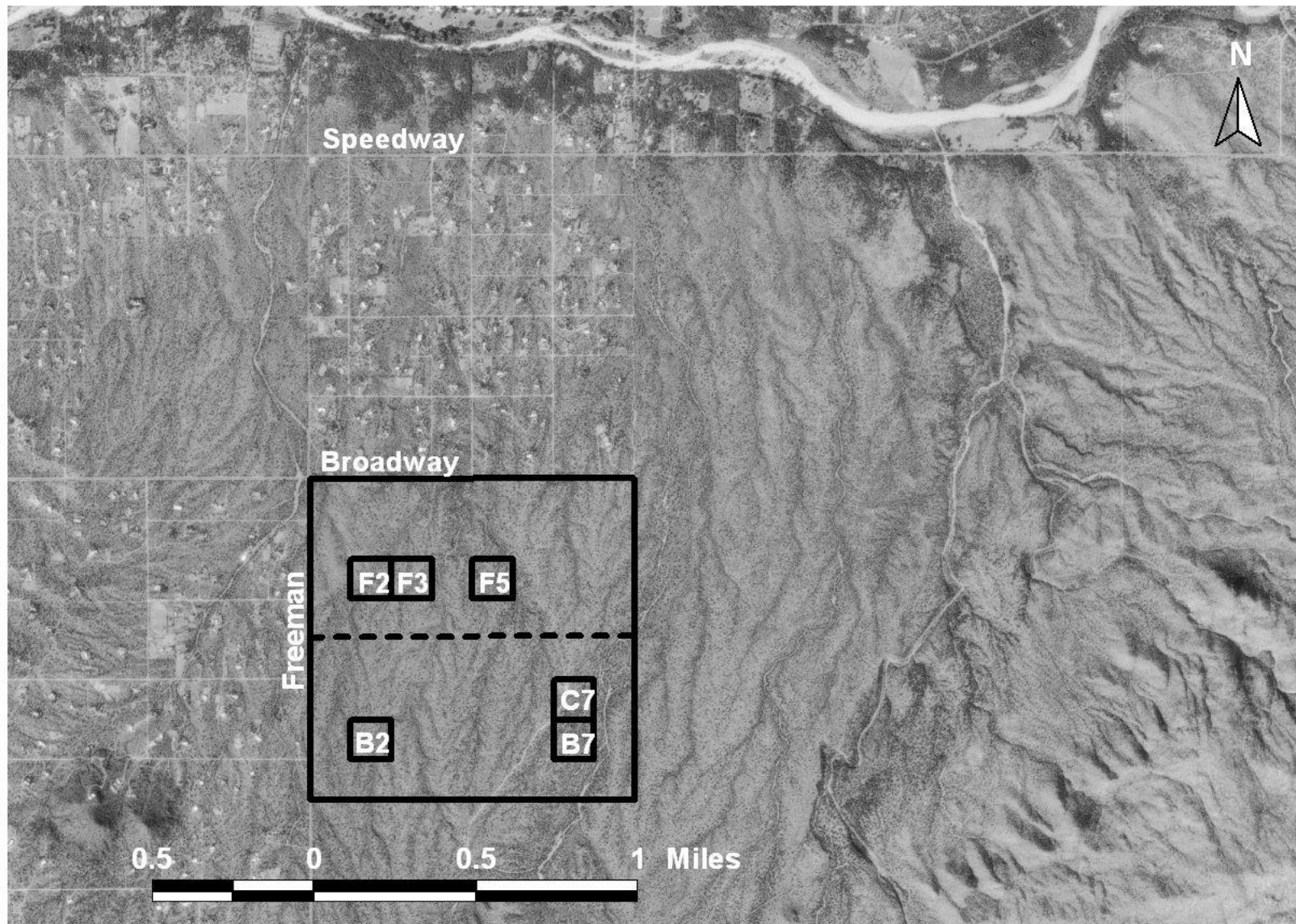


History and Update of the Annual Census of Saguaros in the Cactus Forest of the Rincon Mountain District of Saguaro National Park

