Longleaf Pine Cone Prospects

for 2025

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During the spring of 2025, cone production data were collected from selected low-density (e.g., shelterwood) stands of mature longleaf pine, throughout its native range. Binocular counts of green cones were conducted on the crowns of sampled trees, as viewed from a single location on the ground. Cone visibility on each tree is enhanced when the observer stands with their back to the sun. A breeze that moves the flexible pine needles about also helps the relatively more rigid cones stand out for the observer. The near-term regional average and individual site averages for these counts are reported in Table 1.

Table 1. Estimated Longleaf Pine Cone Production.

Cooperator	County/Parish	State	Estimated cones per tree for fall 2025 from Green Cones	Cone Crop Category
Kisatchie National Forest	Grant	Louisiana	0.0	Failed
Blackwater River State Forest	Santa Rosa	Florida	25.6	Fair
Eglin Air Force Base	Okaloosa	Florida	1.2	Failed
Jones Ecological Research Center	Baker	Georgia	29.6	Fair
Tall Timber Research Station	northern Leon	Florida	8.2	Failed
Apalachicola National Forest	southern Leon	Florida	3.6	Failed
Fort Benning Military Base	Chattahoochee	Georgia	8.1	Failed
Sand Hills State Forest	Chesterfield	South Carolina	18.0	Poor
Bladen Lakes State Forest	Bladen	North Carolina	26.9	Fair
Ordway-Swisher Biological Station	Putnam	Florida	3.0	Failed
Regional Average			12.4	Poor

Regional Summary:

The regional cone crop, based on green cone counts, is **poor for 2025**, at 12.4 cones per tree. Although mostly low counts for this year's crop, the natural variation, typically seen across the native range of longleaf pine, is apparent in this year's data, with three sites having fair crops, one site having a poor crop, and six sites having failed crops. Bumper crops ($\geq$ 100 cones per tree) and good crops (50 to 99 cones per tree) were not observed. A fair crop (25 to 49 cones per tree) is present in Santa Rosa County, Florida; Baker County, Georgia; and Bladen County, North Carolina. A poor crop (10 to 24 cones per tree) is present in Chesterfield County, South Carolina. A failed crop (<10 cones per tree) is present in Grant Parish, Louisiana; Okaloosa County, Florida; Leon County, Florida; Chattahoochee County, Georgia; and Putnam County, Florida.

The 60-year regional cone production average for longleaf pine is about 27 green cones per tree. The single best cone crop occurred in 1996 and averaged 115 cones per tree. Good cone crops were observed in 1967 (65 cones per tree), 1973 (67 cones per tree), 1987 (65 cones per tree), 1993 (52 cones per tree), 2014 (98 cones per tree), and 2017 (62 cones per tree). Fair or better cone crops have occurred during 45% of all years since 1966, with an increased frequency since the mid-1980s. Reasons for this increasing frequency are unclear.

Evaluating Longleaf Pine Cone Data:

Observations, concerning the natural variation in longleaf pine cone crops, and field studies, determining the volume of seed (i.e., number of productive cones per tree) required to successfully regenerate even-aged shelterwood stands, resulted in development of Table 2. The minimum cone crop needed for successful natural regeneration, using an even-aged management technique such as the uniform shelterwood method, is 750 green cones per acre. This assumes 30 cones per tree, with 25 seed-bearing trees per acre. Thus, cone crops classified as "fair or better" represent regeneration opportunities, for which a receptive seedbed may be prepared through application of prescribed fire during the months prior to seed fall in October.

Table 2. Classification of Longleaf Pine Cone Crops*.

Crop Quality	Cones per Tree	Cones per Acre (on 25 trees per acre)
Bumper crop	$\geq$ 100	$\geq$ 2500
Good crop	50 to 99	1250 to 2475
Fair crop	25 to 49	625 to 1225
Poor crop	10 to 24	250 to 600
Failed crop	< 10	< 250

* Cones on mature trees (14-16 inches at dbh) in low-density stands (basal area < 40 feet^2/acre).

When uneven-aged management stand-reproduction methods (e.g., single-tree selection) are used, "seed rain" incident on a site is often sufficient for successful natural regeneration (even though seed fall may be of variable intensity from year to year). While using selection silviculture frees one from dependency on the timing of good cone crops, it may nonetheless be useful for the manager of multi-aged stands to be aware of cone crop quality from year to year when making management decisions. Cone crop information may also benefit tree-nursery managers, in their annual cone collection planning, as they seek to replenish their seed supply.

It is also worth noting that a good deal of spatial variation occurs among longleaf pine stands across the Southern Region, relative to cone production. Therefore, even during a year with a lower overall regional average number of cones per tree, certain localities can experience substantial longleaf pine cone production. This regional report is intended as a guide, which broadly forecasts the overall status of longleaf pine cone production. Thus, we encourage forest

managers to take binoculars to the field and carefully examine any individual stands in which they have an interest. In this way, they can, for those specific stands, acquire more detailed, site-specific information that will aid them in making management decisions.

Study Partners:

- Kisatchie National Forest, Pineville, Louisiana
- Blackwater River State Forest, Milton, Florida
- Natural Resources Management, Eglin Air Force Base, Niceville, Florida
- J.W. Jones Ecological Research Center, Newton, Georgia
- Tall Timbers Research Station, Tallahassee, Florida
- National Forests in Florida, Tallahassee, Florida
- Land Management Branch, Fort Benning Military Base, Columbus, Georgia
- Sand Hills State Forest, Patrick, South Carolina
- Bladen Lakes State Forest, Elizabethtown, North Carolina
- Ordway-Swisher Biological Station, Melrose, Florida

Data Collection Cooperators:

> Molly Hopkins, Sand Hills State Forest, Patrick, South Carolina
> Hans Rohr, Bladen Lakes State Forest, Elizabethtown, North Carolina
> Grace Howell, Ordway-Swisher Biological Station, University of Florida, Melrose, Florida
> Michael Low, Natural Resources Management, Eglin Air Force Base, Niceville, Florida
> Ryan Campbell, Natural Resources Management, Eglin Air Force Base, Niceville, Florida
> Stephen Hudson, Land Management Branch, Fort Benning Military Base, Columbus, Georgia
> Alan Springer, Southern Research Station, USDA Forest Service, Pineville, Louisiana
> Jacob Floyd, Southern Research Station, USDA Forest Service, Pineville, Louisiana

Cone Counting Method:

The following procedure and field data sheet are provided for those who may wish to conduct field observations of longleaf pine cone production in their own locale. Remember:

- **Green cones** tell you how much production will happen this year (see Figure 1)
- Brown cones tell you how much production occurred last year.

- Equipment: 8 or 10x binoculars, field data sheet, clipboard, pencil, and diameter-tape.
- Optional equipment: flagging, bark scraper, paint, tree tags, aluminum nails, hammer.

1. Locate a stand that is growing at a shelterwood density of less than 40 square feet per acre (25 to 35 square feet per acre is a typical range) and contains numerous trees of at least 10 inches at dbh. Better cone crops generally come from larger-diameter trees and poorer cone crops come from smaller-diameter trees. A key consideration is that high brush and/or trees should not visually obscure the crowns of your sample trees, or your data collection will be impaired. The midstory must be relatively open, so you can see the entire crown of each sample tree.

