

1954 SUMAER REPORT

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## GEAR STUDY - KARLU LAKB, 1954

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BEAT STUDY - RARWX LAKE 1954
I. IWPRODUCTSOM

The 1954 genson was spent mainly in attompting to census and mark bear to study movement. Also bear-saimon reletionship and food studies were continued.

## II. BEAR DATA

## A. POPOLATYON DGGEMTMATION

## 1. SICHTLNGS

As in 1952, records of all bear sighted were kept Oy the miter, as well as by other FWS and FRI employees. And as before, there were many duplications recorded. Sightings by the author totalied 242. Details of individual bear or groups were noted in an attempt to preveat counting the same bear more than once. In the following table the only chance of the same bear being counted twice would occur due to its traveling considerable distances in a short time.

1. Clark, W. ${ }^{\text {(1) Bear-Salmon Study - Earluk Lake, } 1952 ~}$

TABLE I.
A. BEAR SIGITINGS BY WETTEA

|  | Large $\mathrm{HO}=$ cubs 17 Smell Hos year of | Sub-Adult | Sub-Ad.-Ad. | Adult |  |
| :---: | :---: | :---: | :---: | :---: | :---: |
| AEEA | $\square$ age | 2 yrs. 3 Jxso | (ifed, Size) | (M. Prob.) | TOTAL |


| Canyon - ornelley | F㫛1 ${ }^{2}$ |  | 2 |  |  | 4 |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Cascade | F\& $3^{2}$ |  | 1 | 1 |  | 6 |
| Berabare pt. |  |  |  |  | 1 | 1 |
| Ione Pto |  |  |  |  | 1 | 1 |
| 至eadow | $\begin{aligned} & F \& \frac{1}{2} \\ & F \& 2 \end{aligned}$ |  | 2 | 1 |  | 8 |
| Halruay | $\begin{aligned} & \mathrm{F} \& 2^{1} \\ & \mathrm{~F} \& 3^{2} \\ & \mathrm{~F} \& 3^{2} \end{aligned}$ | 4 | 1 | 1 | 2 | 18 |
| Grassy | F \& $4^{1}$ |  | 1 | 1 |  | 7 |
| Horaine |  |  |  | 1 |  | 1 |
| Cottomwod | F $41^{3}$ | 1 | 3 | 2 | 3 | 11 |
| ntaes | F\& $1^{2}$ |  |  |  |  | 2 |

```
A. BLAL STGMTNES BX WETHEN (CONTMUED)
```

|  | Large Nom cube | Subaidult | Sub-Ad-Ad. | Adult |  |
| :---: | :---: | :---: | :---: | :---: | :---: |
| AEEA | F\& Small No: year of | 2Jrs 3 Hrso | (Med. Size) | (190.Prob.) | TOLA |



RABLES I．
B．BEAR SICHTMGS BY OMHES ${ }^{2}$

| ARES | $\begin{gathered} \text { F \& } \begin{array}{c} \text { Large No cubs } \\ \text { Small No year of } \\ \text { age } \end{array} \\ \hline \end{gathered}$ | $\begin{gathered} \text { Sub-Adult } \\ 2 \text { vrs. } 3 y r s . ~ \end{gathered}$ | Sub－Ad－Ad (Med.Stigo) | $\begin{gathered} \text { Adolt } \\ \text { (4.Prob.) } \end{gathered}$ | TOLAL |
| :---: | :---: | :---: | :---: | :---: | :---: |
| $\because$ | －．．． | －！． | \％ |  |  |
| Teriuk Miver |  | $\because$ | 1 | $\underline{2}^{\text {2 }}$ | $2:$ |
| Tent Pto | $F \& 1^{2}$ | － | ； |  | 2 |
| Canyon－0＇Malley | $\text { F\& } 3_{2}^{2}$ |  |  | 3 | 11 |
| Cascade | F\＆2？ |  |  |  | 3 |
| Meadow | F \＆${ }^{\text {？}}$ |  |  |  | 3 |
| Long Pt． | F \＆ $2^{?}$ |  |  |  | 3 |
| Moraine |  | 2 |  |  | 2 |
| ． | $\begin{aligned} & 2 \mathrm{~F} \& 8^{2} \\ & 3 \mathrm{~F} \& 6^{?} \end{aligned}$ |  |  |  |  |
|  | $\begin{array}{r} 5 \text { F \& } 14 \\ 19 \end{array}$ | 2 | 1 | 4 | 26 |

（⿴囗玉 rilled by fysor June $24^{(?)} 1954$
2．Walker，Charles．Ficheries Hesearch Institute，Observations

One of the main areas of concentration, Canyon o Qublley, was not visitod as often as desirable and a low count resulbod, wuckily, sight records were kept by Psherieg personnel. The data taken from the late of May until August first by Cherles Walker of Fisheries Remearch Inntitute totaled 49 sightinge. of these, 26 ware undurlicatad bear saen in Conyon o 0 Malley and other areas where tracks were nunerous but few animsis observed by the writer. To the roment no records have been recelved from other personnel, and even so would be quite duplleatire since FHS and FRI combined streem suxveys and other trips.

