

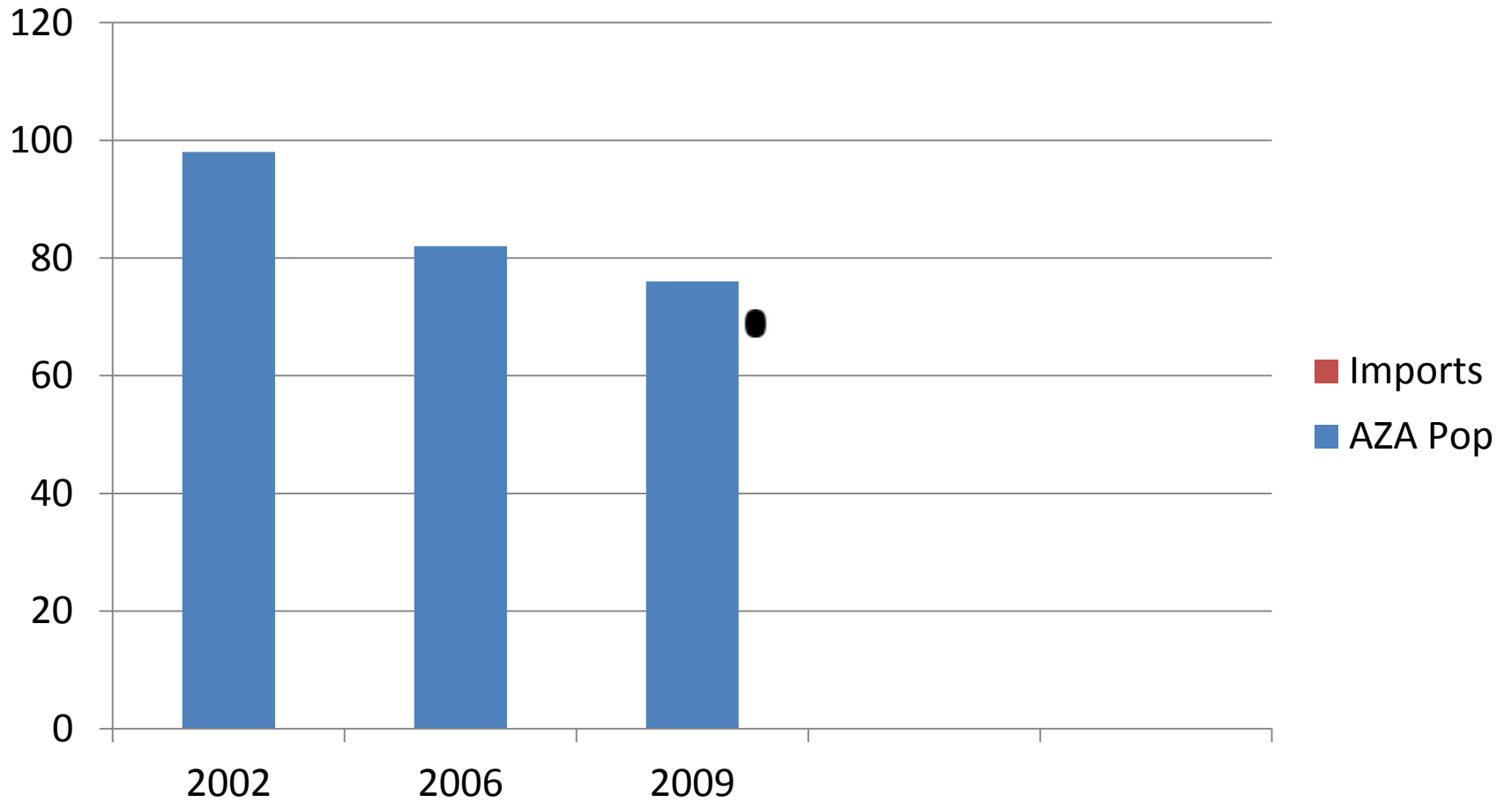
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# AZA White Storks



