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Pollinators in Cranberry: Biology, Status and Conservation

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Pollination in cranberry

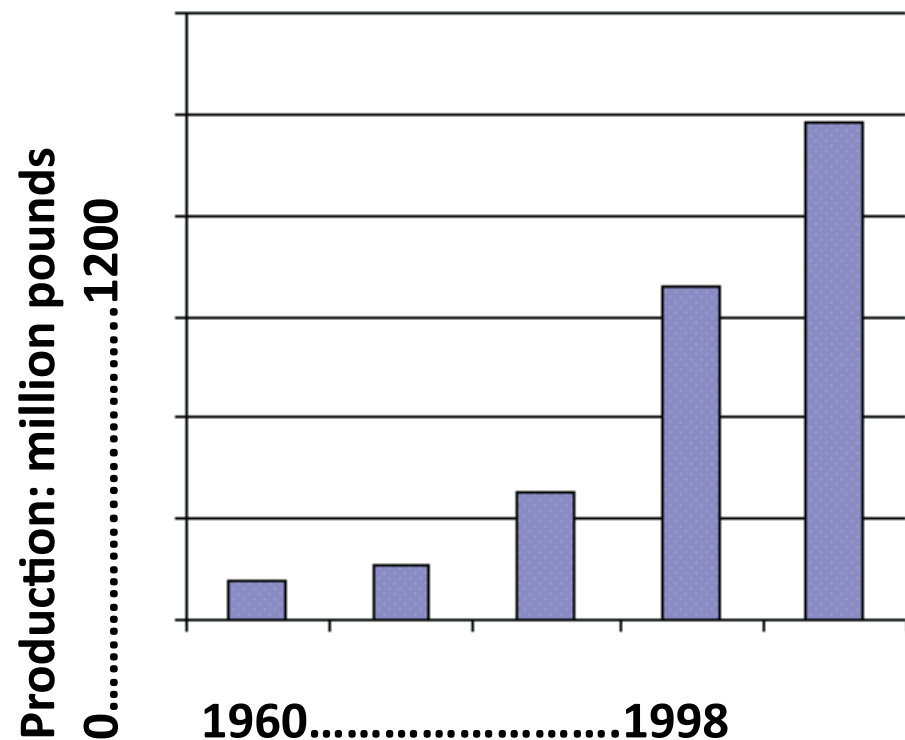


Is pollination secure?

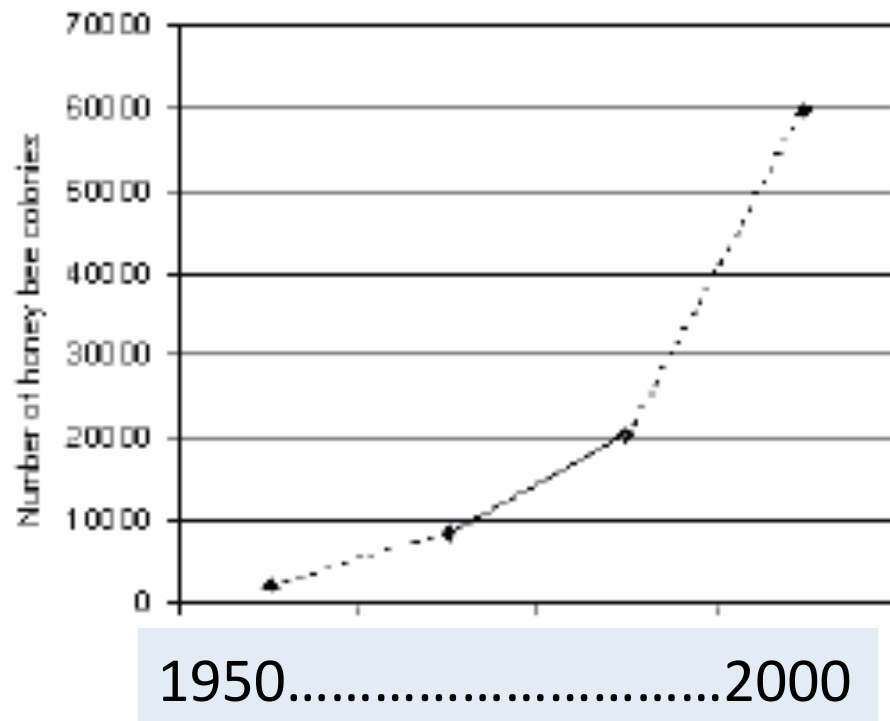
- Managed honey bee availability
 - Demand is increasing
 - Supply is decreasing