Thus with the addition of the 26 to 106 the number 132 approximates the apparont population - reokoned before September 16 , the start of the bunting sexsen.

## 2. COMPARISOR

In the following table comparison of sightinge and ostinates for 1952-54 is shown.

TABLE II.
a. BEAR POPULATION ESTMMAES - KARLOK LAKE, 1952-1954

| Year | Period | Sightings by <br> Totax | Investigator Lotal Less Daplications | Sightinge of Other Bear By Othors Tracks, ete. | Estimate | $\begin{array}{r} \text { Bear } \\ \text { per } \\ \text { sob } 141 \\ \hline \end{array}$ |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 1952 | JuIy $27=00$. 15 | 239 | 124 |  | 124 | 1.55 |
| 19533 | July 11 - Aug. 31 | 76 | 64 | 51 | 115 | 1.44. |
| 2954 | July 7 - Oct. 1 | 242 | 106 | 26 | 132 | 2.65 |

The ostimates would indicate that the population is apparently bolding its own. It ie felt by the writer that the figures are miniman, since some areas mowed tracks where iov or no bear ware seen Eogo Spring Oreek, Loraine Creok, otc. It is noted that the 1953 estimate included neariy one-half the totol based on "trach" date chieflys Also, durine that season bear were scarce on the streams probably becauce of the oariy ripaning of elderberries.

The differenco in length of time spent means litite, ak long as most of July and August are inciuded. This is when most bear are seen and individualism noted. During september and eariy octobor bear are hard to find and hardly a new one is added to the list. Also growth of new fur changes characteristies and might result in duplicationa

## b. DENSITY

Bear per square mile was reckoned by taking the figure of 80 as approximately the area that surrounds the laks and used by the animals. The lake is 12 miles long and roughly a distance of 2 miles on each side of it figured as range. 4 miles were added to the length to cover OMalley Lake and the Karluk River
3. Grogan, Trank. Bear-Selmon Study, Kasluk Lake 1953
section. Thus mantiplication of 16 by 5 gives an area of 80 square mileso

The density varies little for the three years, roughty liz bear gar square mile
c. hunging pressure

Bear kill for the three years has not varied greety and although that for the current year is not final it appears not to be hither, tis show bolow.

TABLE IIT.
BEAR KILL

| 1952 | 19 |
| :--- | :--- |
| 1953 | 23 |
| 1954 | 15 (not complete) |

The present chortor season should help to koep the prescuxe from becoming excessive of the present trend to heavier hunting continues.
3. COHPOSITTON
a. GROUPS AND STNGLES

Table I (A B B has boen used to determine the apparent compostition of the preaent Kariuk take population es shom bolote

TABLE IV.
a. GEOUPS

Submadults
No. of Groups $\frac{\text { No. of Individual }}{\text { Sows }} \frac{\text { Ho.Groups No. Indiv. }}{\text { Cubs }}$
1 cub many $\quad 4$ (1) $\quad 2_{4}(1) \quad 4$ (1)

| 2 cub fanily | $8(3)$ | $8(3)$ | $16(6)$ | $1(1)$ |
| :---: | :---: | :---: | :---: | :---: |
| 3 cub fanily | 417 | $4 \Omega$ | $12(3)$ | 1 |

b. STMGLES

Sex Sub-adults Sub-edult-Aduit : Adult

| Thaknown | 19 | 16(2) |  |
| :---: | :---: | :---: | :---: |
| Male, probably |  |  | $13(4)$ |
|  | 19 | $\begin{gathered} 168(1) \\ 17 \end{gathered}$ | $13 \%(4)$ |

xilled by hysor
Fi Ho parentheses - observed by author Parentheses o observed by C. Walkex, etc

ToTAL 53 singles
GREND FTAT 132

As in 1952, fermles with 2 cubs were most nuserous o sieven of the total of 23, wile five had 3 and algo singies whereas two were seen with 4 yousge The cub/fonale retio for 1954 ts 2.17 which eompares with 20.3 for 1952. Frobeoly 2.1 . would be aptter figure to use for practical purpozeso

Again as in 1952 the crop of cubs approximates two dozen per year. If hunter-kill does not go above 20 per yeer (alloving at least 4 that may de from other causes) then the population should be mustained; providing the sex-ratio of the take is at least 1 to I. If too many femalou axe taken, of courec decinetion wha result. A nay to prevent this would be to pronibit the tatang of any menbere of a sov-cub group. This procedure would help meintaina breeding stock of fomales as the banting prescure ino creasesa

An evan nore dragito measumo would bo to allow only the shooting of lone bear. Beaides protecting the females, highor aporting standards would be enhanced resultimg in larger trophies for it appears that the oldor and larger a bear the rore golitaryg oxcept of cource auring the breeding season. The only other tine gregarioueness seens erident in during the fis ghing pextod wen one talerates another on the sane strean jf not too closes

It is noted by the witer thet resident hunters usualy try for the first bear available and often this mans a bow or cubs. Non-residents are generally after a lerger brophy

The inclusion of sub-adult-adult cless in Table IV b was necencory to take care of a nuber of lone bear seen under poos conditions of light, distance, etc., resulting in inderinitio Indications of size. Due to their mediun size, some cubleps adult fomales nitat be inciuded in this class, as woll as in the sube adult class.