**Imported 22 birds over three years.**

Fort Wayne – three pairs from their sister Zoo in Poland in 2010

Sand Diego Safari Park – two pairs in 2012

San Antonio – two pairs in 2012

Detroit – one pair in 2012

Sedgwick County – one pair in 2012

Omaha – one pair in 2012

Cleveland – one pair in 2012

<b>Invoice from</b>	<b>Reason</b>	<b>(8 birds)</b>	<b>(1 birds)</b>
<b>USDA</b>	<b>Import permit application fee</b>	<b>\$145.00</b>	<b>\$18.00</b>
<b>Warsaw broker</b>	<b>Shipping from Poland to NY</b>	<b>\$11,647.00</b>	<b>\$1455.00</b>
<b>US broker</b>	<b>Broker fees in NY</b>	<b>\$2,455.00</b>	<b>\$307.00</b>
<b>USDA</b>	<b>Quarantine fees</b>	<b>\$4,851.00</b>	<b>\$606.00</b>
<b>USDA</b>	<b>Quarantine testing fees</b>	<b>\$104.00</b>	<b>13.00</b>
<b>Mersant International</b>	<b>Shipping from NY to Detroit</b>		<b>\$556.00</b>
<b>Warsaw Zoo</b>	<b>Crates and testing fees</b>	<b>\$4,032.00</b>	<b>\$504.00</b>
	<b>TOTAL</b>	<b>\$23,234.25</b>	<b>\$1,125.00</b>
		<b>per bird</b>	<b>per bird</b>
		<b>\$2,904.28</b>	<b>\$3459.00</b>

Fort Wayne – They have had very little pairing from any of their birds. Are going to try again this year. If not successful they will try different management options.

San Diego Safari Park – two pairs in 2012  
They had 1.3 instead of 2.2

San Antonio –  
One pair nested last year, incubated four infertile eggs.  
Second pair built a poor nest, did not defend it, and did not lay eggs.  
They appear more bonded this year and have been observed copulating.

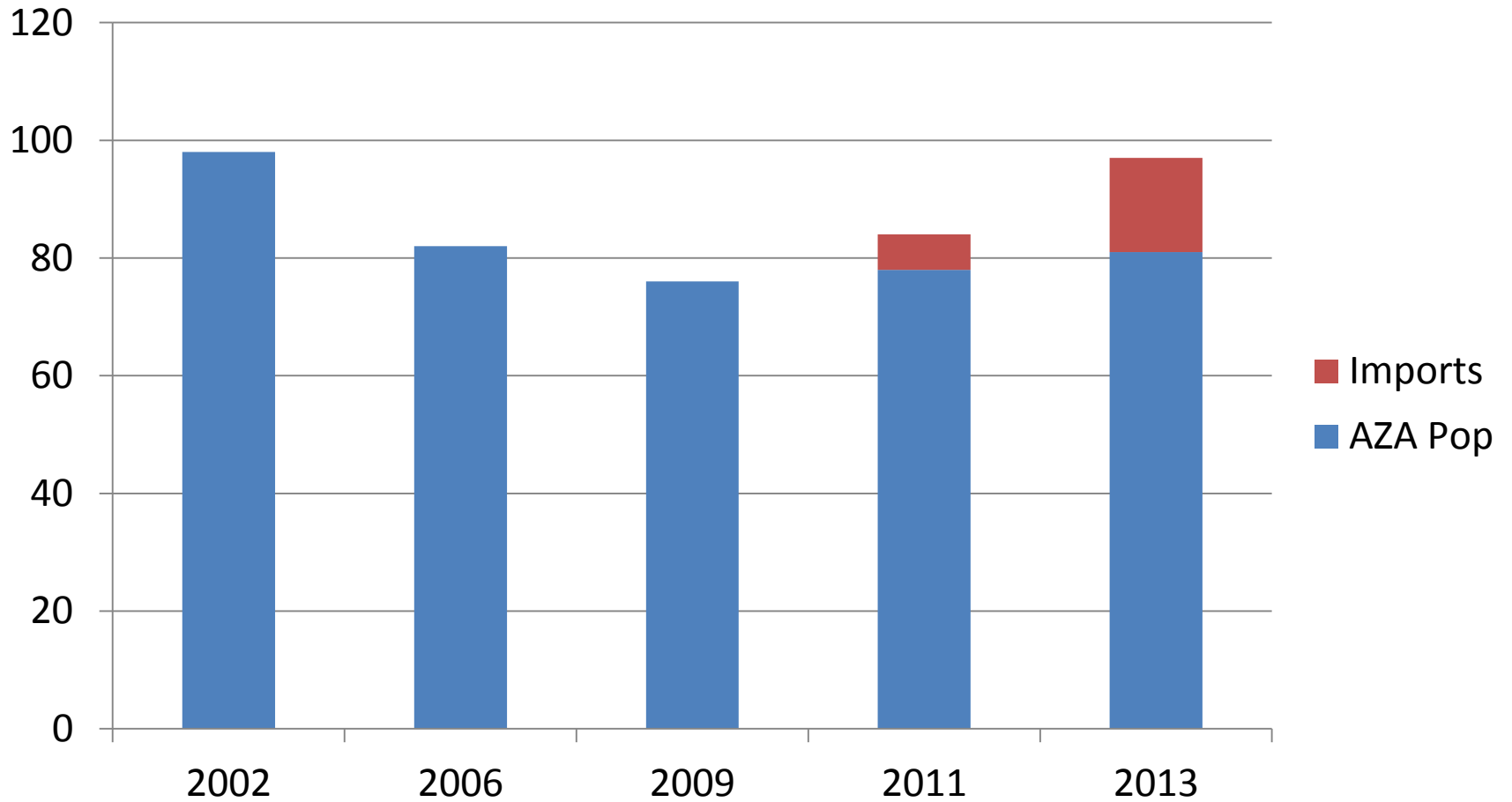
Detroit – Pair has bonded well, but not yet nested

