

Little Birds, Big Problems



HAWK WATCH
INTERNATIONAL

Our Mission

The mission of HawkWatch International is to conserve our environment through education, long-term monitoring, and scientific research on raptors as indicators of ecosystem health.





POP QUIZ!





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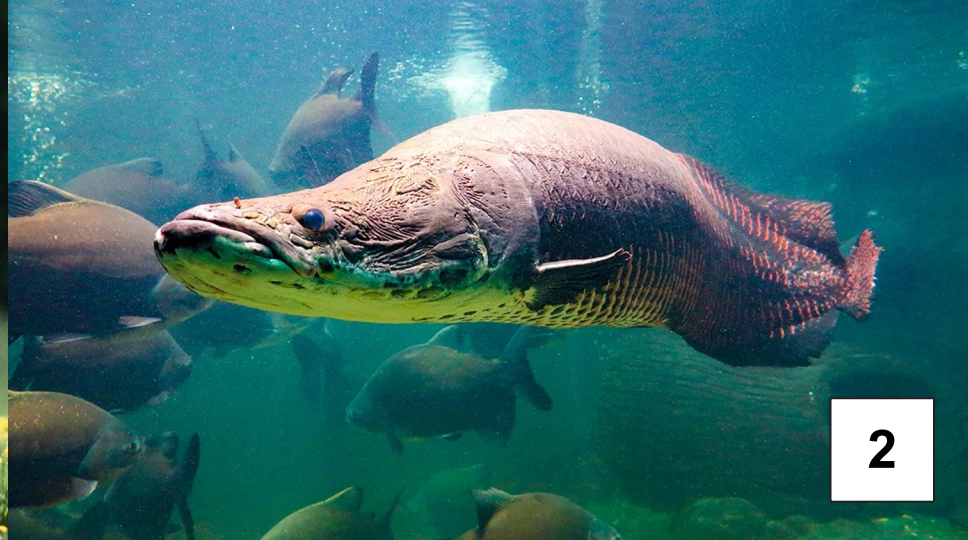
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Defining Characteristics of Raptors





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Kestrel Diet



American Kestrels eat mostly insects and other invertebrates, as well as small rodents and birds. Common foods include grasshoppers, cicadas, beetles, and dragonflies; scorpions and spiders; butterflies and moths; voles, mice, shrews, bats, and small songbirds. American Kestrels also sometimes eat small snakes, lizards, and frogs. And some people have reported seeing American Kestrels take larger prey, including red squirrels and Northern Flickers.

Source: All About Birds, Cornell University

Kestrel Habitat

American Kestrels favor open areas with short ground vegetation and sparse trees. You'll find them in meadows, grasslands, deserts, parks, farm fields, cities, and suburbs. When breeding, kestrels need access to at least a few trees or structures that provide appropriate nesting cavities. American Kestrels are attracted to many habitats modified by humans, including pastures and parkland, and are often found near areas of human activity including towns and cities.

Source: All About Birds,
Cornell University



Kestrel Nesting

American Kestrels nest in cavities, although they lack the ability to excavate their own. They rely on old woodpecker holes, natural tree hollows, rock crevices, and nooks in buildings and other human-built structures. The male searches for possible nest cavities. When he's found suitable candidates, he shows them to the female, who makes the final choice. Typically, nest sites are in trees along wood edges or in the middle of open ground. American Kestrels take readily to nest boxes

Source: All About Birds, Cornell University



Kestrel Conservation



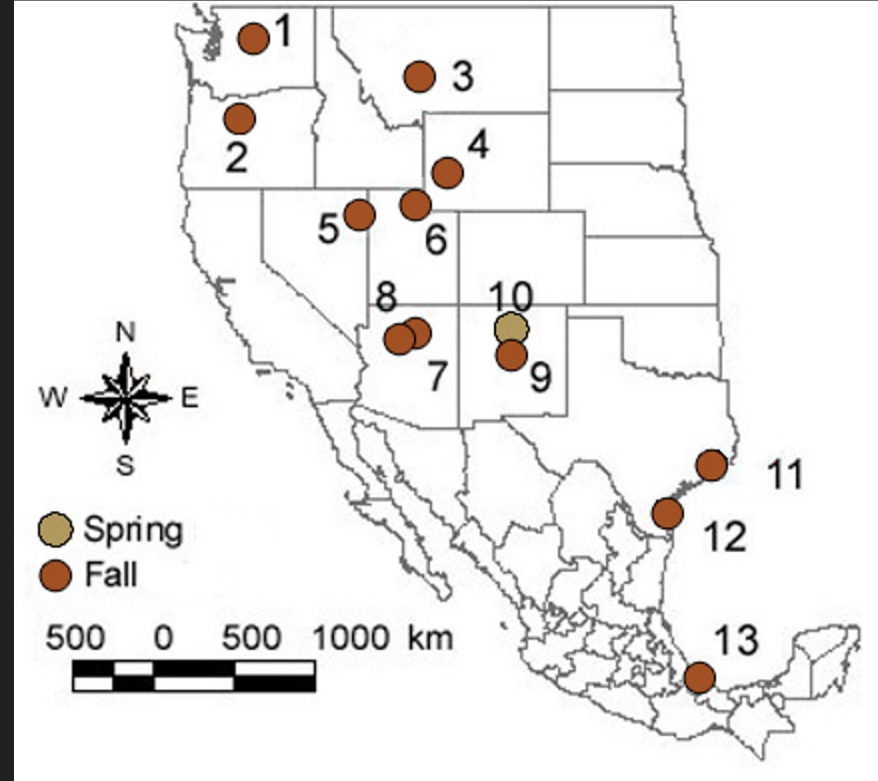
The American Kestrel is the continent's most common and widespread falcon, but populations declined by an estimated 1.41% per year for a cumulative decline of about 53% between 1966 and 2019, according to the North American Breeding Bird Survey. Partners in Flight estimates the global breeding population at 9.2 million and rates them 10 out of 20 on the Continental Concern Score. If current trends continue, American Kestrels will lose another 50% of their population by 2075.

