

# Feral Swine Federal Task Force News

FISCAL YEAR 2019, QUARTER 4

OCTOBER 2019



Manage the Damage  
Stop Feral Swine

## Research Update: Continued Evaluation of Chronic Wasting Disease in Feral Swine.



Chronic wasting disease (CWD) is a disease of high concern for wildlife managers due to its extensive impact to deer and elk populations across the United States. Since the

and the National Wildlife Disease Program partnered with universities and state and federal agencies to evaluate feral swine for evidence of interspecies CWD infection. By working with the Arkansas Wildlife Services Program, 102 samples were collected from feral swine in a CWD-endemic region.

An additional 27 samples were obtained from a region of Oklahoma believed to be free of CWD to serve as negative controls.

Since there is a limited understanding of naturally acquired prion disease in pigs, it is essential for this study to utilize a range of assays to produce meaningful data. Two amplification assays were identified to screen feral swine tissues for small amounts of CWD prions.

range and habitats of feral swine and cervids in the United States overlap in many regions this raises concerns of whether feral swine are susceptible to the disease and if so, what role they could play in the spread and management of CWD.

In 2017, a study conducted by Moore et al. found that domestic hogs were susceptible to CWD through oral exposure. This gave rise to the question of whether feral swine living in CWD endemic regions could become infected with CWD following consumption of infected cervid carcasses and sharing a contaminated environment. In 2018, the National Feral Swine Damage Management Program



Feral swine may encounter deer at wildlife feeders.

### READ ON TO LEARN MORE!

- Chronic Wasting Disease and Feral Swine
- Protecting sea turtles from feral swine
- Urban pigs in Puerto Rico

## Research Update: Chronic Wasting Disease Continued...

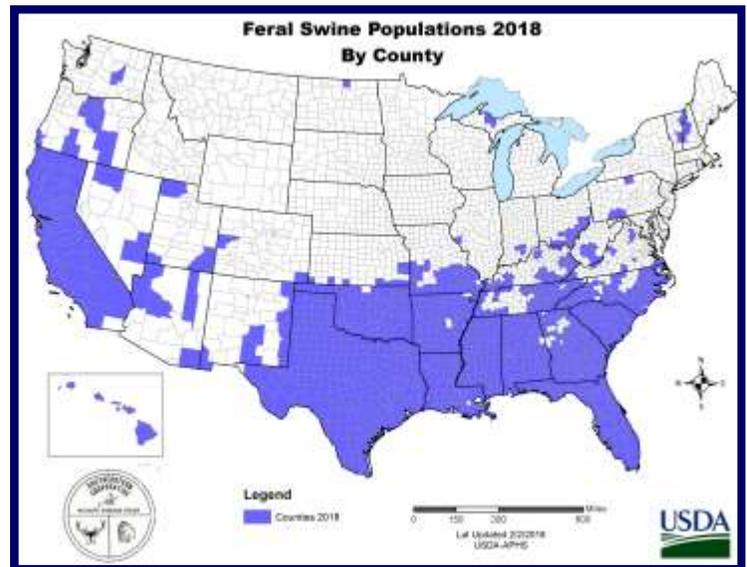
Both tests exploit the ability of the abnormally folded, infectious prions to convert normally folded prions to the misfolded form. Real-time quaking induced conversion (RT-QuIC), is a highly sensitive assay that utilizes a fluorescent probe to identify the formation of groups of misfolded proteins, or plaques, indicative of prion diseases. The other assay used was protein mis-folding cyclic amplification (PMCA) which provides conditions conducive to the formation of detectable levels of misfolded prion proteins from minute amounts infectious prions. These tests were performed in collaboration with partnering universities.

To date, two feral swine samples have come back as suspect positives by both amplification assays. There is very limited information about prions and CWD in pigs, and more analysis needs to be conducted to understand the findings. Therefore, these results are inconclusive at this time. Additional assays to be used include immunohistochemistry (IHC) and a mouse bioassay. IHC is a common immunostaining process which exploits the specificity of antibodies to bind to their target proteins, which in this case, are associated with CWD. The mouse bioassay involves infecting live mice with suspect positive samples from feral swine and watching for signs of disease development.