Sedgwick County – have not nested. Very wary compared to their other birds.

Omaha – Had construction that disrupted them, but they still built a nest, but no eggs.

Cleveland – No breeding. Had some construction.

# AZA White Storks



# DEMOGRAPHICS

## 2009

Current size of population (N) - Total (Males, Females, Unknown)	74 (44.27.3)
# animals excluded from management	16
Population size following exclusions	58
Target population size	100
Mean generation time (yrs)	13.72
Historic/Projected population growth rate ( $\lambda$ )	1.011/1.01

## 2014

Current size of population (N) - Total (Males, Females, Unknown)	97 (59.37.1)
# animals excluded from management	4
Population size following exclusions	93
Target population size	100
Mean generation time (yrs)	13.72
Historic/Projected population growth rate ( $\lambda$ )	1.012

Genetics calculated from the analytical studbook 2014	2009	2009 Potential	2014	2014 Potential
Founders	21	1	21	23
Founder genome equivalents (FGE)	7.44	16.01	6.53	36.5
Gene diversity (GD%)	93.28	96.88	92.34	98.63
Population mean kinship (MK)	0.0616		0.0766	
Mean inbreeding (F)	0.0661		0.0485	
Effective population size/census size ratio (Ne / N)	0.1669		0.1339	
Years To 90% Gene Diversity	12		7	
Years to 10% Loss of Gene Diversity	45		37	
Gene Diversity at 100 Years From Present (%)				
Assuming ( $\lambda = 1.01$ , Target size = 100)	73		67.63	



# 22 at once, current population

## How can you meet your genetic goals?

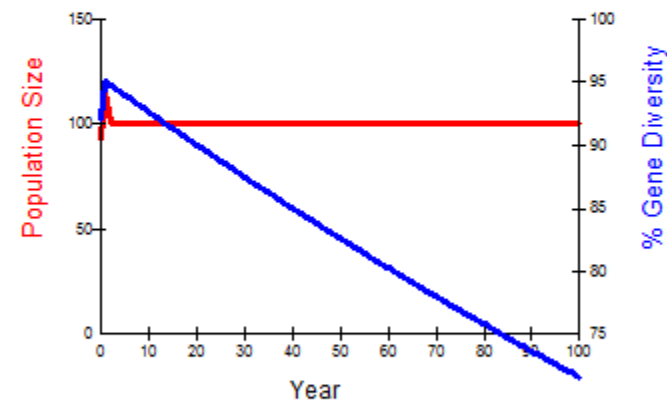
[Multiple Comparisons](#)

