The Red-billed Firefinch *(LAGONOSTICTA SENEGALA)* IN AVICULTURE – PART II

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An unusually heavily-spotted Tulsa Zoo female Red-billed firefinch with its mate. At least four pairs have nested at the same time in Tulsa Zoo's Desert Atrium. Nick Walters, photo.

Meanwhile, in America…

As mentioned in Part I, the inclusion of one or more New World Scarlet Ibises in the collection that included "Senegal Finches" received at Peale's Museum in 1805 (Sellers, 1979, 206) might imply some connection with the "triangle trade" in African slaves. In 1807 the US Congress passed an act prohibiting the importation of slaves, which went into effect in 1808. Thereafter, the US had limited direct trade with Africa for the rest of the 19th Century, with New England ship owners turning their attention to whaling in the Pacific and the Arctic, and trade with China and Japan.

A few African birds continued to arrive in America in the first decades of the 19th century: more Crowned Cranes, as well as Ostriches, Pelicans, and Secretary Birds (specially collected in South Africa in 1834) (Thayer, 2005), but I have found no evidence of small cage birds until the 1840's.

New England in the 1840's had grown prosperous from whaling, sea-trade, railways, and industrial manufacturing, and had developed a vibrant and literate culture. In 1848, the English immigrant James Mann, "Taxidermist, Dealer in Birds, Natural Curiosities, etc.", published *The American Bird-Keeper's Manual* in Boston, where he maintained his shop. A good portion of this book is devoted to North American songbirds and canaries, but he did include a chapter on "South American, Asiatic, and African Birds", which discusses a total of twelve species (Mann, 1848).

Three are identified as African. Though all three are seed-eaters, none are estrildids: The "Broad-shafted" (Sahel Paradise) and "Red-billed" (Pin-tailed) "Widahs", and the "Crimson-collared Widah" *(Euplectes ardens)*. The estrildids are represented by Java Sparrows and Strawberry Finches ("Amandava, or Avodavine Finch") and what Mann (1848) refers to as the "Senegal Finch, or Spice Bird" but states is "Found in various parts of Asia"! One might gather Mann (who did not use Linnaean names in this book) was discussing the Spice Finch (Nutmeg Mannikin) *(Lonchura punctulata)* but his description does not fit at all:

> "This pretty little songster is still smaller than the Amandava, and its note, although not quite so loud, is much more harmonious. The female also sings, and if there are a pair in the cage, they will sit closely together and sing alternatively, the male first, and then the female… The male has the bill red; sides and fore part of the head and chin, black; the top of the head reddish, with black spots; the rest of the plumage is of a light reddish brown, spotted with black and brown. The female has the upper parts of a light brown; the lower parts, reddish gray"(Mann 1848).

While this description is initially baffling, in light of Derek Goodwin's (1982) observation that the Gold-breasted or Zebra Waxbill *(Amandava subflava)* is "very prone to induced melanism under adverse captive conditions", it would appear that Mann's "Senegal Finch" came from Africa after all! This indicates that the Red-billed Firefinch was a forgotten bird in

American aviculture by the 1840's, when James Mann (1848) a prominent Boston bird store owner thought "Senegal Finches" came from Asia.

African estrildid finches appear to have remained rare in America through the rest of the nineteenth century. This was in part due to the commercial exploitation of Northern Cardinals, Painted and Indigo Buntings, and other native song birds, both domestically and for export to Europe (Ossa, 1973). In 1890, the State of New York prohibited this trade, and by 1906, selling North American passerine birds, as well as possessing them without a permit was illegal throughout the US (Ossa, 1973).

Lee Saunders Crandall (1887-1969), the Bronx Zoo's Curator of Birds from 1919 to 1943, then General Curator until 1952, wrote that "the coming of the Audubon laws" caused the "keepers of birds, forbidden to cage familiar native species… to at last [turn] their attention to songsters of other lands" (Crandall, 1944).