Greater demand

- There are over 650,000 acres in CA, ca 80% of world's requirements.
- Almonds are in bloom at one time, ca. 1,000,000 honey bee hives needed

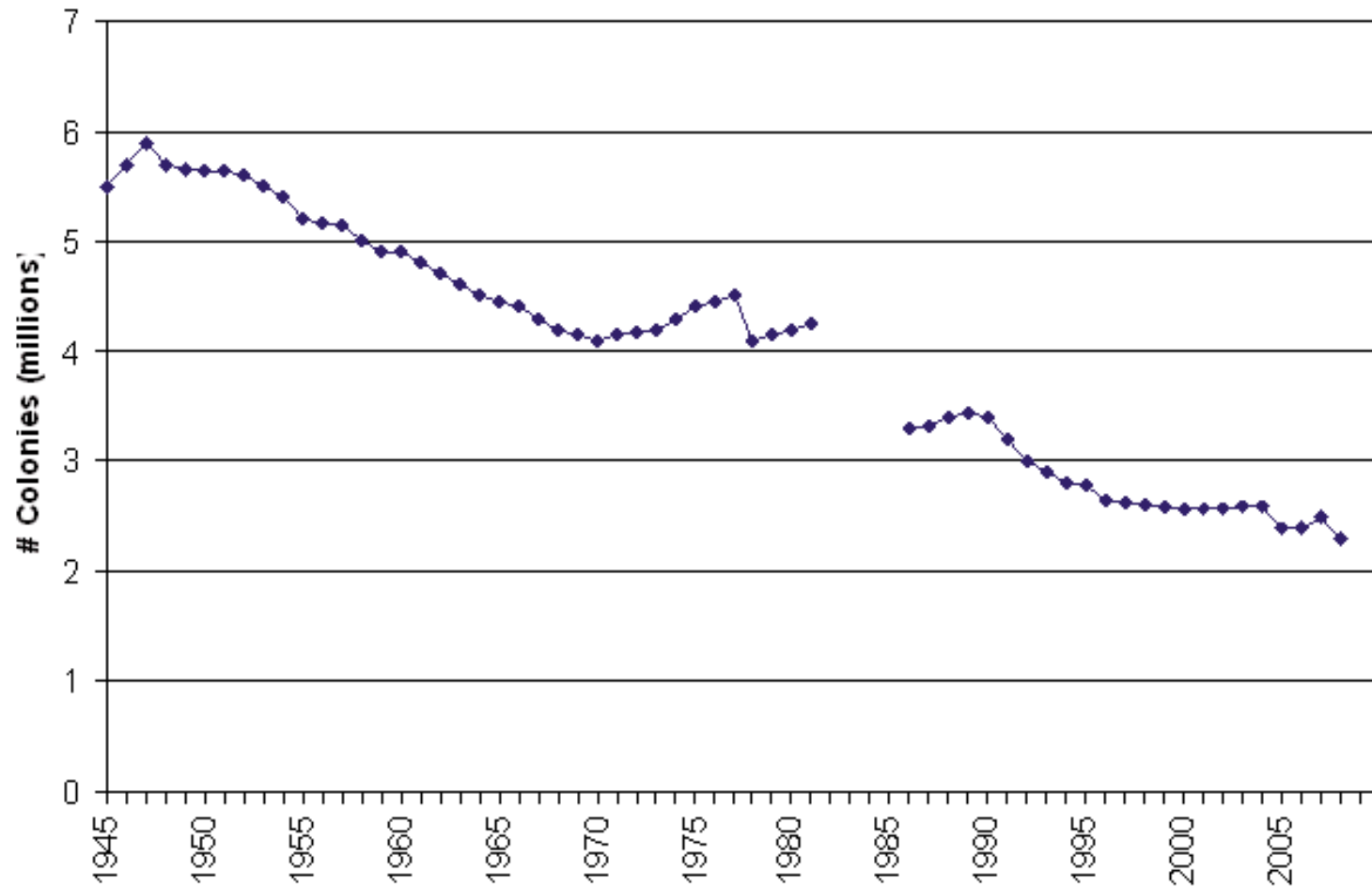


Colonies entering Maine for lowbush blueberry production



6.0 million to 2.3 million colonies in the last 60 years

Managed Honey Bee Colonies in the United States
(National Agricultural Statistics Service)



Migratories travel to CA



All converge in CA and mingle



Are pathogens moving along with the bees?