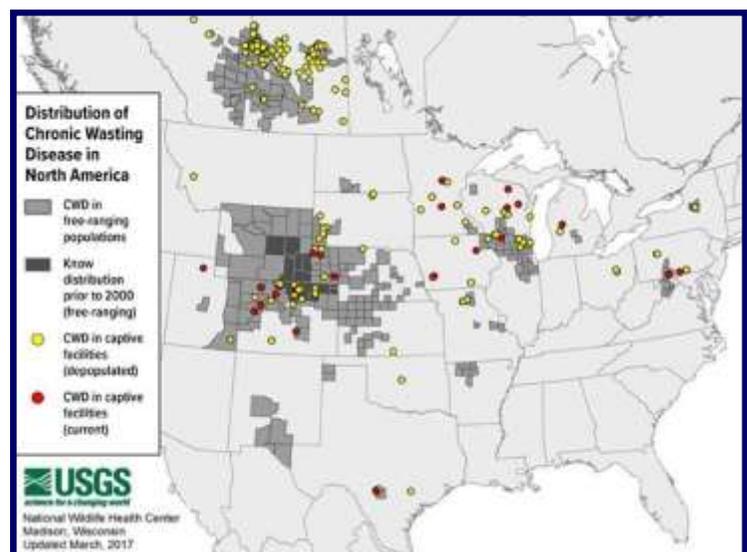
### Want to read more?

Moore, J. S., West Greenlee, H. M., Kondru, N., Manne, S., Smith, J. D., Kunkle, R. A., . . . Greenlee, J. J. (2017). Experimental Transmission of the Chronic Wasting Disease Agent to Swine after Oral or Intracranial Inoculation . *Journal of Virology*.

The data from the amplification assays, IHC, and the mouse bioassay will be compiled and evaluated for evidence of prion disease in feral hogs from a CWD-endemic region. Full and complete results are anticipated in 1-2 years.



Above: Map depicting range of feral swine populations in 2018. Below: Chronic wasting disease in cervid populations across the U.S.



# Managing Urban Pigs in Puerto Rico

In 2017, Hurricane Maria ravaged the island of Puerto Rico leaving thousands without shelter and basic necessities, leaving those living in densely populated low-income areas of San Juan with the most damage. Many fled the city in the wake of the storm, those who remained fought for survival and to rebuild. This unfortunate scenario resulted in an abundance of stray animals left behind while people struggled to recover their homes and livelihoods. Dogs and cats, commonly left stray after a disaster, were one thing to manage and systems were already in place for these animals making management straightforward. However, an unexpected stray animal was more of a challenge. Vietnamese potbellied pigs.

The population of stray pigs roaming within densely populated neighborhoods of San Juan was exponentially increasing. These pigs roamed the streets, parks, and even playgrounds for nearly two years, overturning garbage containers and leaving excrement on sidewalks. The Puerto Rican Health Department identified the situation as a public health concern and requested Wildlife Services assistance in removal of the feral swine from the city.

In July, a team went into impacted neighborhoods to host community meetings and hear from constituents. Since this removal operation was going to be highly visible to the public it was important to lay groundwork and build relationships prior to conducting operations.

Citizens were informed of the disease risks feral swine pose as well as given an overview of the removal operations that would be taking place in their neighborhoods in the coming weeks.

When it came time to conduct the removal, the community showed overwhelming support. Large corral traps were erected, the pigs, already conditioned to being fed, were baited and trapped. The animals were then removed by truck for euthanasia, disease testing, and burial off site. Thanks to the assistance of a multi-state "strike team" that stepped up to assist with the project, the entire population of over 500 pigs was removed within a week.

This effort was unique due to the location and high public visibility which made outreach in the community particularly important. The project went exceptionally well and the community expressed gratitude for the elimination of the feral pigs in their neighborhoods.

Feral pot bellied pigs roam parks, playgrounds, and the streets of San Juan Puerto Rico.



# Protecting Sea Turtles from Feral Swine

Seven species of sea turtle exist in the world - six of those can be found in the waters surrounding the United States and nest on the beaches. All of these sea turtle species have sensitive conservation status and face many threats to their survival such as pollution, fishing nets, and human development encroaching on nesting beaches. Once a mother sea turtle has managed to lay her eggs the eggs and hatchlings face many predators, including one many may not think of - Feral Swine.