Tom Orum and Nancy Ferguson

Map of plots in Section 17, T14S and R16E



Dr. Stan Alcorn lead the annual saguaro census for 44 years from 1955 to 1999



George Olin photos illustrating pollination studies



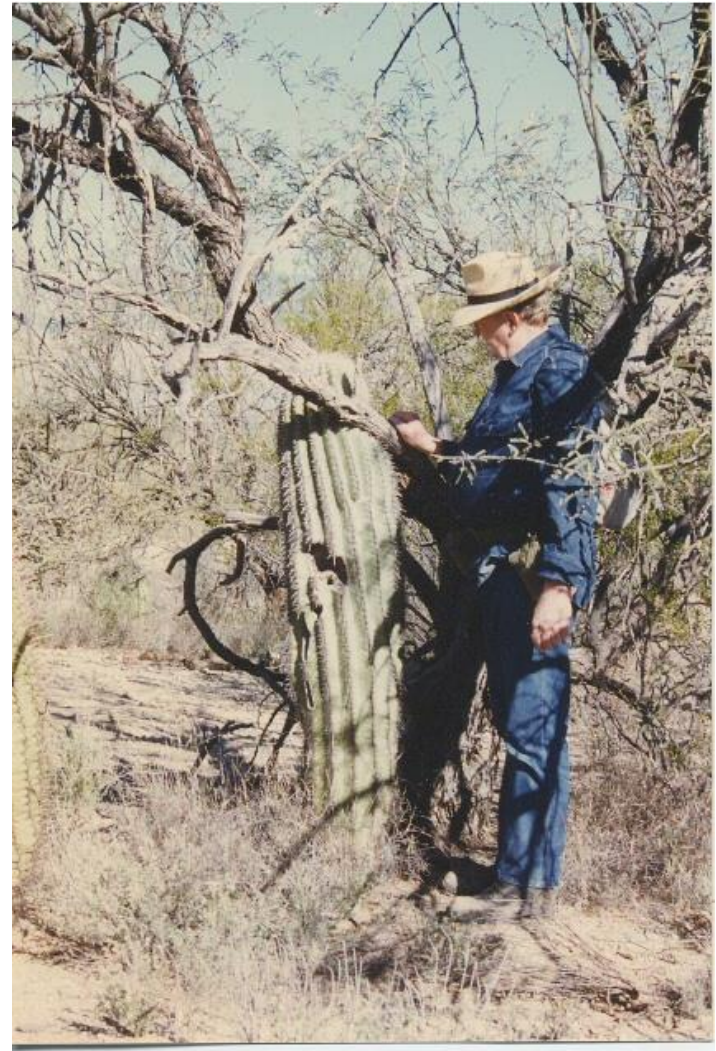
Dr. Alcorn Watering Transplants in 1957



Cattle grazing in Plot B2 in 1957