Source: All About Birds, Cornell University

HawkWatch International Migration Network

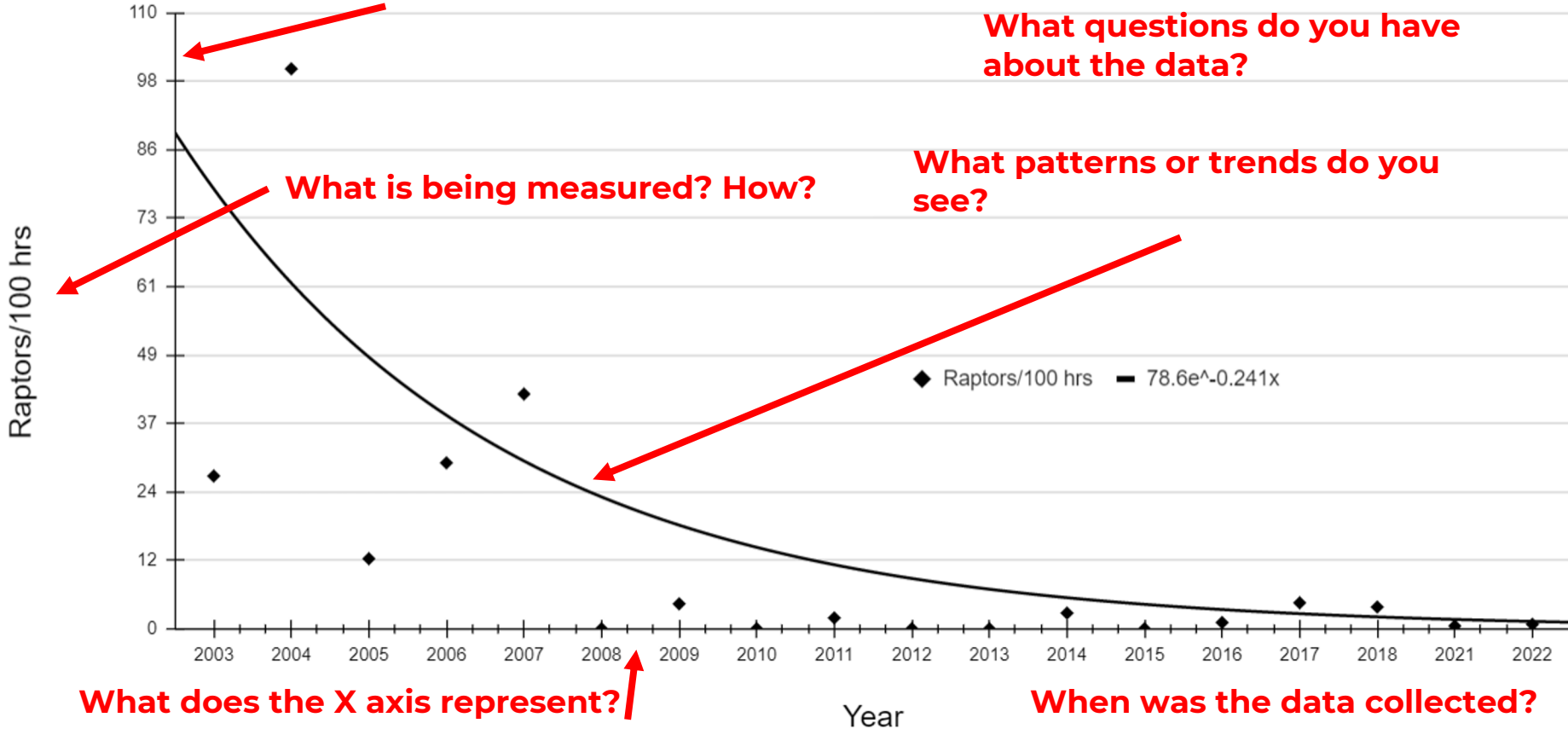
HWI Monitoring Sites

- Bonney Butte, OR
- Chelan Ridge, WA
- Commissary Ridge, WY
- Corpus Christi, TX
- Goshute Mountains, NV
- Grand Canyon, AZ
- Gunsight Mountain, AK
- Manzano Mountains, NM
- Florida Keys, FL (partner)
- Smith Point, TX (partner)
- Veracruz, Mexico (partner)



Gunsight Mountain, AK ← Where was the data collected?

What does the Y axis represent?