The adult (large) clase should contain chiefly moles.
b。 BEAR URITS

In 1952 the writer, using the total popuiation aivided by the number of groups and individuale, "bear untes" o tried to evolve a constant that might be used in other arees on plene, boet or other fast surveys/ On these surveys gach mothes - cub family and each lone bear would be counted as one, to be muls tiplied by this constant to allow for smaller cubs, ovc. possibly missed on these rapid sumpeys. In 1952 the constant was 1.8, the year 1.7. Thus, if three lone bear are seen in a drainage 3 w 1.7 would indicate 5.1. wereas a sow with 2 cupe would show as 1.7. This constant would be noet valuable when an exteno sive area is covered in a short time. The nore bear sean, the
nearer this method would come to an actual count.

From further Intensive surveys another ifigurg could be worked out to allow for we not seen et all on these fagt surpeys. This mould be variable according to time of years time of day, weather, condition and typo of vegetation, sood supply, hwam activity, otc.; in other words, complicated and practicaly impossible to find true digures to cover all conditions, but approsimations could be found. The value woild be low in April and May when visibility is good due to Less Roliage, In July and August when beare on streems; and after mid-0etobar whon foliage decreasos again. Within these periodis would vary according to the other conditions as time of day, meather, etce

To axmve at ugable figures, many togt surveys coupled wth continuling ground counts mould need to be made.
e. ACE CLASSES

The various classes are the same ones ubed in 1952
plus the subadult-adult mixed as follows.
TABL
1952 ..... 1954
No. ..... g
No. ..... 品
In lat \& and years - cubs 51 ..... 41 ..... 50 ..... 36
In 3 rd \& 4th years subemalts ..... 37 ..... 30 ..... 26 ..... 20
In 4 th year \& $_{4} 4^{2}$ sub-adults adults

                adules
    Beyond Lth year - adults 36 ..... 29 ..... 132

39 (22 F and (17 4)1713
Of the 50 cuns seen tith sovs,
16 were of the current yar.
25 bere 7earlinge $=$ in their zecond year
3 were probably in their third yeaz
6 vere not asgigned but presured to be of this season (Table I, $B$ )
50
In dadtion 7 motherless mall tear were thought to be in thesr second year because of their sige, although of courge there was no way of comparing whth an dult ferele. In the Table above the 7 g are included in the sub-adult groupo No Lone beare were obecrved this year that geemed younger whan geanhings. The mriter fools thet yearling cubs easily get along all right $2 x$ they
should lose their nother. Younger cubs probably would have a harder time but should be able to survive as long as food is avadiable。

A heavily lactating female died on September 25, after running a considerable distance from where it was first hito Hunters seld thoy heard cubs arging the next day, but not close to the motherg body. When the author was in the vicinity on the second day, the cub or cubs wore neither seen nor heard. If more than one they should be alright, for other motherless couples and tries have been seen. If a lone cub, probably lonea liness would be a factor affecting survival. The greatest dangers to the $e$ little fellows are man and the dears.

Comparison of 1952 and $195 h_{r}$ figures (Table 7.$)$ shows the percentage of the various age groups to be similer.

The number of females can be expressed quite accurately because of the presence of cubs. When cubless, old femeles cen be told by slow movenents and stocky appearance. The ama plus largoness usually indicates old males, The lankiness, faster actions and madium siss of the subodult group is characteristie. Probably the majority axe males. This group appeare to bear the brunt of hunting pressure due to their activity and roaming tendencies.
4. GEAREY AREAS

Trips into adjoining drainages by tho author indicated fair populations, but with few axception not as high as that in Karluk Lake area The exceptions were Dog Salmon Creek, Connecticut Creek, and an area north west of kariuk Lako that drains into Karluk River"

Fraser, Akalura, Ayakulit (Red River) and Bere Lekes were checired as well as nearby gections of Uyak Bay and Dog Salmon Creek. These hikes took place during late Juiy and the month of August, when "vegetative" trails are noticoable on the slopes and bear are concentrated near samon streams.

## B. MOVEYDM

## 1. GBMERAL

The beas generally seemed to behave in this respect no different than thoy did $2 n 1952$.

Early in july they were seen at and above alder line, as well as along the lake shore. From mionty until mid-Angust most were observed in strean ereas. Then they semed to disappearg

But as in 1952 this period coincided with ripening of elderberry, Bambucus racemogus pubchs.

