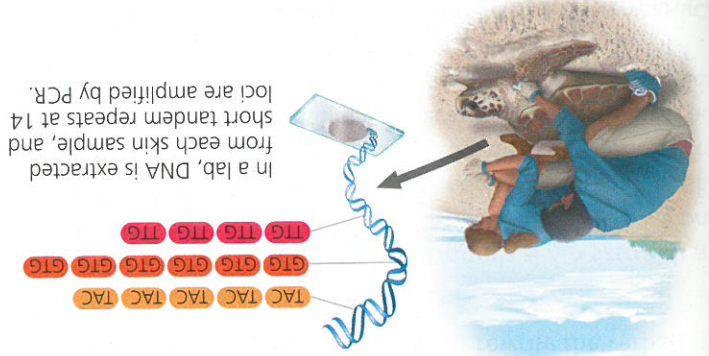


and 2009. From these samples, they amplified nuclear short tandem repeats at 14 loci using the polymerase chain reaction (PCR) and produced a genetic profile for each female (Figure 53.7). They then extracted DNA from an eggshell from each turtle nest on the beaches they studied and, using their database of genetic profiles, matched the nest to a specific female. This approach allowed them to determine how many of the 198 females were breeding without having to disturb the females during egg laying.

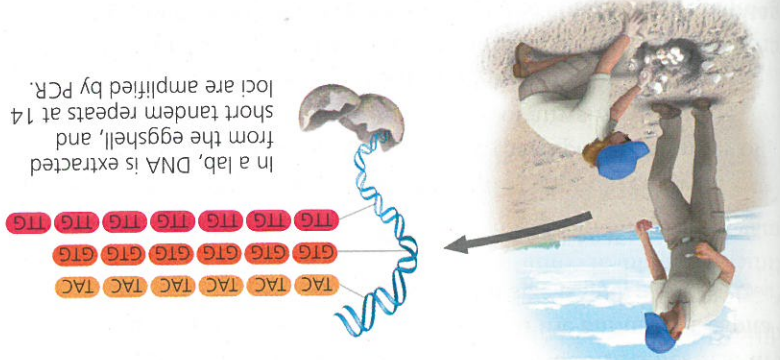
The age of reproductive females is another important variable for estimating reproductive rates. A reproductive table, or fertility schedule, is an age-specific summary of the reproductive rates in a population. It is constructed by measuring the reproductive output of a cohort from birth until death. For a sexual species, the reproductive table tallies the number of female offspring produced by each age-group. Table 53.2 illustrates a reproductive table for Belding's ground squirrels. Reproductive output for sexual organisms such as birds and mammals is the product of the proportion of females of a given age that are breeding and the number of female offspring of those breeding females. Multiplying

Part 1: Developing the Database:



Skin samples are collected from female logghead turtles.

Part 2: Comparing Samples to the Database:



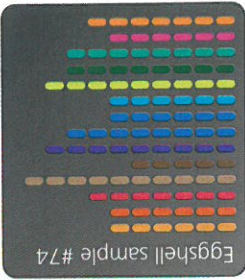
An eggshell is collected from a logghead turtle nest.

▲ Figure 53.7 Using genetic profiles from logghead turtle eggshells to identify the eggs' mother.



The genetic profile of the eggshell is compared with an established database containing genetic profiles of adult female logghead turtles. A match identifies the female that laid the eggs in the nest.

A genetic profile is determined for each eggshell sample.



❓ Which breeding female laid the eggs in the nest that eggshell sample #74 was taken from?

Table 53.2 Reproductive Table for Belding's Ground Squirrels at Tioga Pass

Age (years)	Proportion of Females Weaning a Litter	Mean Size of Litters (Males + Females)	Mean Number of Females in a Litter	Average Number of Female Offspring*
0-1	0.00	0.00	0.00	0.00
1-2	0.65	3.30	1.65	1.07
2-3	0.92	4.05	2.03	1.87
3-4	0.90	4.90	2.45	2.21
4-5	0.95	5.45	2.73	2.59
5-6	1.00	4.15	2.08	2.08
6-7	1.00	3.40	1.70	1.70
7-8	1.00	3.85	1.93	1.93
8-9	1.00	3.85	1.93	1.93
9-10	1.00	3.15	1.58	1.58

Source: P. W. Sherman and M. L. Morton, Demography of Belding's ground squirrel, *Ecology* 65:1617-1628 (1984).

*The average number of female offspring is the proportion weaning a litter multiplied by the mean number of females in a litter.