### Population Variables

Generation Length	13.7
Maximum Potential Population Growth Rate	1.012
Current Population Size	93
Current Effective Size	12.1
Ratio of $N_e/N$	0.13
Current Gene Diversity	0.9234
Maximum Allowable Population Size	100
<b>Population Size Needed to Meet Goals</b>	
New Founders per Addition Event	22
Year to Start Adding Founders	1
Year to Stop Adding Founders	1
Years Between Addition Events	10
FGE Recruited per New Founder	0.4

### Management Goals

- 90 % Gene Diversity at the END of 100 Years  
 At Least 90 % Gene Diversity DURING 100 Years



Solve For: Population Size Needed to Meet Goals →

Goal Not Possible - Can Only Maintain 71.62%  
 Can maintain 90% GD for 20 years



# Fifty pair now

## How can you meet your genetic goals?

[Multiple Comparisons](#)

Population Variables		Management Goals
Generation Length	13.7	<input checked="" type="radio"/> 90 % Gene Diversity at the END of 100 Years
Maximum Potential Population Growth Rate	1.012	<input type="radio"/> At Least 90 % Gene Diversity DURING 100 Years
Current Population Size	93	<p>The graph plots Population Size (red line, left y-axis 0-150) and % Gene Diversity (blue line, right y-axis 75-100) against Year (x-axis 0-100). The population size starts at 93, jumps to 100 at year 0, and then declines linearly to approximately 10 at year 100. The gene diversity starts at 92.34% and declines linearly to approximately 72.87% at year 100.</p>
Current Effective Size	12.1	
Ratio of Ne/N	0.13	
Current Gene Diversity	0.9234	
Maximum Allowable Population Size	100	
<b>Population Size Needed to Meet Goals</b>		
New Founders per Addition Event	50	
Year to Start Adding Founders	1	
Year to Stop Adding Founders	1	
Years Between Addition Events	10	
FGE Recruited per New Founder	0.4	

Solve For: Population Size Needed to Meet Goals

Goal Not Possible - Can Only Maintain 72.87%

Can maintain 90% GD for 26 years



# Two every twenty years

## How can you meet your genetic goals?

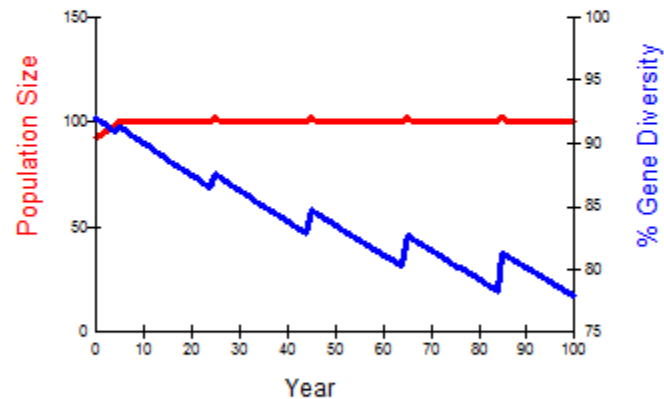
[Multiple Comparisons](#)

### Population Variables

Generation Length	13.7
Maximum Potential Population Growth Rate	1.012
Current Population Size	93
Current Effective Size	12.1
Ratio of $N_e/N$	0.13
Current Gene Diversity	0.9234
Maximum Allowable Population Size	100
<b>Population Size Needed to Meet Goals</b>	
New Founders per Addition Event	2
Year to Start Adding Founders	5
Year to Stop Adding Founders	100
Years Between Addition Events	20
FGE Recruited per New Founder	0.4

### Management Goals

- 90 % Gene Diversity at the END of 100 Years
- At Least 90 % Gene Diversity DURING 100 Years



Solve For: Population Size Needed to Meet Goals →

Goal Not Possible - Can Only Maintain 77.89%  
Can maintain 90% GD for 10 years



# Two every ten years

## How can you meet your genetic goals?

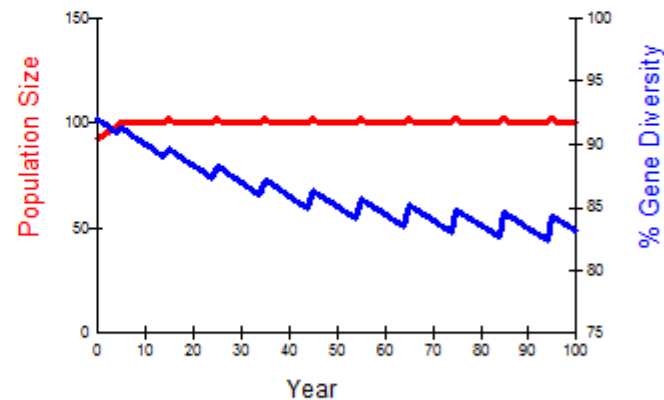
[Multiple Comparisons](#)