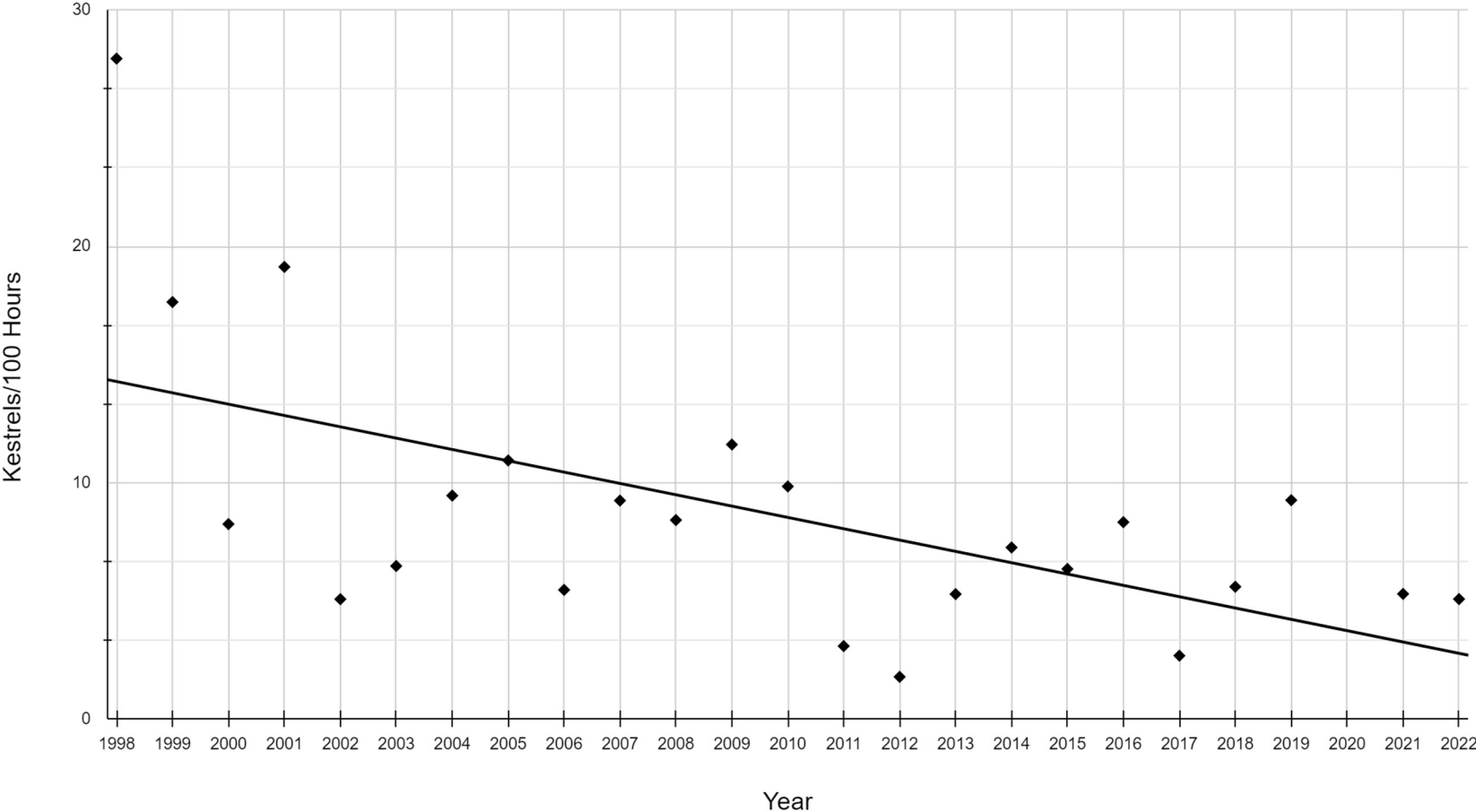


Phenomenon Exploration

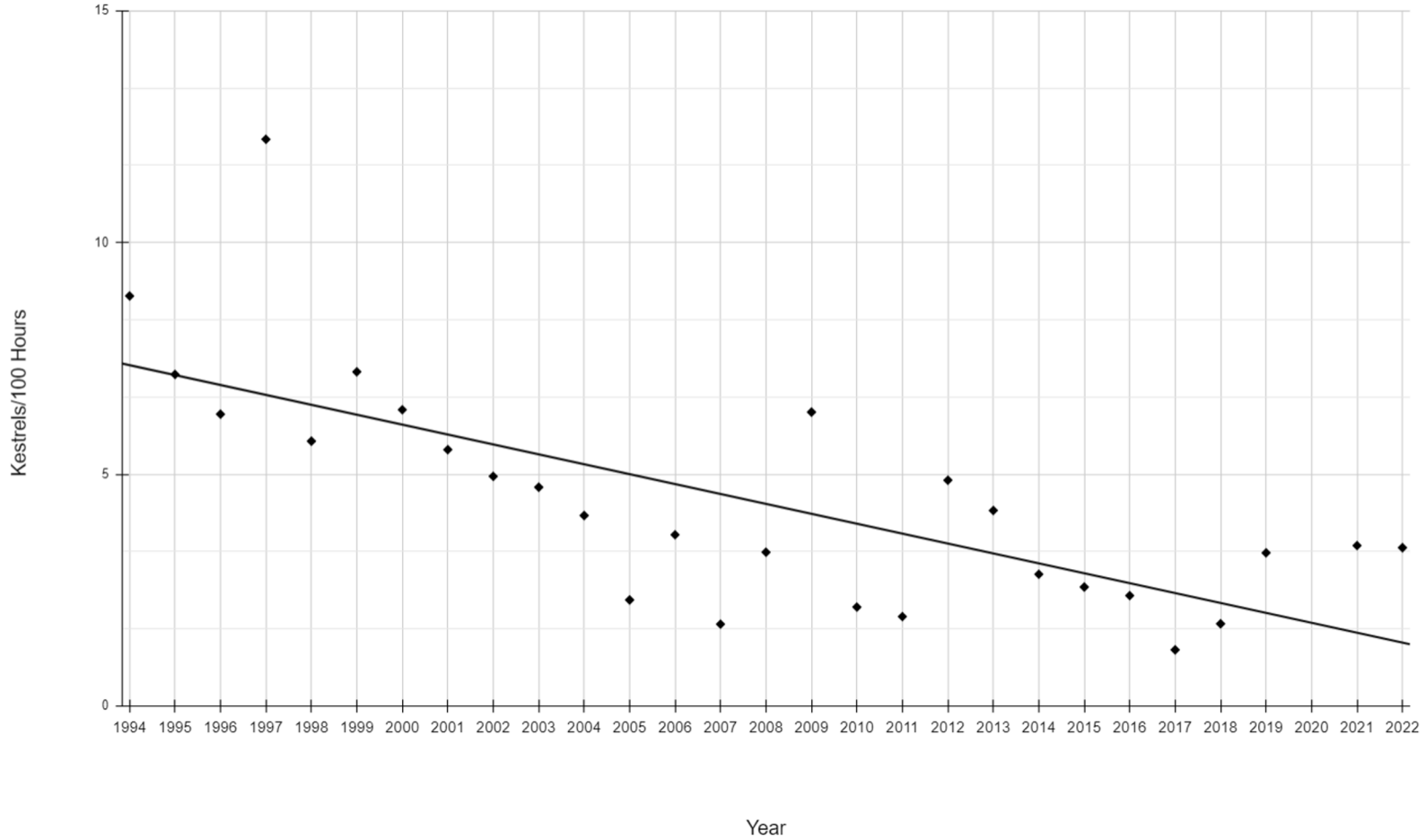
- What state is your migration site in?
- How many years has your site been operating?
- What was the highest year/number for Kestrel sightings at your site?
- What was the lowest year/number for Kestrel sightings?
- What is the overall trend at your site?