A fen climbe through the aldereelderberry tangles indicated intensive usgine use of the plentiful berries. with no frost until late bepternber the fruits remained in good condition and seemed to hold the bear close by, in spite of murerous baech and thumblo - Canfon - OManley stream apamine fall yun red salmono
2. DATLI

Amount of daily travel depended on type or cood being used. In the eariy spring grazing period, continual roamine appeared to be the rule although the digtance coverea was usually short and cone in a rambling manner. Thme of rest probably found the anmals littie more then a mile or two from the start of an ordinary dey's wandering.

During the ilshing period, generally hardiy more than round trips from a secluded spot in heary cover to a favorite fishing area vere made. Rarely was more than a mile on atrean visited.

During the berry seasoa daily travel was probably lecs
than at any other time oxcept in winter" with plenty of berries close to dense cover there was little need for much exertiono

## 3. SEASONAL

Again food geomed to be the determining fagtor HE Hor slopes uged for grazing wero vacated as manon spanod anc died In the sereams. Then the fnediate vichnty of creekt the forseken for the thick alderoelderbery thickets, of the slopes. As the berries above ripened, those below deteriorated and the bear ranged upwarde where frits were the begt.

## 4. WLCRATIONAL

During the pericd spent at the lake by the authow, Inttie travel in or out of the area was noted. The permanent trails of high andles and ridges were little used. in the writar' ${ }^{2}$ opinion these are travaled constderably in the spring and possibiy late fall to some extent.

A short trail from Opfalley Lake to Dog Salnon Creek ghowed ruch use during fishing aeason. At appears that bear. visit Dog Balnon as there are fow balnon in the area et the south and of o'falley Lake. This might be termed a temporary
migration, more seesonel, and similer to other movements within the Karluk Lake drainage. When the trail tas surveged, July 30 , tracks showed direction of travel to be both ways. At thas time there were but few chums left in Dog Salmon Greek.
C. $\operatorname{FOOD}$

## 1. GENERAL

In generel, foods used tere the usual, although one now one, nettle, Urelea was noted. A good selmonberry, fubus gooctabilis, crop was produced and much use was made of it. The rolshed elderberry was as abundant as usual. No heavy frost occurred until September 26 so berry crope remeined in good comdition.

## 2. SIGRT FEDDINGS

By using a 20 power Beusch and Lomb scope, bear were obacrved grazing, but usuaily at such distance thet faentification of plants tas impossible. Tisits to the area later shoved Angelice, grasses, sedges to have been taken.

Of course bear were seen taking salnon, usually found to be easy-tometteh spawn outs, and often carcasses lying In the streams. The bear seen fishing used the usual method of dashing after a fish or occasionally standing quietly then taking a suipe when a figh cams close. One good-sized one used the novel method of standing on its hind Iegs and wading short distances then coming down with a lunge after a fish. when wading on its hind legs the resemblence to a heawweight wrestler was striking, This method was observed but once and was used when fiah were scarce and in the deeper poole. Other bear using nore conventional methods were having much leas luck in the sano area.

Lhter boar were observed reaching up with a forepaw to bring elderberry fruit to their youth, while sittting on therir haunches.

Ony one bear was observed in the act of drinting weter, glthough others that were seen in water may have taken some. The one in quastion came down a slope to a lake then jumedietely returned, even though there was a well-used trail along the ghore. In other words, it appeared to heve made the trip just for the drink

## 3. FEFING SIGUS

TABLE VI.
Date Mame Eart
July $8=15$ Large Sedge, Carex lymbed Lear tips
Grasses, Graminee Leayes
Mesdow Berley, Hordeum nodosum?
Beach Rye, mymus mollis Leaf tips
Cow Pargnip, Reraglsum lamatum Hearts
Comon Angeltca. Angelice lucida Leaves
Bent-leaved Angelica, Angelica Flowert and genuflexa stens
Gurly Docks Rumex crispue Leaves
Nettle, Ustics 1Yalin? Plant bips
ned Salmon, Oncorhynchus nexka All but jaws andgonade
July 16 - 31 Horsetail, Equisetum gpo ..... Stems
Large Sedge
Grasses
Headow Barley
Coman Angellce
Bont-leevod Angelica
Curly Dock
Date
Mame
Part
July $16-31$ Samonberry, Fubug gpactabilis Fruits
Blderberyy, Smbucus racerosus pubens Truits. green
Winlow, Galix 390 Granch tips
Mughroom (sp?) ..... Entire
Red Selmon
Chum Salmon, Oxyorhyachus keta All but jous and goneds
Bumblebees, Bopbus gio Entire \& honey
! ..... \#
Yellowjeckets
August 1-15 Grass
Beach Rye
Meadow Barley
Salmonberxy
Elderberyy
Red gsimon
Dolly Varden, ..... Solvelinus malma
Slin and part ofbídy
Angust 16-31 miderberyy
Salmonberry
Red Salmori

TABIE VI. (CONT'D)

Date

September $1-15$
Hame
Part

Elderberry
Salmonberry
Hed Salmon
Pink Salmon

Septerber 16-30 Elderberry
Hed Salmon
Pink salmon

The variety of foods taken early in the season dwindisd to but a few in Soptember. Elderberry was the big favorite; plontio ful, easy to get, fills stomach fast.