### Population Variables

Generation Length	13.7
Maximum Potential Population Growth Rate	1.012
Current Population Size	93
Current Effective Size	12.1
Ratio of $N_e/N$	0.13
Current Gene Diversity	0.9234
Maximum Allowable Population Size	100
<b>Population Size Needed to Meet Goals</b>	
New Founders per Addition Event	2
Year to Start Adding Founders	5
Year to Stop Adding Founders	100
Years Between Addition Events	10
FGE Recruited per New Founder	0.4

### Management Goals

- 90 % Gene Diversity at the END of 100 Years  
 At Least 90 % Gene Diversity DURING 100 Years



Solve For: Population Size Needed to Meet Goals →

Goal Not Possible - Can Only Maintain 83.12%

Can maintain 90% GD for 10 years



# Twenty two at year 90

## How can you meet your genetic goals?

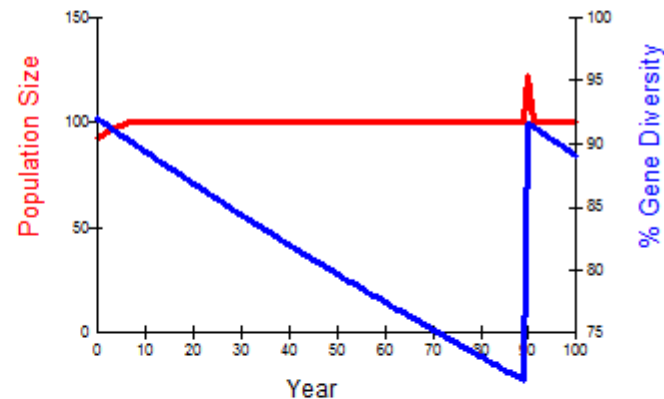
[Multiple Comparisons](#)

### Population Variables

Generation Length	13.7
Maximum Potential Population Growth Rate	1.012
Current Population Size	93
Current Effective Size	12.1
Ratio of $N_e/N$	0.13
Current Gene Diversity	0.9234
Maximum Allowable Population Size	100
<b>Population Size Needed to Meet Goals</b>	
New Founders per Addition Event	22
Year to Start Adding Founders	90
Year to Stop Adding Founders	90
Years Between Addition Events	10
FGE Recruited per New Founder	0.4

### Management Goals

- 90 % Gene Diversity at the END of 100 Years  
 At Least 90 % Gene Diversity DURING 100 Years



Solve For: Population Size Needed to Meet Goals →

Goal Not Possible - Can Only Maintain 89.06%

Can maintain 90% GD for 7 years



# Two every five years

## How can you meet your genetic goals?

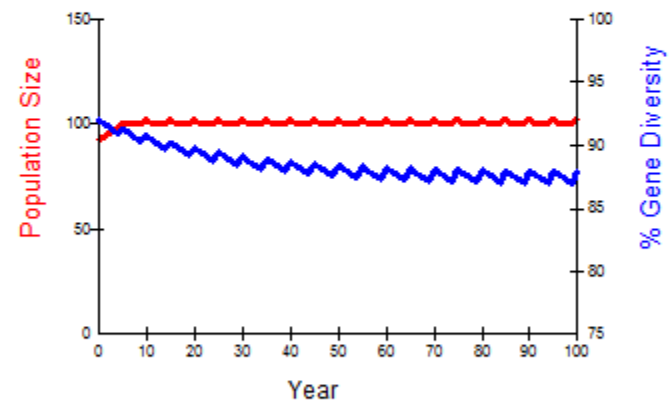
[Multiple Comparisons](#)

### Population Variables

Generation Length	13.7
Maximum Potential Population Growth Rate	1.012
Current Population Size	93
Current Effective Size	12.1
Ratio of $N_e/N$	0.13
Current Gene Diversity	0.9234
Maximum Allowable Population Size	100
<b>Population Size Needed to Meet Goals</b>	
New Founders per Addition Event	2
Year to Start Adding Founders	5
Year to Stop Adding Founders	100
Years Between Addition Events	5
FGE Recruited per New Founder	0.4