Figure 1. Two **green cones** on a longleaf pine branch, as they would appear in spring.

2. Select at least 10 trees in the stand to serve as your representative sample for monitoring, by painting a ring around the tree at dbh or higher and a sequence number on each (use a color other than white to avoid confusion with the white rings often painted around trees having RCW nests). You may also attach a metal tag to the tree using an aluminum nail. But attach this high enough so that the tag number will not become obscured by char, or the nail will not melt during prescribed fire (these can happen, when tags are too low).

3. Using the field data sheet, enter the following data at the top: location, date, and crew. Then for each sample tree: measure its DBH in inches (to the nearest 0.1 of an inch) and record that measurement. Now, you are ready to count the green cones.

4. Walk away from the tree and toward the sun. The precise distance away from the tree is not crucial, but it should be far enough away to give your neck a comfortable angle while looking up, but not so far away that you cannot clearly see the cones with 8 or 10 power binoculars. With the sun at your back, you may need to adjust your position a bit to the left or to the right, so that you can view the entire tree crown without moving from your counting location. An uncrowded midstory will be helpful at this point.

5. Count the number of green cones that can be seen from the single spot on which you are standing. We usually start at the lower left of the crown and work up to the top of the crown, then move across the top of the crown to the right, and then down the right side of the crown all the way to the bottom-most branches. This is a systematic approach that scans across the entire crown (left half, top, right half) and leads to consistently accurate counts. Once you have done this, enter the number of green cones into the data sheet.

6. Because these developing cones are green, they can be difficult to see against green pine foliage. It helps to count these green cones on a sunny day when the light is bright. It also helps if there is a light breeze blowing that moves the pine needles about, thereby revealing the more rigid cones. These green cones contain the seed that will be shed during the coming October, and these data will become the numbers upon which the cone crop forecast for the current year will be based (a forecast in which many forest managers and tree-nursery managers have a great interest). News of a fair or better cone crop alerts forest managers to begin preparing their seedbeds so they will be receptive to capturing and deriving the most benefit from the upcoming seed fall. Tree-nursery managers are also alerted to cone collection opportunities. Note on the data sheet that the raw number you see in your green cone count needs to be multiplied by 2 at the end of the column. Many years of research by Bill Boyer indicated that this adjustment to the raw count was needed to obtain an accurate estimate (the actual regression from his work approximated 1.98). In general terms he explained this need, because the cone count is performed by looking at only one side of the tree, thus the raw count for green cones needs to be doubled.

Field Data Sheet:

The field data sheet appearing on the following page can accommodate up to 24 sample trees. Spaces are provided at the bottom for summing the total cones for the count, multiplying the total times 2, and computing the average number of cones per tree. Should you wish to collect data for a greater number of trees, multiple sheets may be used. However, this format can be easily created on a computer by using an electronic spreadsheet program, which can be vertically extended to provide ample room for a great number of sample trees, with summary spaces at the bottom.

Regional Longleaf Pine Cone Study: Count of Green Cones - - Field Data Sheet

Location: _____ Date: _____ Crew: _____

Tree Number	DBH in inches	Number of Green Cones
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
16		
17		
18		
19		
20		
21		
22		
23		
24		