## 4. SGAT EXAMTNATTON

Field examination of bear dropping generalls indicated, as in 1952, use according to avallability, amount, ease of procurement, and possibly pertiality. Components and rough estimates (percentages) of each were recorded. Results are tabulated in the following tebles. Items arranged according to earliest apparance chronologically and to sone axtent taxonomically.

## TABLE VIII.



## TABLE VIIL. (COMqD)



```
#% = 100%
    100-75
        75-50
        50-25
        25-5
Tr - 5-Trace
```

Dock
Salix 1
Conk (Dendentonus Spo)
Yellowjeckets
Bumblebees
Gravel
(Cestode Segments)
octobil 1, 1954)

$$
\begin{aligned}
& \text { July 8-15 (61 Scats) July 16-31 (32 Scats) August 1-15 (38 scats) } \\
& \begin{array}{lllllllllllllllllllll}
\mathrm{T} & 100 & 75 & 50 & 25 & 5^{\mathrm{Tr}} & \mathrm{~T} & 100 & 75 & 50 & 25 & 5^{\mathrm{Tr}} & \text { I } & 100 & 75 & 50 & 25 & 5^{\mathrm{Tr}}
\end{array}
\end{aligned}
$$

1


## Nettle

## ThBLE TIII. (COMPM)



```
T= 100%
100-75
75-50
50-25
25-5
Tr-5-Trecs
```

                                OcTober 1, 1954)
    ```
Rugusk 16-31 (12 Seats)
Deptember 1-15(15 Scata)
September 16-30 (18 ScatB)
T 100 75 50 25 [llllllllllllllllllllll
```

Dock
Selix
Conk (Dendentonus Sp.)
2
Yellowjackats
Eumblebees
Erevel
(Cestode Segrents)
(1)

APEARANCES AMD PERCDIVAGES OF FOODS IN 176 BEAE BCATS - TGRLUK LAKE

|  |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 100-75 (176 acem) |  |  |  |  |  |  |  |  |
| 75-50 |  | \% 20 | L | 176 | ccats) |  |  | - lotal |
| 50-25 | T | 100 | 75 | 50 | 25 | 5 |  | Appearancee |
| $25-5$ |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
| Horaetails | 3 | 17 | 11 | 7 | 3 |  |  | 42 |
| Sedges | 5 | 6 | 5 | 6 | 3 | 1 |  | 26 |
| Grasses | 3 | 3 | : 2 | 4 | 11 | 16 |  | 39 |
| Angelice Lucide | 10 | 5 | 15 | 10 | 11 | 4 |  | 55 |
| A. Genuflera |  | 2 | 2 | 1. | 2 | 2 |  | 9 |
| Fish | 10 | 4 | 4 | 6 | 8 | 5 |  | 37 |
| Salmonberry | 2 | 11 | 6 | 1 | 1 | 2 |  | 23 |
| Elderberry | 42 | 16 | 14 | 9 | 12 | 7 |  | 100 |
| Highbush Cranberxy |  |  | 4 | 2 | 10 | 6 |  | 22 |
| Crowberxy |  |  |  |  | 1 | 5 |  | 6 |
| Nettle |  |  |  |  | 2 |  |  | 2 |
| Dock |  |  |  |  |  | 1 |  | 1 |
| Salix |  | 1 |  |  | 1 |  |  | 2 |
| Conk (Dendentonus Sp, |  |  | 1 |  | 1 |  |  | 2 |
| Yellowjackets |  |  |  |  | 1 | 2 |  | 3 |
| Bumblebees |  |  |  |  | 2 | 2 |  | 4 |
| Gxavel |  |  |  |  | 1 | 1 |  | 2 |
| (Cestode Segmant |  |  |  |  |  | (4) |  | (4) |
|  | 75 | 65 | 64 | 46 | 70 | 54 |  | 374 |

As in 1952, elderberry was the item most used. Foods that appeared most comonly were:

TABLE VIII.
Appearances

| Kumber | 管 of geats | In $100{ }^{\prime}$ Amt | \% of Scats |
| :---: | :---: | :---: | :---: |
| 100 | 56.8 | 42 | 24 |
| 64 | 36.3 | 10 | 6 |
| 42 | 23.3 | 3 | 2 |
| 39 | 22.2 | 5 | 3 |
| 37 | 21.0 | 10 | 6 |
| 26 | 24.8 | 3 | 2 |
| 23 | 13.1 | 2 | 1 |
| 22 | 12.5 |  |  |

Comparisons with the 2952 determinations cannot be made unless the differences in time of collecting are considered. In that year none were collected before the end of July. fins year 61 reats hed beon examined by mid-july These were chiefly vegetative with Angelicas, horsetails and gresses well represented This same bype of material is usually found in scats during May and June.

## 5. STOMACH MALISES

Only 2 bear stonachs were cheoked. Both anmais had been taken during the hunting geason in late heptembero

September 25 Male Blderbery ( $6 \mathrm{Ib} \mathrm{E}_{0}$ ) $100 \%$

| September 25 Fenale | Ehderberry | $60 \%$ |
| :--- | :--- | :--- |
|  | Fish | $30 \%$ |
|  | Highbush Cramberry | $10 \%$ |

The stomach of a male kllled in Anton Istren Bay near the tom of Kcilals, killed october 2h, contained:

Fish bones $\quad \therefore \quad 90 \%$
Wight of contents 9 1bs.
E1derberry
啳
Highbush Cranbersy
$2 \%$

## D. ACRIUTPY

## 1. CETERAL

In general, behavior geemed normel, with more bear and the largar ones seen noer dupk than at any other time. Some
activity during the day was noted in July and the firgt hels of August anong the subadult and the sow-cub groups near streans.

Host animels were observed walling or running and many others while foeding; or in related activities e.ge, chasing galmon. Very few bar were noted resting, although sow were seen to 110 down during the observation period.

Young were usually following their mother but gtopped to Invegtigate objects and occasionally to wrestle or play, During one sighting, two young, probably in thind gears wretited for over one-half hour, thelr mother entering the fun, but briefly, on occasion.

A pair of yearlings at another time wrestied for about 20 minutes, their mother remaining aloof.

Barlier in the geason tresh beds were noted on high points; later in the thick alder-willow near streans and even on gravel bers and beacheso During the elderberry-feeding perioc, beds were found in the dense growth of the slopes.
2. STMD

The beans seem to do moh rembling, with many otope
to investigate objects or grazes, etc. When one dees cover longer Afstances on trails, stc., a man has to almost run to keep the animal in sight even though it seoms to be shufeling alonge.