Feral swine impacts to sea turtles can be devastating as they seek out nests and root up eggs, devouring entire clutches. This predation can severely impact recovery efforts for these sensitive species. The extent of this impact was investigated by Engeman et al. on North Island off the coast of South Carolina from the first recorded feral swine nest depredation in 2005 through 2016 when the last feral swine were removed from the island.

Engeman's study saw a drastic reduction in feral swine predation on sea turtle nests after a three year period of intensive trapping on North Island from 2011-2013. Before the removal efforts 138 of 158 (87%) of sea turtle nests were found to be predated by feral swine. After the removal efforts significantly reduced feral swine populations on the island feral swine predation of sea turtle nests dropped to 2 of 162 (1%) of nests.

By 2015 only five feral swine remained on the island, however, these few animals still depredated a third of the nests (75 out of 222) on the island inflicting an estimated loss of 4,532 hatchlings. In 2016 the final feral boar was removed from the island, eliminating the threat of feral swine predation to sea turtle nests!

This example highlights the impact feral swine can have on an endangered species like sea turtles. Since this scenario was an island habitat it was possible to eliminate the swine from the landscape. However, genetic review indicates that the animals did not migrate to the island on their own and it is highly likely that humans illegally transported the swine to the island. This means monitoring will need to continue to prevent re-introduction of feral swine on North Island.

Management for feral swine depredation of sea turtle nests as well as other sensitive ground nesting species such as Piping Plover is essential to protect these species and their habitat. Mainland sea shores face additional trials in management. Since mainland beaches are not a closed system, like an island, there is a continuous inland source population making elimination challenging. However, targeted management during nesting season can still improve nest success and help protect native and endangered wildlife.

Feral swine rooting protective screen over known sea turtle nest (left) and rooting on beaches (right).



**Want to read more?**

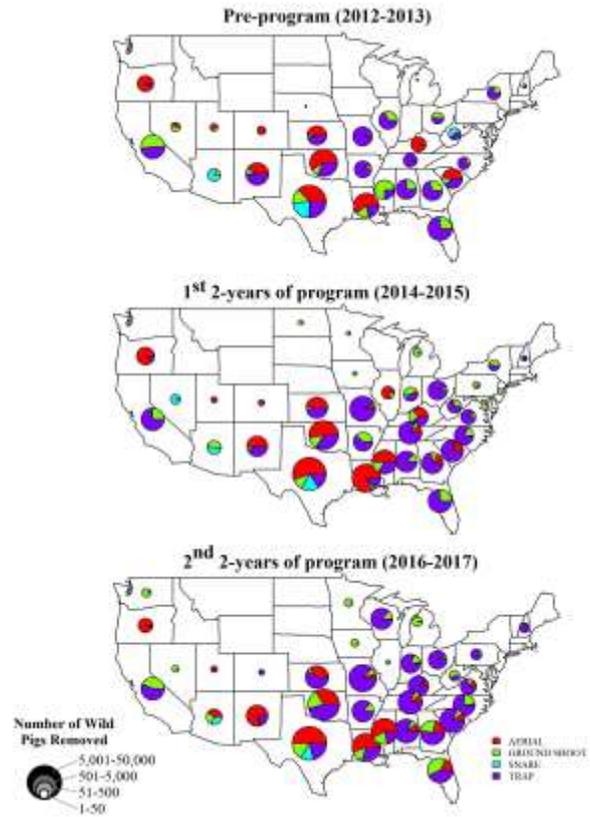
Engeman, R. M., Byrd, R. W., Dozier, J., McAlister, M. A., Edens, J. O., Kierepka, E. M., Myers, N. (2019). Feral swine harming insular sea turtle reproduction: The origin, impacts, behavior and elimination of an invasive species. *ActaOecologica*.