Total Number of Green Cones =

Total Number of Green Cones x 2 =

Average Number of Green Cones Per Tree =

Regional and Local

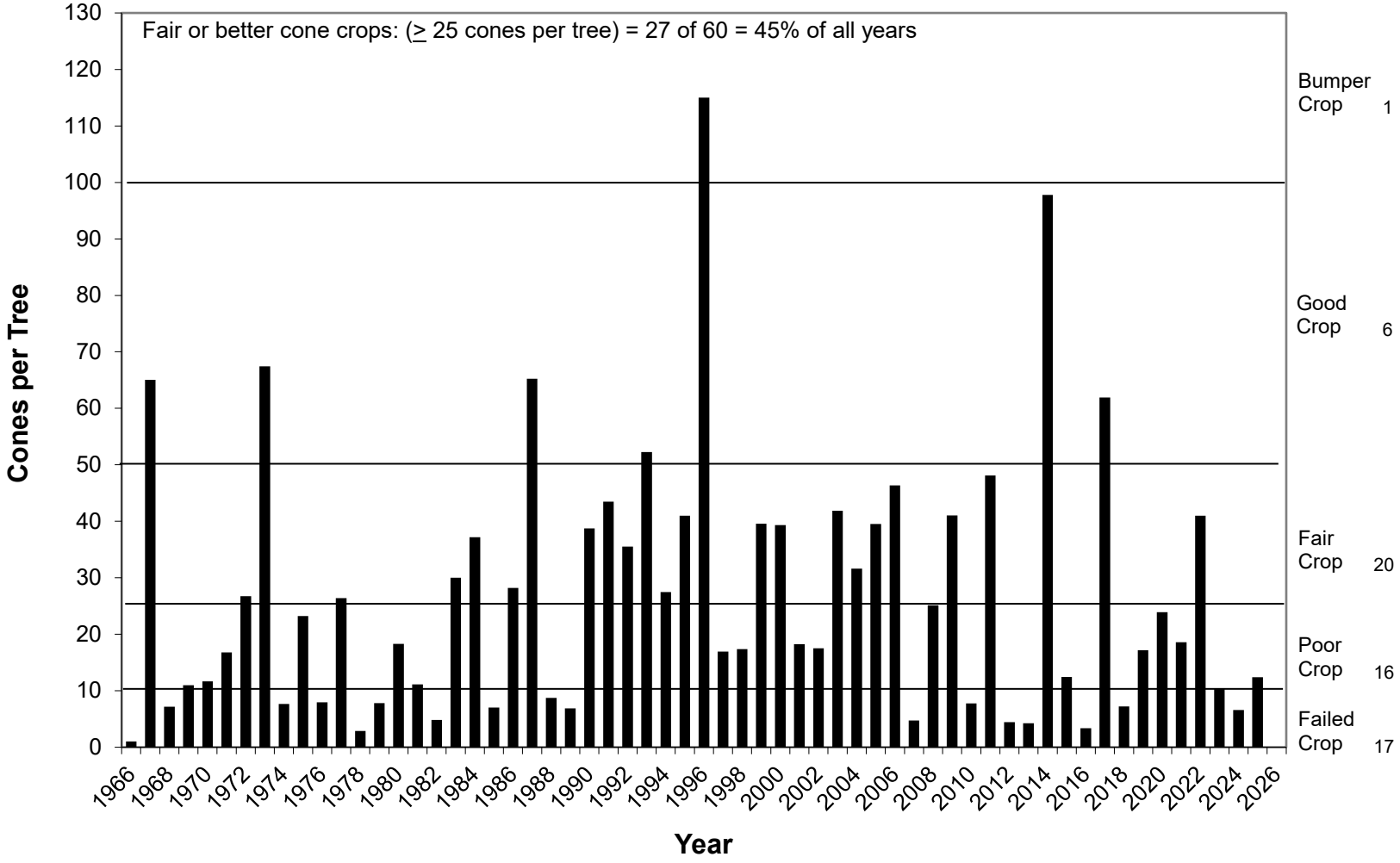
Summary and Graphs

Year	**Southern Region**	LA-Kisatchie National Forest	W FL-Blackwater River State Forest	W FL-Eglin Air Force Base	W FL-Apalachicola National Forest	SW GA-Jones Research Center	Red Hills-Tall Timbers Research Station	W GA-Fort Benning Military Base	SC-Sand Hills State Forest	NC-Bladen Lakes State Forest	FL Pen.-Ordway-Swisher Biological Station
1966	**1.0**				0.6						
1967	**65.1**	26.4	13.8		18.7	2.7					
1968	**7.2**	5.8	2.5	0.2	9.9	0.4				0.2	
1969	**10.1**	10.1	2.5	0.6	5.2	0.8			9.2	1.9	
1970	**11.7**	13.6	1.7	0.9	1.0	7.5			7.1	0.9	
1971	**16.8**	4.8	29.2	4.1	14.4	1.5			10.2	2.7	
1972	**26.7**	8.3	0.9	3.5	0.2	0.4			51.0	25.6	
1973	**67.4**	55.6	14.4	10.6	27.2	7.2			92.0	8.8	
1974	**7.7**	1.9	3.0	1.6	9.6	0.3			6.7	0.3	
1975	**23.2**		17.5	10.6		5.0			67.3		
1976	**7.9**		1.5	1.7	22.9	1.6			16.1		
1977	**26.4**	47.4	9.9	1.1	89.7	1.1			25.5	16.9	
1978	**2.9**	5.0	0.8	0.3	2.7	1.0			8.5	0.3	
1979	**7.8**	10.6	5.5	4.4		3.1			18.4	1.4	
1980	**18.3**	67.3	0.5	0.6		2.3			36.2		
1981	**11.1**	13.6	1.2	1.0		0.9			43.5		
1982	**4.8**	0.7	3.2	8.1		1.7			2.3		
1983	**30.0**	94.2	11.8	22.9		11.0			25.8		
1984	**37.2**	133.8	12.3	5.9		1.5			50.6		
1985	**7.0**	3.8	8.5	6.1		1.2			9.3		
1986	**28.2**	60.3	19.2	28.3		19.4			10.8		
1987	**65.2**	89.0	58.7	18.1		11.2			110.2		
1988	**8.7**	24.8	8.2			1.2			3.1		
1989	**6.9**	26.6	2.1			0.7			4.8		
1990	**39.9**	46.3	35.5			50.3			17.8		
1991	**43.5**	47.0	33.7			1.2			117.5	37.8	
1992	**35.5**	4.8	8.3		76.6	0.2			152.4	5.3	
1993	**52.3**	16.2	89.8		5.7	91.2		15.6	71.0	0.7	
1994	**27.5**	118.1	9.7	20.1	11.1	24.9			3.7	17.6	
1995	**41.0**	42.7	10.9	10.1	17.9	66.1		10.4	51.0	152.1	
1996	**115.0**	75.9	206.4	87.8	190.8	123.7		34.9	48.2	110.3	
1997	**17.0**	11.3	8.2	6.7	38.6	16.9		52.7	7.2	9.7	
1998	**17.3**	55.6	27.1	11.3	1.2	3.9		16.1	1.1	1.4	
1999	**39.5**	25.1	13.0	15.6	3.8	112.5	43.7	21.7	52.2	98.3	
2000	**39.3**	8.5	30.5	15.8	22.0	106.1	58.8	22.4	8.1	61.7	
2001	**18.3**	60.3	8.8	8.4	9.8	2.3	14.2	17.6	2.9	1.0	
2002	**17.5**	4.5	3.7	7.9	2.2	6.9	63.3	12.8	40.0	31.7	
2003	**41.9**	34.3	69.4	31.8	13.8	89.1	42.6	8.4	7.3	18.4	
2004	**31.6**	67.8	24.9	43.6	37.9	88.9	32.8	2.4	4.5	5.0	
2005	**39.5**	28.9	23.0	57.1	36.1	117.1	26.8	21.2	37.4	3.5	
2006	**46.3**	19.0	4.1	16.9	14.0	129.2	56.8		49.9	108.8	
2007	**4.7**	15.1	0.0	0.8	2.8	5.8	2.0	15.4	0.7	3.9	
2008	**25.1**	24.3	38.6	30.2	38.4	8.6	30.6	16.2	7.0	0.4	
2009	**41.0**	58.0	31.6	14.3	6.0	65.1	20.2	81.4	55.3	38.1	
2010	**7.8**	6.3	4.0	3.7	0.8	1.6	2.6	39.8	5.6	10.0	
2011	**48.1**	31.3	141.2	65.1	32.8	66.2	7.0	38.1	18.4	7.6	
2012	**4.5**	5.8	1.0	0.6	1.8	2.4	12.1	2.2	8.1	3.3	
2013	**4.2**	4.7	2.6	1.8	0.8	0.9	1.3	12.7	3.9	2.3	
2014	**97.8**	222.8	149.0	74.9	7.0	134.4	13.6	138.5	54.1	24.1	

