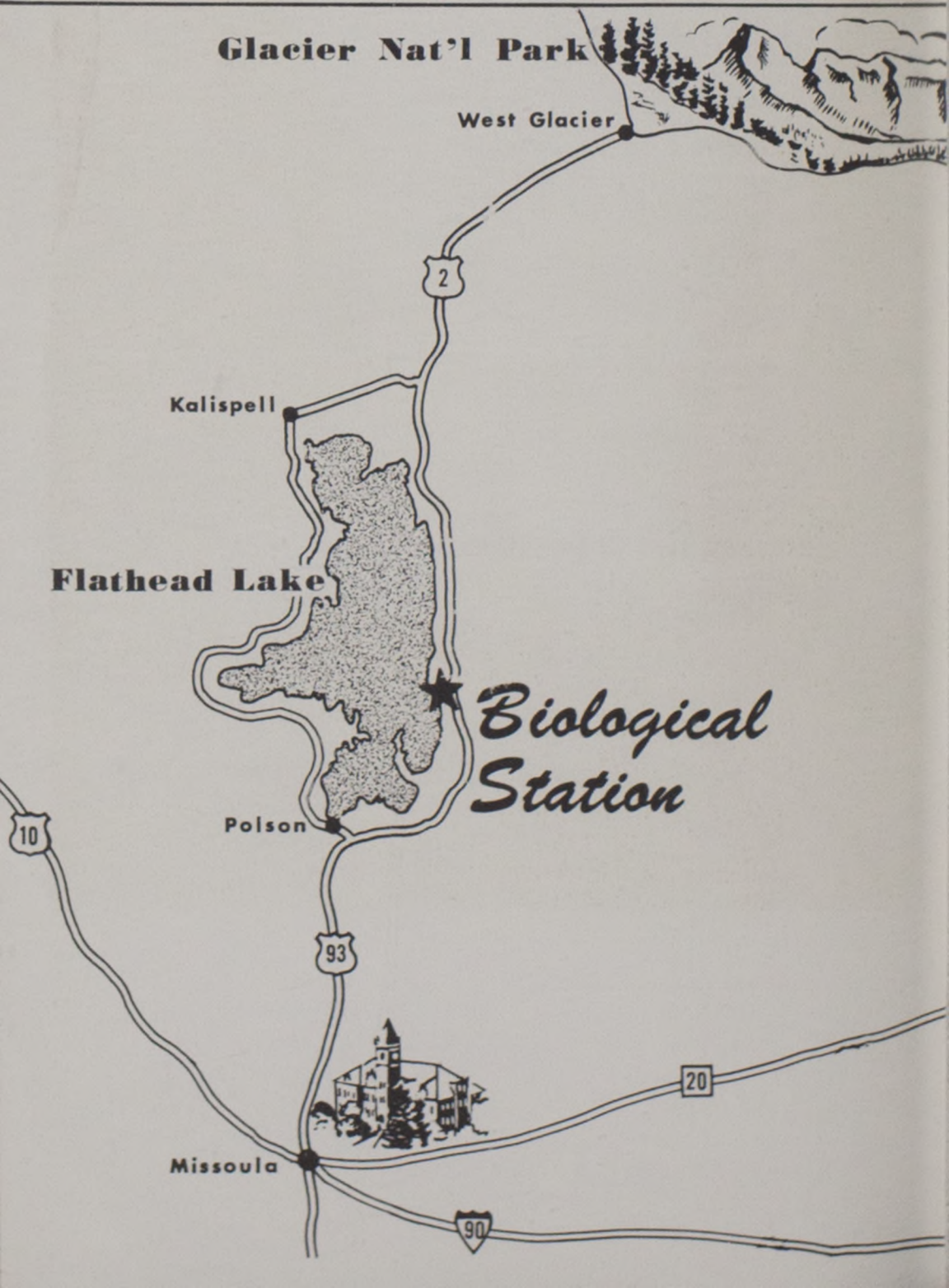

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1971 SUMMER SESSION

University of Montana

BIOLOGICAL STATION

June 27 to August 21

The Biological Station is a unit of the Summer Session of the University of Montana. All courses offered at the Station give graduate credit and are designed for those working at the upper division and graduate level. Students who have reached the junior level in college and who have satisfactorily completed necessary course prerequisites are eligible for admission. Other students may petition the Director for entrance. Biology teachers are invited to take advantage of those courses designed particularly to fit their teaching needs. Investigators in all fields of natural history and biological research are encouraged to utilize the facilities of the Station.