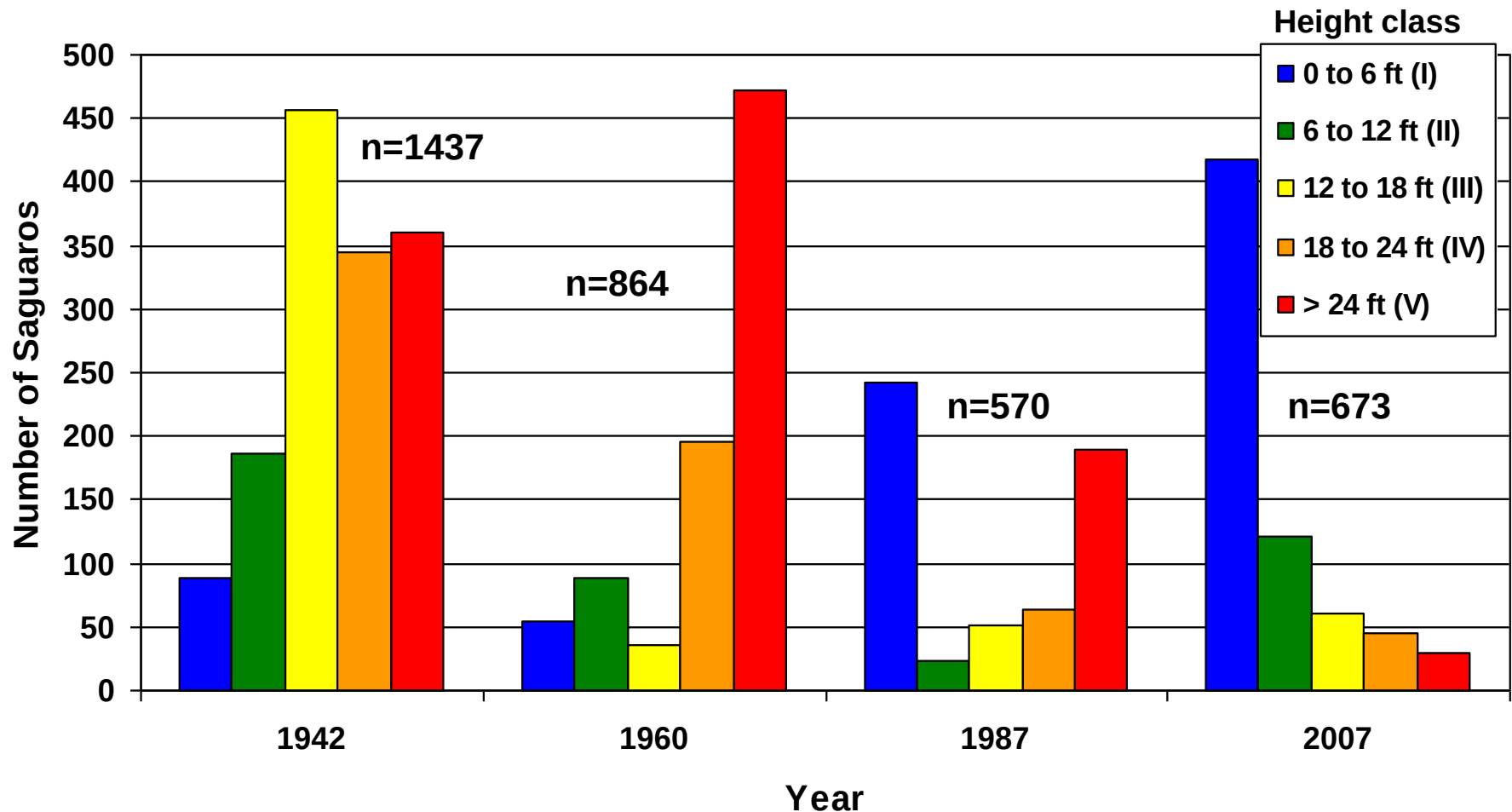
Dr. Alcorn in about 1960 and in 1997



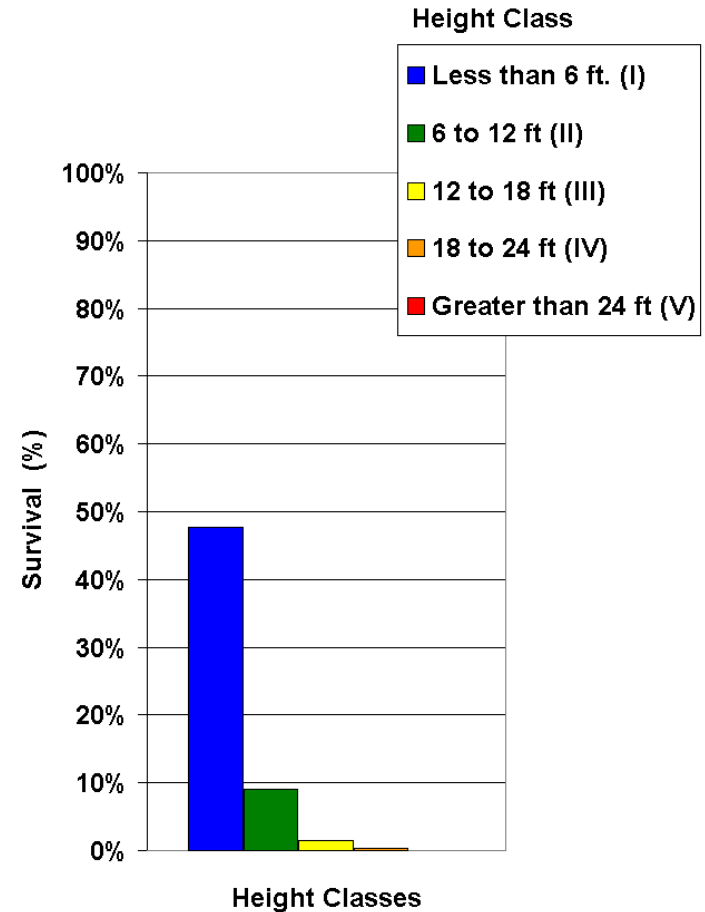
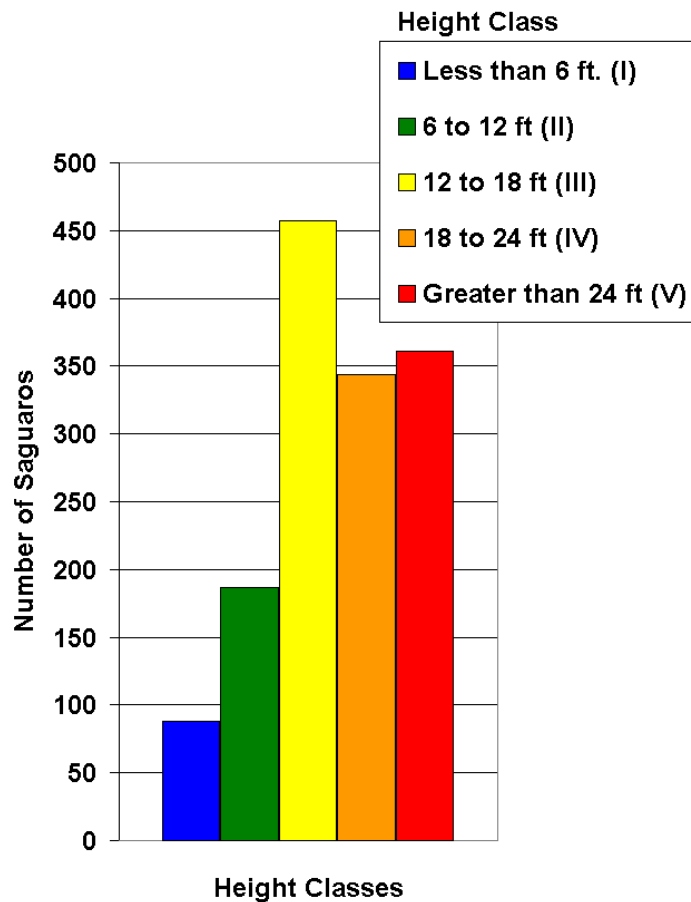
Plant B7 184 in 1997

Update on data

Changes in Height/Age Structure 1942 to 2007



Survival of Plants from the 1942 Census until 2007



Of 1,437 saguaros censused in 1942, 67 (4.7%) are alive today. Only one of the plants between 18 and 24 ft tall in 1942 has survived. The last of the 361 plants over 24 ft tall in 1942 died in 1996.



Life History of F5 - 345

1942 - Less than 6 ft tall (I)

1960 - 16 ft tall (III)

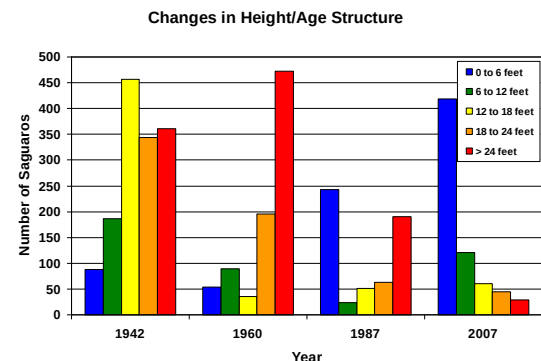
1987 - Over 24 ft tall with 10 arms (V)

