

Documentation of a poxvirus (Squirrel Fibromatosis) infected Big Cypress fox squirrel within Big Cypress National Preserve. Final Report.

On 28 June 2010, I (John Kellam) was contacted by a private landowner living on Burns Lake Road (within the administrative boundary of Big Cypress National Preserve; BICY) who informed me that he had observed an “injured” *Sciurus niger avicennia* Howell (Big Cypress fox squirrel; BCFS) on his property and would like assistance with assessing the BCFS’s condition. Later that same day, I drove to the landowner’s property where I observed the reported BCFS slowly climbing up a pine tree and then into the canopy of an adjacent cypress dome. Although the BCFS exhibited no outward signs of a specific injury or disease, it was acting lethargic, so I deployed 3 baited wire box traps (with the landowner’s permission) in an unsuccessful attempt to capture the BCFS for closer examination. On 01 July 2010, the landowner informed me that he had relocated the “injured” BCFS on his property and that its condition had apparently deteriorated (i.e., increased lethargy). Later that same day, I captured the BCFS (Fig. 1) with a long-handled net and placed it in a towel covered live-trap (within a cardboard box) in preparation for transportation to the Conservancy of Southwest Florida Wildlife Rehabilitation Clinic in Naples, Florida.

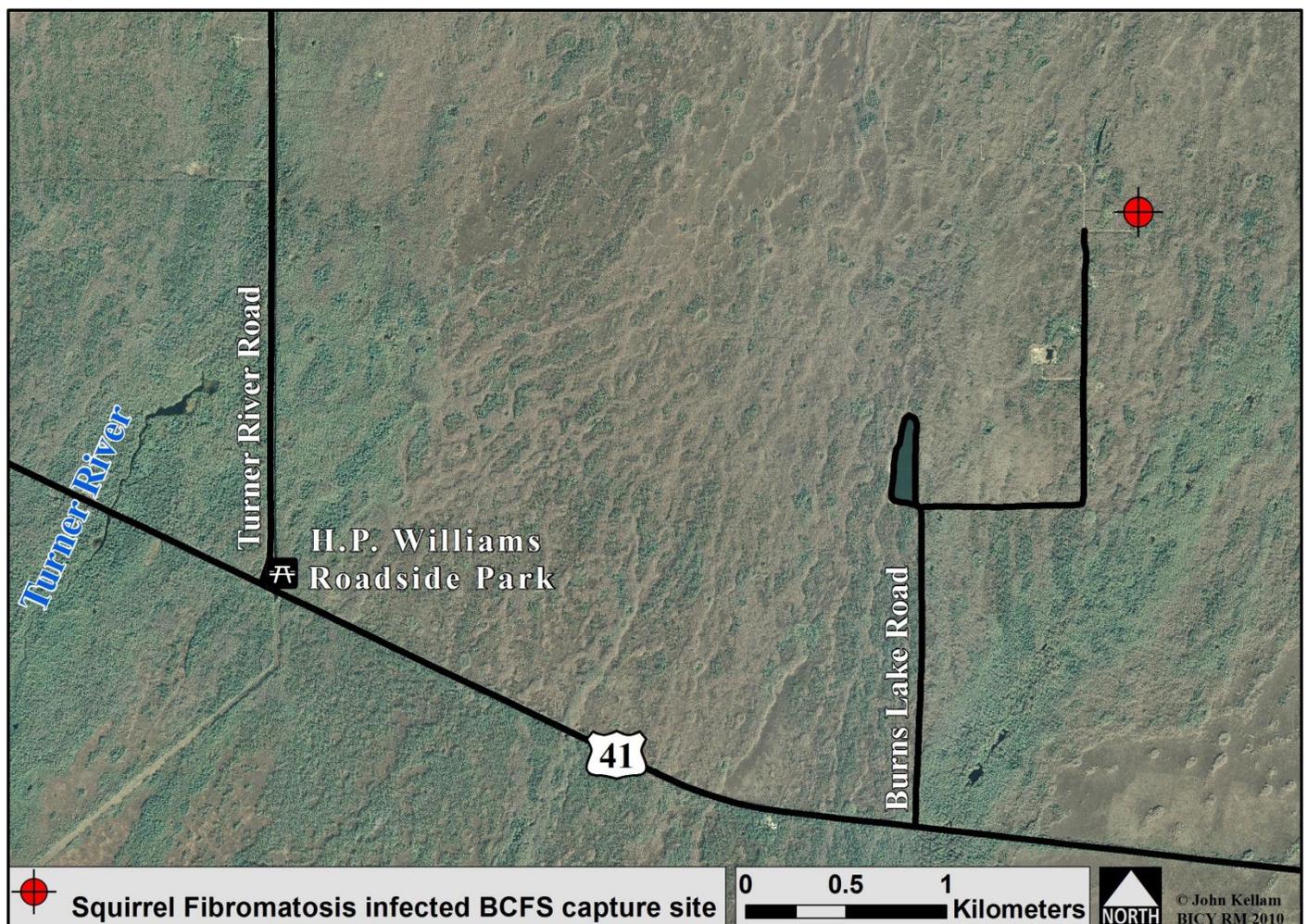


Figure 1. Squirrel Fibromatosis infected BCFS 01 July 2010 capture site within BICY.