GEOGRAPHIC LOCATION

The Station is located on Yellow Bay on the east shore of Flathead Lake at the base of the northern end of the Mission Mountains. The Station also has land on Bull Island and on Polson Bay and owns the two small Bird Islands. Flathead Lake lies in the Flathead Valley at the southern end of the Flathead and Purcell Trenches of the Rocky Mountains. The valley, bordered by mountain ranges showing marked differences in geological structure, lies about 40 airline miles west of the Continental Divide and 100 airline miles south of the Canadian Border. This valley and the adjacent valleys and mountains form one of the upper reaches of the Columbia River Drainage. The headwaters of the Mississippi and Hudsonian Drainages are easily accessible in Glacier National Park.

OPPORTUNITIES FOR STUDY AND RESEARCH

Although the more formal part of the course work is given in well-equipped laboratories, all courses emphasize field work.

The many mountain ranges and valleys, with altitudes from 3,000 to 10,000 feet, which are accessible from the Station offer a wide variety of habitats. Plant associations include palouse prairie; sage brush; montane, coast and sub-alpine fir forests; sub-alpine to alpine meadows; and tundra. Aquatic environments include eutrophic and oligotrophic lakes, glacial potholes, ponds, swamps, bogs, streams, and rivers. Opportunities for field trips and for problem work are therefore many and varied.

There is a stimulating, academic environment at the Biological Station. Students, instructors, researchers and others work together very closely maintaining a scholarly and sociable atmosphere. A number of scientists conduct research at the Biological Station; visiting scientists and guest lecturers stop by often throughout the summer. Activities are not restricted to the courses listed below.

This summer a radioecology workshop will be held at the Biological Station. This course is designed to provide the biologist with an understanding of natural and man-made radioisotopes and radition sources. Laboratory exercises employing radioactive tracers in aquatic and terrestrial experiments will emphasize the dynamics of radioactive elements and labeled molecules.

COOPERATING AGENCIES

The facilities and active cooperation of many state and federal agencies are available to the staff and research workers of the Biological Station. Research projects are conducted independently and in cooperation with biologists and naturalists in Glacier National Park, at the Rocky Mountain Laboratory in Hamilton, at the National Bison Range at Moiese, with the Cooperative Wildlife Research Unit at the Missoula campus, and with the State Fish and Game Department in various sectors of the state. Both long-range and short-term research projects are feasible under these arrangements.

SUMMER MAILING ADDRESS

University of Montana Biological Station
Yellow Bay, Flathead Lake
Bigfork, Montana 59911

Description of Courses

Credits earned at the Biological Station are transferable to other colleges and universities the same as are credits earned in the Departments of Botany and Zoology on the University Campus. Undergraduates may take only those courses numbered below 500.

Credit is given in "quarter credits." The recommended load for students is ten credits for the eight week session. Maximum load for any student is thirteen and the minimum load is six credits. Graduate Assistants may carry a maximum of six credits. Only exceptional students will be granted permission to carry courses in excess of thirteen credits. A six-credit course normally meets two days a week and a three-credit course meets one day a week; however, both are scheduled for an extra day each week to make two-day field trips possible.

A student electing Problems Courses in either Botany or Zoology must secure the consent of the instructor in charge before action can be taken on his application.