# Have we made a difference?

## Halting the spread of feral swine through a national approach.

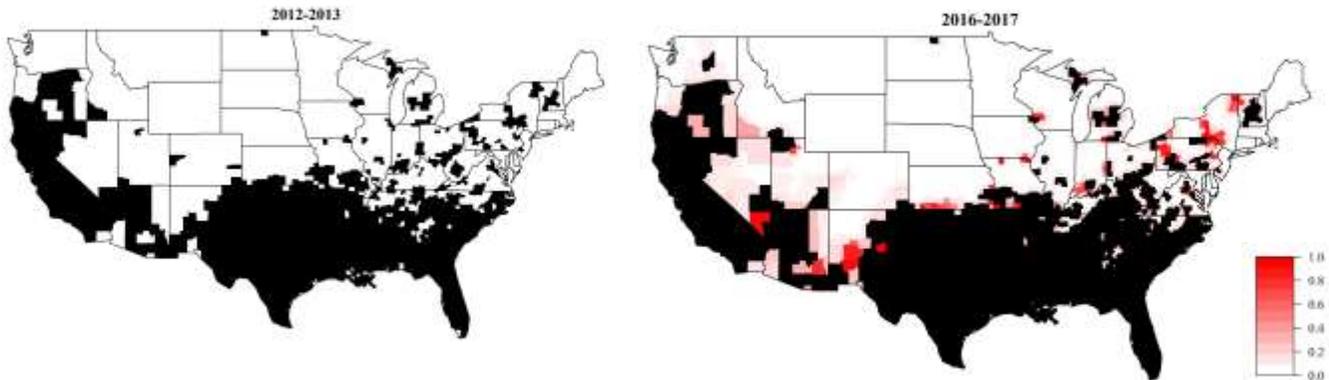
Given the extensive damage farmers were experiencing from feral swine congress allocated funds in 2014 for the first time to specifically address this invasive species. The National Feral Swine Damage Management Program (NFSDMP) was created to spearhead a coordinated effort to protect agricultural and natural resources, property, animal health, and human health and safety by managing damage caused by feral swine in the United States and its territories. With the onset of the program, feral swine damage management efforts increased significantly across the country. See Figure 1 for a map depicting numbers of feral swine removed through management efforts across the country. Increased efforts in states with low or emergent populations of feral swine are particularly notable. So the question is, has it made a difference?

After four years of efforts coordinated by the NFSDMP, the probability of feral swine invading a new county was reduced by 8% overall and by 15% in states with low-density populations. Models indicate that if feral swine had been allowed to continue to expand their range at pre-program levels, they would have invaded 122 more counties (on average) in states with low to no previously existing populations. See maps below for a depiction of how feral swine populations likely would have spread without the efforts of the NFSDMP and their partners.



Pre- Program Establishment

Post-Program Establishment



On the left is feral swine population range, in black, before the program was established. On the right we see current range in black and prevented range expansion in red; areas where pigs are not currently but likely would be without management efforts. A darker red color indicates a stronger probability that feral swine would have expanded to the region had it not been for program efforts.

### Want to read more?

Pepin K.M., D.W. Wolfson, R.S. Miller, M.A. Tabak, N.P. Snow, K.C. VerCauteren, and A.J. Davis. 2019. [Accounting for heterogeneous invasion rates reveals management impacts on the spatial expansion of an invasive species.](#) *Ecosphere* 10(3): e02657

## State Updates

### Alabama

Wildlife Services provided management assistance at 24 different locations to protect soybeans, cotton, peanuts, hayfields and natural areas.

### Arizona

Wildlife Services provided a presentation on feral swine to participants of the Federal Bureau of Investigation/Animal Plant Health Inspection Service's Animal Plant Health Joint Criminal- Epidemiology Investigations Course.

### Arkansas

Wildlife Services provided several presentations relevant to the Arkansas Feral Swine Program / Farm Bill Feral Swine Eradication and Control Pilot Project around the state this quarter to a number of organizations including the Arkansas Forestry & Wildlife State Technical Sub Committee, NRCS State Technical Committee, and the Arkansas Farm Bureau Feral Hog Committee.

### California

Wildlife Services responded to feral swine damage at a landfill in the San Francisco Bay area.

### Colorado

Wildlife Services was able to survey over 95 miles of river bottom in eastern Colorado after extensive networking with ten separate landowners to allow access to property.



### Florida

Wildlife Services continues aggressive removal strategies on St. Vincent Island, Florida's largest barrier island, with the goal of soon eliminating the last remaining feral swine from the island.

### Georgia

Wildlife Services continues to provide assistance to the National Park Service and Little Cumberland Island in regards to feral swine control to reduce impacts to sea turtles and their nesting. Sea turtles began nesting this quarter. Across the state, sea turtle nest numbers have reached a new record high.

