

PROPOSAL 145

5 AAC 92.029. Permit for possessing live game.

5 AAC 92.230. Feeding of game.

5 AAC 92.990. Definitions.

Classify *F. catus* as deleterious exotic wildlife and prohibit their release into the wild, feeding, and maintaining unconfined populations as follows:

PROPOSAL: (Revision of former 'Proposal 63', submitted before Alaska Board of Game, November 2017, Anchorage, AK)--**ref.** 5 AAC 92.029--permit for possessing live game; 5 AAC 92.230--prohibition against releasing pets; 5 AAC 92.029 (b), (d), (h), 5 AAC 92.990 (21), Alaska Statute 16.05.940--restrictions for and definition of "game" and "deleterious exotic wildlife":

(1) Add language to 5 AAC 92.029 (b) which specifically prohibits release of domesticated cats (*Felis catus*) into wild, rural and urban environments for any reason in the state of Alaska.

(2) Add language to 5 AAC 92.029 which specifically and by name prohibits maintaining any unconfined population or individuals of *F. catus* under the aegis of "trap-neuter-release", "trap-neuter-vaccinate-release", "return-to-field" or other so-called "no-kill" practices predicated on trapping, providing veterinary treatment for and then releasing stray/feral cats outdoors anywhere in the State of Alaska.

(3) Add language to 5 AAC 92.230 which specifically prohibits feeding unconfined *F. catus* or aggregations of same anywhere in the State of Alaska.

(4) Add language to 5 AAC 92.230 which prohibits Alaskan animal control agencies from placing *F. catus* with members of any organization practicing "no-kill" management schemes, including those which maintain unconfined *F. catus* on their own properties and/or distribute "barn cats" or "working cats" to farms or businesses ostensibly for "rodent control".

(5) Specifically prohibit keeping or maintaining unconfined/unrestrained *F. catus*--regardless of 'owned' status or lack thereof--on either public or private property in wild, rural or urban environments for any reason in the State of Alaska per 5 AAC 92.029 (b) and 5 AAC 92.230; add language specifically requiring all specimens of *F. catus* only be allowed outdoors under direct owner control, e.g. in escape-proof enclosures or restrained on leashes per 5 AAC 92.029 (d) (1).

(6) To classify all specimens of *F. catus* as deleterious exotic wildlife per definitions and relevant restrictions outlined in 5 AAC 92.990 (21), 5 AAC 92.029 (b), (d), (h) and AS 16.05.940.

What is the issue you would like the board to address and why? On March 15th, 2018 the Western Governors Association, which represents 22 US states and--at the time--included former Alaska Governor Bill Walker, ranked feral cats (*Felis catus*) among the five most deleterious invasive species established in our western states. Authors of the above proposal herein respectfully submit this determination constitutes a long-overdue precedent for providing an effective remedy--indeed the *only* effective remedy--to the stray/feral cat overpopulation scourge, which presents a dire threat to both public health and biodiversity.

We note the Board of Game has previously classified the following domesticated, semi-domesticated and/or wild species as deleterious exotic wildlife: domestic dogs (*Canis familiaris*), European rabbits (*Oryctolagus cuniculus*), ferrets (*Mustela putorius*), raccoons (*Procyon lotor*), turkeys (*Meleagris gallopavo*), African hedgehogs (*Antelerix* spp.), Norwegian rats (*Rattus norvegicus*) and house mice (*Mus musculus*). Its status as a "pet" notwithstanding, *F. catus* is far more destructive to naturally-occurring fauna than other terrestrial species currently included on the deleterious exotic wildlife list, many of which are likewise regarded and kept as 'pets'.

Such animals are termed "game" per 5 AAC 92.029 (d) and AS 16.05.940. This term includes feral domesticated animals. A game animal defined as deleterious exotic wildlife is *feral* if the animal is not under direct control of the owner, not confined in a cage or other physical structure, or not restrained on a leash; per 5 AAC 92.029 (i) such an animal may NOT be released--even temporarily--anywhere in the State of Alaska if there is a preponderance of evidence indicating the species:

- (1) is capable of surviving in the wild in Alaska;**
- (2) is capable of causing a genetic alteration of a species that is indigenous to Alaska;
- (3) is capable of causing a significant reduction in the population of a species that is indigenous to Alaska;**
- (4) is capable of transmitting a disease to a species that is indigenous to Alaska;**
- (5) otherwise presents a threat to the health or population of a species that is indigenous to Alaska;**
- (6) is captured from the wild for use as a pet;
- (7) presents a conservation concern to the species' native habitat outside of this state;
- (8) cannot reasonably be maintained in good health in private ownership; and
- (9) presents a likelihood that concerns about, or threats to human health and safety will lead to adverse consequences for captive animals.

Items (1) and (3)-(5) from the above list clearly disqualify *F. catus* from being considered a species suitable for even temporary release into the wild, and just as clearly qualify them for designation as "deleterious exotic wildlife". Authors emphasize this qualification and proposed designation apply to the species *F. catus*--'owned' or 'un-owned'. We predicate this argument on:

(1) *F. catus* is capable of surviving in the wild in Alaska. In 2016 the Mat Su Borough animal shelter euthanized 364 feral cats--on average one a day. Shelter staff warned the numbers were increasing. The Borough has by law prohibited outdoor cats unless they're restrained on leashes or held in enclosures.

