Metis NLP Project

Did the COVID-19 pandemic shift the public perception of bats?

INTRODUCTION

- Bats have been historically maligned (wrongly accused of being good for nothing blood-sucking, hair-grabbing, disease vectors)
- Bat Conservation International is dedicated to ending bat extinctions worldwide
- Interested in how COVID-19 pandemic affected public perception of bats
- Use findings to inform outreach and communication efforts and build support for bats and for their work

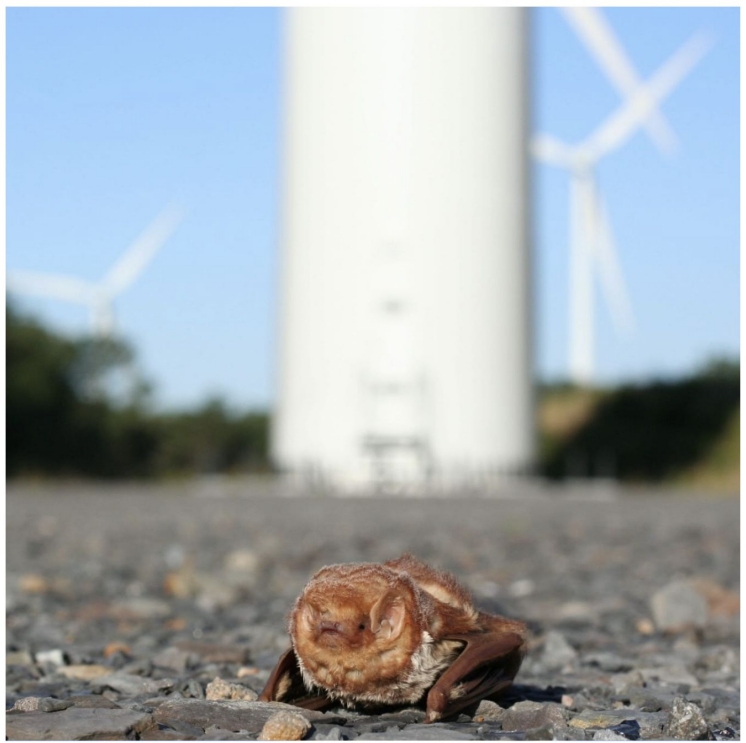
DATA & DESIGN

- Used Twint to scrape >19,000 tweets from 2019-2022 containing the terms “bat” and “wildlife”
- Document-term matrix created from cleaned and lemmatized terms using scikit-learn’s CountVectorizer
- Non-negative matrix factorization to determine topics
- Vader sentiment analysis

