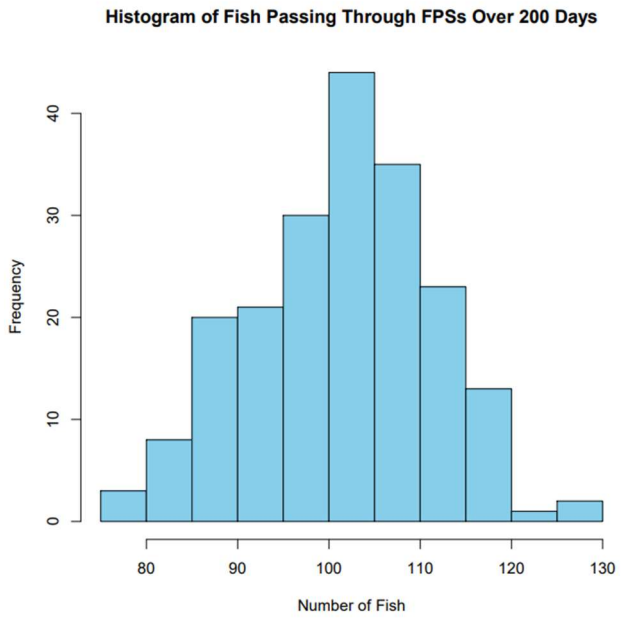
a) **Seven days of data simulated using R:**

```
> set.seed(123)  # for reproducibility
> one_week_data <- rpois(7, lambda = 4.3 * 24)
> one_week_data
> [1]  97 115  86 104 120 107  90
```

b) **Simulate 200 days of data:**

```
> set.seed(123) # For reproducibility
> two_hundred_days_data <- rpois(200, lambda=4.3 * 24)
> two_hundred_days_data
```

c)



The histogram appears to be roughly symmetrical and bell-shaped, centered around 100-105 fish per day. The histogram also appears to be skewed to the right. This shape is consistent with what we'd expect from a Poisson distribution with a large lambda value. The spread of the data seems to range from about 70 to 140 fish per day, with most days falling between 90 and 120 fish.

R code for histogram:

```
hist(fish_data_200days, main = "Histogram of Fish Passing Through FPSs Over 200 Days",
xlab = "Number of Fish", ylab = "Frequency", col = "skyblue",border = "black")
```

d) **Simulated Mean:**

```
> # Calculate the mean of the simulated data
> mean_simulated <- mean(two_hundred_days_data)
> mean_simulated
> [1] 101.89
```

Theoretical Expected Mean:

The theoretical expected number of fish during a 24-hour period is $\lambda \times 24 = 4.3 \times 24 = 103.2$.

The simulated mean should be close to the theoretical mean of 103.2, but due to random variation, it may not be the same. In our case, the mean values are not the same since there is a difference of 1.31. The small difference between the two is due to the randomness in our simulation. `