

① Least Bittern ^{Talpe & Merriam} Yeater

Between the dates July 20 and July 31, 1928 a study was made of the nesting habits of two pairs of Least Bitterns (*Ixobrychus exilis exilis* (Gmelin)) in the swamp near the mouth of Maple River, at Bent Lake, Cheboygan County Michigan.

~~While~~ At a distance of three hundred feet or more from Bent Lake the swamp consists of a rather extensive area of ~~fallen~~ ^{standing and fallen,} dead larch trunks, and some shrub growth. The area between this part and the lake is comparatively free from shrubs ~~and~~ except along the shore. The water ^{during this period} ~~is~~ from about eight ~~inches~~ ^{to} three feet deep, a vegetable mat over a muddy bottom supports a thick growth of buckbean (*Menyanthes trifoliata*) which rises several inches above the water, and in many places is the only plant. Rather thin patches of cattails and rushes

(*Phragmites communis*) occur over this section of the swamp, and very rarely low shrubs, sweet gale, willows and, near the dead larches, leather leaf (*Chamaedaphne calyculata*). Open water occurred only in the side branch of Maple River and in a slow stream ~~that~~ through the vegetation.

This section ^{at this time} was frequented by black ducks, grebes, Virginia rails, American bitterns, ~~a few long billed marsh wrens,~~ numerous redwing black birds, and at least three pairs of least bitterns, all of which probably nested. Kinglets, crested flycatchers, robins, cedar waxwings, swamp sparrows, Maryland yellow throats and a few long billed marsh wrens were heard or seen, and occasionally a marsh hawk.

Both nests of the least bittern were ~~in~~ ^{about 3 or 4 inches} above the water, in low shrubs.

Neither were more than a dozen feet from the open ~~with~~ stream. The first ^{found July 20} contained five young which left the nest about four days later. It measured 4' x 6', and was

nests well about 75' apart

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made of cattail leaves, twigs, marsh grass stems, bull rushes and lined with bits of cattail, fine twigs and stems. The other nest, found July 21 in a ^{low} sweet gale shrub was lined only with finer stems of marsh grass which extended beyond the edge. It measured $6\frac{1}{2} \times 3\frac{1}{2}$ " This nest contained five pale light blue eggs (measurements). A dead cattail helped to support each nest and furnished nesting material. Though partly concealed by the from below and the sides by the leaves of the shrubs and the surrounding buck bean which grew about as high as the top of the nest, they were easily seen from above. ^{and giving some protection} Around one of the nests, ~~partly hiding it~~ was a sprouting growth of cattails and rushes.

The latest record for eggs given in Bent's North American Marsh Birds for Michigan or Wisconsin is July 1. The second nest which was hatching July 25, ^{was} nearly two weeks later than the other and probably was an attempt after an earlier failure.

Behavior.

a blind with a raised floor was set up (over)

near the ~~nest~~ later nest and most of the observations were made on this nest while the photographs are of the young of the earlier brood which probably left about July 24.

The cooing notes of the males described by Mr. Arthur A. Allen (Bent's N.A. Marsh Birds) as *uh-uh-oo-oo-oo-oo-oo-ooah*, were heard ^{frequently} on the evening of July 20 and morning of July 21, but not on July 25 or thereafter. There were numerous variations of this call sometimes *uh-uh-uh-ooah* or *kuu-kuu-kuu*.
of these notes

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The young were about one and two days old
the ~~male~~ ^{parents} ~~and~~ female both approached the
nest freely and brooded the young much of the
time. When this nest was found ^{on July 21} the female
did not leave until I was within a few
feet of the nest. However on July 30 and 31 when
the young were about 5 and 6 days the adults
were very wary ^{and difficult to photograph} and there was no brooding
except at night. At this time the adults
always tried to keep concealed in the leaves and
feed ~~the~~ from the side of the nest.

The actions of the female in defense
of the nest were well revealed on the
evening of July 26, when the young were
about a day old. While I was seated in
a boat ^{by the nest} weighing and measuring the
young the female appeared from the
growth of buckbean and climbing a cattail
clump a dozen feet away watched me closely. Upon
descending cautiously she moved very slowly
over the ~~thicket~~ ^{thicket} vegetation toward the nest.
At about 4 feet away she stopped, ~~reared~~
~~and~~ ~~its~~ ~~beak~~ ~~up~~ ~~and~~ ~~stretched~~ ~~up~~
~~and~~ ~~its~~ ~~beak~~ ~~up~~ ~~and~~ ~~stretched~~ ~~up~~
to its full length, her eyes, appearing on
each side of the elevated beak, fixed on me.

Her wings were spread and drooped in the water. Her head was held still while her whole body and neck undulated side wise in a snake like motion - certainly a menacing looking ~~enough~~ creature, ~~the~~ ~~frighten~~ ~~any~~ ~~timid~~ ~~enemy~~. Then keeping this attitude she moved slowly toward the nest and porting the haves she stealthily entered and hovered the two young, keeping her head erect and her eyes fixed as me as she did, so ~~so~~ as I made a motion toward the nest, shot her sharp beak in my direction, uttering a startling hissing note as she struck. She flew a few feet away and remained in full view, swaying her body until I had finished. The erect guarding and sharp beak of the adult during the first few days of the young's ^{life of the bird} ~~is~~ must save the young ^{from destruction} in many instances.