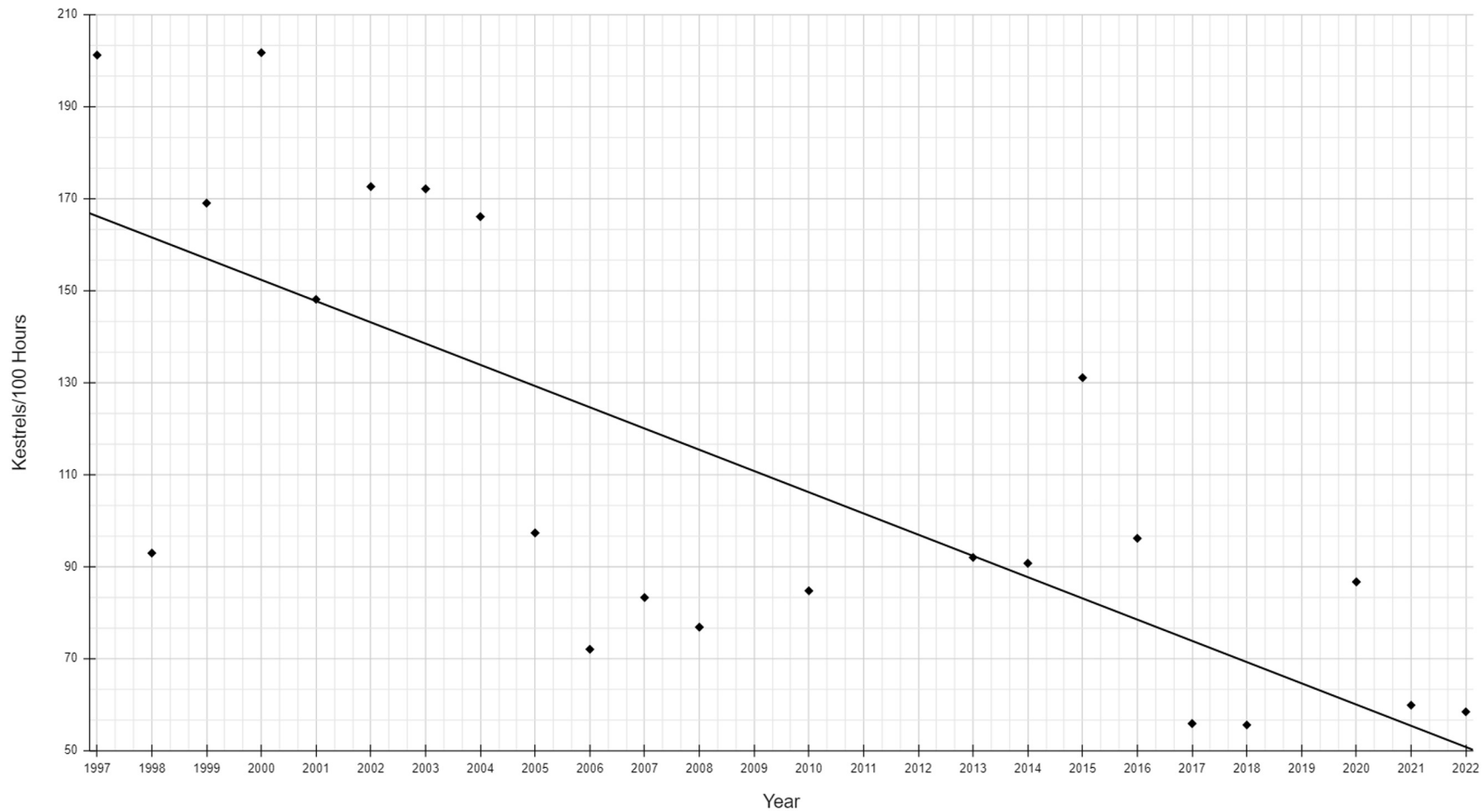
Chelan Ridge, WA



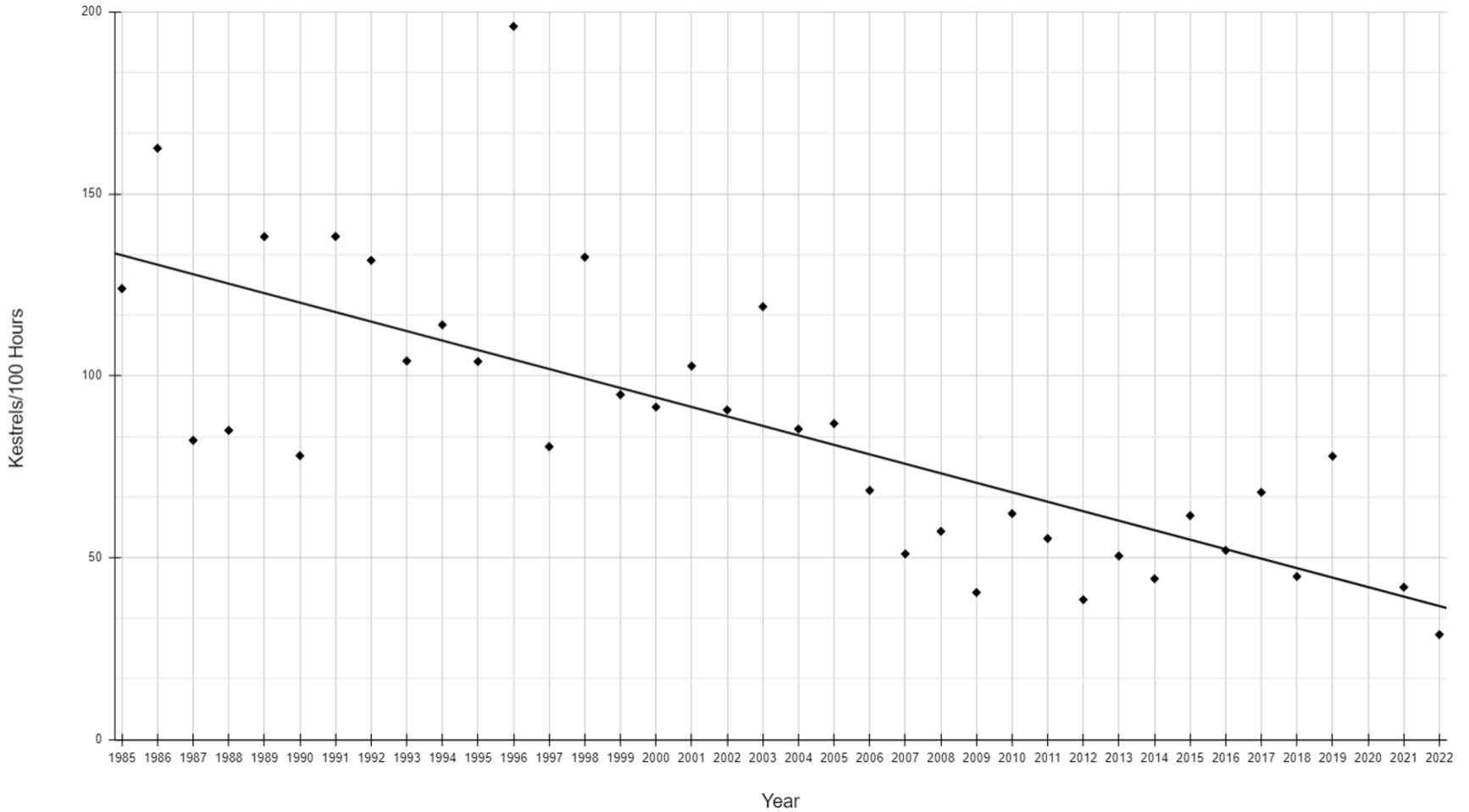
Bonney Butte, OR



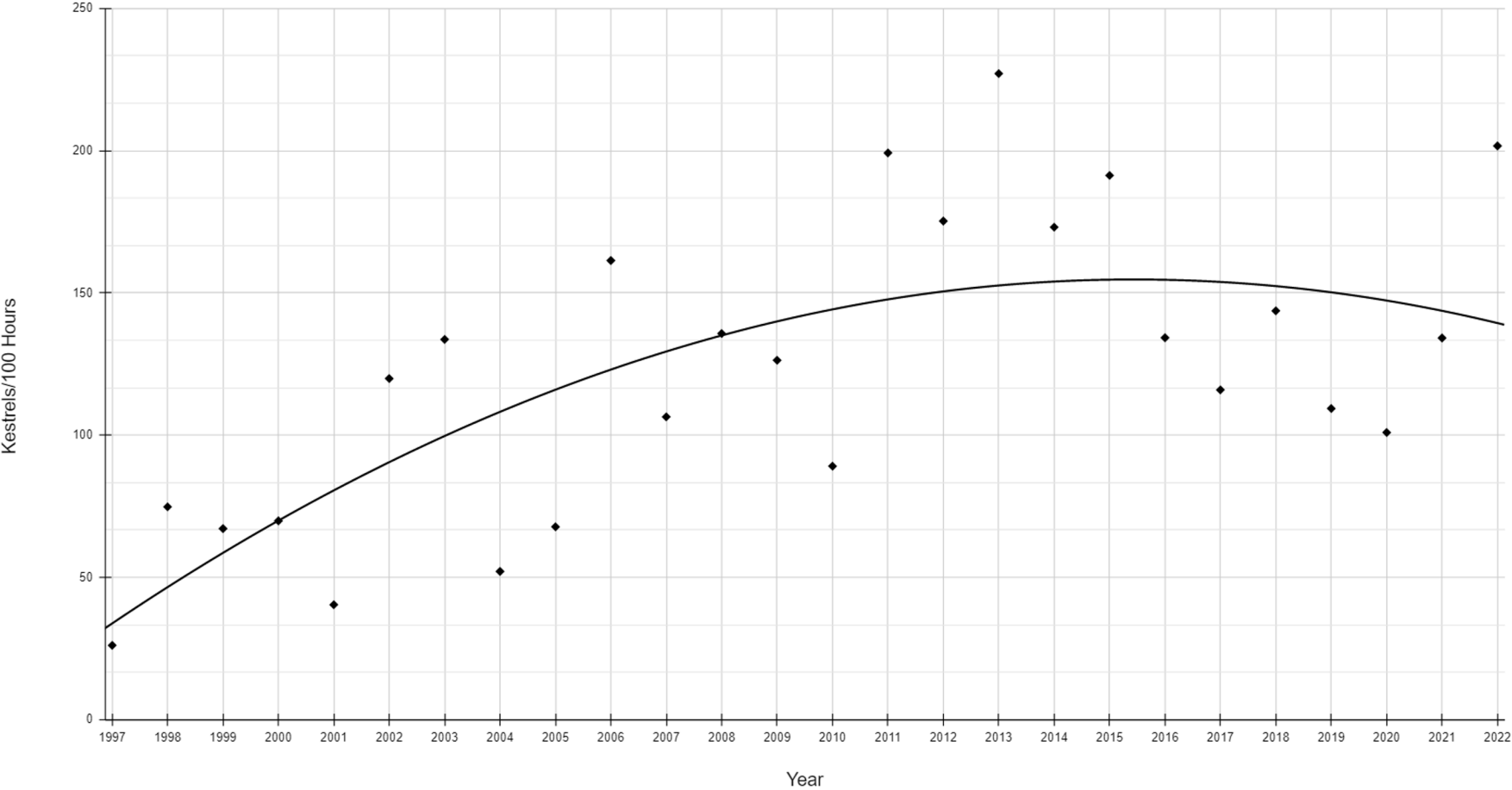
Grand Canyon, AZ



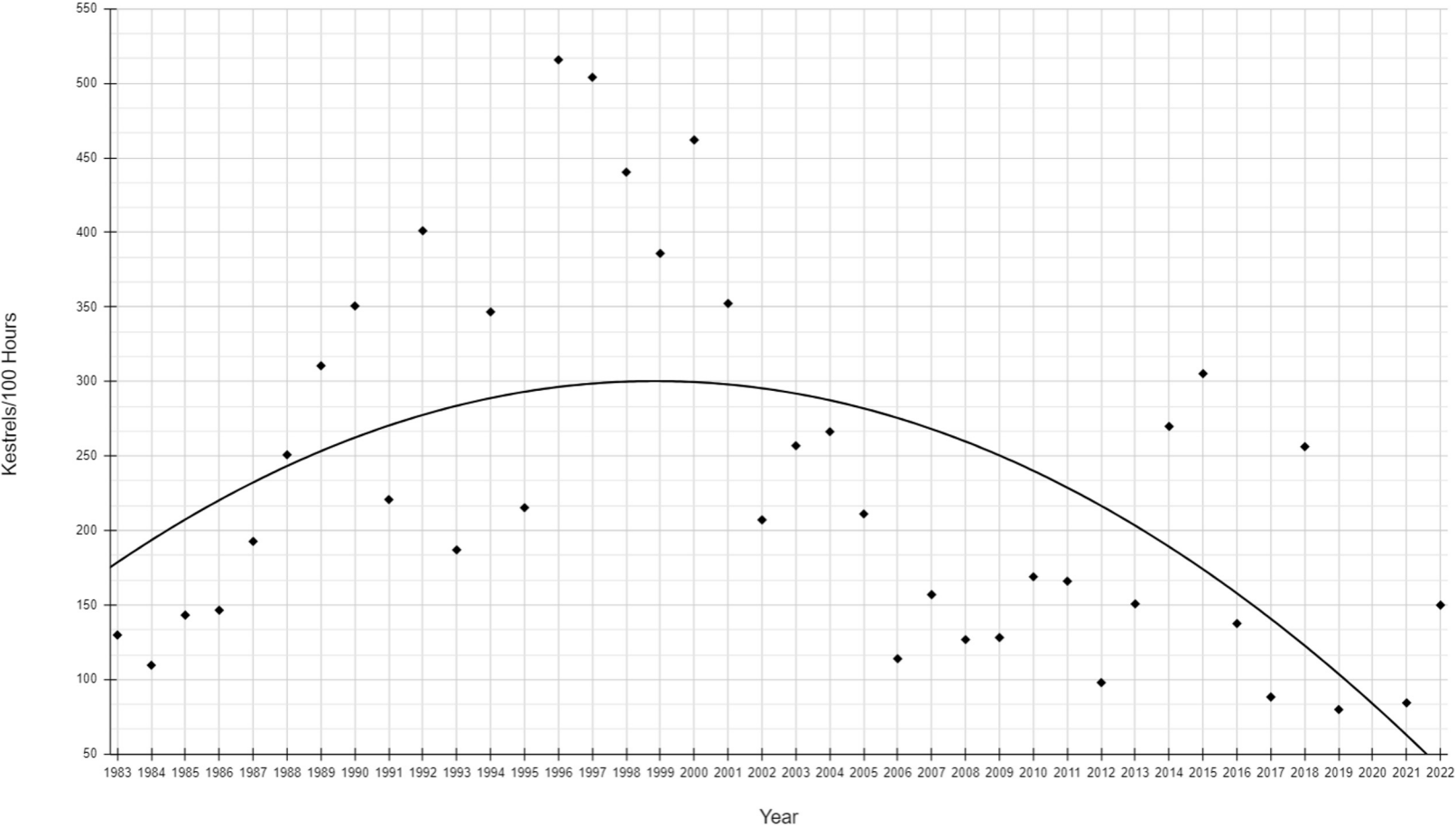
Manzano Mountains, NM



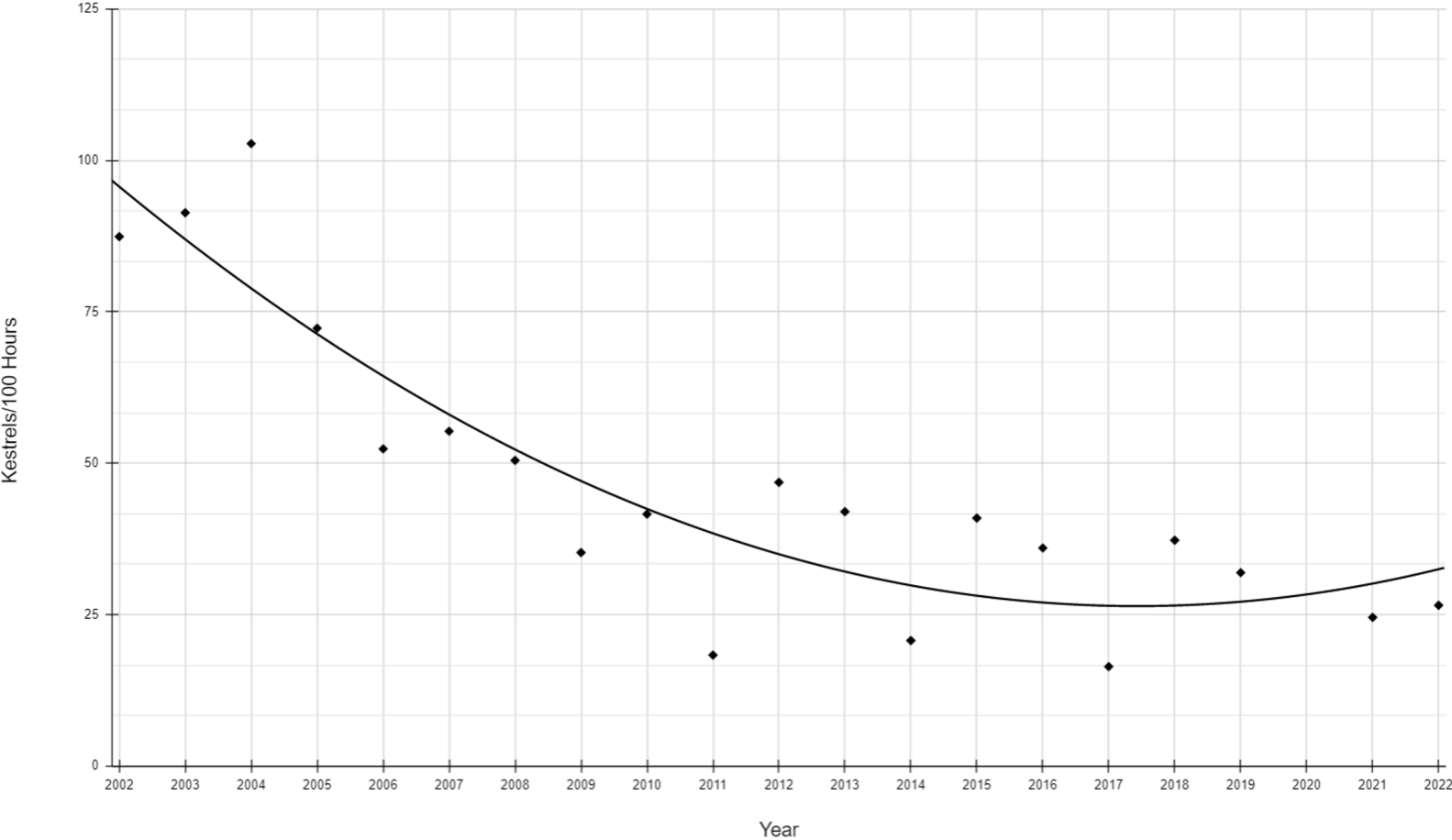
Corpus Christi, TX