1994 - prickly pear first noted

2003 - this photo taken

2005 - 15 arms

2006 - dead



Plant F5-345 in 2003 and in 2006

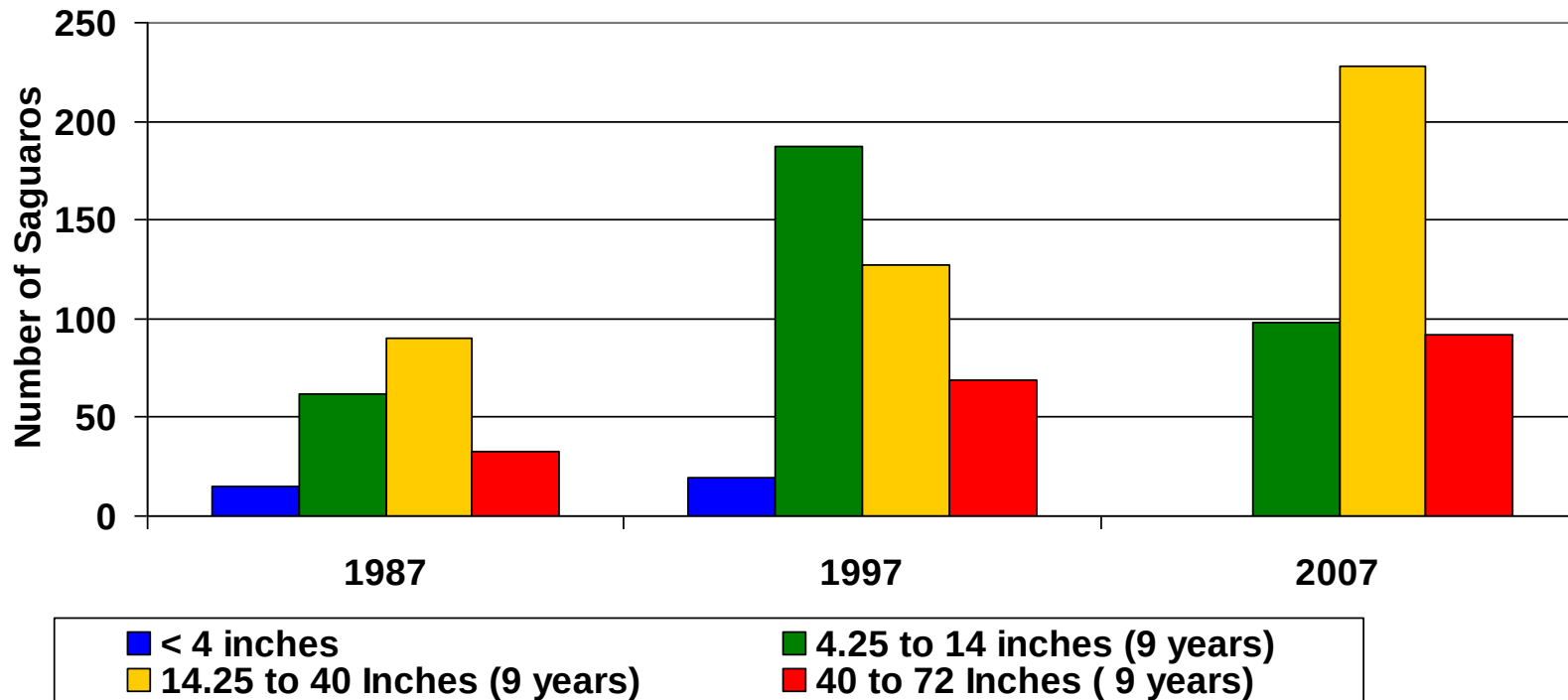