The menacing attitudes of the adults are assumed by the young ^{in the nest} ~~when~~ only a day or two old. A youngster two days old affected the drooping of wings and swaying of body and struck at me as I reached the nest. The young ^{up} the

first hatched food, when about four
days before leaving the nest would
assume savage attitudes and all pick
strikes at once with open mouths,
although their beaks were too soft to
do ^{any} other than prigaten an eyeing.
~~to inflict any damage to my hand.~~

Young

On the morning of July 25 three
young were found hatched in the nest
when I came to put up the blind. The
other two young were ^{unfortunately} chilled and died
in the shell. The young newly hatched
bitterns were ~~buff~~ light buff on the back,
a shade darker on the head, and somewhat darker
still on the shoulders. The down was nearly
1 cm long and standing erect on the
head and body gave the young a
pinnacled appearance. The beak was
so very flexible and remained so all
during the observation.

During the observation of July 24 and
27 the adults hovered much of the time.

From 3:56 P.M. to 5:22 P.M. July
26 the male though disturbed by the
blind hovered about 35 minutes.

From 5:22 to 6:20 the female was

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Paraph

was on the nest constantly. At 6:30^{PM} of the ~~same~~ same day the young weighed 15.1 gm, 17.2 gm and 22.1 gm respectively indicating considerable difference in the time of hatching. At this time the smallest regurgitated a partly digested half minnow weighing nearly a gram. The next larger also regurgitated a half minnow over an inch long weighing 1.9 grams. I was surprised at the size of the masses these youngsters could swallow. The lower lips distended widely. They are curled or gaped. Minnows seemed to make up a good deal of the liquid food which never regurgitated by the smallest young in all cases.

On July 30, 3:10 to 4 P.M., the female approached the nest twice but there was no brooding. The oldest

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of the young was now making excursions out of the nest into the ~~frankia~~ shrub.

On July 31 the nest was under observation from 4:30 A.M. to 11:45 A.M. at daylight the male was found brooding ~~the~~ ^{young} but he left shortly after 5 A.M. and there was no more brooding during the forenoon. The adults came to the nest five times during the period and fed from the side. At this age the young did much twittering, giving a slightly more electric peep, lower and softer than that of a little chick. One of the young left the nest to drink water but returning again about 10 minutes, then nested quietly for 1 1/2 hours.

The following observations were made from 7:45 A.M. to 12:15 P.M. July 27 when the young were about

two days old.

7:45 I enter blind

7:49 The female appeared from hiding, and spreading her feet ~~at~~ to mess the young, she entered and settled down.

9:05 The young though covered have been pupping for sometime. A young one emerges and grasps the ~~beak of the mother~~ to be fed. Regurgitation seemed an effort and the young puts its beak in the mother's mouth. The effort was finally successful. appeared

9:18 The male ~~approached~~ quietly at the back of the nest, a slight squawking was heard ~~from~~ from the adults, and the female ~~checked~~ ~~quickly~~ ~~to~~ ~~the~~ ~~beak~~ left the nest.

The male entered cautiously but stepped on one of the young. He opened his wings slightly and settled down, but he was not as quiet as the female as ~~the~~ a head soon appeared between

(D)

wing and body.

~~4:24~~
9:55 One young appeared in front of the male and grasped his bill. The response started at once. Shortly another one came out to be fed.

10:10 One young grasped the male's bill near the nostril and another nearer the tip. The higher one followed the food mass down and swallowed it.

10:37 The nasal note of the female indicated her coming 20' away. She was walking above the water by horizontal stems, making very short flights and jumps, walking over some low vegetation, stopping occasionally to calculate her body. As she came to the nest the male yawned, evidently tired of brooding. The female took the male's place, and fed the young, taking pains to deposit food in the mouth of one complaining of not being fed.

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~~12:15 The male reappeared and~~
12:15 The male returned and as he
appeared through the leaves, the
female turned her head, ~~and~~ toward him
opened her beak wide, ~~and looking at~~
him ^{and} uttered some high querulous
notes that sounded like scolding.

The adult bird when sitting on
the nest always kept the bill elevated
to about 35° but did not ~~extend~~
~~beak~~ ~~to~~ ~~the~~ ~~full~~ ~~length~~
~~of~~ ~~the~~ ~~bill~~ ~~and~~ ~~the~~ ~~head~~ ~~and~~ ~~neck~~ ~~extended~~ ~~upward~~ ~~as~~
recorded by Ira N. Gabrielson (1944 Bent
N. G. Marsh Bird). Also ~~containing~~
~~the~~ ~~information~~ it was found
that in this case the female as
well as the male fed the young, whereas
Mr. Gabrielson found only the male
~~feeding~~ did the feeding.

The nest was empty on Aug 6.
3+ days after the young hatched.

	524016	524017	524018
1.			
Bill-Nos.	9 6 7 8	6 6 9	6 7 10
Bill-Eye	16 17 21 24	11 17 24	16 20 26
Extent	71 83 100 134	72 78 134	75 93 149
Wing			
Bend Tip	20 21 31 35	21 22 35	26 25 39
Tot. Length	147 154 180 196	136 141 142	155 168 184
Toe Tarsus	34 44 49 57	34 40 57	38 46 64
Toe heel	56 67 79 93	57 66 93	61 72 102
Wt. gms.	22.252	15.145	17.287

Young Bird from Early Nest about 9 Days Before Leave

	mm
Bill	21
Bill-Nos	15
Bill-Eye	28
Eye Diam.	7
Wing	87
Wing Body	80
Leg Body	130
Tarsus Toe	70
Foot	65
Toe I	30
Nail	7.5
Toe II	32
Nail	7
Toe III	37
Nail	7
Toe IV	32
Nail	8
Fly	
Prim.	
Sheath	7
Length	172
Extent	175

Egg Measurements Nest 2

1.	26mm	x	32mm
2	27	"	32 "
3	28	"	34 "
4.	26	"	34 "
5	27	"	34 "