Below is a calendar of courses that require firm daily scheduling:

	M	T	W	Th	F	S
Limnology	———	———	———			
Mycology	———	———	———			
Systematic Botany	———	———	———			
General Ecology				———	———	———
Phycology				———	———	———
Ecology of Higher Vertebrates				———	———	———

Courses Offered

BOTANY

Call Numbers	Course Numbers
0900	**365. Systematic Botany.** (Sec. 2). 6 cr. Prerequisite Botany 113 or equivalent. Identification and classification of the vascular plants especially of the Northern Rocky Mountains. Monday*, Tuesday, Wednesday.* Turner, NSF Inst. Course.
0901	**441. Phycology.** (Sec. 2). 6 cr. Prerequisite: Botany 111, 112, 113, or equivalent (a year's laboratory course in botany). Identification, classification, distribution, life histories and limnological relationships of the algae of the Northern Rocky Mountains. Thursday*, Friday, Saturday.* Prescott.
0902	**449. Problems in Morphology.** (Sec. 2). 2-6 cr. May be repeated during succeeding quarters not to exceed a total of 6 credits. Prerequisite: consent of instructor. Individual or group work (consisting of research problems, special readings, discussions, etc.) dealing with aspects of plant morphology not taken up in regular courses. Staff.
0903	**469. Problems in Taxonomy.** (Sec. 2) 2-6 cr. May be repeated in succeeding quarters not to exceed a total of 6 credits. Prerequisites: Botany 365 and consent of instructor. Individual or group work (consisting of research problems, special readings, discussions, etc.) dealing with aspects of plant taxonomy not taken up in regular courses. Staff.
0904	**475. Mycology.** 6 cr. Prerequisite: Botany 265 or consent of instructor. The classification and relationships of the fungi, with training in their collection, preservation and culture. Monday*, Tuesday, Wednesday.* Miller.
0905	**490. Seminar in Biology.** (Sec. 2). 1 cr. Lectures and discussions of special problems in biology. One evening each week. "Pass or Fail" grade only. Staff
0906	**551. General Ecology.** 6 cr. Prerequisite: Bachelor's degree and a major in botany, biology or zoology. Community concepts including succession, stratification, periodicity and energy relationships; introduction to population problems. Thursday,* Friday, Saturday.* Clebsch
0907	**600. Research.** (Sec. 2). Credit variable. The botany department is prepared to arrange for properly qualified graduate students to carry on research in plant anatomy, cytology, ecology, morphology, mycology, pathology, physiology, and taxonomy leading to a master's degree. Maximum credit allowed 15. Staff.
0908	**699. Thesis.** (Sec. 2). Credit variable. Maximum credit allowed 15.

ZOOLOGY

Call Numbers	Course Numbers	
0909	431.	**Problems in Vertebrate Morphology and Taxonomy.** 1-5 cr. Prerequisites: 25 credits in zoology including adequate background courses in the subject and consent of the instructor. Semi-independent work. By variation of content, the course may be repeated during succeeding quarters. Staff.
0910	433.	**Problems in Vertebrate Ecology.** (Sec. A) 1-5 cr. Prerequisite: 25 credits in zoology including adequate background courses in the subject and consent of instructor. Semi-independent work. By variation of content, the course may be repeated during succeeding quarters. Staff.
0911	433.	**Ecology of Higher Vertebrates** (Problems Sec. B) 6 cr. A course providing an investigation of ecological processes and principles (e.g. competition, population dynamics, diversity) as exemplified by the higher vertebrates. Thursday,* Friday, Saturday.* Fisher.
0912	434.	**Problems in Invertebrate Morphology and Taxonomy.** 1-5 cr. Prerequisite: 25 credits in zoology including adequate background courses in the subject and consent of the instructor. Semi-independent work. By variation of content, the course may be repeated during succeeding quarters. Staff.
0913	436.	**Problems in Invertebrate Ecology.** 1-5 cr. Prerequisites: 25 credits in zoology, including adequate background courses in the subject and consent of the instructor. Semi-independent work.
0914	461.	**Limnology.** 6 cr. Prerequisite: Elementary Zoology and one collegiate course in chemistry. Ecology of lakes, streams and ponds, with emphasis on the physical, chemical and biotic factors which determine their biological productivity. Although most of the work is done on Flathead Lake, a three-day trip is taken to some mountain lake and a complete limnological survey is made of that body of water. A field trip is taken to a glacier in Glacier National Park where students observe the history of the water through a succession of lower lakes to the valley floor. Monday,* Tuesday, Wednesday.* Gaufin.
0915	490.	**Seminar in Biology.** (Sec. 2). 1 cr. Lectures and discussions of special problems in biology. One evening each week. "Pass or Fail" grade only. Staff.
0916	531.	**General Ecology.** 6 cr. Prerequisite: Bachelor's degree and major in botany, biology or zoology. Community concepts including succession, stratification, periodicity, and energy relationships; introduction to population problems. Thursday*, Friday, Saturday.* Clebsch.
0917	600.	**Advanced Zoological Problems.** (Sec. 2) 1-5 cr. Opportunity is given to graduate students with sufficient preparation and ability to pursue original investigations. Staff.
0918	699.	**Thesis.** (Sec 2). Credit variable. Maximum credit allowable 15.