Feral cat populations have existed for many years in Anchorage, Wasilla, Soldatna, Kenai, Homer, Houston, Bethel, North Pole, Unalaska, Wrangell and Ketchikan, to name but a few locations.

Private 'cat-rescue' organizations such as 'Loving Companions Animal Rescue' (North Pole) and 'St. Francis Animal Rescue' (Wrangell) feed and maintain unconfined feral cat 'colonies' on their properties, which is unlawful per 5 AAC 92.230, per which maintaining and feeding unconfined 'pet' species, *even on one's own property* is prohibited (authors' *emphasis*). The former group has

been doing so for 15 years, and the latter claims to have 'rescued' 467 abandoned and/or feral cats in the last four years. Disposition was either 'adoption' or release onto their properties. One of the authors (FHM) verified the above from the organizations' websites and with organization spokespersons in February 2019. <https://www.adfg.alaska.gov/index.cfm?adfg=pets.releasing>

Since at least 2013 Wasilla-based 'Clear Creek Cat Rescue' has argued that "*...cats need and have a right to the outside as much as humans or dogs...and to enjoy the wonders of the natural world.*" <https://clearcreekcatrescue.org/about/>

Prior to 2017 this group openly declared on their website they fed and kept unconfined feeding aggregations of cats (so-called 'colonies') in the Mat-Su Valley. Since the Alaska Board of Game ruling against legalizing such colonies in 2017, the group no longer publicly admits this. However, they still admit to placing so-called 'barn cats' in southcentral Alaska and the Kenai Peninsula. On their website they describe this process as follows:

"An adopter of barn cats will need to provide...food and water...each day, as well as shelter...They will also need to be provided with health care... In exchange for these essentials, the cats will help control the rodent population in the adopter's barns, outbuildings, gardens and around homes.

In most cases we offer barn cats in pairs or multiples where they have a support system...With a friendly group or companion, the cats are more likely to remain at their new home...we bring them to your home and get them set up for a 'settling in' period that will last 2 or 3 weeks. During this time they are kept in an enclosed area--tack room, garage, shed or a cage if...warm enough. They must be provided food, water and litter...until they are adjusted to the new place...after that time the door of the enclosure is opened and they are allowed to roam in and out until...settled" (authors' emphasis).

It's mentioned in passing that *F. catus* are non-hierarchical and do not form 'colonies'. What groups such as Clear Creek Cat Rescue inflict on our environment and communities are human-subsidized feeding aggregations--without feeding cats will disperse into the environment.

Obviously Clear Creek Cat Rescue distributes feral cats with the intention of their being fed and maintained *unconfined* in our rural communities, and has been doing so for years. This is just as obviously in violation of 5 AAC.92.029 and 5 AAC 92.230. <https://clearcreekcatrescue.org/barn-cat-project/>.

The group describes itself as 'non-shelter', but claims to 'rescue and rehome' 500 stray, feral and 'lost' cats *annually*. In March 2019 Clear Creek Cat Rescue's founder verbally admitted to one of the authors (FHM) via telephone her group still released 'barn cats' in rural south-central Alaska and the Kenai Peninsula. When advised this was illegal she hung up.

Anchorage-based rescue group 'Mojo's Hope'/'KAAATS' have likewise admitted online to feeding and harboring illegal cat 'colonies', and declared their intention to *continue* doing so. The group's president most recently stated this online on 11/17/17, the same day the Alaska Board of Game unanimously rejected her group's proposal to allow exemptions to 5 AAC 92.029 to accommodate trap-neuter-release (TNR). She posted that the group had removed their illegal 'colonies' to undisclosed locations. Since then the group has apparently deleted all mention of this from their website.

Conclusion: invasive felines have persisted unconfined in Alaska since at least the 19th century, and probably arrived much earlier with Russian settlers. Local 'animal rescue' groups currently enable and perpetuate this in defiance of Alaska Administrative Code and state law. They essentially function as permit-less 'cat ranchers' on both public and private land in Alaska.

(3) *F. catus* is capable of causing significant population reductions of native species. Scott R. Loss and Peter P. Marra, both of the Smithsonian Institute's Migratory Bird Conservation Center and National Zoological Garden, and Tom Will of the US Fish & Wildlife Service's Division of Migratory Birds released in 2013 a systematic review of 84 cat predation rate studies from the lower 48 US states and found that cat predation may constitute the single greatest cause of anthropogenic bird and small mammal mortality in the US. Their results indicated that unconfined cats--both "owned" and "unowned"--slaughter on average 2.7 billion (range 1.3-4.0 billion) wild birds and 14.3 billion (range 6.3 to 22.3 billion) mammals in the US each and every year.

This and subsequent studies by these and other researchers have found that invasive feline predation is a greater cause of bird mortality than wind-turbine, power line, building, window and auto collisions, open oil container/oil-spill entrapment, agricultural toxins and hunting--*combined*. USFWS estimates current wild bird populations at ~10 billion. This estimate more-or-less doubles during peak migration season (which is for most species also peak breeding season). Cats take from 15% to 33% of the US wild bird population annually. This is tantamount to each cohort (or 'year-class') of fledglings launching themselves from their nests directly into cat gullets.