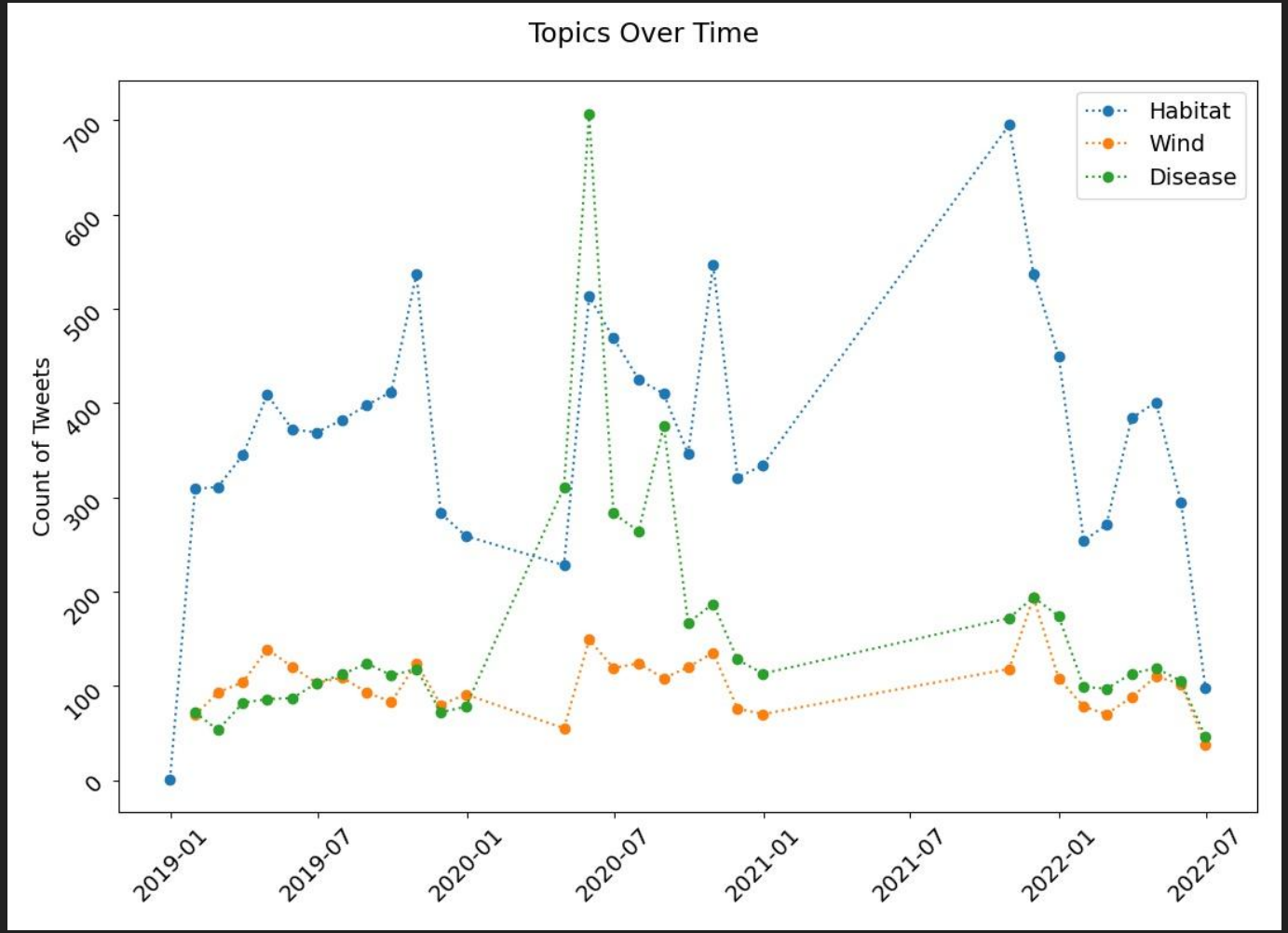
MICHAEL DURHAM / MINDEN PICTURES

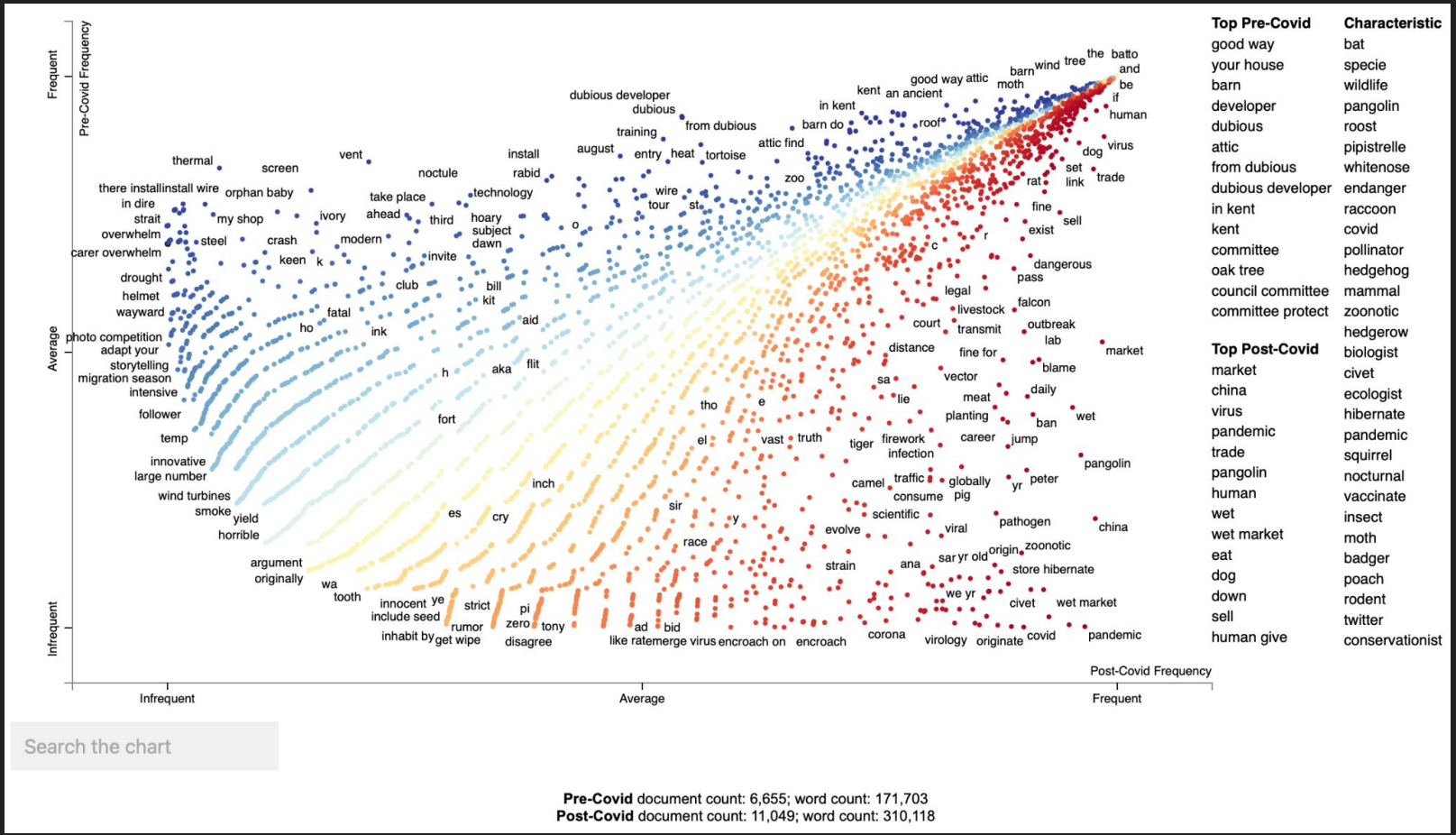
TOPICS

Wind	Disease	Habitat
include	wet	people
bee	eat	include
turbine	trade	woodland
insect	live	need
kill	china	home
garden	wild	habitat
habitat	market	protect
box	virus	tree
wind	human	help
bird	animal	specie



A DEAD EASTERN RED BAT FOUND AT A WIND TURBINE FACILITY IN PENNSYLVANIA
MICHAEL SCHIRMACHER


Topics Over Time
Habitat
Wind
Disease
Count of Tweets
0
100
200
300
400
500
600
700
2019-01
2019-07
2020-01
2020-07
2021-01
2021-07
2022-01
2022-07



Top Pre-Covid	Characteristic
good way	bat
your house	specie
barn	wildlife
developer	pangolin
dubious	roost
attic	pipistrelle
from dubious	whitenose
dubious developer	endanger
in kent	raccoon
kent	covid
committee	pollinator
oak tree	hedgehog
council committee	mammal
committee protect	zoonotic
	hedgerow
Top Post-Covid	biologist
market	civet
china	ecologist
virus	hibernate
pandemic	pandemic
trade	squirrel
pangolin	nocturnal
human	vaccinate
wet	insect
wet market	moth
eat	badger
dog	poach
down	rodent
sell	twitter
human give	conservationist

Search the chart

Pre-Covid document count: 6,655; word count: 171,703
Post-Covid document count: 11,049; word count: 310,118

SENTIMENT ANALYSIS

- Percentage of negative tweets about bats pre-Covid: **21.35%**
- Percentage of negative tweets about bats post-Covid: **26.05%**
- **4.7%** increase in percentage of negative tweets