### Management Goals

- 90 % Gene Diversity at the END of 100 Years
- At Least 90 % Gene Diversity DURING 100 Years



Solve For: Population Size Needed to Meet Goals →

Goal Not Possible - Can Only Maintain 87.94%  
Can maintain 90% GD for 12 years



# Twenty two now with increased Ne/N

## How can you meet your genetic goals?

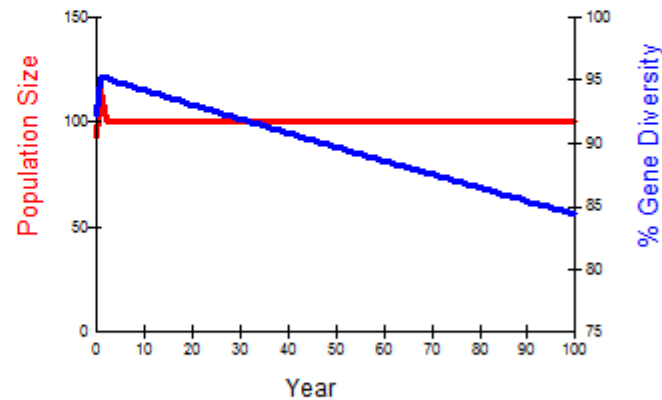
[Multiple Comparisons](#)

### Population Variables

Generation Length	13.7
Maximum Potential Population Growth Rate	1.012
Current Population Size	93
Current Effective Size	27.9
Ratio of $N_e/N$	0.3
Current Gene Diversity	0.9234
Maximum Allowable Population Size	100
<b>Population Size Needed to Meet Goals</b>	
New Founders per Addition Event	22
Year to Start Adding Founders	1
Year to Stop Adding Founders	1
Years Between Addition Events	1
FGE Recruited per New Founder	0.4

### Management Goals

- 90 % Gene Diversity at the END of 100 Years
- At Least 90 % Gene Diversity DURING 100 Years



Solve For: Population Size Needed to Meet Goals →

Goal Not Possible - Can Only Maintain 84.38%  
Can maintain 90% GD for 47 years



# Two every seven years with increased Ne/N

## How can you meet your genetic goals?

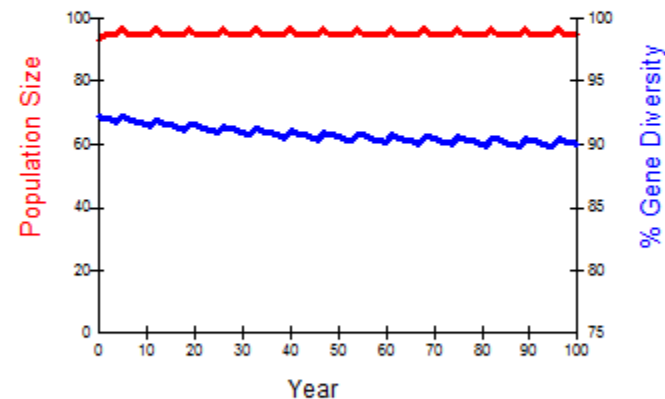
[Multiple Comparisons](#)

### Population Variables

Generation Length	13.7
Maximum Potential Population Growth Rate	1.012
Current Population Size	93
Current Effective Size	27.9
Ratio of Ne/N	0.3
Current Gene Diversity	0.9234
Maximum Allowable Population Size	100
<b>Population Size Needed to Meet Goals</b>	
New Founders per Addition Event	2
Year to Start Adding Founders	5
Year to Stop Adding Founders	100
Years Between Addition Events	7
FGE Recruited per New Founder	0.4

### Management Goals

- 90 % Gene Diversity at the END of 100 Years  
 At Least 90 % Gene Diversity DURING 100 Years



Solve For: Population Size Needed to Meet Goals →

Population Size Needed to Meet Goals Needed = 95  
 GD at end of 100 years = 90







Bird was observed in 1822  
In Germany

They traced the arrow to  
Central Africa

Helped explain  
migration