<https://www.nature.com/articles/ncomms2380>

Authors noted during the November 2017 Board of Game meeting some board members' comments that scientific data presented by opponents and proponents of TNR offered "conflicting scientific reports" in support of their respective arguments. Respectfully, this was not the case--the only *scientific* data was presented by opponents of (pro-TNR) Proposition 62.

Proposition 62 authors offered--at best--misrepresentation of three peer-reviewed studies which did not in fact support their position, and at worst outright propaganda from well-funded "nonprofit" feral cat-advocate groups which demonstrated no regard for accuracy and was predicated on no viable data. Two groups in particular--"Animal Best Friends Society" and "Alley Cat Allies"--had previously initiated science-denial campaigns attacking Loss, Will and Marra's findings, mostly via social media. The primary writers of these were P. J. Wolf and G. J. Matthews.

In June of 2018 Loss, Will, Marra and Longcore published point-by-point refutations of these groups' criticisms. To date neither Wolf, Matthews nor their respective sponsors have publicly responded to the authors' defense of their work, but have simply continued to repeat the same misinformation they've promulgated since release of the original study.

https://www.researchgate.net/publication/326379872_Responding_to_misinformation_and_criticism_regarding_United_States_cat_predation_estimates

Nor is theirs the only such study demonstrating the ecological devastation caused by domestic cat predation. Similar findings have been outlined in studies published in the US, Canada, Mexico, UK, Australia, New Zealand, Israel, South Africa, Oceania, the Caribbean and elsewhere. Feral cat proliferation has become a dire threat to Australia's unique and irreplaceable wild fauna. John C. Z. Woinarski, B. P. Murphy et al released in June of 2018 a meta-analysis of 80 separate studies involving data garnered from stomach content analyses of ten thousand feral cats. From this data

he found that feral cats slaughter 1.8 million native Australian reptiles each and every *day*. This carnage cuts a swath across 25% of Australia's more than 1,000 described reptile species. Note that this toll is only attributable to *feral* cats--it doesn't count predation by the ~ 4 million unconfined 'pet' cats in Australia, which were estimated to take an additional 53 million reptiles annually. Such needless destruction of wildlife is inexcusable, unnecessary and above all unsustainable. <https://thylation.com/wp-content/uploads/2018/12/WR17160-Cats-eat-reptiles.pdf>

Authors are unaware of any specific studies of cat predation of wild species in Alaska. Yet we see no reason to expect, given the preponderance of data demonstrating invasive cats' global impacts on naturally-occurring wildlife assemblages, that the growing presence of this invasive species in Alaska will prove any less deleterious to our state's native wildlife.

Firstly, many of the migratory avian species which spend much of their yearly life cycles in Alaska have been shown to undergo significant cat-engendered population declines elsewhere in North America. Indeed, current estimates for all native North American bird species together are *one-third* what they were three decades ago.

Hence invasive cats deplete Alaskan bird populations even if much of the actual killing occurs in the lower 48 states (or beyond). Secondly, the board has in the past demonstrated due diligence by placing other species on the deleterious exotic wildlife list because of their known destructive impacts elsewhere--and rightly so.

An example is the Eurasian ferret, or polecat (*M. putorius*). Ferrets are popular pets in many regions, and were in fact domesticated in the Old World for rodent control long before cats were; nonetheless they, along with *F. catus*, are primarily responsible for the extinction of half of New Zealand's endemic bird species, and remain an egregious threat not only to that country's surviving birds, but to nearly all of its more than 60 indigenous reptile and amphibian species, status of most of which ranges from 'threatened' to 'critically endangered'. In light of such destructive history, it hardly seems necessary to require a local study to justify placing ferrets--and even more so *cats*--on the Deleterious Exotic Wildlife List.

(4) *F. catus* is capable of transmitting a disease to a species that is indigenous to Alaska

F. catus transmits the following zoonotic diseases to other species, including taxa which naturally occur in Alaska.

Rabies: All mammals are susceptible to the rabies virus, although some taxa such as rodents only rarely become infected and almost never transmit it. Rabid caribou, little brown and Keen's myotis bats, Arctic and red foxes, wolves, domestic dogs and polar bears have been documented in the State of Alaska. Rabid black bears (*Ursus americanus*) have been recorded in Canada, and coyotes (*Canis latrans*)--the range of which has expanded into Alaska--have been documented rabid in Canada and the lower 48 states.

The primary wild rabies vectors in Alaska appear to be Arctic and red foxes. Endemic or "native" strains of the virus--including a self-maintaining strain in Arctic foxes (*Alopex lagopus*) which apparently doesn't kill its hosts--occurs in Alaska's north and west coastal regions, including the Aleutian Chain. Non-native strain(s) dominate in the Alaskan interior, including the Fairbanks area, where the primary vectors are invasive red foxes (*Vulpes vulpes*). Further, studies have

postulated climate change may affect rabies' ecological niche in Alaska--a Scandinavian study found positive correlation between rabies incidence and increasing temperatures, and generated a model that predicted reduction of endemic Arctic strains and increase of non-endemic strains.