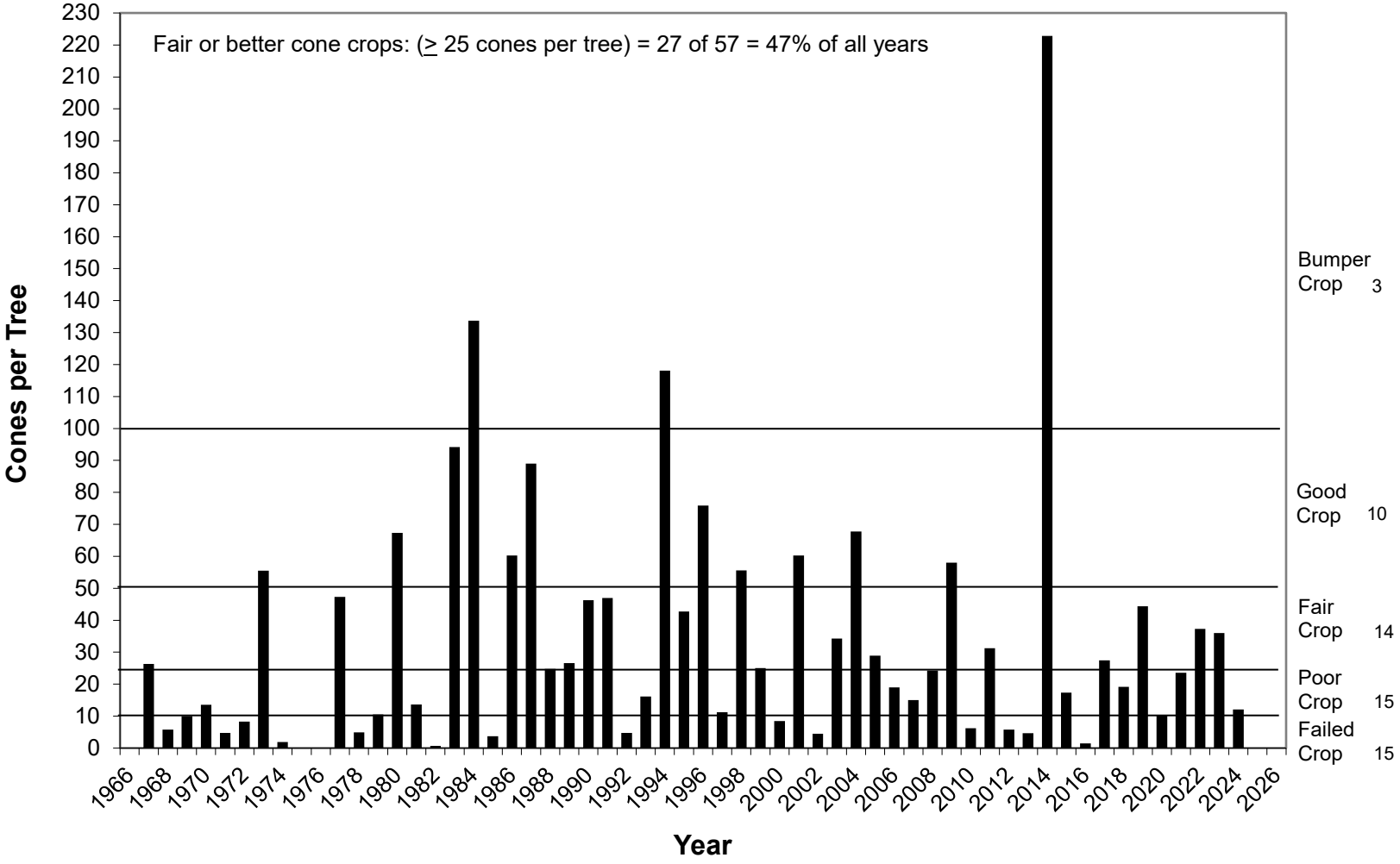
2015	**12.4**	17.3	16.8	2.8	21.4	6.5	14.7	32.0	1.1	4.3	1.2
2016	**3.4**	1.5	1.0	2.6	0.6	1.5	3.8	5.9	6.9	12.5	0.4
2017	**61.9**	27.5	154.0	34.9	35.6	148.6	28.2	113.1	7.1	1.2	29.0
2018	**7.2**	19.2	9.2	0.4	0.8	1.5	13.1	3.8	13.9	12.0	0.4
2019	**17.2**	44.4	24.0	15.1	5.8	17.5	12.2	9.0	17.5	19.6	13.0
2020	**23.9**	10.3	51.3	20.5	13.6	32.3	42.0	20.7	20.7	19.8	0.9
2021	**18.6**	23.6	11.2	0.8	0.2	55.6	6.2	5.7	40.0	49.7	2.4
2022	**41.0**	37.3	110.4	86.5	35.8	62.7	14.0	11.5	32.4	26.7	6.4
2023	**10.3**	36.0	20.2	7.1	1.3	1.0	1.6	17.6	13.9	2.3	5.2
2024	**6.6**	12.1	6.6	0.3	0.6	5.8	7.3	8.9	12.3	12.3	5.2
2025	**12.4**	0.0	25.6	1.2	3.6	29.6	8.2	8.1	18.0	26.9	3.0
2026											
Mean	**26.8**	**34.5**	**27.7**	**15.9**	**19.4**	**29.9**	**21.5**	**26.3**	**28.4**	**22.2**	**6.1**
Year	**Southern Region**	LA-Kisatchie National Forest	W FL-Blackwater River State Forest	W FL-Eglin Air Force Base	W FL-Apalachicola National Forest	SW GA-Jones Research Center	Red Hills-Tall Timbers Research Station	W GA-Fort Benning Military Base	SC-Sand Hills State Forest	NC-Bladen Lakes State Forest	FL Pen.-Ordway-Swisher Biological Station

Data are the average number of cones per longleaf pine tree forecasted for the fall (late October) with estimates based on counts of green cones during the spring (April to June) of each year.

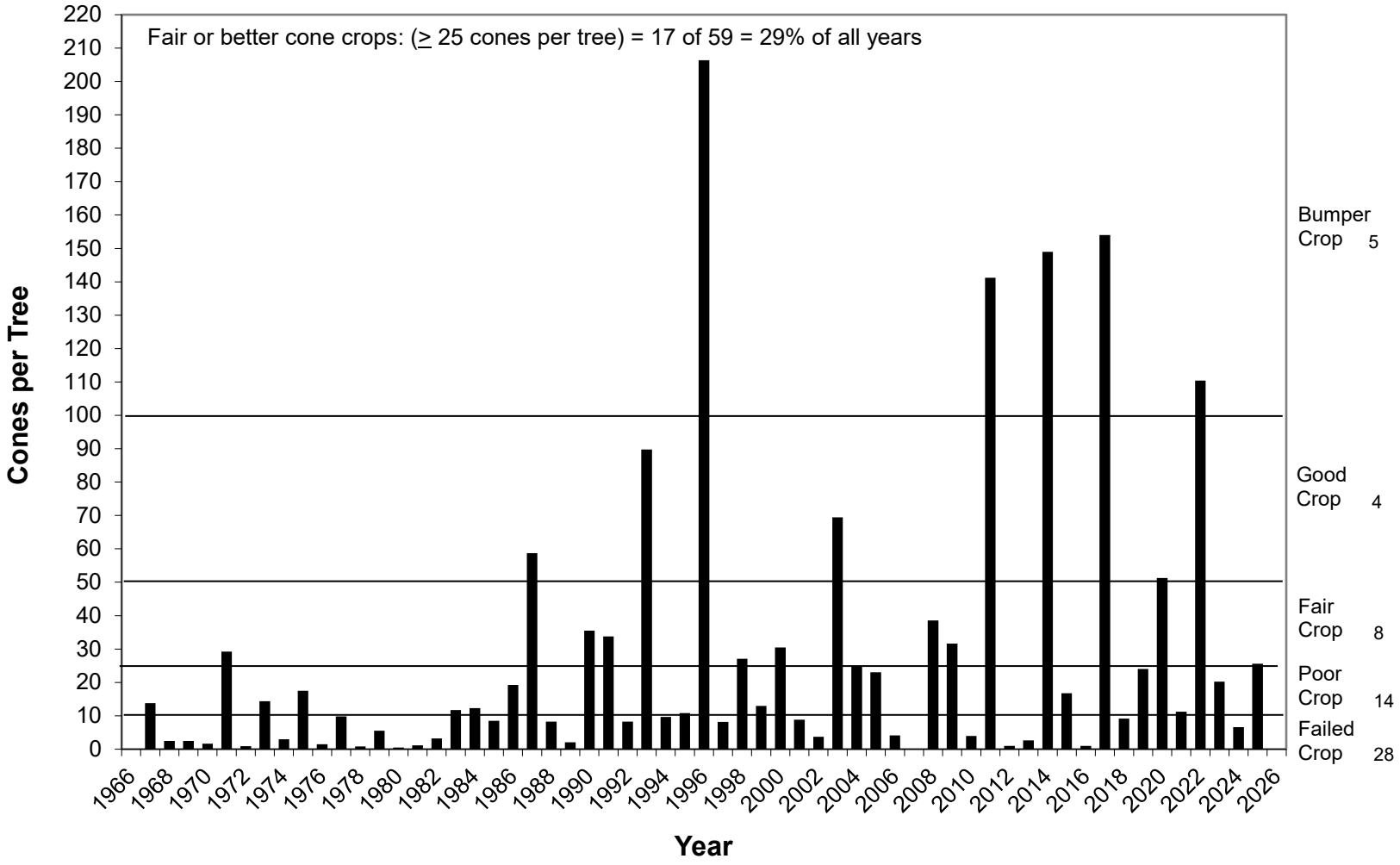
Longleaf Pine Cone Production in Southern Region (since 1966)