*Indicates scheduled class days. Other days listed to be used at the discretion of the instructor.

A.

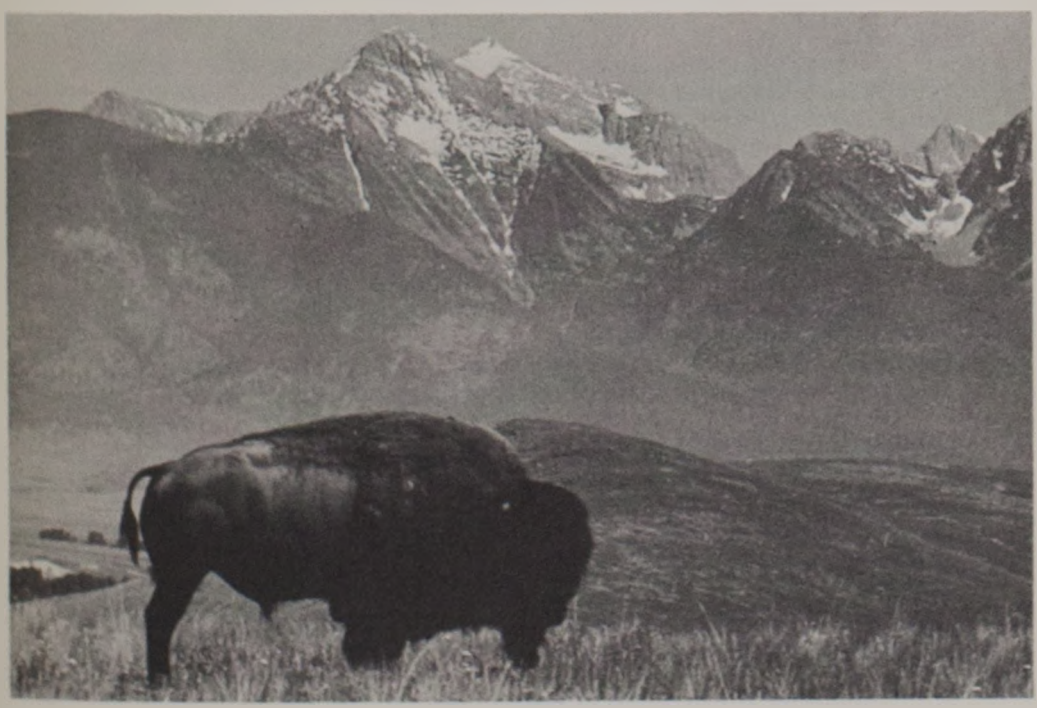
B.

A—*Plankton sampling in Yellow Bay on the Biological Station's research vessel, Daphnia II. Elrod laboratory can be seen in the background.*

B—*A view of some student cabins which have an unrestricted view of the entire lake.*

C—*The proximity of the National Bison Range at Moiese affords occasion for interesting wildlife studies. The Mission Range is in the background.*

C.