<https://tandfonline.com/doi/pdf/10.1080/22423982.2018.1475185>

Enter feral cats. Outside Alaska red foxes and other wild vectors, including raccoons and skunks, have been shown to readily transmit rabies to feral cats, and vice-versa. Today cats are the leading domesticated vectors of the rabies virus in the US. They have been the source of one-third of annual human rabies exposures--that's ~13,000 human exposures each and every year--for the last three decades. Without treatment, rabies is almost invariably fatal:

<https://www.documentcloud.org/documents/681002-zoonotic-diseases-associated-with-free-roaming.html>

Toxoplasmosis

Cats are the definitive host of a highly dangerous pathogenic protozoan—*Toxoplasma gondii*—which sexually reproduces exclusively in feline digestive tracts. In the US between 40% and 70% of free-roaming cats are infected with it and can be reinfected throughout their lives, usually by consuming infected rodents (secondary hosts).

From 15% to 20% of the US human population is also infected, and ~750 fatalities from this pathogen occur each year. Toxoplasmosis is per the CDC also the leading cause of pathogenic blindness. It is particularly dangerous to pregnant women and unborn fetuses, causing ~190,000 stillbirths, blind-births and other serious birth defects in the US annually.

https://www.academia.edu/24189429/Toxoplasma_gondii_in_Circumpolar_People_and_Wildlife
<https://www.sciencemag.org/news/2019/04/scientists-decry-usdas-decision-end-cat-parasite-research>

The pathogen's oocysts are its infectious agents, and infected cats shed hundreds of millions of them with their feces. *Only* cats shed the oocysts; the single exception is dogs which ingest feces from *T. gondii*-infected cats.

The oocysts persist and remain infectious for up to 1.5 years on land, and 4.5 years in water (including seawater). With an average feral cat population growth rate of ~38 million annually in North America, *T. gondii* oocysts now occur in our environment at densities of from three to 434 per square foot. They are capable of infecting and utilizing any warm-blooded animal, including humans, as secondary hosts. Infection is permanent, even if symptoms don't immediately manifest. Toxoplasmosis is killing thousands of marine mammals from Arctic Canada to New Zealand and from the California coast to the North Sea.

https://www.researchgate.net/publication/236608342_Detection_of_Toxoplasma_gondii_in_environmental_matrices_water_soil_fruits_and_vegetables

Both Atlantic and Pacific beluga (*Delphinapterus leucas*) populations are succumbing to the pathogen--a 2014 outbreak of congenital toxoplasmosis-induced stillbirths, birth defects and chronic miscarriages among Inuit women in western British Columbia was caused by consumption of infected beluga. Between 2009-2012, toxoplasmosis killed more than ten beluga a year off Quebec:<https://news.ubc.ca/2014/02/13/bigthaw/>

Canadian researchers found that sea-ice retreat due to climate change has apparently enabled *T. gondii* oocysts to spread into waters from which they were formerly absent, and advocate ongoing toxoplasmosis screening of beluga and seal meat prior to consumption. Their studies also cited the human-assisted proliferation of domestic cats, with resulting feces-contaminated runoff from unprecedented numbers of cats causing toxoplasmosis-induced marine mammal deaths--either directly or from strandings.

<https://pressfrom.info/ca/news/canada/-98482-belugas-infected-with-cat-parasite-study.html>
https://www.academia.edu/24189429/Toxoplasma_gondii_in_Circumpolar_People_and_Wildlife?email_work_card=view-paper

Further studies indicated *T. gondii* oocysts from feces-contaminated runoff accumulate in sessile filter-feeding organisms such as geoduck clams, mussels and oysters, as well as in those which feed in the water column like herring, anchovies and sardines. They postulated this was the route whereby toxoplasmosis is causing marine mammal die-offs. However, more recent studies suggest aquatic organisms ingest oocysts directly from water, macro-algae and substrates in their contaminated habitat, and that this may be the primary means of marine mammal infection. In any event the proliferation of *T. gondii* oocysts in Alaska's inshore marine environment poses a threat not only to our State's marine mammals, but to Alaskans who harvest them for subsistence.

https://cfpub.epa.gov/si/si_public_record_report.cfm?Lab=NERL&dirEntryId=213670

Nor is it necessary to consume seal or whale, or even raw shellfish, to contract toxoplasmosis. Sheep, both wild and domesticated, are particularly susceptible to toxoplasmosis--this frequently manifests as chronic miscarriage/abortion in ewes, usually followed by barrenness. Toxoplasmosis is so prevalent among domesticated sheep, women are cautioned to avoid contact with them if pregnant. The risk to human females is likewise chronic miscarriage/abortion, barrenness, stillbirths and serious birth defects in fetuses carried full-term.

Recent studies found as much as 66% of Ohio's white-tailed deer population is infected with toxoplasmosis. This is almost *entirely* from unconfined *F. catus* feces-contaminated browsing areas. Except for the bobcat (*Lynx rufus*) Ohio's native cats are extinct. Bobcat numbers there are minuscule compared to those of domestic cats, thus representing negligible contribution to this disease's prevalence among white-tailed deer. An equally alarming situation exists in Illinois, where ten Canadian hunters contracted toxoplasmosis from consuming deer they shot on a hunting trip there last December. Canadian authorities now warn against consuming deer harvested in Illinois. Toxoplasmosis is also sexually transmissible from infected males to their partners.

https://montrealgazette.com/news/local-news/quebec-outbreak-of-toxoplasmosis-linked-to-undercooked-venison?fbclid=IwAR3mh6xoA72ZFk8O_AoVVY-IQmx14dd792BJyCB0dKQu_KtAZv9DtaffRg0

Although *T. gondii* oocyst density in Alaska is probably less than in the lower '48—if for no other reasons than our colder climate and relatively lower human--and therefore cat--populations, toxoplasmosis has persisted and appears to be gaining ground in the north and is infecting a variety of mammalian and avian species.