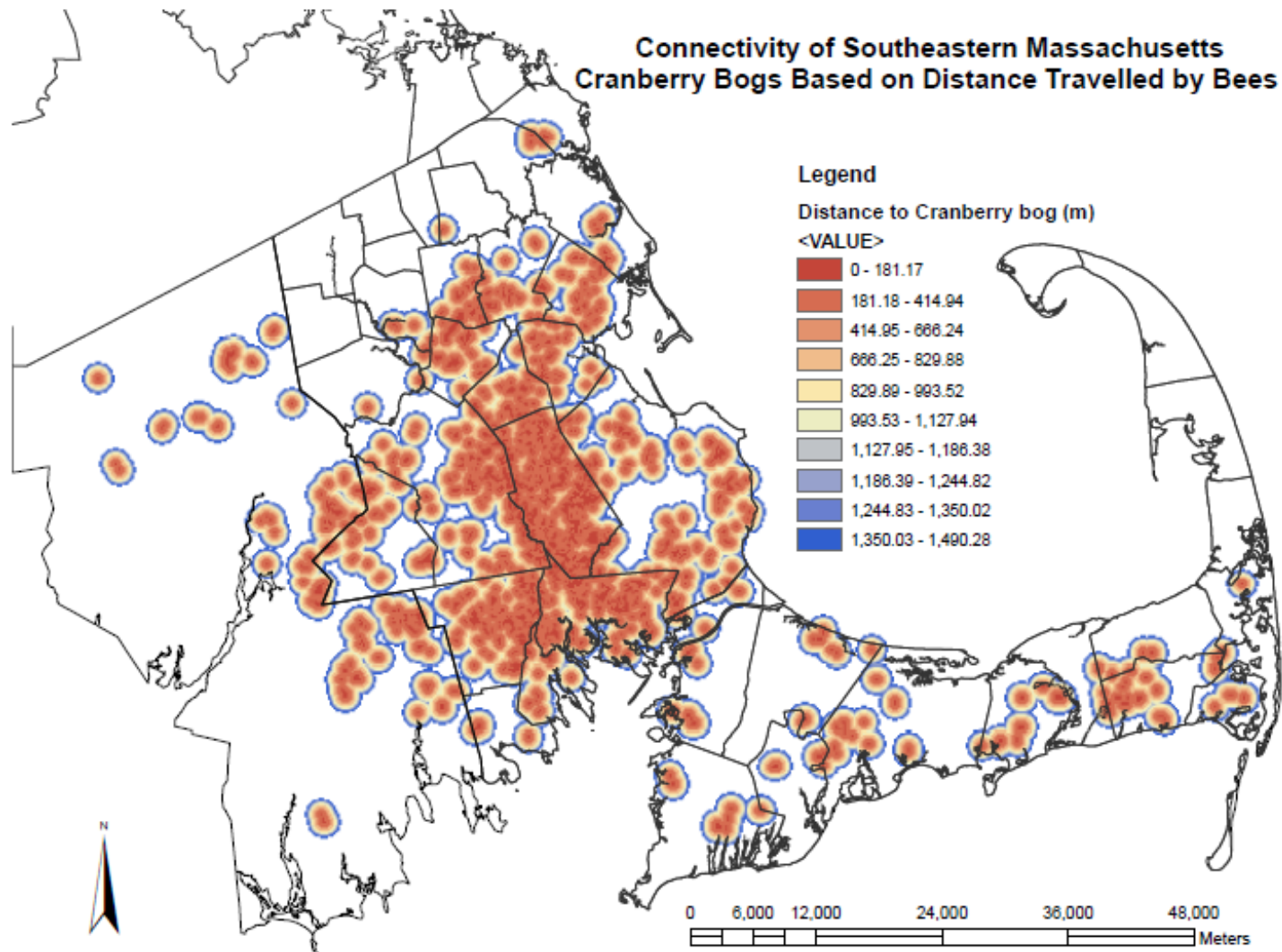


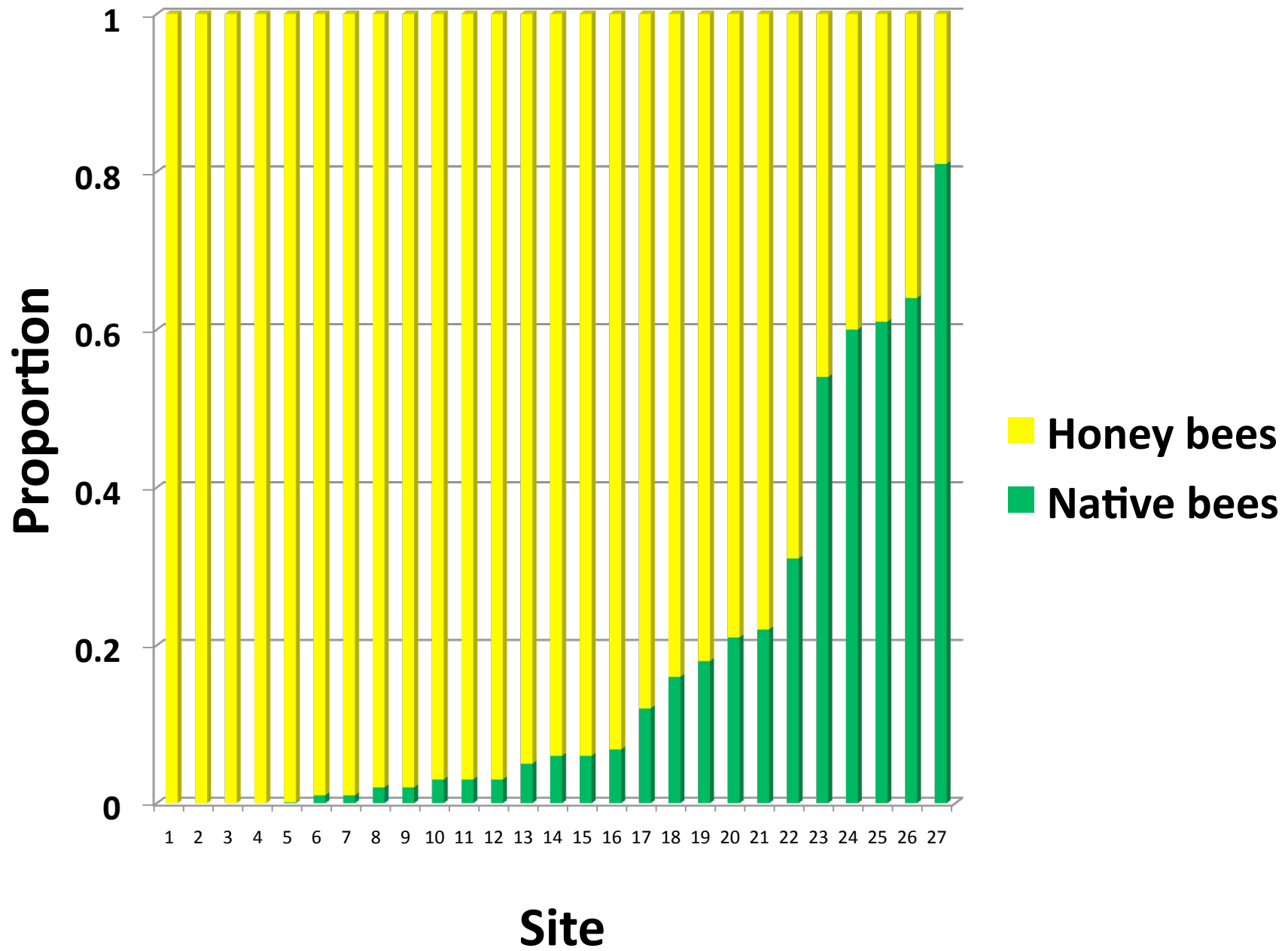
Honey bee pathogens in wild bees

| | | | % infected | | |
|---------|-------------------------|--------|------------|-------|------|
| Date | Genus | Number | DWV | BQCV | SBV |