General Information

FEES

A student fee of $123.00 (maximum) is charged both resident and non-resident students. In addition, all students pay a $10.00 Field Trip Fee to cover in part the cost of Field Trip transportation.

Those desiring to carry on independent research, resident or non-resident, are charged an investigator's fee of $25.00 per week. This entitles him to the use of one 4' x 6' table and a proportionate amount of shelving. Chemicals and glassware are provided in reasonable amounts. Microscopes will be provided if available. Those with special equipment, supplies or space problems should write the Director.

The student fee on a per quarter credit basis is as follows:

Credits taken	Fee	Credits taken	Fee
1	$19.00	6	90.00
2	38.00	7	101.00
3	57.00	8	112.00
4	68.00	9 or more	123.00
5	79.00		

LODGING

All individuals are housed in 12' x 14' or 12' x 16' cabins which have three 36" x 24" windows. Each cabin is provided with lights and electric (AC) outlets, beds, mattresses, pillows, chair, table, dresser, and minor items of equipment. The cabin fees are $4.00 weekly per person. **Student families may not live in Station housing. An exception is wives of childless families who enroll in Station courses.**

BOARD

All resident station students and personnel are required to board at the Commissary; 8-week costs: $238.00 for adults and $174.00 for those under eight. First meal served will be dinner on Saturday, June 26, and last meal served will be lunch on Saturday, August 21. **No refunds are made for absences of less than a week, and any absence must be preceded by a one-week prior notification. All commissary facilities are under the direction of the central University food service.**

BATHING FACILITIES

The Station has three modern washrooms with hot and cold running water and toilet facilities. The central one, in addition, has showers and washing facilities. It also has an ironing room and ironing boards. The Station does not provide irons.

HEALTH SERVICES

Each student is covered by the student health plan which covers sickness and certain accidents which may occur during the session at the Biological Station. This is paid by the health service fee. The nearby towns of Polson and Kalispell have excellent doctors and hospital facilities for emergencies, and the student health center in Missoula remains open 24 hours a day for those who can avail themselves of its services.

ADVANCED DEGREES

Qualified students who are officially enrolled in the Graduate School may take course work and do research at the Station toward advanced degrees. Master's degrees are offered in Botany, Zoology, Wildlife Biology and Teaching of Biological Sciences. Students interested in earning a master's degree through successive summers at the Biological Station should write to the chairman of either the Department of Botany or Zoology for additional information. Both of these departments also offer the Doctor of Philosophy degree.

FIELD TRIPS

Transportation will be provided for all regular class trips. All field trips are under the supervision of an instructor. Many of the field trips will be completed within one day, although overnight trips in each course may be expected. Meals on such trips are supplied by the commissary. The Station cannot as yet offer transportation for independent research workers; however, space on scheduled field trips may be used when available.

REMUNERATIVE WORK

Opportunities for work are not numerous. Assistantships which pay $600.00 per session are available for some courses. To be eligible for these the student should have a major in the field concerned and experience in the subject matter of the course to which the assistantship is assigned. Research assistantships are occasionally available. There are some part time jobs for janitorial work, labor, and driving vehicles. Work-study funds are available for qualified students.

RECREATION

Opportunities for recreation are many. Mountain climbing, hiking, swimming, boating and fishing offer the best means of relaxation. Some of the best fishing in the western United States is found within a few hours' drive of the Station. Fine catches of rainbow, cutthroat, Mackinaw and Dolly Varden trout and landlocked salmon are made the year round in Flathead Lake. Ideal trout fishing may be had in most of the streams and rivers in the area. There are Forest Service and Indian Service trails in the Mission and Swan Mountains. There are also many fine trails with overnight accommodations at chalets in Glacier National Park.

Since the Station area is a game reserve, dogs and other pets are not allowed. Firearms may not be brought onto the premises without advance written permission from the Director.