Toxoplasmosis represents a significant food safety hazard for Alaskans, among whom subsistence hunting is greater per capita than further south. A pregnant woman in Anchorage consumed toxoplasmosis-infected flesh from a moose her husband shot in October 2013, and passed *T.*

gondii oocysts to her unborn child, who nearly died. At birth the infant presented with a 200 bpm heart rate and organ cavities filled with lymphocyte fluids. Thanks to heroic measures the child was stabilized, but he remains at risk of partial or complete blindness as well as hearing loss, cardiac, respiratory and seizure disorders. He will in any event be infected for life. 80% of newborns who congenitally contract toxoplasmosis will manifest usually severe symptoms within months, or years, of birth.

<https://www.adn.com/alaska-news/article/link-found-between-moose-meat-and-unborn-babys-infection/2013/10/11/>

The following is a partial list of nearctic species in which toxoplasmosis has been documented--those marked with an asterisk (*) have been recorded in Alaska. Others were from extralimital populations of species which also occur in Alaska, most documented in Arctic Canada: moose (*Alces alces*)*, caribou (*Rangifer tarandus*), musk ox (*Ovibos moschatus*), humpback whale (*Megaptera novaeangliae*), Risso's dolphin (*Grampus griseus*), beluga (*D. leucas*), killer whales (*Orcinus orca*), narwhal (*Monodon monoceros*), fin whale (*Balaenoptera physalus*), Minke whale (*B. acutorostrata*), Arctic foxes (*A. lagopus*)*, red foxes (*V. vulpes*), gray wolves (*Canis lupus*), black bears (*U. americanus*)*, brown bears (*U. arctos*)*, polar bears (*U. maritimus*), bearded seals (*Erignathus barbatus*)*, spotted seals (*Phoca largha*)*, ringed seals (*P. hispida*)*, harbor seals (*P. vitulina*), northern fur seals (*Callorhinus ursinus*), elephant seals (*Mirounga augustirostris*), Stellar's sealions (*Umetopias jumatus*)*, walrus (*Odobenus rosmarus*)*, wolverines (*Gulo gulo*), mink (*Neovison vison*), river otters (*Lutra canadensis*) and sea otters (*Enhydra lutris*)*.

We again emphasize this is a *partial* list of Alaskan mammals in which toxoplasmosis has been found--nearly all warm-blooded vertebrates are susceptible to toxoplasmosis, with carnivores being particularly vulnerable. However, as previously shown herbivores also become infected by browsing *T. gondii* oocyst-contaminated areas and/or drinking contaminated water. Wild mink have ingested the oocysts directly from water in their habitat and become infected, and farmed mink from contaminated meat/offal used as feed.

The pathogen is increasingly prevalent in Nearctic wildlife--in Saskatchewan, 60% of Arctic foxes are seropositive. Infection among Canadian polar bears has doubled in the last decade to where 46% are now seropositive. In Minnesota 52% of wolves (reestablished from Alaskan stock) and 45% of river otters are infected, as are 52% of California's southern sea otter population. The latter have incurred mass die-offs from toxoplasmosis.

By no means have all Alaska's native species been tested for toxoplasmosis--the CDC refers to toxoplasmosis as a 'neglected' parasitic infection even with respect to humans. Example, authors could find no research mentioning toxoplasmosis in martens (*Martes americana*). Yet martens are commercially trapped in Alaska more than any other furbearer, and their diet is almost exclusively rodents. This strongly suggests martens may serve as secondary *T. gondii* hosts. It is an obvious--and *serious*--potential health concern for fur trappers.

All studies reviewed in preparation for this proposal documented *acute* cases of toxoplasmosis--most were fatal to the animals sampled. Said studies also included observations concerning the public health significance of toxoplasmosis in northern regions--one 1974 study found 28% of n = 1,572 Native Alaskans tested positive for toxoplasmosis antibodies. This was thought to reflect the high percentage of families with cats in the sampled villages; incidence of infection in targeted

subsistence species was not measured in that study (see second link below). A more recent (2009) study in Nunavut, Canada found 60% of the Inuit population was seropositive for toxoplasmosis. This was attributed to harvesting/ingesting toxoplasmosis-infected terrestrial and marine mammals and waterfowl for food.

https://www.researchgate.net/publication/14608928_Serologic_survey_of_Toxoplasma_gondii_in_grizzly_bears_Ursus_arctos_and_black_bears_Ursus_americanus_from_Alaska_1988_to_1991

https://www.researchgate.net/publication/12362457_Prevalence_of_Toxoplasma_gondii_Antibodies_in_Muskox_Ovibos_moschatus_Sera_from_Northern_Canada

http://www.epi.alaska.gov/bulletins/docs/b2005_07.pdf

The worst recorded toxoplasmosis outbreak in North American history occurred in 1995. The source was Humpback Reservoir, which serves as the Victoria, BC municipal water supply. Intake filter mesh did not exclude *T. gondii* oocysts, and chlorination at levels used in drinking water do not kill them. The result was 110 acute cases in the first nine months of 1995, including 42 pregnant women, 11 newborns and at least seven cases of toxoplasmosis-induced ocular lesions. Ultimately as many as 7,000 Canadians suffered (mostly) acute infections. The life history of the pathogen with respect to its asexual reproduction in secondary hosts suggest ultimately all, or nearly all, will manifest acute infections/disease.