| 5/25/10 | <i>Apis (Honey bee)</i> | 16 | 87.5 | 87.5 | 6.25 |
| 5/25/10 | <i>Bombus</i> | 3 | 100 | 100 | 0 |
| 5/25/10 | Other | 17 | 29.41 | 41.18 | 0 |
| 6/30/10 | <i>Bombus</i> | 27 | 0 | 14.81 | 0 |
| 7/19/10 | <i>Bombus</i> | 40 | 0 | 15 | 0 |

Other = *Andrena*, *Osmia*; DWV=Deformed Wing Virus; BQCV = Black Queen Cell Virus, SBV = Sacbrood Virus

'Connectivity' of MA bogs for bees





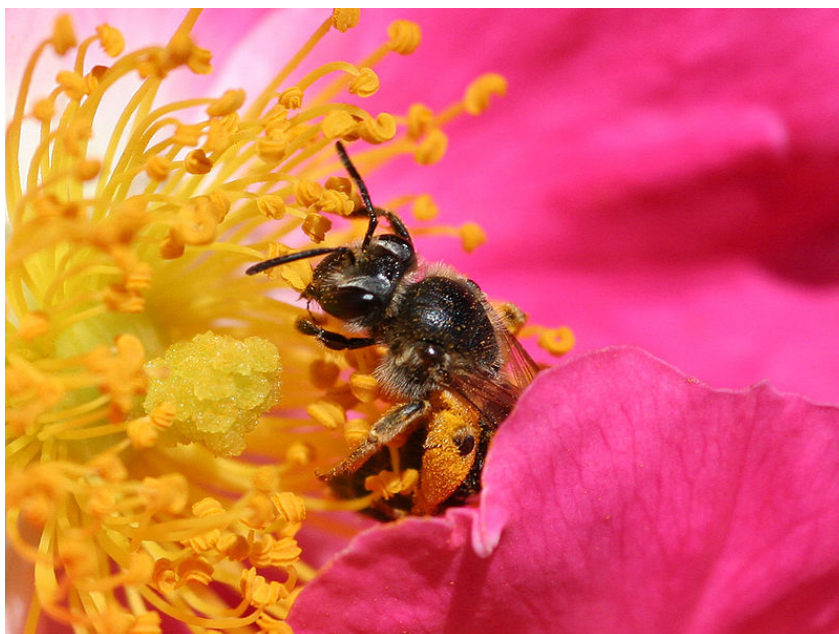
20 years ago, had 8 species of
bumble bees; now 5