A sub-adult was observed walking along the trail along Thumb hake about one mile in length. The distence wes covered in Less than 10 minutes, including three short hesitations.
3. SWIMTIMG

One bear wes encountered swimane from Camp Island to the nearby lake shore, a distance of about 100 yarde.

Other bear were observed in water near the lake shore but appeared to have their feet on the bottom most of the thac, seoningly attempting to use their front paws to bring salmon carcesses to the surfiace.

Who yearlings westled in shallow water for nearly 10 minutes. In no case was a bear seen wholly submerged.

## 1. PELAGE

A11 ghades of brown were noted, from light te dark. Most blondness, if present, wes seen about the head and shoulders although one lone yeariing wes mostly blond with patchy, long hair.

Color of a bear in early duly may be considerably differont than the same one two months later, Old lone winter fur tends to be a zuch IIghtor shade than the new, chort, dark coat of Iate sumater

## 2. SIEE - AGE CHARACTEALSTICS

A long-legged bear although of good size is probably not very old, even subeadult. This is especially true iff it moves with some speed. An older bear is much more filled out, giving the legs a shorter look. It ueually moves in a lumbering fachion. Heal old bear seem to have a bway back. The above bear are ugually maleg.

The adult females, smallex thon males, usualiy ohow similar age characteristics, but seres are hard to dietinguioh in the field wnless there are cubs present.
a. EKIGETS

In Septaber 2 bear wore woighod:

㒹le sub-adut in 3 rd year $\quad 356$ pounds Female adult (lactaeing) 437 pounds
(In October a laxge male from Anton Lareen Bay area was found to weigh 1225 pounds).

## 3. THJURIES

Only one bear mas observed with a definite injury. This one had a stilf bowed-out left leg (foreleg) and walked with diffLeunty and slowness. It appeared to be in good condition. On a stream it pawed at carcassas, making no attempt to catch live fish. Another bear fishing in the vicinity seemad not to notice this cripple.

## F. GREGRHOUSUSS

The only time there was any sign of gragariousness was during the breeding season and anong cubs for a while after they
had lost or left their mother. Otheruse hardly over were bear, other than sub-adults and sow-cub groups seen together.

One group, tro large and a sub-adult, seen in eerly July appeared to be a boar and soy with cub in tte third year. Probably the boar wes still sexually interested in the sow and the single cub had not left its mother/ It kept its atstance. from the larger bear.

TII. SALMOM RELATIONGHIPS
A. BeAE

1. GHEMAL

Although no weirs nor electric fences were installed some small amount of data vere collected and general sfecte noted.

The streans on which there had been electric fences showed much bear use, indicacing that the effect of a stream having been protected as hardiy noticeable a year or two afterwerds, Both Moraine and Halfway Creeks were visited by bear and kopt free of corcasses presenting a much different aspect than that of 1952 wen they were loaded with fungused salmon remains within the fences.

## 

\& few insh showing bear marks but with undanaged interiors were dissected and tallied as to spawedress. The results show that nearly all were spamed out. The following flsh were checked from July 22 to 25 th during the height of the spaming period on the smaller creeks.

TABIE IX.
SPAWMIIG CONDITION OF 406 WROLT BEAR-GIKEN SALION

Feralo
Unspawned

July 121
133
$17 \quad 70$
17 . 34
$24 \quad 1$
25
known figures beceuge whole fish were examined. The fenale is probably the nore valuable and necessery because of apparent promiscnosity and the ability of one male to fextilize the ogge of several iomales.)

Of course many jows and partial remains were found but Littlo desinite data were extracted.
3. ESCAPE PATHMENS
a. UNSPANED TISH RETUEA TO LAKE
(As was noted in 1952, fresh spathers frantically returned to the safety of the lake wen disturbod in the small streans. This escape pattern must be a factor in keeping low the number of un spawned fish taken by bsar. Of course, the fresh fish are harcer to cateh than those more spawed out.
b. ADAPTATION TO HTGA SPEED SPANATMG

Another factor that tends to keep the unspawned figure Low is the apparent adaptabillty of the creek fich to high speed spaming as against a semingly alower rate among the fish in more protected areas of the lakesinore and large, deop streams.


#### Abstract

The creek fish ceem to school at the creek mouths until ripe. then make a mun to do their actual ppaning in possibly as Iittle as two days. 取thout sone such adaptation it is doubtral Aif satmon ruas on the small creeks could have combinued through the years in their "preman-exploited" abundance.


## 4. RAGGING

The writer" believes that a tageng axpsmant conducted at the mouths of these chenl ereeks would indicate the specd of spawnins. Daily cheoks mould need to be nade and probably nonkill examination, using a dip net, to determine spawnedness. Others could be discected to determine the condition positively