Victoria has what the BC SPCA admits is an "enormous" stray/feral cat population. There are numerous feral cat 'colonies'--by definition this means someone is *feeding* them--with some colonies having up to 200 cats. In adjacent Surrey, cat advocates estimate there are 20,000 unconfined cats.

<https://www.cdc.gov/mmwr/PDF/International/e-2118.pdf>

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC106314/>

Of particular concern in light of the above is the threat *T. gondii* poses to drinking water supplies in rural Alaska--chlorination of these water sources is frequently as low as 0.02 ppm--insufficient to kill oocysts--and overall state of rural water treatment facilities maintenance is, if anything, worse than that of Victoria, BC a quarter-century ago.

Authors have so far mentioned only two of at least 70 cat-vectoring zoonotic diseases. "Zoonotic" is defined herein as diseases transmissible between different animal species, including humans:

Flea-borne typhus (*Rickettsia typhi*)--in May 2018 a case of cat-vectoring *R. typhi* was reported in San Diego Co., CA. It has since become an outbreak, spreading to and through Riverside and Los Angeles counties. Hundreds of cases have been reported. In Los Angeles typhus-carrying fleas have infected Los Angeles City Hall personnel, causing temporary closure of some offices;

R. felis--another form of cat-vectoring typhus which may be transmitted from them to humans and other animals by ticks, true bugs, lice, mosquitoes and other blood-sucking arthropods--it can cause infections serious enough to require emergency medical intervention;

Bartonella henselae and **Afipia felis** are both etiological agents of "cat-scratch disease"--the latter less common than the former. Transmitted by cat scratches or bites. Immunocompromised individuals are vulnerable to potentially lethal systemic complications. Infections have sometimes been misdiagnosed as adult-onset schizophrenia;

Pasteurella motocida--an oral bacterium in 70%-90% of cats, and transmitted through their bites. Systemic infections can be serious and cause cardiovascular damage. Cat bite wounds are frequently deep, which facilitates sepsis. Elderly people and recipients of immunosuppressive therapy are particularly vulnerable;

Toxocara catii (e.g. toxocariasis, or larval migrans)--is a parasitic roundworm transmitted through contact with cat feces, causing potentially serious infections of central nervous system, ocular and renal tissues. Young children are particularly vulnerable and may be subject to developmental disability and blindness. P. J. Hotez, Dean of the Tropical Disease Institute at Baylor College of Medicine, states one-third of black American children living in low-income communities are infected. CDC recognizes toxocariasis as another 'neglected' disease;

Giardiasis (**Giardia lamblia**)--likewise transmitted via contaminated feces from Felids to Canids, Ovines and humans--and vice-versa. Transmissible to wildlife to the extent it can be contracted from drinking feces-contaminated water in seemingly 'pristine' areas. Also can be passed as an STD from infected to uninfected humans;

Campylobacteriosis (**Campylobacter jejuni**)--cats are a common vector. The organism is transmitted via incidental ingestion of feces by other animals (including humans);

Capnocytophaga canimorsus--associated with exposure to cat body fluids, including saliva. Has caused septicemia and meningitis. Elderly and immunocompromised people are particularly vulnerable;

Tularemia (**Francisella tularensis**)--the causative organism is common in the Alaskan interior--rabbits and hares are particularly susceptible. The disease can be transmitted by tick and fly bites, by consuming raw/undercooked flesh from an infected animal, drinking contaminated water in which an infected animal has died or inhaling/ingesting aerosolized **F. tularensis** bacteria. Is associated with dressing infected animals. Cats also carry and transmit the disease. The causative organism has been weaponized by the US, Russia and Japan. One application of 50 kg of **F. tularensis** aerosol can kill 19,000 people;

Salmonellosis, including a recently-described 'super strain' first identified in cats. **Salmonella** is per the CDC the leading cause of fatal food-borne illness (toxoplasmosis is second-place);

More than nine species of **Platyhelminthines**, i.e. flatworms or flukes, are transmissible from cats to humans. Worldwide they infect *millions* of people. Consequences include tuberculosis-like URI symptoms, cerebral hemorrhaging and seizures. Some can enter through skin on the soles of the feet;

Q fever (*Coxiella burnetii*)--ruminants are particularly vulnerable, but cats also carry and transmit the disease. It's highly infectious with a variety of transmission pathways. Acute cases can present as severe (life-threatening) URI, chronic endocarditis--usually fatal--and hepatitis;

Leptospirosis--is a potentially fatal disease caused by as many as ten different *Leptospira* bacterial strains. As it commonly infects rodents, it's commonly transmitted to cats and thence to people. Transmission may occur via skin contact or through cat urine. Severe symptoms include pulmonary hemorrhage, meningitis and hepatitis;

MRSA--an antibiotic-resistant *Staph aureus* strain which can cause extensive tissue necrosis--sometimes called 'the flesh-eating disease', and is potentially lethal. Commonly carried by cats and is transmissible by direct contact;