Conserve native bees

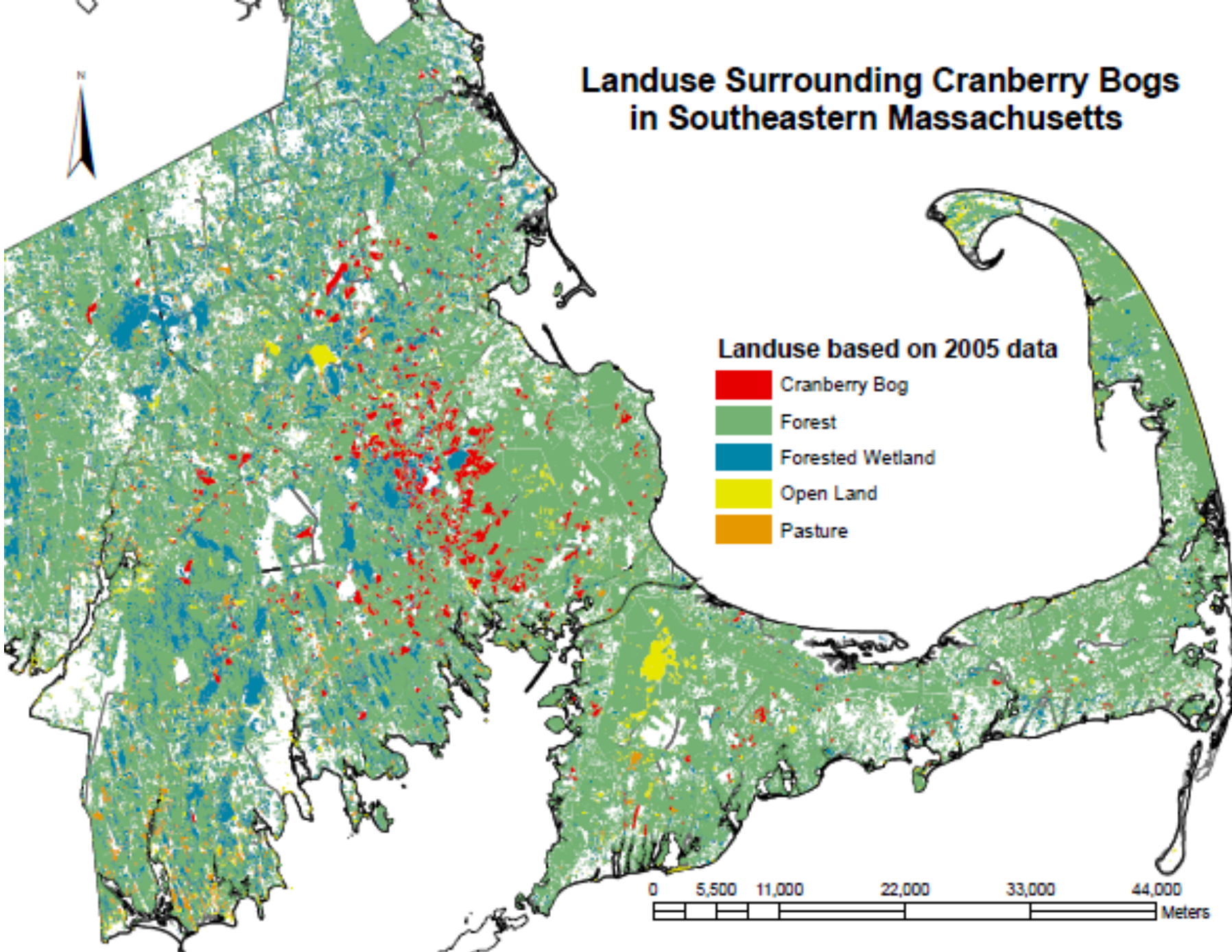
- Many different species that need different resources
 - Alternate forage before and after bloom
 - Consider nesting sites
 - Avoid pesticides when bees are on bogs
 - Native bees will be foraging on weed flowers before and after bloom
 - Stay on bogs later into fruit set
 - Begin foraging 2 h earlier in the morning

Conserve alternate forage



- Queens overwinter and start nests in spring
- New queens and males produced in summer
- Need flowers (pollen) at these critical points before and after cranberry bloom