Goshute Mountains, NV



Commissary Ridge, WY

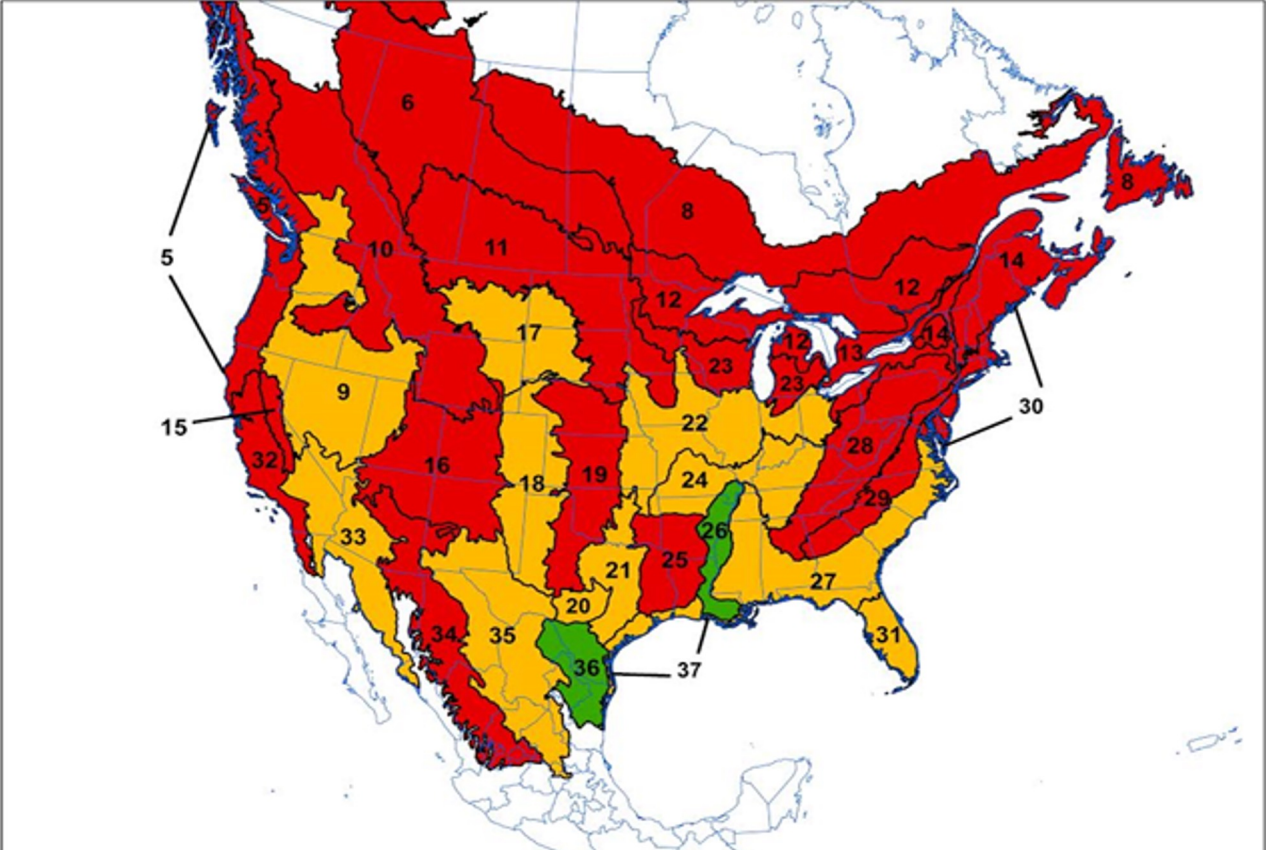


Phenomenon Identification

If Kestrel migration is lower at the majority of sites, what does that suggest about Kestrel populations over all?



Map of American Kestrel Population Declines by North American Bird Conservation Regions



Map Key

Red - Decline

Green - Growth

Orange - Trend Uncertain

Source: American Kestrel Partnership. <https://kestrel.peregrinefund.org/decline>

Phenomenon Identification

What could be a driver of the decline in American Kestrel populations? Come up with at least two ideas.