EQUIPMENT AND SUPPLIES NEEDED

Course and field trips: The student should, if he has them, bring dissecting kits, hand lens, field glasses, musette bag, and other usual field and laboratory course supplies. Since the Station is located in a mountain valley and many of the classes will work in the mountains during the course of the summer, students are strongly advised to have adequate clothing and footwear. Nights are cool and temperatures can

be low. There will be cool, rainy as well as warm to cool dry weather. Therefore one should have warm, wool clothing, cotton clothing, and rainy weather equipment. Good hiking boots with 6 to 8 inch tops are advised for field trips in the mountains. Tennis shoes or hip boots are the best type of footwear for aquatic work. Remember that mountain streams are cold. Inasmuch as some overnight trips will be taken, back packs, warm sleeping bags (such as the inner arctic type) with liners and ground-cloth are recommended.

Living equipment: The student is responsible for supplying his own blankets, bed linen, towels, toilet articles, and proper clothing. Most students wear slacks or jeans. A flashlight, small mirror, reading lamp, and curtains for the three cabin windows (36 x 24) also will be useful. Recreational, musical and photographic equipment are also useful.

STUDENT STORE

The student store carries books and other course supplies, toilet articles, stationery, and confections. Limited scientific equipment such as vials can be borrowed or purchased from the student store. A complete grocery store is within walking distance of the Station.

ENROLLING

Application for admission to courses should be made before May 15, using the blank provided in this catalog. Additional blanks will be provided on request. Applications are reviewed on May 15 and notification of acceptance is mailed soon thereafter. Applications made after May 15 will be considered in the order in which they are received.

Students who have not previously enrolled at the Station must submit a complete official transcript together with recommendations from two instructors. **Graduate students must first enroll in the Graduate School of the University of Montana.** Application blanks for this will be sent to all such students.

Official registration will be held at the Station on Sunday, June 27. Classwork begins Monday, June 28 and extends through the full session of 8 weeks.

An institute for secondary school teachers of biology supported by the National Science Foundation will be offered in part at the Biological Station. During the summer, a course in mycology will be provided for students at this institute. Students in attendance at the Station will also register for additional courses chosen from among the offerings at the Station, and for the seminar offered at the Station. For further information, write Dr. J. F. Tibbs, University of Montana.

ENROLLMENT PROCEDURE:

Complete Station application and colored form and mail to "Biological Station, University of Montana, Missoula, Montana 59801."

Application for Admission

UNIVERSITY OF MONTANA
BIOLOGICAL STATION
SUMMER SESSION, 1971

Name _____
Last First Middle

Address _____
No. and Street

_____
City State Zip Code

Age _____ Sex _____

Will you be attending under the G.I. Bill? _____

Check level work desired:

☐ Graduate ☐ Undergraduate

If undergraduate, how many biology credits will you have by June, 1971?

_____ quarter credits _____ semester credits

Institutions previously attended:

Name of Institution Dates Degree

_____

_____

_____

Undergraduate major field _____

Graduate major field _____

If you have attended the University of Montana since Autumn, 1965, give Student I.D. Number _____

(Continued on next page)

You will travel by:

Car ..... Train ..... Bus ..... Plane .....

Remove this page, complete both sides, and mail to the Station Director. If a member of some instructional staff, give status and address of school.

.....

.....

Schedule of courses desired (First Choice)

.....

.....

.....

(Second Choice)

.....

.....

.....

If research work:

☐ Independent ☐ Under supervision

If under supervision, with whom and in what field?