### Guam

Wildlife Services began work on an amended agreement with Southern Guam Soil and Water Conservation District to extend feral swine control throughout the remainder of the fiscal year. Wildlife Services conducted feral swine trapping on 13 properties as part of the agreement this quarter.

### Hawaii

Wildlife Services has located local vendors to fabricate portable feral swine traps. In an effort to maximize feral swine control impacts these portable traps will be loaned to help private individuals with smaller pig problems.

### Illinois

Wildlife Services continues to support legal efforts of the County & the Illinois Department of Natural Resources (IDNR) in eliminating the source of free-roaming 'domestic' swine in Illinois.

### Indiana

Despite an exceptionally wet spring delaying planting and complicating land access Wildlife Services continued management efforts through aerial, trapping, and night shooting.

### Iowa

Wildlife Services provided assistance for the National Veterinary Services Laboratory Foreign Animal Disease Diagnosticians Course in Ames, IA through demonstration of Classical Swine Fever and African Swine Fever Surveillance in Feral Swine.

### Kansas

Wildlife Services has seen a shift in landowner attitudes toward the program which has allowed for greater access and management in key counties for elimination of feral swine from the state.

## State Updates

### Kentucky

Wildlife Services aided the Nature Station at Land Between the Lakes National Recreation Area in educational efforts by providing the skull of a mature boar feral swine for display.

### Louisiana

Wildlife Services has seen a decline in damage to coastal marsh habitat, alligator nests, and pastures in a focused project area. Fewer feral swine have been seen in the area as well.

### Maine

Wildlife Services responded to escaped pigs from an established Eurasian/Eurasian hybrid breeding facility. Following their escape, the pigs caused damage to neighboring properties. Through surveillance efforts, the pigs were located and recaptured by the owner.

### Michigan

Wildlife Services provided presentations on feral swine damage and control efforts at the Swine Health Champions Upper Peninsula meetings. Wildlife Services partnered with Michigan State University Extension to provide feral swine information to domestic swine producers in the Upper Peninsula.

### Minnesota

Wildlife Services responded to two incidents of feral swine sightings this quarter. One resulted in a farmer shooting a "wild" pig on his farm. Wildlife Services was able to obtain a tissue sample for future DNA analysis, results are pending.

### Missouri

Wildlife Services attended important open houses in the community as the U.S. Forest Service continues consideration of the proposed closure of the Mark Twain National Forest (MTNF) to feral swine hunting.

### Mississippi

Wildlife Services continues management activities on US Army National Guard Military Base, Camp Shelby. Feral swine rooting occurs on firing ranges, roads, and other training site infrastructure which then necessitates routine management. Coordinated efforts have been conducted to allow the US Army National Guard to reach their training goals safely. Additionally, feral swine were controlled on the wooded portion of this property to protect declining plant and animal species, including the federally threatened gopher tortoise.

### Nevada

The Paradise Valley feral swine population continues to be monitored by Wildlife Services.

### New Hampshire

Wildlife Services continues implementing strategies to monitor the Canadian and New Hampshire border for feral swine. Preparations for the use of assets of the feral swine Detector Dog Program continue.



### New Mexico

Wildlife Services removed 43 feral swine this quarter. Approximately 1,842 feral swine have been removed by NM Wildlife Services since eradication began in 2013.

### North Carolina

Wildlife Services conducted aerial operations in three locations within the state this quarter, including aerial work over state managed game lands. Current access for aerial operations in the state is small but plans are to expand access and utilize this tool more in the future.

### North Dakota

Wildlife Services personnel conducted a follow-up site visit on a report of feral swine but could not confirm the presence of feral swine in the vicinity. Personnel are continuing to monitor the area and will respond to any additional reports.

### Ohio

Wildlife Services was able to eliminate an emergent population of feral swine. Following up on reports that a landowner had harvested an adult sow, Wildlife Services immediately began to investigate the area. It was learned a hunting preserve previously offering "feral swine" hunting had shut down. Three weeks prior to the initial report of feral swine on the landscape the fence to the hunting preserve had been taken down. Wildlife Services worked diligently with the local landowners and local Wildlife Officer to locate and remove 22 feral swine in one trap catch. Surveillance efforts continue with no additional reports or sightings of feral swine in the area.