What are potential divers of American Kestrel decline?

Habitat Loss

Predation

Deforestation

Lack of Food

Urbanization

Natural Disasters

Climate Change

Forest Fires

Poaching

Drought

Poisons/Toxins

Competition





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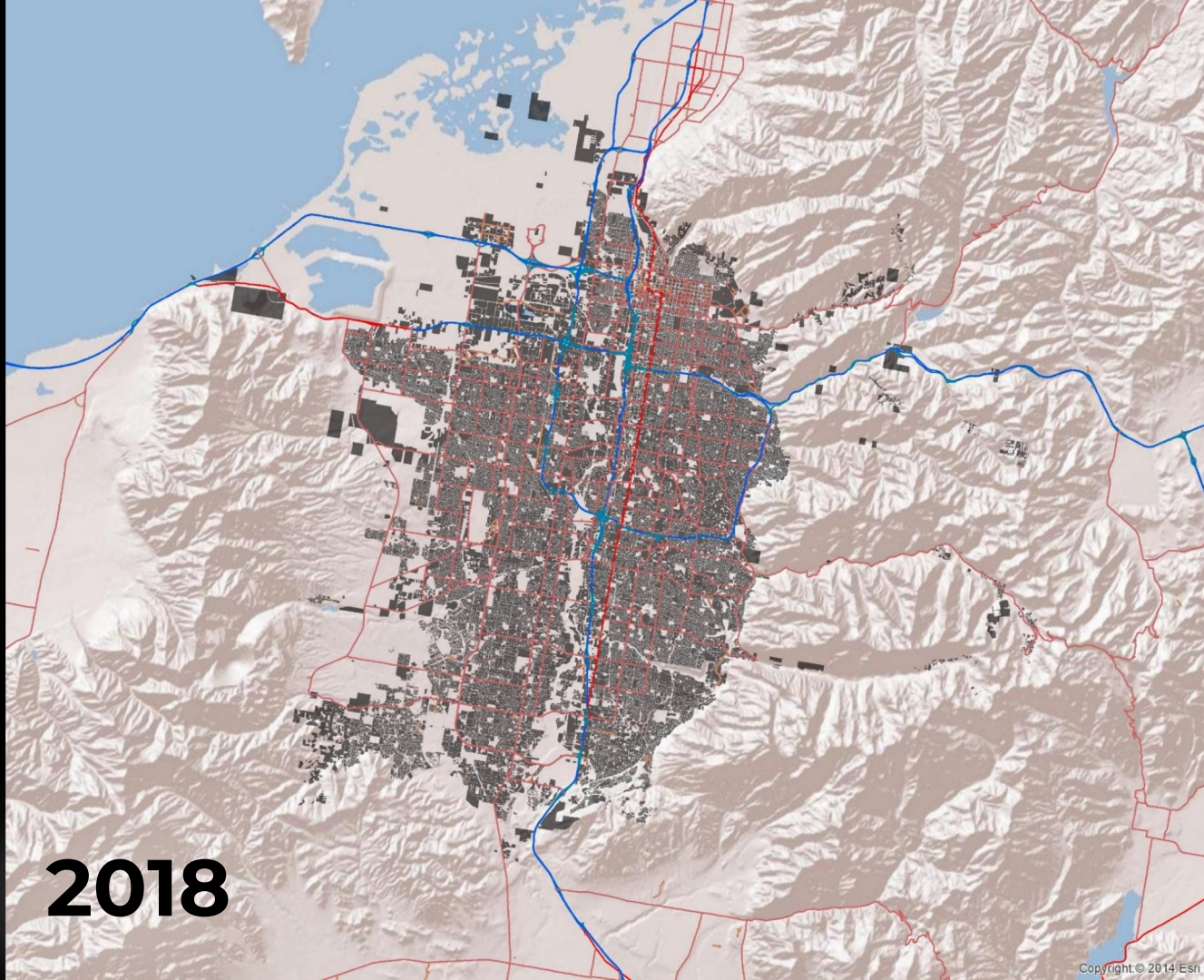
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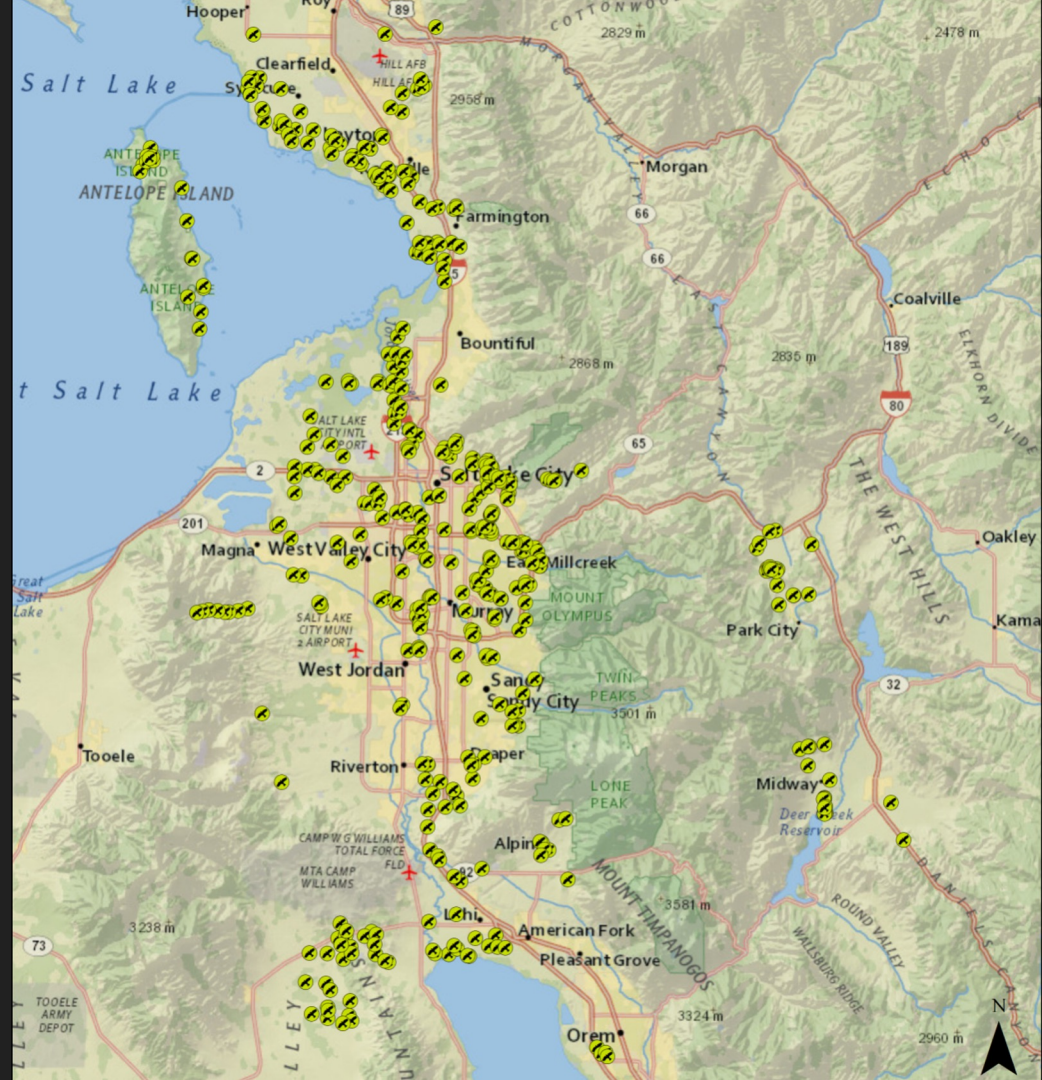
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2018