While Lee Crandall is held in reverence by zoo historians today for his monumental 1964 book, *Management of Wild Mammals in Captivity,* he was an enthusiastic aviculturist, and wrote extensively about birds. He served as Vice President of the Avicultural Society of America and was an Associate Editor of its magazine Aviculture.

Nearly forgotten is Crandall's *Pets: Their History and Care,* published in 1917, the year the US entered WWI. By then, an extensive variety of foreign birds was available in the bird shops of large Eastern cities, and this book is a fascinating record of what one might find. Of the fifty-five "Finches" described in his book, twenty-five are African. These comprise thirteen estrildids, eight weavers, three parasitic whydahs, and two serins (Crandall, 1917a).

Regarding the Red-billed Firefinch, Crandall (1917a) wrote:

> "The male Fire Finch (Lagonosticta minima) is a beautiful atom, mostly rosy crimson, the back washed with brown and the tail black. The sides of the breast have a few tiny spots of white. The female is more brown, tinged here and there with crimson. This little bird is one of the most delicate in captivity, being very hard to establish. Even then the greatest care is required to keep it in health."

Lee Crandall took pains to document first breedings of birds in the US aviculture. Through the year 1929, he catalogued eleven estrildid finches: The Cut-throat Finch, Australian Zebra, Chestnut Munia, and Java Sparrow through 1909; Strawberry Finch and Shaft-tailed Finch from 1909 through 1917; the Masked Grassfinch, Owl Finch, Sydney Waxbill, Diamond Sparrow, and Gouldian finch from 1917 through 1926 (Beebe & Crandall, 1909, Crandall, 1917b, 1927, and 1930). Out of the "the rather astonishing total of 170" avian taxa that Crandall (1930) was aware had been bred in captivity in the US through 1929, the Cut-throat Finch and the Black-headed Weaver *(Ploceus melanocephalus)* were the only African passerine birds.

African finches maintained a low profile in US aviculture until well after World War II. During the winter of 1936-1937, Jean Delacour spent more than a month in Southern California, and shortly thereafter published a lengthy account of his visit. He was very interested in the availability of birds there, as compared to France and England:

> "The prices of imported foreign birds are generally higher than with us; but Japanese, Filipino, and Australian birds are about the same or cheaper. Mexican, Central American, Colombian, and Venezuelan birds, rather cheap. Indian and, still more, African birds are five or six times dearer than they are in Europe…
>
> "A few words in general on the birds one sees almost everywhere may be useful. With the exception of the firetails and Painted Finches, all Australian species are numerous and bred in large numbers. Gouldians do extremely well, and also Diamond Sparrows. There are only a few Parrot Finches, and all African Waxbills are rare, although they do well. Zebra Finches are common and very cheap; a silver and a white strain has been evolved. White and grey Java Sparrows are widespread. Other seed-eaters are scarcer than in Europe" (Delacour, 1937).

At that time, a leading Los Angeles bird breeder was J.C. Edwards, who, by 1928, was producing 15,000 budgies a year. The famed English aviculturist Arthur Prestwich (1929) remarked: "While the breeding of 'Buddies' [sic] is a business with Mr. Edwards, his hobby is rearing Finches and Lovebirds". In 1936, Edwards shared his perspective on California Finch breeding. He had this to say about African finches:

> "Most of the finches coming from Africa seem to do best in single pairs, with the possible exception of the Golden Breasted Finch and Cordon Bleu, the rest are usually rather scrappy among their own kind.
>
> It is possible to keep different varieties of them in the same cage but not two pairs of the same kind if you want to avoid fights and trouble.
>
> It is, however, possible to keep the offspring of a breeding pair together. Being reared in this manner they appear to get along peaceable [sic] with each other.

In these Africanders [sic] the Cutthroat is about first in line as a breeder, next come the Golden Breasted, the Cordon Bleu, Orange Cheeked Waxbills, and Fire Finches.

The Redcheeked Waxbills, Lavenders, Amadines [Red-head], St. Helenes have so far not proved themelves as successful breeders.