J. SCOTT ALTENBACH

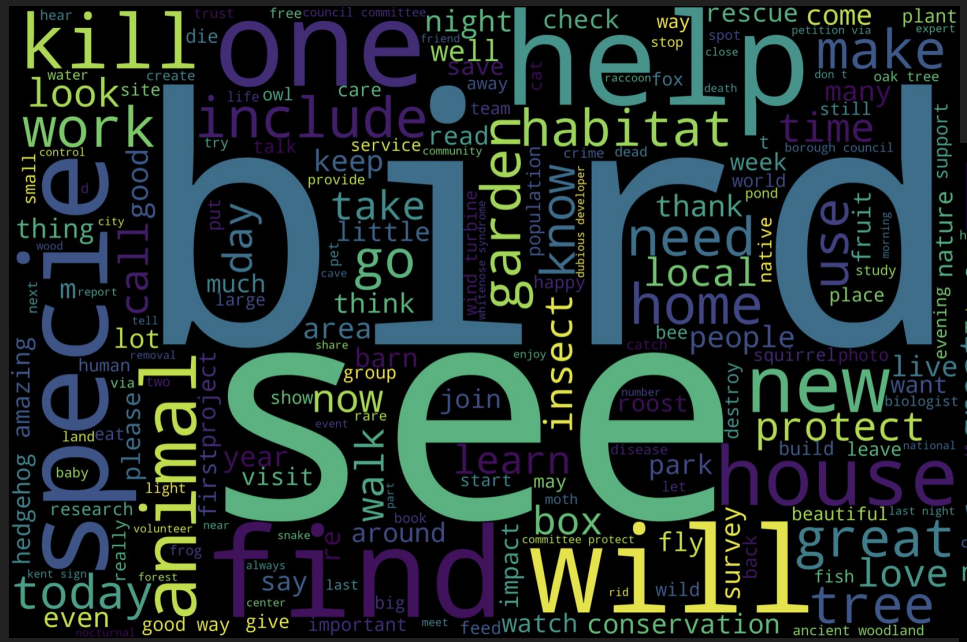
TAKEAWAYS & RECOMMENDATIONS

- Focus on disease tapered off after initial spike (communication campaigns were effective)
- Threat of wind energy to bats receives less attention than habitat and disease issues (opportunity to tell this story more)
- Posts about bats remain positive overall but were more negative post-Covid (continue to monitor this trend)
- Future opportunity to analyze a wider array of tweets