Looking Southwest in 2003



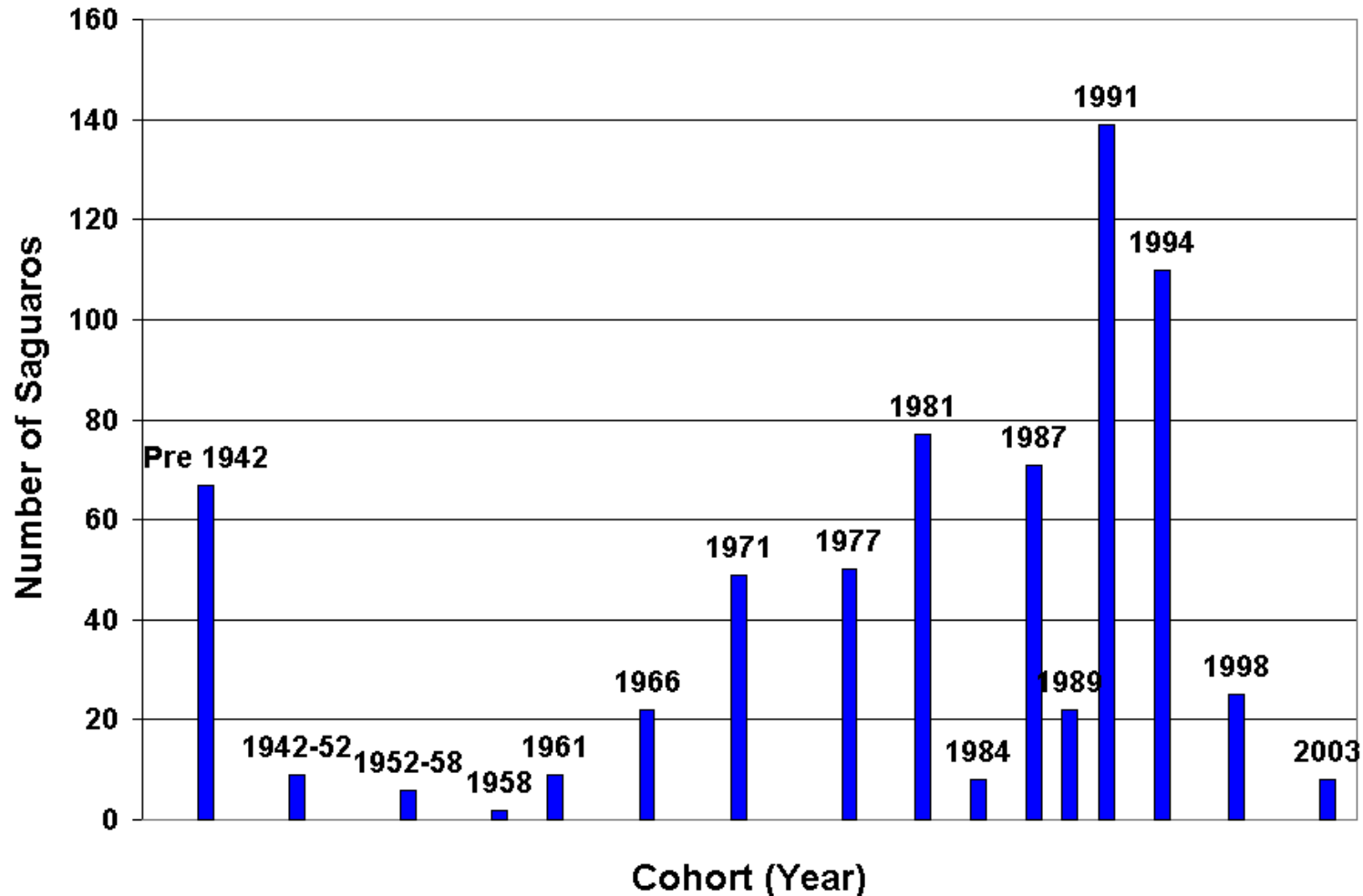
Looking East in 2006

Height structure of plants under 6 feet tall