Feline leukemia virus (FeLV)--transmissible to wild felines such as Canada lynx. Has killed endangered Florida panthers (*Puma concolor cougar*);

Sporothrix schenckii* and *S. brasiliensis--these are fungal diseases transmitted by contact with spores in soil, on vegetation and via infected cat scratches, bites and skin lesions. Domestic and wild felines--and humans--are susceptible. Also transmissible to other mammals. *S. brasiliensis* infection, until recently largely restricted to cats, produces more severe symptoms than *S. schenckii*. In Brazil thousands of cases of cat-vectored *S. brasiliensis* in people are being reported, and it's spreading to neighboring countries. *S. schenckii* is widespread in the US. *S. brasiliensis* hasn't reached here--yet.

Leishmania infantum--Leishmaniasis, is caused by at least 20 *Leishmania* bacterial strains, and is also referred to as a 'flesh-eating disease'. It's transmitted by biting flies. The disease in humans is serious and may be chronic. Cats, dogs--including wild Canids--are reservoir animals;

Chagas' disease (*Trypanosoma cruzii*)--formerly restricted to the neotropics, it has spread north with migrating human populations. It is a deadly disease from which one-third of its victims will sustain life-threatening cardiovascular complications. It's transmitted by blood-sucking 'true bugs' (order Hemiptera, family Reduviidae). Feral cats are a reservoir species, which when bitten by a Hemipterid can transmit the disease to humans. Transmission has been associated with individuals who sleep with cats;

Chlamydia psittacii--although usually called 'parrot fever', strains occur in pigeons and gallinaceous birds as well. Domestic mammals, including cats, are likewise hosts. It can be spread to other animals and humans via direct contact and/or respiratory droplets;

Cryptosporidiosis (*Cryptosporidium* spp.)--are pathogenic protozoans most commonly contracted by drinking water contaminated by infected animal feces. Cats (and other animals) shed *Cryptosporidium* oocysts with defecation. Oocysts survive in the environment for lengthy periods. Cryptosporidiosis is per the CDC a leading cause of water-borne illness;

Plague (*Yersinia pestis*)--like cats themselves, plague is invasive to North America. Cats are particularly susceptible and transmit bubonic, septicemic and (most commonly) pneumonic strains. The latter is the deadliest and hardest to diagnose and treat. Without early treatment 70% of infections are fatal.

Authors have listed less than *half* of the known zoonotic diseases carried and transmitted by cats. These diseases are more prevalent and infectious in regions with large unconfined cat populations. By demonstrating the destructive potential of this invasive disease-vector to public health and biodiversity, it is authors' hope to prevent Alaska from becoming like those regions.

SARS-Cov2 (causative viral agent of "coronavirus")--the origin of the SARS-Cov2 pandemic is believed to be the Chinese horseshoe bat (*Rhinolophus sinicus*) which ranges through much of China, Nepal, Vietnam and India). Bat life history seems to lend itself to generation of novel virus outbreaks because bats roost together in dense numbers, thus facilitating spread/transmission. Such viruses can travel via respiratory droplets and possibly other body fluids, and sometimes move across species-barriers.

For example, bats' propensity for huddling in dense populations is probably the reason they're the primary wild rabies virus vector. Bat-to-human transmission of rabies via respiratory droplet inhalation has been proven.

At this point the intermediate vector between bats and humans is said to be unknown. However, it has been shown that Felids and Mustelids process the virus more effectively than other species. At least one laboratory study has demonstrated transmission between cats placed in adjacent cages. With onset of SARS-Cov2 in Wuhan, China, local authorities undertook systematic killing of cats and dogs in infected households as a precaution.

<https://www.biorxiv.org/content/10.1101/2020.03.30.015347v1.full>

It has also long been known that cats carry and transmit SARS-Cov1, precursor to the current virus and which shares 70% of its genome with SARS-Cov2. Cats have tested positive for SARS-Cov2 in the US, Belgium and more than one location in China, as have several tigers and lions at the Bronx Zoo. Recently SARS-Cov2 rapidly infected caged mink kept in large numbers on two Netherlands mink ranches. While speculated the mink originally caught the virus from humans, this has not been demonstrated--but without question it was transmitted between mink.

https://wwwnc.cdc.gov/eid/article/10/5/04-0022_article?fbclid=IwAR1VAV8dZXdPWl377JbNkpaTzBSFAJRQau2QxChLhzXroSZ_76EOaJy2d5I

<https://nltimes.nl/2020/04/26/mink-found-infected-covid-19-two-dutch-fur-farms-areas-now-closed-public>

In light of these facts, allowing people to deliberately feed and maintain dense populations of domestic cats is to say the least problematic. Subsidizing dense artificial aggregations of invasive predators with food, usually near to human dwellings, is unsound in terms of public health, particularly in our current circumstances. However, so far the WHO has not found evidence of cat-to-human transmission of SARS-Cov2.

One potentially very serious problem, if it's determined that cats do consistently act as SARS-Cov2 vectors, is that this may hinder attempts to establish monitoring of the virus' spread via "contact tracing", which has in the past proved to be effective for, indeed essential to, controlling viral

outbreaks. Thanks to human-driven proliferation of *F. catus*, it is now the most common and widespread terrestrial predator in North America.