Landuse Surrounding Cranberry Bogs in Southeastern Massachusetts



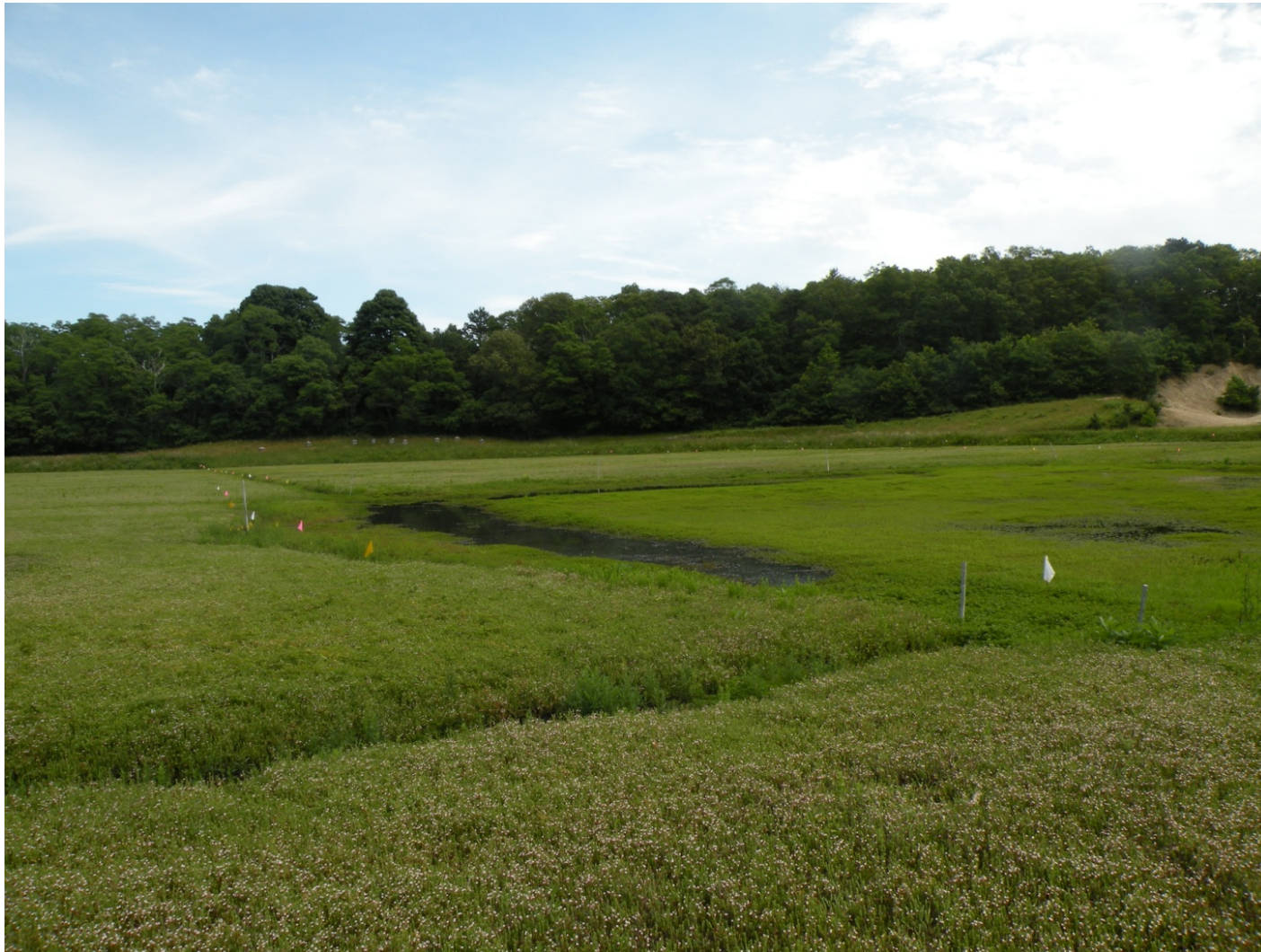
Think about flower availability before
and after bloom



Fencerows, hedgerows, snags provide nest sites for some



Patches of flowers may persist and attract lots of bees, even after majority of bog has set





Bumble bees forage 2 hours earlier in morning than honey bees

Pesticide kill evaluation

- Visited beds prior to and after spray
- Walked perimeter of bed and counted dead bees



Survey for bee kills during bloom

- No Delegate kills observed, even though is very toxic to bees
- Dow asserts it is relatively non-toxic when dry



One Belay honey bee kill (for weevil) at end of bloom