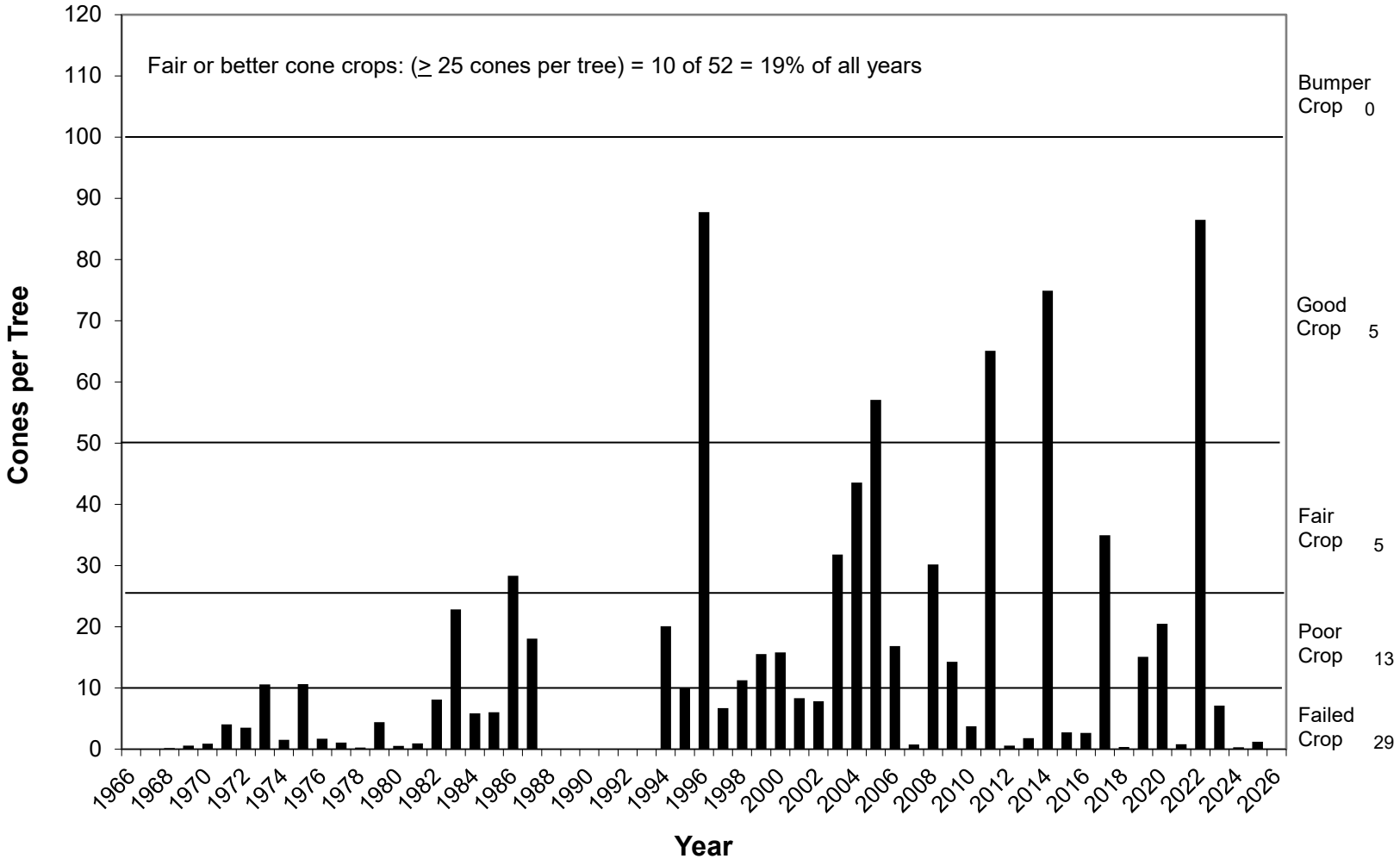
Longleaf Pine Cone Production in Louisiana at Kisatchie NF (since 1967)



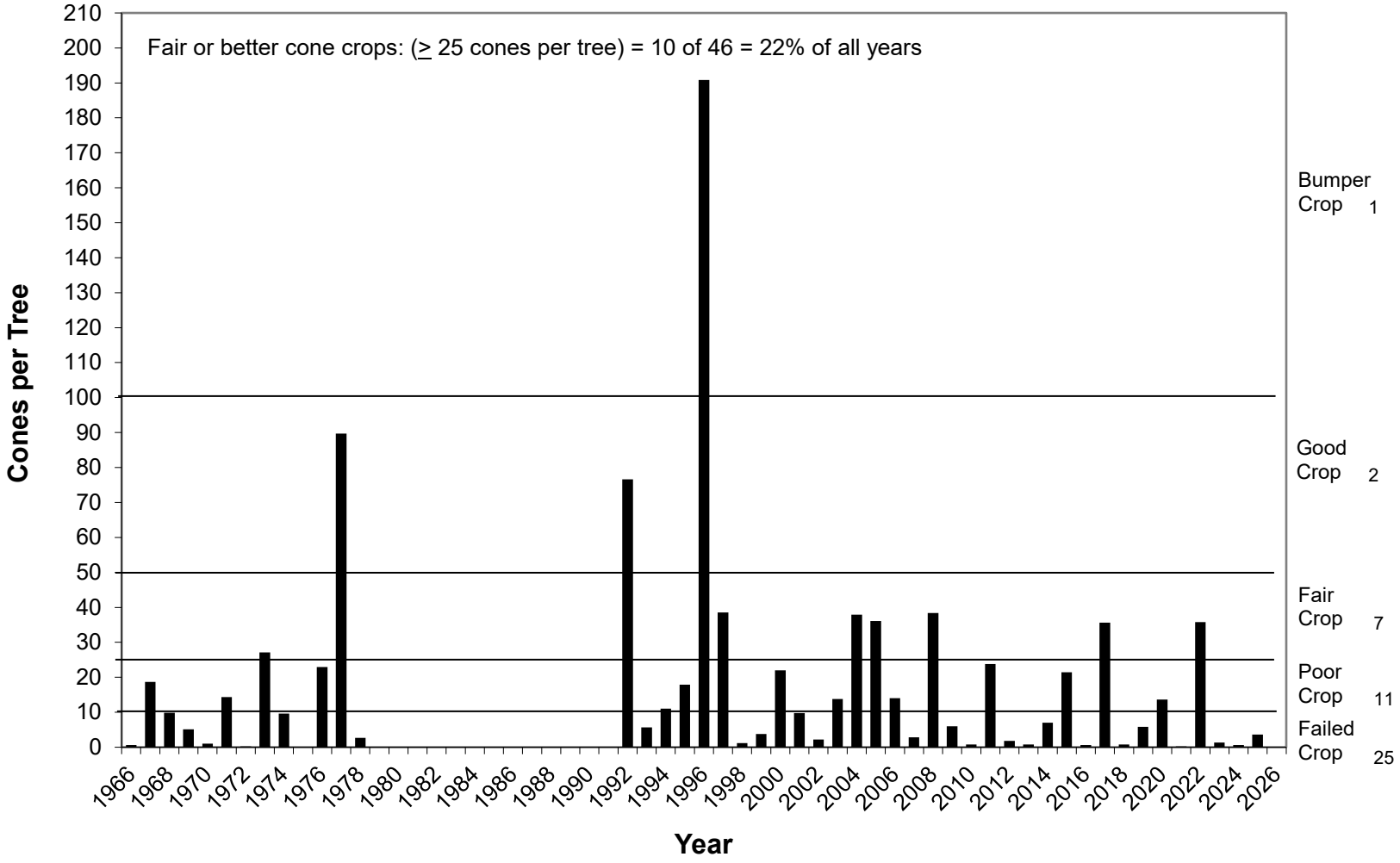
Longleaf Pine Cone Production in West Florida at Blackwater River SF (since 1967)