There are several other varieties of finches coming from Africa at times but they are so seldom obtainable and no breeding results in them are known to me.

The Combassous, Weavers and Wydahs in full color and plumage they are a most attractive aviary bird, also most interesting it is to observe them weave their artistic nests, but with the exception of some Bloodbill Weavers [Red-billed Quelea] few of these have been bred in California.

Anyway why fool with these when Australia supplies us with prettier birds that are mostly all peaceable, get along nicely together and have so far proven themselves as reliable breeders…" (Edwards, 1936).

A Tulsa Zoo female Red-billed Firefinch with no spots. Aaron Goodwin, photo.

Mr. Edwards' parting remark will be painfully familiar to those who, over the years, have attempted to build enthusiasm towards establishing one African finch species or another. At any rate, however, one might infer from his above remarks that someone had bred Red-billed Firefinches in California. However, I have come across nothing more definite than that. In fact, I am not aware of a definite US breeding prior to 1973, when the National Zoological Park, in Washington DC hatched and reared four (Duplaix-Hall, et al, 1975).

When the San Diego Zoo obtained its first four specimens of the "West African Fire-finch *(Lagonosticta senegala)*" (Stott, 1949) on 18 November, 1948, this was noted in three separate articles in the Zoological Society of San Diego's magazine (Anon, 1949, Orcutt, 1949, Stott, 1949), though this was at least partially due to their arriving with the zoo's first Great Hornbills and Black-necked Stork, from the Southern California Bird and Pet Exchange, near Los Angeles, after a storm-delayed ocean voyage made notorious when food for the elephants and other animals "had to be flown out and dropped in the sea where the distressed ship could pick [it] up" (Orcutt, 1949).

The post-war recovery of the 1950's resulted in a massive international bird trade, where birds were flown to Europe and then sent by ship to America (Zahl, 1953). A major importer was Louis Ruhe, Inc. which maintained a five story facility on 3rd Avenue, in Manhattan's Bowery. The Ruhe family had started in the bird business peddling canaries in the street in Germany in 1846 (Livingston, 1974) and commenced exporting them to the US in 1860 (Alan Shoemaker, pers com). By the 20th Century, Lous Ruhe, Inc. was a major source of large mammals for American zoos and circuses (Hanson, 2002), but maintained its status as a dealer in exceptional birds as well.

In 1953 Paul A. Zahl, who wrote and took pictures for National Geographic from 1949 to 1978, spent some days at Ruhe's New York facility, taking more than 3,000 photos, producing magnificent documentation of the remarkable birds arriving there. Among the 29 species presented in a resulting article (Zahl, 1953), twelve were African Finches. Dr. Zahl described "the small-bird room" where "tiny finches,… on arrival from abroad, were often released to join hundreds of others in a large wire enclosure…". He explained how Howard La Vine, who managed the collection, retrieved birds from this set-up: " As I pointed, say, to a certain Gouldian finch sitting on a set of branches in company with several hundred cordon bleus and zebra, fire, and strawberry finches, he waved the whole group into flight with one arc of the net wand. On the return sweep he almost invariable capture from out of the swarm the single specimens designated—and only that one!"

A single male Red-billed Firefinch, perched next to a male Zebra Finch in one of Dr. Zahl's photo chambers appears on page 90 of the January, 1953 *National Geographic.* This is the earliest published photo of a Firefinch in America of which I am aware (Zahl, 1953). The caption noted that "Fire Finches are sparrow-common in parts of Tropical Africa".

By the early 1960's, enormous shipments of African finches were continuously arriving in the US and continued to until 1972, when the Exotic Newcastle's Disease importation ban, and subsequent quarantine requirements were imposed. Red-eared Waxbills *(Estrilda troglodytes)* were everywhere, including such department stores as Sears, Woolworths, Montgomery Ward's, and White Front. Along with Orange-cheeked Waxbills, Cut-throats, Silverbills, and Strawberries, they were often subjected to $3.99 a pair "Sales".