A luminous tag in the dorsel fin area would be bast for gighting in the ares. In addtion a mall numbered tag through the lower pret of the gill cover or gav to identify individual fish would be helpiul, especially if bear-taken.

Other infomation might also be collected, such as nomber of talos involved with one femple, langth of time in vicintty of redd efter spawning, etc.

This sumer the witer tested the feasibility of gill cover tagging but few of the swall tage could be seen in fast water. Dorsal dises would be vers helpful.

Of 105 figh tagged at Halfoy and Cascade Creeks 4. were seen in the creeks and one tag was found on the banks. Unfortunately, a dally count could not be made so this small return should not be taken as indicative of success.

Both Don Bevan of Fitheries Research Inseitute and Bob Ranker of the Alaska Department of Ftherios heve noticed this apparent high speed spowning. In fact Bevan had tagged 200 croek spatmere for another reason and mentioned that the fish spent about 4 days before leaving the 'redd' area and drifting dowstream, His return was low also; due partly again to not making daily visite. In Bristol Bay oxperiments, Beyan gata that fish stayed. an small streams 3 weeks or more, but spawnd in the first weok. He mentioned that there wes slight predation in the area tested.

A tagging in comjunction with a weir would bs:a valuble experiment. A suitable creek would be halfway; not too long and easy to visit. Probably an experienced Fieheries man in addttion to the gams men would help a great deal in axriving at a definite degree of spamedness and deternination of other facts noted in dally visits.

## B. DOLEY VARDETY

Occasionally Dolly Varden are caught by bear. One such of fair gize the writer found at Meadow Creek which on examination of its stomach was found to contain at least 490 salmon egge. A few other Dollies caught at the mouch of Caseade Oreok alzo contained considerable numbers.

## C. STOM DAHAGE

Whth the lowest escaperent through the Karluk Weir ever recorded, an added disaster wes the two day stom of Augugt $22-23$. Several atreams were terrifically scoured, courses altered and much spawning gravel moved out into the lake as new deltas. Sone of the eggs may heve withstood the burfeting, unless later buried too deeply or picked up by gulls or Dolly Varden. Streens hardest hit were Grassy, Halfway, Meadow, Cascede and Salmon with Canyon and Uppar Thumb to a lesser cegree. Attempts to find aggs on these creeks later by Fishery persomel met with litile successe If the eggs had eyed out, their tougher skins mey have saved riore than it appears.

The evencual number of adults thet return to these hard hit creeks should be noted and compared with normal returne and
ratume at streans that were little affected by the storm.

## IV. BEAR MAKMG

## A. METHODS

Marking attempts were carried out in the Karlulk area agein this summer to try and laarm more of the movenents git the beors. Little use was made of the cross-bow method due to lack of assisting personnel. A fow wax packets were attached to undex gides of willow and alder branches that hung over trails. These were contacted, but it appeared that some were bitton rather than rubbed. More effective, at least in contacts, were the "bottle stations ${ }^{\text {. }}$

Fron August 2 to September 25 a total of 61 stations were set out. By September 27 the Lest day any were visited, there had been at leest 104 contacta Sons were hit several times, very few none or only once.

The "botile station" consisted of an upside-dom corked bottle $1 / 3$ paint-filled, hooked to e wire triangle, the bese of which stresched aerose a bear trail - no batt wes used.

## B. RESULTS

In apite of the numerous contacto, the writer feels that few lasting marks were carried by the bears. The chief geason was the type of paint aveilable. Again the author's dog was used ws a best anian and indicated that the fact drying thin lacquers and rubber base paints were visible from a little as two days to hardly more than a wek. Thicker solutions appared, to be somowhat more permanent.

It was noted thet application of laequer to the humen skin produced a temporary burnine sensation. The effect on the dog apparently wes similar for much rolling on the ground occurred after contact. Also after lacquer was hard and dry on the hate it segned to crack of easily on contact with brush, etc. Rubber-base paint was somowhat better in this respect, remaining more reallient; even so it showed littis permanencyo

Hark applied before mid-August appear to have much less permanence than those after, due to the final rubbings of old fur and the growth of new coets.

Not a marked bear was observed by the writer and to date no hunters or other persons heve reported any.
of the paints tried carlien (1952) by the author, plain
red lead has seemed most effective. Probably various sticky, gemithick, ordinary "house" paints would also work to give variety in eolor.