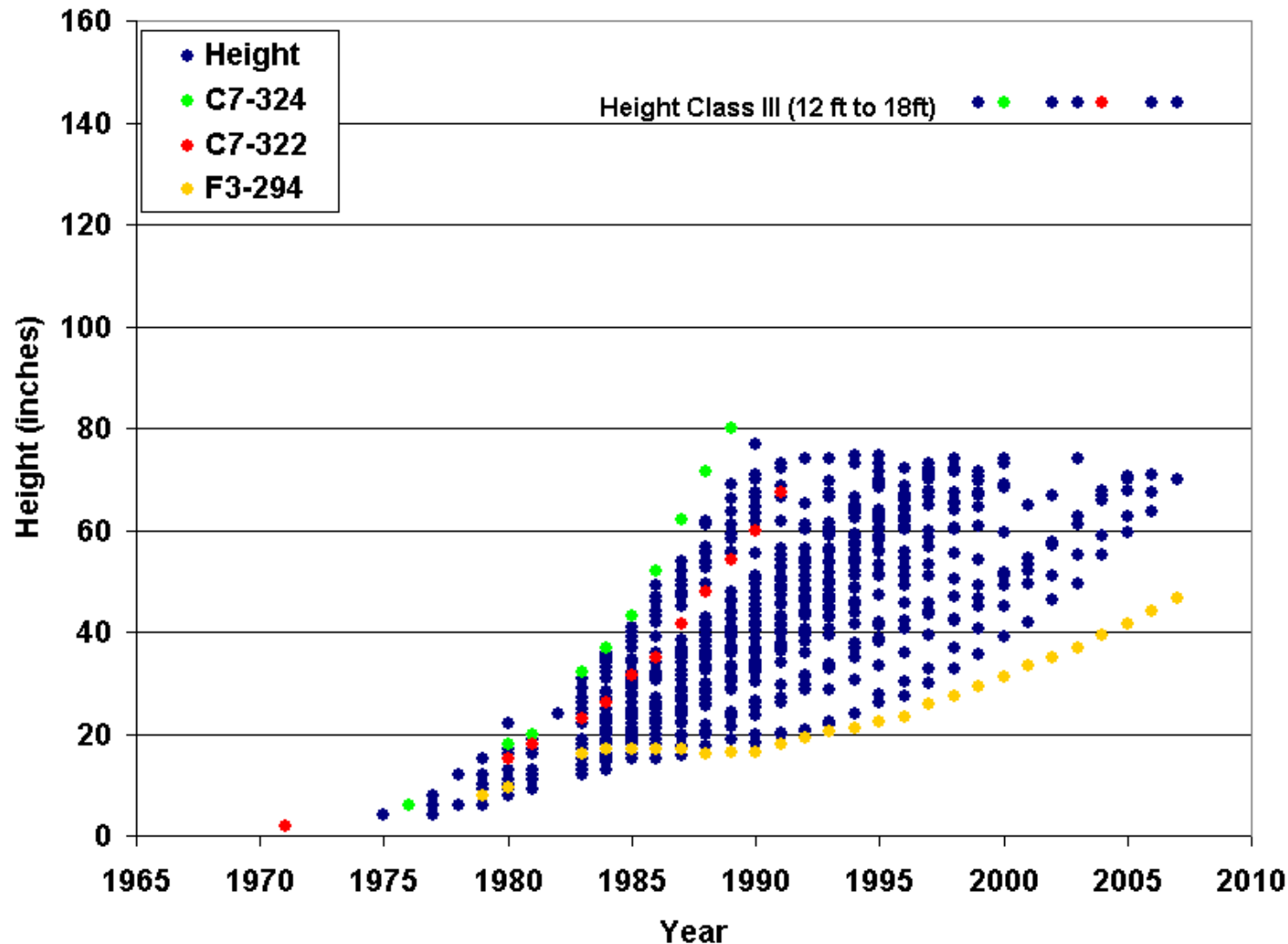
Height class intervals represent a median of 9 years of growth based on annual height measurements for cohorts 1971 and 1981