I never saw Firefinches in department stores. I only remember seeing them twice in retail situations. My friend Donald Brock,

who died in 1983, owned a Berkeley, California Institution, "Brock's Bird Store" which his father had started before WWII. The counter of his little shop was lined with small cages full of canaries, waxbills, munias, and Zebra Finches. Back behind him on the wall were a few cages with single birds: sometimes a European Goldfinch, once, in the 1970's, a male Firefinch. The other time was the month in 1988 when I managed the birds and freshwater fishes at a short-lived pet store in San Francisco. I took the opportunity to order a single pair of Red-billed Firefinches from an importer. The male died the next day.

This is in keeping with the prevailing wisdom. *Finches and Soft-billed Birds* was written in 1963 by Henry Bates and Robert Busenbark, who founded the Palos Verdes Bird Farm, in Hermosa Beach, California, which operated from 1954 through 1989. This book has had a very broad influence on American aviculturists, as a "wish list" as well as a care manual. It is also a fascinating look at the 1960's, when imported birds were more affordable and easily obtained then at any other time, until the Newcastle's restrictions brought that to an end.

Lagonosticta senegala appears thusly in *Finches and Soft-billed Birds:*

> "Of the several species of African Fire Finches the Senegal or Common Fire is the most frequently imported, the lowest priced, and still one of the prettiest. It sometimes is called the Ruddy Waxbill.
>
> As with most Fire Finches, it is extremely delicate until it is acclimated. After that period, it becomes very hardy. Most importers separate Fire Finches from other finches upon arrival because of the necessity for extra care for the first two or three weeks" (Bates & Busenbark,1963).

Since it is not included in the species account on pages 136-137 of *Finches and Soft-billed Birds,* it is easy to overlook a note that Bates and Busenbark (1963) included with the caption of a photograph that appears in the color section at the back of the book, on page 510: "The South African subspecies *[l. senegala rendalli]* …is hardy right from the beginning but it is more rare and more costly. Both sexes are more prominently spotted then the regularly imported Senegal race…" Despite the fact that shipments of other Southern African finches such as Red-headed Finches, Violet-eared Waxbills, and Black-cheeked Waxbills came out of Botswana at least as recently as the 1990's, I am not aware of *L. s. rendalli* arriving with them.

Obviously from their own experience, Bates and Busenbark (1963) accurately describe this species as "among the most calm of all finches. They rarely panic; and, when a dealer tries to catch one in a net, most will circle the aviary and fly down to the floor. In fact, Fire Finches spend a great part of time near the ground and are much happier in a planted aviary which has some growing grasses. They are gregarious, happy, and peaceful but will protect their nests."

When they go on to state that "Fire Finches are probably the best breeders in the waxbill family" and proceed to present incubation as usually twelve or thirteen days, with the chicks fledging anywhere from between seventeen to twenty-one days", Bates and Busenbark (1963) do not mention any particular US breeding. It is thus not clear if they were speaking from observation or from the literature. As Bates and Busenbark devote a paragraph to recommend turning firefinches loose in gardens in the "summertime", one suspects some influence from their counterparts across the Atlantic, Boosey (1926,1956, 1959) and Brooksbank (1949).

After Newcastle's - American zoos

The Red-billed Firefinch's predisposition to travel poorly when freshly imported limited its presence in the enormous shipments of Red-eared and other waxbills that arrived in the pre-Newcastles quarantine days. It is ironic that it became a more familiar species in the mid 1970's, once African Finches were subjected to the month-long quarantine period. As happened from time to time, if a single finch showed signs of Newcastle's disease at any time during that period, all birds in the quarantine were either destroyed or returned to their country of origin. This automatically raised the price of a pair of Red-eared Waxbills from $3.99 to $40.00 a pair, with other species priced correspondingly. When all African finches became expensive more attention was focused on the species with established reputations for breeding in captivity.