Other solutions that might be investigeted are peroxides, hair tints and dyes. fost of these are light shades and should usually show well on the derts coat of most bear.

## V. ADDITEONAL DATA

A. AvTFAuna

## 1. BAGLSS

Eagles did not seem quite as numerous as in 1952, and again there wes little indication of predation. Where feeding was observed, nearly all the eagles were acavenging selmon carcasces.

## 2. BIRD LIST

A bird list was kept throughout the gunaer. Arong the birds reconded nearly overy day were bald eagles, glaucousowinged and chorto billed gills, magpios and black-capped chickadees. Song birds seen
comonly until early September were the pileoleted werbler, savannah, golden-crowned, and fox spurrows, although the latter was also numerous until the middle of the month.

Common loons, gelden-eye ducks, and red-breasted mergansers semed most plentiful among the waterfowl. Migrating geese were noted on September 7, 20, 24, 25 and October 1st/ A pair of whistling ewans stopped by on Thumb Lase on Septerber 7th.

Apparently the first bird to leave the area was the violetgreen swallow, Hone was recorded after the 31st of July That Iong distance champion, the arctic term, was not observed beyond the 21st of August. During September the one warbler and sparrows becans acarce.

## B. FLOKA

Again plants were collected for addition to the herbamium at the Kodials office. Also somo seeds were identified, dried and placed in vials.

## TI. SUMPARY

Using methods similar to those of 1952, a poputation of 132 was estimated for the area, a density of 1.65 bears por square mile. Two years ago the estimate was 124 and 1.55 the density.

Distribution of age classes was also similar with a good cub (seasonel and yearling) crop, representing $38 \%$ of the totel (1952, 41\%), The adults, best trophies, made up $29 \%$ in both years.

Most sows were observed with two cubs, a few with one and three and two with four. The average was 2.17 young per forale compared with 2.13 two years age.

Hunting pressure has remained high resulting in a take that practically eliminates the increase of approximately two dogen per year.

The bear-unit constant, for possible use in aerial surveys, was 1.7 as compared with 1.8 in 1952.

Ground surveys in late duly and August to nearby areas indiceted no definite signs of migration into or out of Karluk dreinage.

Wovement within the drainage was sivilar to that noted in 1952. Gencrally from upper slopes to concentrations near salmon streams from mid-duly through early August, then a return to the lower slopss as the elcerbermes ripened, in spite of numorous fall run salmon in the laxger streams.

Again, elderberry wes the most frequent consiftuent of scats ( 56,8 8) in spite of the fact that over onemalif the amples were checkd in July when vegetative remoins were dominant, other important items were: Angelica, horsetails, grasses, fish, sedges. salmonberry and highbush cranberry in thet order of apposrance. In total amount in individual scats, elcerberry again led with $24 \%$; far below were Angelicas, fish, grasses, horsetatis, sedges and salmonberry.

No strange: actions were noted exoept for one beap that waded in a stream on his hind legs while Atening. One cripple seemed in good condition despite its injured foreleg.

The only signs of gregeriousness appear to be during breeding season and a limited tolorance for each other at the same fighing holo.

Two streans where electric fences were installed in 1952 showed bear activity comparable to others. The once-fenced
streams were clean, whereas two years ago they were choked with fungused salmon carcasses.

Of 406 red salmon, bear-taken but with undamaged interiors, $2.5 \%$ of the femies and $6.9 \%$ of the meles were found unspamed.

In the smaller streans an escape pattern was aeain observed among unspownd fish in their frantic return to the protective laice when disturbed.

In these seme streams an apparent adeptation to high speed spaming seems to have evolved to maintain salmon populations through earlier tines when beare were uncontrolled. Further study would be valueble.

Dolly Varden were taken containing numerous salmon eggs, one taken by a bear contefined over 490 by count.

A storm on August 22 and 23 apparently did much damage to this season's ege deposit of early run salmon on several of the majl streans.

Bear marking results were unsabisfactory, although many bear were apparently smeared on visits to "bottle stations". The only matorials allowed were lacquers and rubber bese paints which, although fast'drying, lacked permaneney and irritated the skin of the buthor and also test dogs. Sticky red leads, etc. seemed

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much more effoctive two years ago.
    Bird sight recorda were kept and plants and seeds were
collected.
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Nath AR ABCHO


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(ileadou Capolt)


3 3 80 2t. Downstagum - Batt
of salmon moving downs


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