At the clinic, the BCFS was given subcutaneous fluids, antibiotics, and received a preliminary diagnosis of poxvirus (Squirrel Fibromatosis). On 03 July 2010, the BCFS died at the clinic (Fig. 2) and the fresh carcass was delivered to Dr. John Lanier DVM (Naples, FL) who collected tissue specimens for laboratory analysis. The remaining BCFS carcass was then overnight shipped to Dr. Kevin Castle and Dr. John Bryan (NPS-BRM-DVMs) for additional analysis at the Colorado State University Veterinary Diagnostic Laboratory. Necropsy and laboratory results confirmed the BCFS was infected with Squirrel Fibromatosis.



Figure 2. Squirrel Fibromatosis infected BCFS with visible cutaneous tumors (fibromas). 03 July 2010 necropsy photos © Ralph Arwood.

Squirrel Fibromatosis is an infectious disease (Robinson and Kerr 2001) that can cause high rates of mortality in infected squirrels (Terrell et al. 2002). Squirrel Fibromatosis has a reported incubation period of 7–14 days before visible cutaneous tumors (fibromas) appear (Hirth et al. 1969) and typically either goes into remission or leads to mortality in < 2 months (Kilham 1955). In 1998, a widespread outbreak of Squirrel Fibromatosis in *Sciurus carolinensis* Gmelin (Eastern gray squirrel) in Florida infected > 200 squirrels (across 7 counties) causing high rates of mortality (Terrell et al. 2002). The discovery of a Squirrel Fibromatosis-infected BCFS within BICY, which is the first confirmed case in natural habitats, may explain local BCFS extirpations described by Jodice and Humphrey (1992). Squirrel Fibromatosis can be transmitted from insect bites (e.g., mosquitoes and fleas) and by direct animal-to-animal passage (e.g., faecal-oral routes and fibroma/lesion contact) (Atkin et al. 2010, Bruemmer et al. 2010, Kilham 1955, Terrell et al. 2002). Bruemmer et al. (2010) found that attracting and congregating squirrels to the same place (via bird and wildlife feeding stations) could contribute to spread of Squirrel Fibromatosis by creating a “hotspot” for the disease. Therefore, if Squirrel Fibromatosis is detected in a BCFS or Eastern gray squirrel population, the use of bird/wildlife feeding stations should be discouraged on private and public lands in and near the disease outbreak area until monitoring findings suggest otherwise.

The BCFS is currently (2010) a Florida State listed Threatened species. Squirrel Fibromatosis-BCFS research, monitoring, and reporting are needed in order to understand and mitigate the potential adverse effects this disease may have on BCFS populations range-wide.

This report should be cited as:

Kellam, J. 2010. Documentation of a poxvirus (Squirrel Fibromatosis) infected Big Cypress fox squirrel within Big Cypress National Preserve: Final report. National Park Service, Big Cypress National Preserve, Ochopee, FL. 3 pp.

LITERATURE CITED

- Atkin, J.W., A.D. Radford, K.P. Coyne, J. Stavisky, and J. Chantrey. 2010. Detection of squirrel poxvirus by nested and real-time PCR from red (*Sciurus vulgaris*) and grey (*Sciurus carolinensis*) squirrels. *BMC Veterinary Research* 6:33–41.
- Bruemmer, C.M., S.P. Rushton, J. Gurnell, P.W.W. Lurz, P. Nettleton, A.W. Sainsbury, J.P. Duff, J. Gilray, and C.J. McInnes. 2010. Epidemiology of squirrelpox virus in grey squirrels in the UK. *Epidemiology and Infection* 138:941–950.
- Hirth, R.S., D.S. Wyand, A.D. Osborne, and C.N. Burke. 1969. Epidermal changes caused by squirrel poxvirus. *Journal of the American Veterinary Medical Association* 155:1120–1125.
- Jodice, P.G.R., and S.R. Humphrey. 1992. Activity and diet of an urban population of Big Cypress fox squirrels. *Journal of Wildlife Management* 56:685–692.
- Kilham, L. 1955. Metastasizing viral fibromas of gray squirrels: Pathogenesis and mosquito transmission. *American Journal of Hygiene* 61:55–63.
- Robinson, A.J., and P.J. Kerr. 2001. Poxvirus infections. Pp. 179–201, *In* E.S. Williams and I.K. Barker (Eds.). *Infectious diseases of wild mammals*. 3rd Edition. Blackwell Publishing, Ames, IA. 558 pp.
- Terrell, S.P., D.J. Forrester, H. Mederer, and T.W. Regan. 2002. An epizootic of fibromatosis in gray squirrels (*Sciurus carolinensis*) in Florida. *Journal of Wildlife Diseases* 38:305–312.