I don't recall having seen Red-billed Firefinches in a public zoo before 1978, when San Diego Zoo exhibited them in an aviary

expressly intended to showcase African finches, converted from a former community parrot exhibit. (A single "Fire Finch" is included among the list of 249 birds of 100 taxa present in San Diego's Rainforest [today's Owens Aviary] not long after its opening on 21 July 1960 (Anon, 1961). Since its cagemates included both species of Cocks of the Rock, Indian and Javan Hill Mynahs, Toco and Keel-billed Toucans, and two species each of Motmots and Aracaris, it is not surprising that ZIMS [Zoological Information Management System] documents this bird arrived 39 August, 1960 and died 19 November, 1960. Intriguingly, ZIMS also documents this firefinch was donated by a Karl Kenyon, who subsequently donated four more in 1964. Whether this was the same Karl Kenyon, who as an employee of the US Fish and Wildlife Service was a recognized authority on Sea Otters and pinnipeds might now only be guessed at, but that zoologist did have a pronounced interest in ornithology…)

As mentioned earlier, the hatching of four chicks at the National Zoo, in Washington, D.C, in 1973, is the earliest clearly documented US breeding of which I am aware. As can be seen from Table I, six US zoos hatched this species in the 1970's, five in the 1980's, and four during the first seven years of the 1990's. This makes a total of 146 hatched (of which 79 appeared to have survived to independence) among 13 zoos from 1973 through 1996 (The final year for which the *International Zoo Yearbook* published breeding records).

San Diego Zoo stands out in the *IZY* records for hatching Red-billed Firefinches four years in a row, from 1979 through 1982, and once more in 1986, producing a total 35 chicks, of which nineteen reached independence. As it happens, 1984 was the one year that San Diego's breeding records were not submitted to the IZY, and three hatched and two survived that year, so, in truth, San Diego's actual total is 38, of which 21 reached independence.

From the data presented by ZIMS (Zoological Information Management System), it appears that none of the San Diego chicks that hatched from 1979 through 1984 were of known parentage. The possible parents were two males received from the Point Defiance Zoo in Tacoma, Washington in December, 1977, which died in November, 1979 and November, 1980, and three males and four females imported from the Taronga Park Zoo, in Sydney, Australia, June, 1978, of which the last female was gone by 1983, and the last male by 1986. There were ten 1979 chicks, divided among clutches that hatched in March, May, June, October, and November. In 1980 four hatched, all in October. Things picked up again in 1981 when fourteen hatched, from clutches that hatched in January, March, May, and October. The two that hatched in 1982 both did so in October. The three 1984 chicks hatched in March and April. None of these offspring were distributed to other collections. Neither were the five hatched in 1986, in September and December. The parents of the December 1986 bird were two of the four birds purchased from SE BIRD Bird and Supply Co, in June, 1986. Located in San Gabriel, California, that company was owned by Sigie Meyer, who will be well remembered by people who attended ASA functions in

Table I: RED-BILLED FIREFINCHES *(Lagonosticta senegala).*

EUROPE		
Copenhagen	1959	unspecified
Stockholm	1959-1960	unspecified
Helsinki	1961-1966	unspecified
Moscow	1964, 1966, 1968, 1972	14(5)
Stagsden	1966	4(4)
Wuppertal	1975-1980	56
Bochum	1978-1981	18
Chester	1978, 1995	4(2)
Berne	1984	2(1)
AFRICA and the MIDDLE EAST		
Port Elizabeth	1964, 1985, 1987	10+
Abu Dhabi	1982	1(1)
ASIA		
Beijing	1975	5
AUSTRALIA and NEW ZEALAND		
Sydney	1971-1972, 1974-1975 1977-1980, 1982	47(2)
Adelaide	1986, 1988-1992	34(5)
Auckland	1987-1988	4
NORTH AMERICA		
Washington, DC	1973	4
Columbia	1975	6(6)
Milwaukee	1977	5(1)
Houston	1978	2(2)
Memphis	1979	2
San Diego Zoo	1979-1982, 1986	35(16)
Philadelphia	1980, 1984	2
Columbus	1981	2
Pittsburgh (Aviary)	1981	3
Toledo	1988, 1990-1991	17(12)
Fort Worth	1993-1996	33(16)
Honolulu	994-1996	21(11)
Kansas City	1994	14(3)

(Compiled from the records of animals bred in captivity, the International Zoo Yearbook 1-36) (Zoological Society of London (1960-1998).) Josef Lindholm, Curator of Birds, Tulsa Zoo.