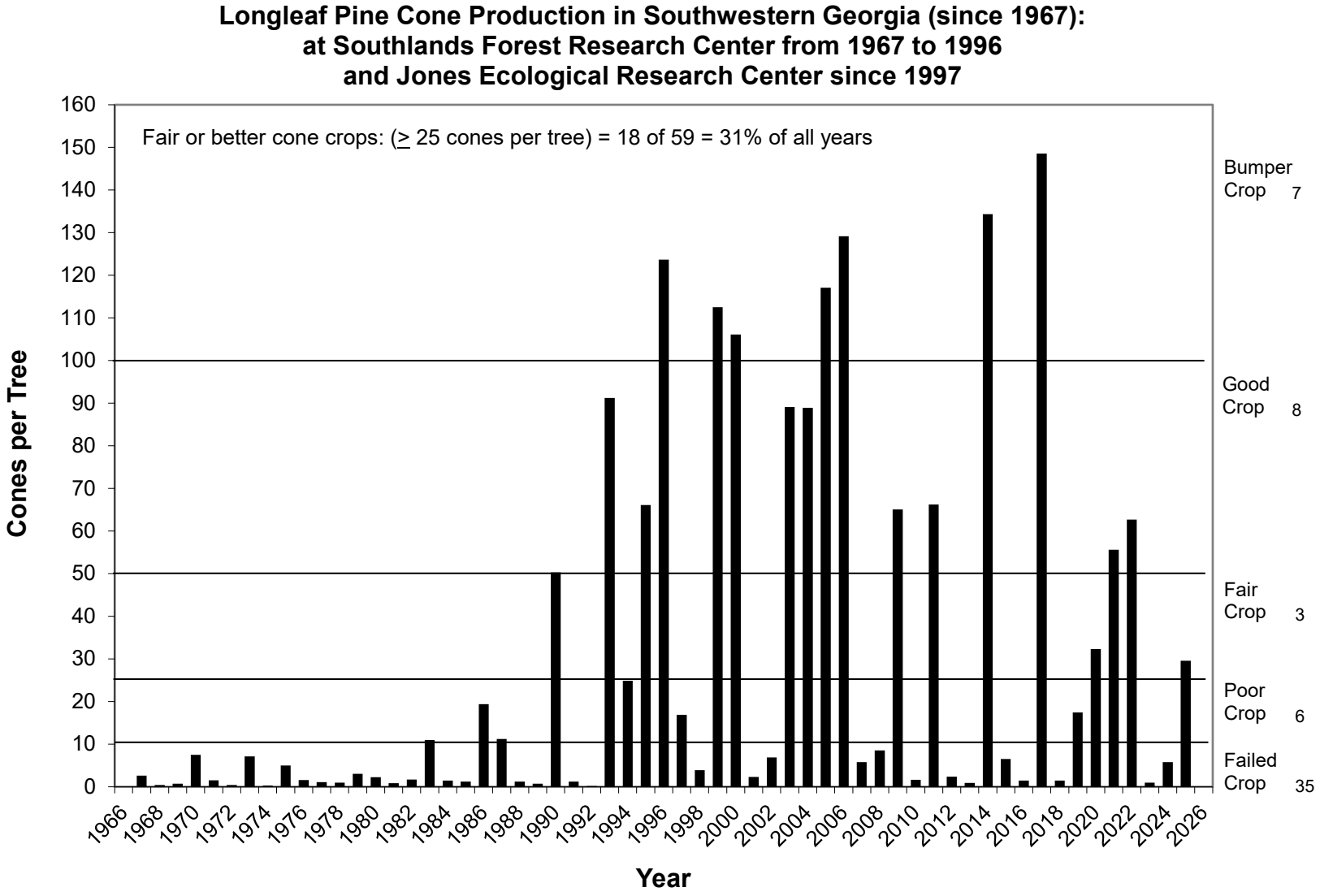


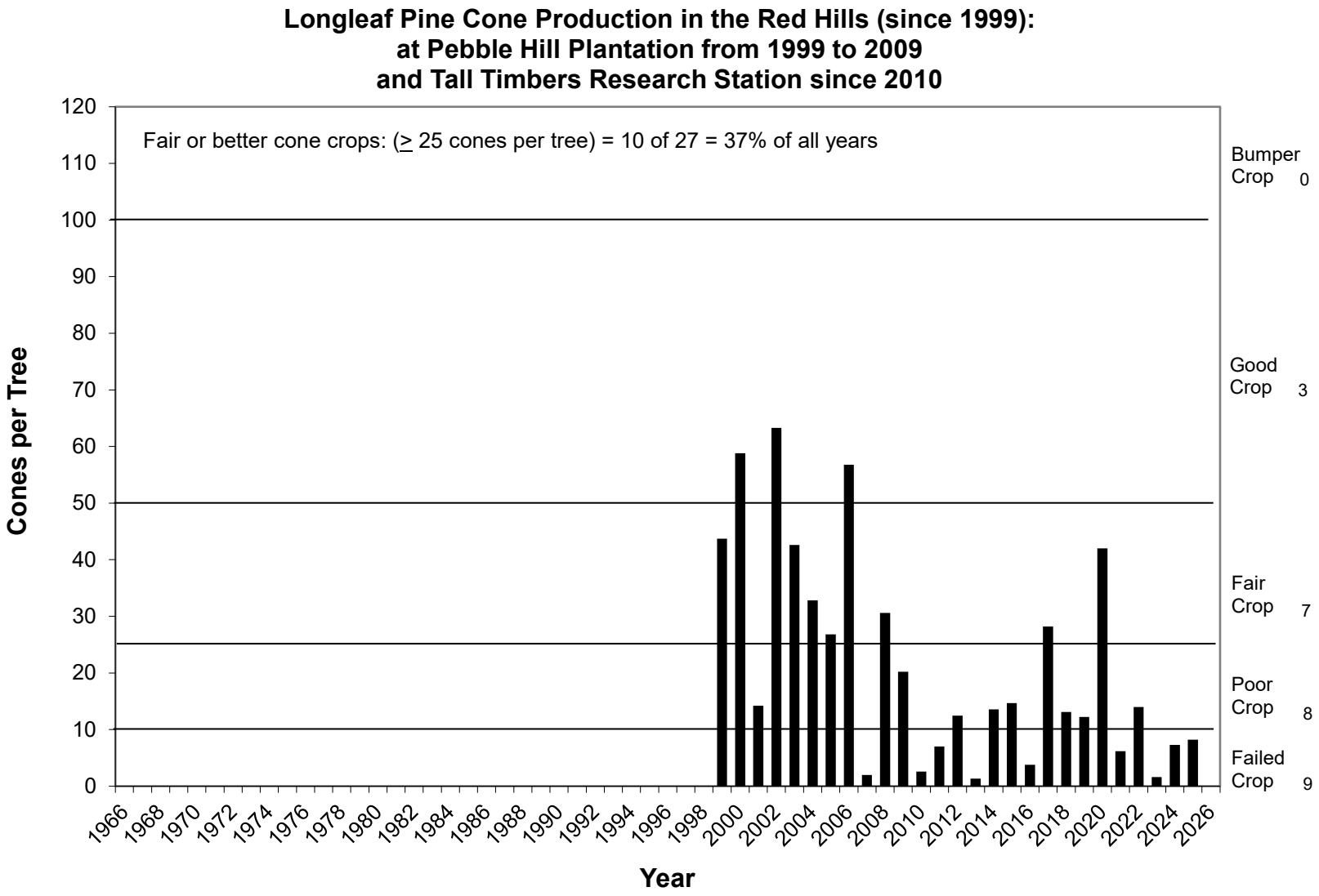
Longleaf Pine Cone Production in Western Florida at Eglin AFB (since 1968)