## State Updates

### Oklahoma

Wildlife Services initiated a project with twelve landowners encompassing 18,616 contiguous acres. These ranches historically experience monetary losses due to damages caused from high populations of feral swine. Feral swine damage includes rooting to pastures and hayfields as well as rooting and consumption of wheat crops. In an effort to create feral swine free zones in small contiguous acreages, a project was initiated to provide additional damage management assistance to cooperators in the region. Gains were made and all areas will continue to be monitored for feral swine ingress.

### Oregon

Wildlife Services continues surveillance efforts. The state is approaching one year without a feral swine detection.

### Pennsylvania

Wildlife Services met with members of the Allegheny National Forest staff to discuss feral swine reporting and management solutions for the forest. Presently, no swine have been documented on the Allegheny but information for reporting swine is being proactively developed since there have been reports in the past of swine near the forest.

### Puerto Rico

In addition to responding to numerous requests involving agricultural damage by feral swine, Wildlife Services continues to establish and strengthen cooperative relationships between PR Dept. of Health, PR Dept. of Agriculture, PR Dept. of Natural and Environmental Resources and the Dept. of Public Safety.

### South Carolina

Wildlife Services provided a presentation at the SC Natural Resource Conservation Service's State Technical Committee meeting. This meeting was attended by representatives from Federal and State natural resource agencies, agricultural and environmental organizations, and agricultural producers.

### Tennessee

Wildlife Services initiated efforts to form the Cumberland Plateau Feral Swine Working Group. Consisting of federal personnel involved in agriculture, wildlife, and natural resources management in Cumberland Plateau Counties. The purpose of creating the group was to enhance communication and cooperation between different agencies so that the public has the best access to feral swine damage management services available from group members.

### Texas

Wildlife Services conducted 810 outreach activities, reaching 3,005 participants. Presentations around the state included information on meat borne pathogens in feral swine meat.

### Utah

Wildlife Services and U.S Fish & Wildlife Services worked with Wildlife Services detector dog teams to verify non-existence of feral swine in suspected areas or areas where feral swine were previously removed. No canine responses were recorded for the trip indicating no feral swine in area.



### Virginia

Wildlife Services followed up on several reports of feral swine during this quarter that were revealed to be free-ranging domestic livestock or pot-bellied pigs.

### Vermont

Officials in Vermont are considering new legislation to redefine all free ranging swine to feral status after 48 hours of notification of an escape. This would be greatly beneficial due to continued disregard for state laws regarding free-ranging domestic swine.

### Washington

Wildlife Services successfully removed a lone feral swine which had been feral for at least two years, causing damage to multiple properties.

### Wisconsin

Wildlife Services continues to respond to feral swine reports; six this quarter. The majority of sightings involved domestic and/or potbellied pigs that were resolved by the animals' owners.

### West Virginia

Following two years of attempts to gain property access to target a known population of feral swine, Wildlife Services with the assistance of WV Department of Environmental Protection, was finally able to build relationships with landowners and gain access to remove feral swine.

# Contributors and Collaborators

## Thank you to this quarter's contributors:

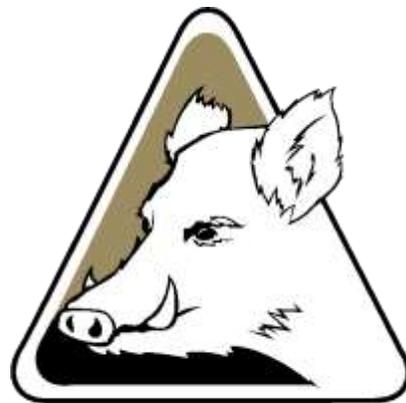
- Jeanine Neskey—Biologist/Extension Specialist; National Feral Swine Damage Management Program
- Kim Pepin— Research Biologist, National Wildlife Research Center
- Tanya Espinosa — Public Affairs Specialist, Wildlife Services

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## National Feral Swine Damage Management Program

### Program Staff

- Dale Nolte— Program Manager
- Michael Marlow— Assistant Program Manager
- Esmeralda Reynolds— Budget Analyst
- Mark Lutman—Wildlife Biologist
- Jeanine Neskey— Biologist/Extension Specialist
- Jeremiah Psiropoulos -- Wildlife Biologist
- Vienna Brown— Biologist
- Alexandra Mitchell— Program Specialist



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