APPENDIX

https://github.com/ngoodby/nlp_project

Word Clouds of Pre and Post-Covid Terms


bird
see
one
help
kill
species
find
will
animal
today
tree
great
house
protect
new
habitat
garden
include
work
look
make
rescue
come
night
check
way
plant
well
save
take
little
go
need
local
home
people
use
fruit
know
insect
learn
park
box
around
love
watch
conservation
ancient woodland
beautiful
survey
fly
impact
visit
walk
barn
area
think
keep
thank
time
many
still
place
live
want
join
now
build leave
squirrel
photo
bee
nature support
evening
dubious developer
wind turbine
whitenose syndrome
oak tree
raccoon
fox
borough council
crime
dead
death
team
community
service
care
owl
life
site
water
create
trust
free
council committee
petition via
expert
spot
close
stop
hear
die
friend
don t
hedgehog
amazing
human
via
two
please
land
eat
baby
light
research
really
volunteer
near
frog
snake
kent sign
forest
always
good way
give
important
meet
feed
center
big
say
last
rid
wild
fish
committee protect
build
disease
national
roost
destroy
back
start
may
moth
book
part
rare
event
show
group
barn
enjoy
catch
share
bee
squirrel
photo
tell
removal
cave
pet
report
next
m
wood
small
control
city
thing
call
good
day
much
large
put
population
dead
crime
team
community
service
care
owl
life
site
water
create
trust
free
council committee
petition via
expert
spot
close
stop
way
night
check
rescue
come
plant
make
oak tree
raccoon
fox
many
still
time
habitat
garden
know
use
fruit
need
local
home
people
thank
world
week
pond
native
nature support
evening
dubious developer
wind turbine
whitenose syndrome
insect
live
want
join
now
build leave
squirrel
photo
bee
share
catch
enjoy
group
barn
area
think
keep
provide
take
little
go
thing
city
wood
small
control
pet
cave
report
next
m
tell
removal
human
via
two
please
land
eat
baby
light
research
volunteer
near
frog
snake
kent sign
forest
always
good way
give
important
meet
feed
center
big
say
last
rid
wild
fish
committee protect
build
disease
national
roost
destroy
back
start
may
moth
book
part
rare
event
show
hedgehog
amazing
firstproject
walk
year
visit
learn
park
box
around
love
watch
conservation
ancient woodland
beautiful
survey
fly
impact
tree
great
house
protect
new
habitat
garden
include
work
look
make
rescue
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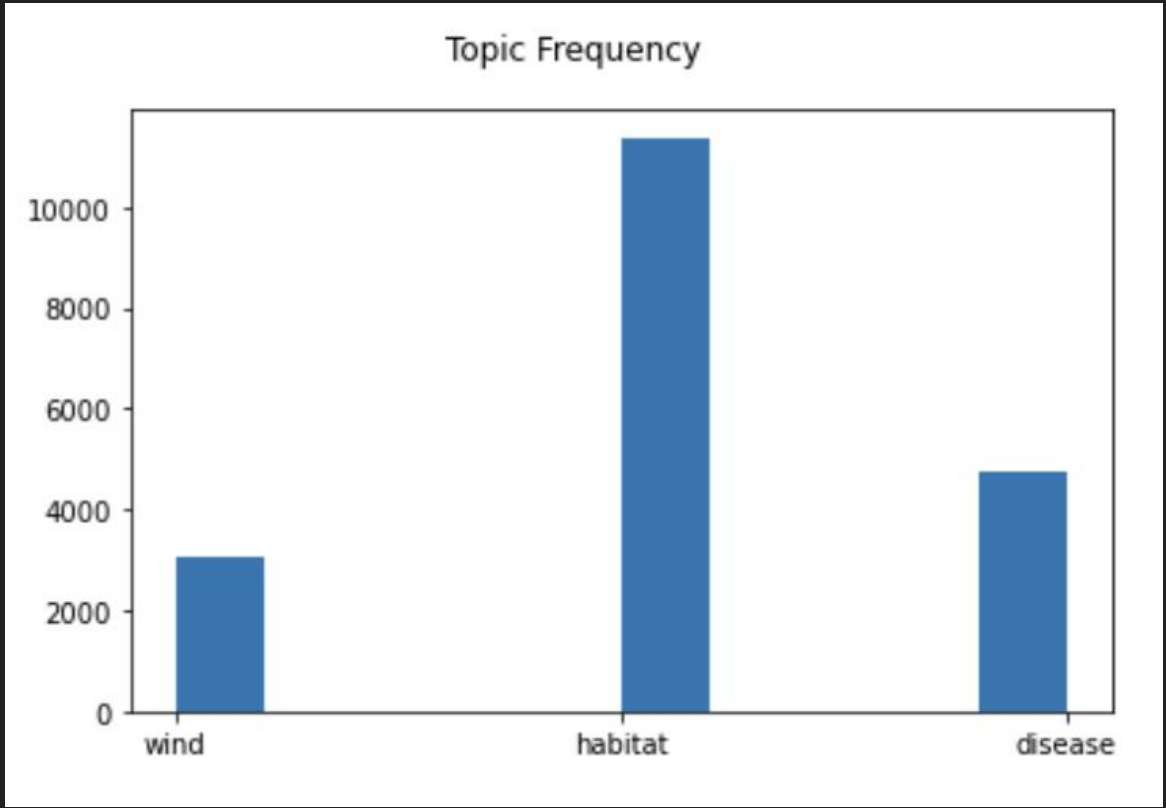
Overall topic frequency