Cohort Frequencies of Saguaros Alive in 2007

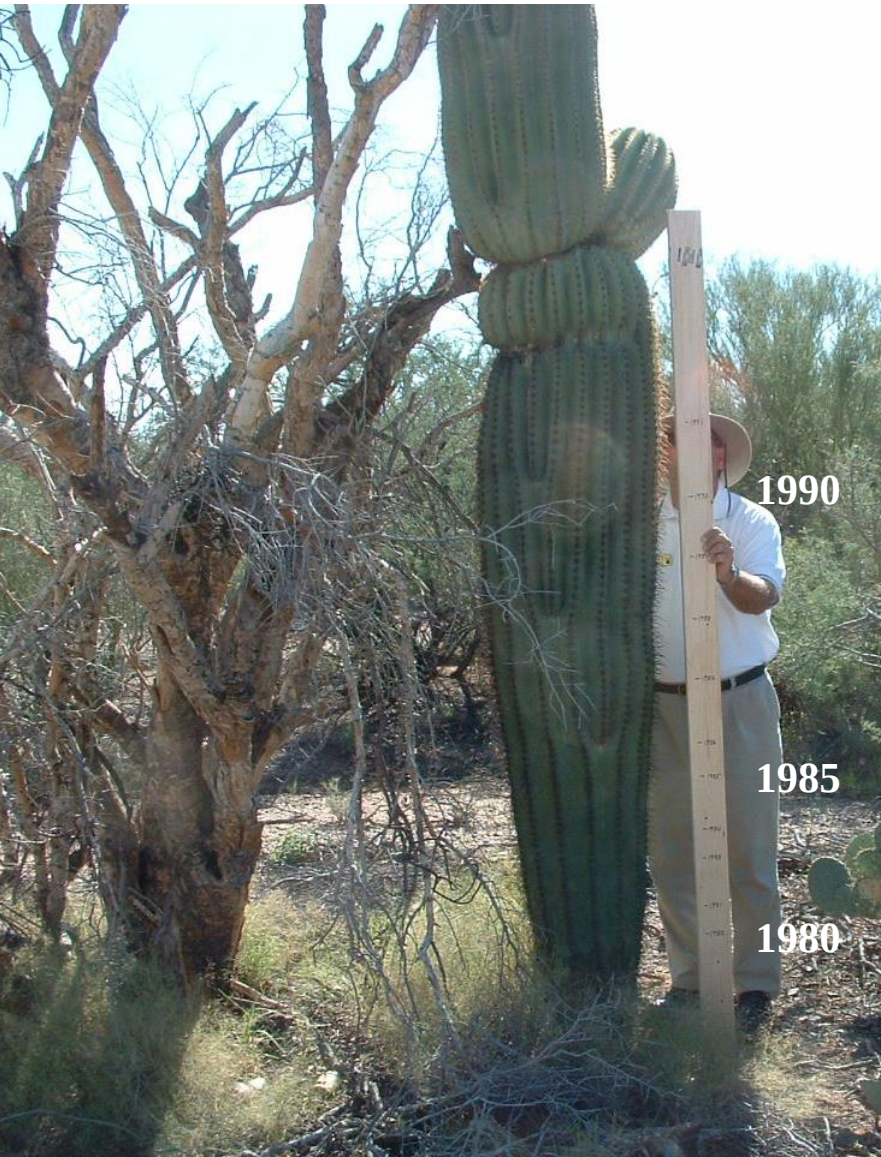


A cohort is a group of individuals of approximately the same age. Plants are assigned to cohorts based on their height in the year they are found compared with the growth history of other plants in the cohort. The cohort year is not the germination year. The year of germination is probably 3 to 8 years prior to the year designating the cohort.

Height of Saguaros in the 1971 Cohort



Life History of C7-322 (1971 Cohort)



1971 – Found west of palo verde 2 inches tall.

1980 – 15 inches tall

1992 - Over 6 ft tall (Class II)

1994 – Palo verde limb kills the growing tip.

1995 – Two new tips

1997 – Only one new tip survives

2002 – New arm forms below ring

2003 – Palo verde dies.

2004 – Over 12 ft tall (Class III)

Life Histories (1971 Cohort)

F3-294 (slow growing)

1979 – 8” tall. Found in dead shrub
(Old tip injury)

1983 – 16” tall

1990 – Still 16” tall, top yellow

1992 - Growth resumes

1994 – 21” tall. First *Cactobrosis*
pupal case noted; two rings
at 7” and 17”.

2004 – 39.5 ” tall. New *Cactobrosis*
exit hole with 2” rot pocket

2005 – *Cactobrosis* exit hole on
west at 28 inches (no rot)

2007 – 47” tall.

C7-324 (fast growing)

1976 – 6” tall; S. side of palo verde
near Mica View Picnic area

1986 – Grew 9” to 52” tall.

1987 – Grew 10” to 62” tall.

1989 – 80” tall; enters height class II
with 8.5” of growth

1990 – No holes

1991 – Human poke on S. at 3 ft

1999 – 2 new arms

2000 – Height class III (over 12 ft)

2006 – Large hole on S. at 3 ft

2007 – Between 12 and 18 ft tall with
4 arms and 1 nubbin.

Smallest plant in the plots in 2007



Wrap up and conclusions

- **It appears we have entered a period of limited recruitment similar to the period between 1942 and 1966.**
- **Based on the growth of the 1971 cohort, about 25 years from now, most of plants in the 1989 to 1994 cohorts will be in height class III (12 to 18 feet tall).**
- **If the lack of recruitment continues (drought et al.), in 2032, the height structure of the population will again be similar to the height structure in 1942. The number of plants in the population will be about 40% of the number in the 1942 population.**