500+ Nest Boxes
3 Study Areas:
Salt Lake, Boise, and
Tucson







URBAN

1



AGRICULTURE

2



WILDLANDS

3

**Which habitat
type will have the
highest average
successful nests?**

Analyzing and Interpreting Data

- What is being measured?
- How is it being measured?
- Use math to figure out the missing numbers.
- What patterns or trends do you see?
- What could explain the patterns or trends?
- What questions do you have about the data?



Percent of American Kestrel Nests Fledging at ≥ 1 Young (number of nests)

Year	Wildland	Agriculture	Urban	Total
2014	77 (13)	62 (13)	89 (9)	74(35)
2015	72 (26)	95 (20)	74 (24)	79(70)
2016	70 (23)	75 (32)	74 (42)	74 (97)
2017	67 (15)	62 (37)	60 (45)	62 (97)
2018	71 (18)	77 (27)	77 (58)	76 (105)
2019	72 (36)	80 (15)	84 (50)	79 (101)
Average	71.5 (21)	75.2 (24)	76.3 (38)	74 (84)







Non-Kestrel Nest Box Occupancy**2018**

Species	Number of Boxes
European Starling	122
Northern Flicker	6
Western Screech Owl	4

2019

Species	Number of Boxes
Deer Mouse	1
Duck	3
European Starling	113
Northern Flicker	8
Pigeon	1

Non-Kestrel Nest Box Occupancy**2019 cont.**

Species	Number of Boxes
Squirrel	28
Tree Swallow	1
Western Screech Owl	11

2020

Species	Number of Boxes
European Starling	75
House Sparrow	1
Northern Flicker	2
Squirrel	20
Western Screech Owl	10

Starling Diet



Kestrel Diet



Starling Habitat
Kestrel Habitat





What's Next for the Kestrel Project?

- Blood sample analysis for toxins
- Nest box parasite sampling
- Territory mapping via transmitters
- Food delivery analysis
- Long-term survival rates of fledglings
- Expanding study areas



Engaging in an Argument from Evidence

Based on the data we have reviewed today, which factor do you think is likely a more significant driver of American Kestrel population decline: urbanization or competition for nest sites? Provide evidence for your claim.





Learn more at
HawkWatch.org

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INTERNATIONAL

Conserving Raptors and Our Shared Environment

Starling Diet



Starlings will eat nearly anything, but they focus on insects and other invertebrates when they're available. Common prey include grasshoppers, beetles, flies, caterpillars, snails, earthworms, millipedes, and spiders. They also eat fruits including wild and cultivated cherries, holly berries, hackberries, mulberries, tupelo, Virginia creeper, sumac, and blackberries; as well as grains, seeds, nectar, livestock feed, and garbage.

Source: All About Birds, Cornell University

Starling Habitat

Starlings typically live around people, using mowed lawns, city streets, and agricultural fields for feeding; and trees, buildings, and other structures for nesting. Their main requirements are open, grassy areas in which to forage, a water source, and trees or buildings that contain suitable cavities or niches for nesting. They avoid large, unbroken stretches of forest, chaparral, and desert.

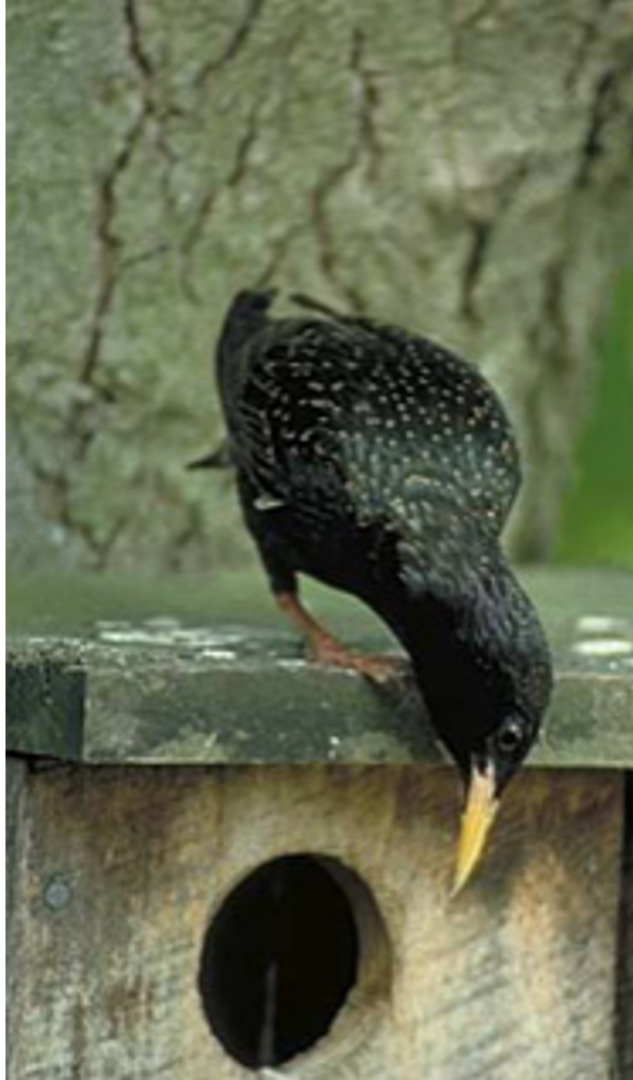
Source: All About Birds,
Cornell University



Starling Nesting

Males choose the nest site and use it to attract females. The nests are virtually always in a cavity, typically in a building or other structure (look for them in streetlights and traffic signal supports), an old woodpecker hole, or a nest box. Starlings also occasionally nest in burrows and cliffs. Nest holes are typically 10-25 feet off the ground but can be up to 60 feet high.

Source: All About Birds, Cornell University



Starling Conservation



Partners in Flight estimates a global breeding population to be 250 million and rates them 7 out of 20 on the Continental Concern Score. Starlings are a fairly recent and extremely successful arrival to North America and are fierce competitors for nest cavities. Starlings often take over the nests of native birds, expelling the occupants. With so many starlings around, there is concern about their effect on native bird populations.

Source: All About Birds, Cornell University

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