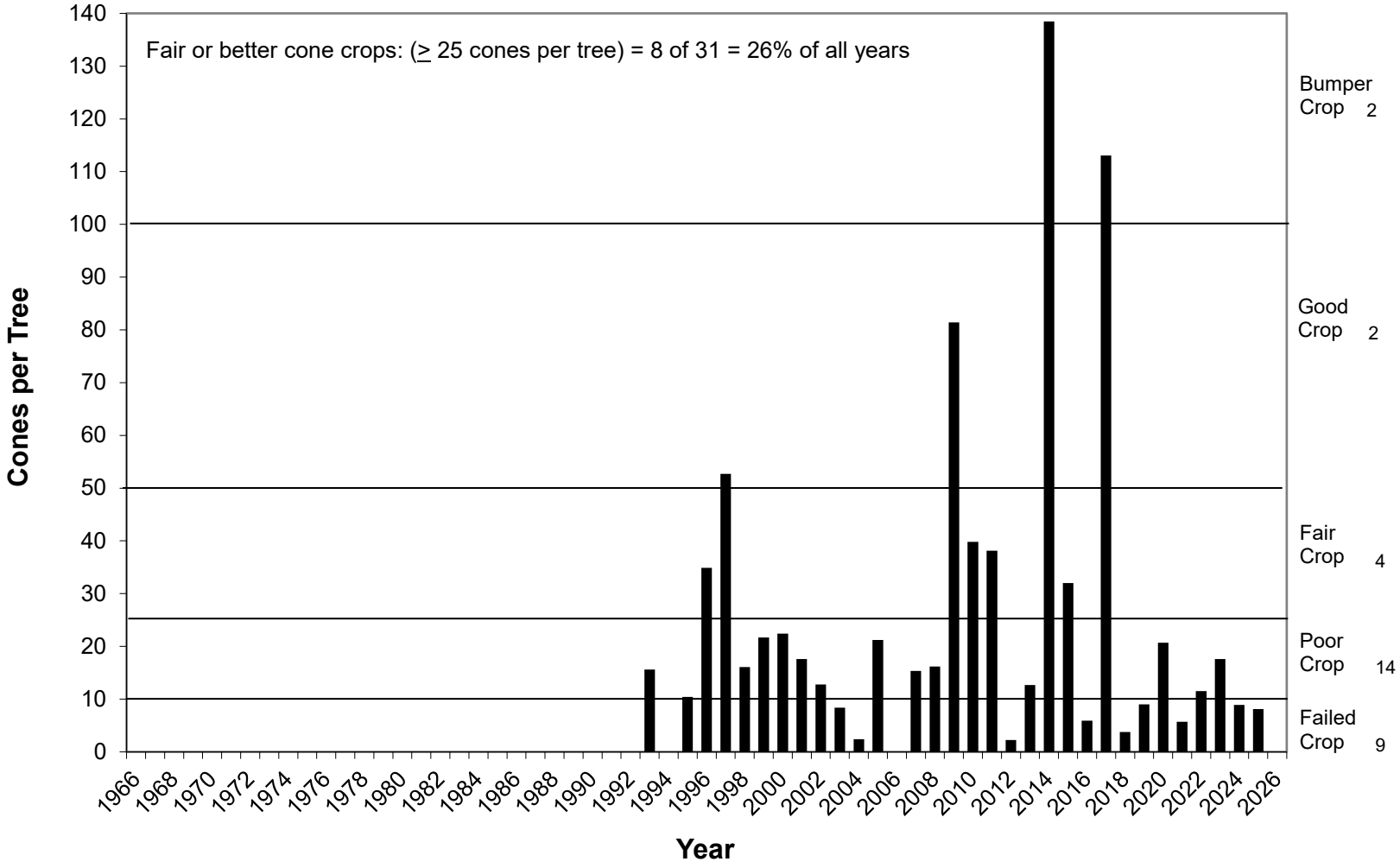
Longleaf Pine Cone Production in Western Florida at Apalachicola NF (since 1966)