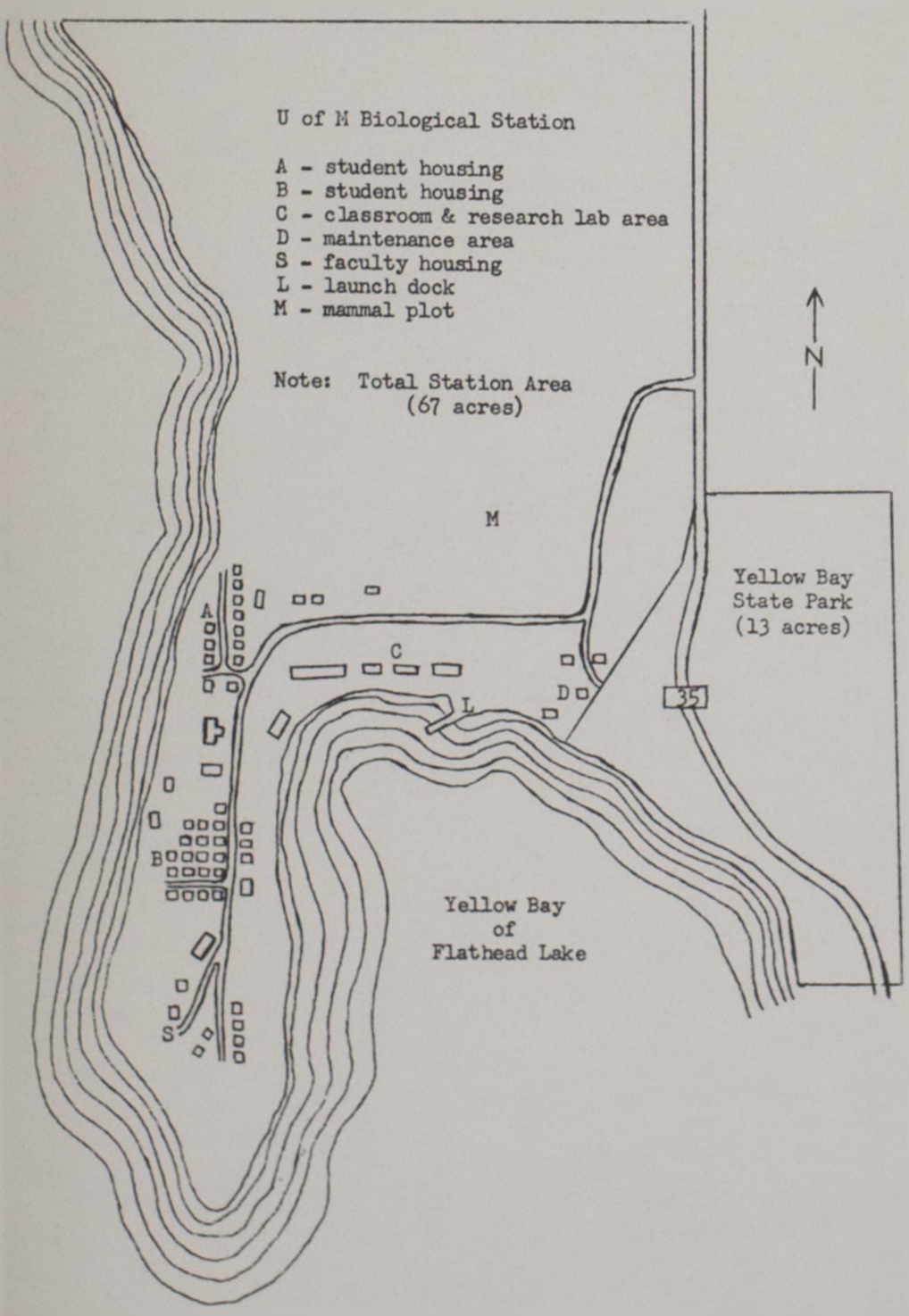
.....

.....

Roommate preferences: .....

.....

INSTRUCTIONS FOR ARRIVAL AND OTHER PERTINENT INFORMATION WILL BE MAILED TO APPLICANTS UPON ACCEPTANCE


U of M Biological Station
A - student housing
B - student housing
C - classroom & research lab area
D - maintenance area
S - faculty housing
L - launch dock
M - mammal plot
Note: Total Station Area
(67 acres)
N
M
Yellow Bay
State Park
(13 acres)
35
A
B
C
D
L
S
Yellow Bay
of
Flathead Lake