1. Since there were three quolls, there must have been nine bettongs (there were three times as many bettongs as quolls). As half the total animal population was bandicoots, the other half was made up of bettongs and quolls, a total of $3 + 9 = 12$. So there were 12 bandicoots and hence 24 animals altogether.

2. The total animal population at the end of the second year was 40 and half was bandicoots, so there were 20 bandicoots. Therefore the total number of bettongs and quolls was 20. There were still three times as many bettongs as quolls, so there were 15 bettongs and 5 quolls. So at the end of the second year there were 20 bandicoots, 15 bettongs and 5 quolls.
3. If there were 8 quolls, there would be $3 \times 8 = 24$ bettongs, and the total number of bettongs and quolls would be $8 + 24 = 32$. This would leave $55 - 32 = 23$ bandicoots. However, more than half the total animal population was bandicoots, so the Chief Ranger has made a mistake in his count.

4. If there were 7 quolls, there would be $3 \times 7 = 21$ bettongs, so the total number of bettongs and quolls would be 28. This would leave $55 - 28 = 27$ bandicoots. However, more than half the total animal population was bandicoots, so there could not be 7 quolls.

If there were 6 quolls, there would be $3 \times 6 = 18$ bettongs, so the total number of bettongs and quolls would be 24. This would leave $55 - 24 = 31$ bandicoots. This is more than the combined number of bettongs and quolls, so it is possible. Fewer quolls means even more bandicoots.

Therefore the largest possible number of quolls in the area at the end of the third year is six.

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