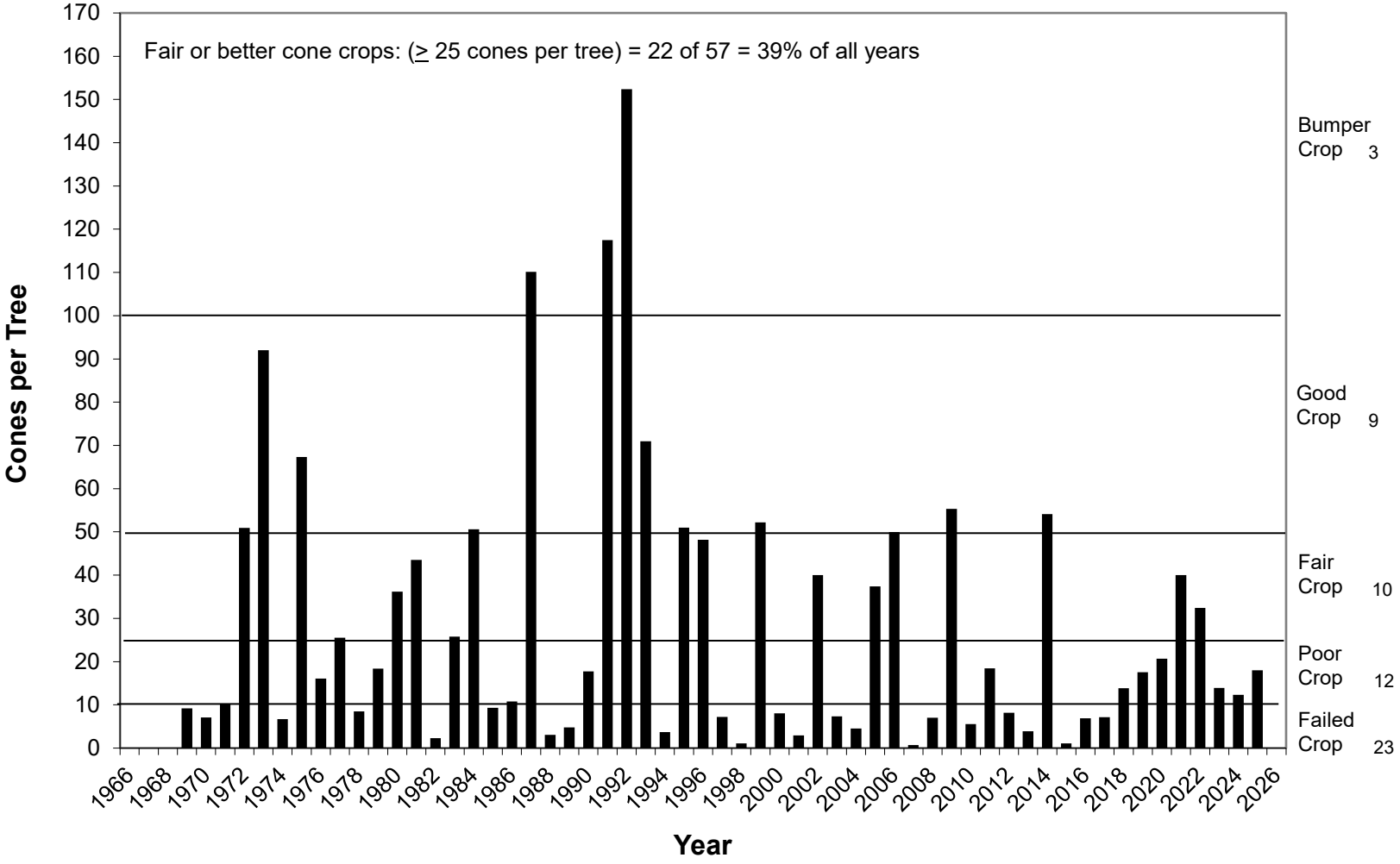

Longleaf Pine Cone Production in Southwestern Georgia (since 1967):
at Southlands Forest Research Center from 1967 to 1996
and Jones Ecological Research Center since 1997
Fair or better cone crops: (≥ 25 cones per tree) = 18 of 59 = 31% of all years
Cones per Tree
Year
Bumper Crop 7
Good Crop 8
Fair Crop 3
Poor Crop 6
Failed Crop 35


Longleaf Pine Cone Production in the Red Hills (since 1999):
at Pebble Hill Plantation from 1999 to 2009
and Tall Timbers Research Station since 2010
Fair or better cone crops: (≥ 25 cones per tree) = 10 of 27 = 37% of all years
Cones per Tree
Year
Bumper Crop 0
Good Crop 3
Fair Crop 7
Poor Crop 8
Failed Crop 9

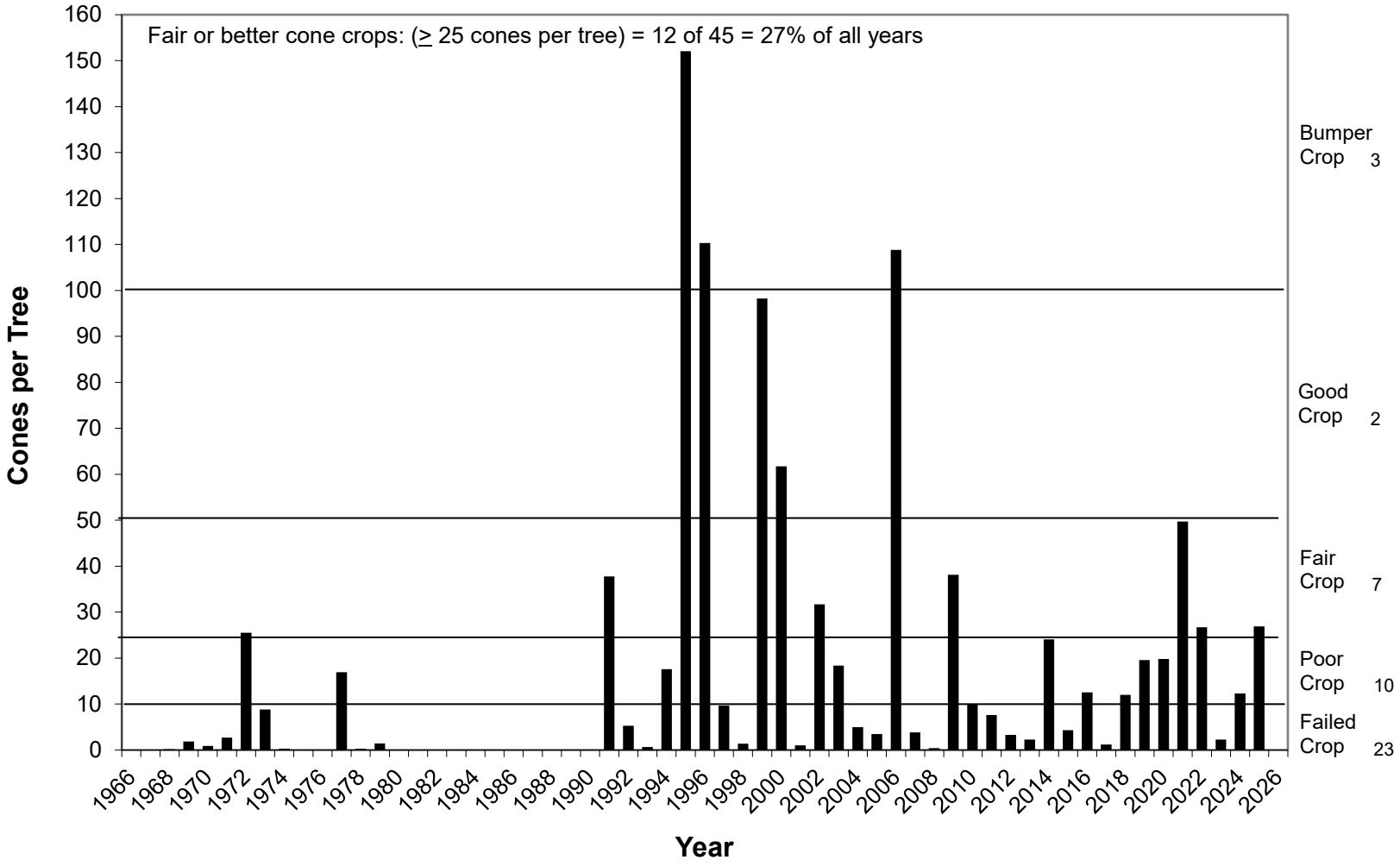
Longleaf Pine Cone Production in Western Georgia at Fort Benning (since 1993)



Longleaf Pine Cone Production in South Carolina at Sand Hills SF (since 1969)



Longleaf Pine Cone Production in North Carolina at Bladen Lakes SF (since 1968)



Longleaf Pine Cone Production on Florida Peninsula at Ordway-Swisher Biological Station (since 2015)