(5) Otherwise presents a threat to the health or population of a species that is indigenous to Alaska

The International Union for the Conservation of Nature lists cats the second-most destructive invasive terrestrial vertebrate--only commensal rodents (*Rattus rattus*, *R. norvegicus*, *R. exulans* and *M. musculus*) are worse.

Unconfined *F. catus* represents an overarching ecological threat to native Alaskan wildlife even beyond direct predation and transmission of zoonotic disease. In high numbers they represent significant ecosystem destabilization risks. Whether "owned" or "unowned", humans subsidize cats through consistent feeding. This enables *F. catus* to exist at densities beyond the environmental carrying capacity of any naturally-occurring predator. This in turn engenders 'cascading trophic effects' through the elimination of prey species on which native predators depend.

Population growth is entirely dependent upon food supply. Natural systems reflect cyclical increases and decreases of food. With increase of Arctic grasses, ferns and shrubs, snowshoe hare populations increase, as does that of Canada lynx. With decrease in such vegetation, snowshoe hare populations decline, followed by lynx populations. This cycle of naturally-occurring organisms co-evolving through struggle to eat-and-not-be-eaten over millennia results in mutually-sustainable numbers of predators and prey such that the latter don't exhaust their food supply and then starve, and the former don't eradicate their prey and then starve.

Feral cats have no place in such a system--they are domesticated reflex-killers. Cyclical population decrease is mitigated--or eliminated outright--by human feeding. Their killing and feeding impulses are controlled by separate regions of their brains. Humans bred them this way, perhaps even 'passively' by only supporting (and/or not culling) individuals which exhibited such behavior. This has been demonstrated experimentally in both laboratory and field.

In a San Diego, CA study by K. R. Crooks and M. E. Soule' ('Nature' 1999), wildlife kills by 35 *well-fed*, free-roaming 'pet' cats' were tallied. It was estimated these cats killed ~840 mammals, 525 birds and 595 reptiles each year. Adjusted for native species percentages (64%, 95% and 100% respectively), the cats' toll would have been ~563 native mammals, 499 native birds and 595 native reptiles--or 16 native mammals, 14 native birds and 17 native reptiles per cat/per year.

The authors warned their findings were probably underestimates, as they only counted prey items brought back to the cats' residences, not those eaten or abandoned in situ. A subsequent study by Loyd, Hernandez et al ('Biological Conservation', 2013) which utilized collar-mounted video cameras on 50 unconfined 'pet' cats found the cats only brought home 25%-50% of their prey. A similar South African study found that pet cats only returned on average 22% of the animals they killed.

If Crooks' and Soule's' death toll is adjusted to include an 'average' of the above estimates of animals killed but not recovered or counted by owners, the estimated toll becomes 944 native mammals, 837 native birds and 998 native reptiles annually--or 27 native mammals, 24 native

birds and 29 native reptiles per cat/per year. This is not an unreasonable estimate. 80 native wild animals per cat/per year is slightly less than one prey animal killed every five days.

Predation varies in different regions according to prey type and availability. For example, there are no reptiles in Alaska, so cats wouldn't be expected to kill them there. In Florida, established exotic reptile species outnumber native reptile species by more than two-to-one, so it's to be expected non-native reptiles would be well-represented in cat-kills there. Nonetheless the above calculated results are comparable to (and were derived from) findings from actual cat-predation studies, and are thus offered to demonstrate cats' destructive impacts on natural ecosystems.

SPCA estimates of US stray and feral cat populations average 84.5 million (range 47 million-122 million). Add to this 58 million (range 50 million-66 million) unconfined 'pet' cats. If the above calculations are representative, then unconfined US cats slaughter *11.4 billion* native mammals, birds and reptiles annually. Recall this represents each cat taking one prey item every five days--and that it may still be an underestimate.

This highlights *F. catus*' destructive and unsustainable impact on ecological systems. 11.4 billion smaller prey items annually removed by invasive felines represents 11.4 billion food items made unavailable to native lynx, raptors, foxes, wolves and mustelids each year. Therefore these native predators must expend more energy to obtain food, thus driving the 'energy-exchange balance' (i.e. the amount of energy expended in obtaining food vs. the amount of energy obtained from it) sharply against native predators. This is an example of a cascading trophic effect. The more energy required to obtain food, the more native predators are subject to starvation, injury and/or exposure to predation themselves. Note this is much less an issue for domestic cats subsidized by human feeding.

Alaska is one of the few regions in which North American 'apex predators' survive--trophic 'disruption' by invasive *F. catus* in Alaska may prove to be at least as intense--and as ecologically destabilizing--as its impacts globally, if the species is permitted to increase in numbers at the rate they're expanding elsewhere in the world. Alaska is home to the Canada lynx (*L. canadensis*) and--possibly--the cougar (*P. concolor*), which may be naturally expanding its range into southeast Alaska from British Columbia. Alaska needs no other cats.

[http://www.elkhornsloughctp.org/uploads/files/1238046095Crooks Soule 1999 Nature Mesopredators.pdf](http://www.elkhornsloughctp.org/uploads/files/1238046095Crooks_Soule_1999_Nature_Mesopredators.pdf)

<https://digitalcommons.unl.edu/cgi/viewcontent.cgi?article=1656&context=natrespapers>

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