These three adult male Red-billed Firefinches all hatched at Tulsa Zoo, but display a range of variation in the amount of white spotting that would normally be associated with subspecific variation. However according to Derek Goodwin, birds from Tanzania may or may not display spots, suggesting a Tanzanian ancestry for Tulsa's birds. While spots are typical for West African birds, if anything, the Tulsa bird on the left appears to have more spots than the Fort Worth male, recorded as coming from Senegal, illustrated elsewhere in this article. Photo credits: Left and Center, Nick Walters; Right, Kyle Thomas.

the '80's and '90's. The same female, but paired with an unknown male (perhaps from the six birds purchased from Sigie Meyer in 1985), produced the four Sept. 1986 chicks. These were to prove the last for San Diego Zoo until 2015.

ZIMS also reveals that none of the chicks hatched in any of the other five US zoos that hatched Red-billed Firefinches in the 1970's, or the four others that bred them in the '80's (Table I.) went to other collections either.

While Tulsa Zoo did not hatch Red-billed Firefinches until 2013, two specimens that lived there in the 1970's are of interest. They were purchased from Bronson Tropical Bird Aviaries, in New York City, which appears to have succeeded Louis Ruhe, Inc, as the major US finch importer after the 1950's. From Tulsa's records, I found this pair arrived from New York 4 June, 1971. Details are not available to me, but I suspect they were kept with the Gouldian Finches which produced 10 chicks from 1974 through 1977. The female died 1 November, 1977, and the male died 1 June, 1979, three days short of eight years at Tulsa. For imported birds with such a reputation for delicacy, this is certainly respectable.

Richard Weigl, the distinguished German historian of captive animals, informed me of two extreme longevity records for *Lagonosticta senegala.* One he extracted from the classic work, *Contributions to our knowledge of the duration of life in vertebrate animals,* published in 1925 by Major Stanley Flower (1871-1946). Major Flower was Director of the Giza Zoo, in Cairo, Egypt, from 1898 to 1924. A specimen of the Ethiopian subspecies *(L. senegala brunneiceps)* lived there for twelve years and a month (Flower, 1925). The other record is for a bird that died at the Zoo in Barcelona, Spain, at the reported age of thirteen years and five months. As there is not corresponding documentation from Safari Zoo, on the Spanish island of Majorca (Mallorca), where this bird is reported to have hatched, this record may be questioned.

After Newcastle's - American private aviculture

An immediate response to the 1972 Newcastle's import embargo and quarantine requirements from the US avicultural communty was a concerted effort to establish Australian finches. By the 1980's, however, there was some serious interest among private aviculturists towards sustained propagation of African finches.

One voice advocating establishing African finches in the US at the end of the 1980's was the Memphis aviculturist Don Warmbrod, who also ran the Hollywood Pet Star chain of stores. With his wife Diane, he received AFA US First Breeeding Awards, 1983, for his 1980 successes with the Blue-billed Firefinch *(Lagonosticta rubricata),* as well as the Dybowksi's Twinspot and the Yellow-winged Pytilia (Thompson, 1989). His article, "The Challenge of African Finches", was published twice in *AFA Watchbird,* in issues intended to be distributed at CITES conferences.

In this article, he exhorted American aviculturists to work with African finches:

> "The attitude that if you raise Australians you raise finches, and if you raise Africans, you don't, is tragic! How many different mutations of Gouldians can there be before they become like budgies or chickens and what's accomplished from an avicultural point of view? …The pet trade has been through who knows how many millions of African finches and where are the self-sustaining, captive populations and who is establishing them? My friends, I don't see either… This is the American Federation of AVICULTURE and it's my feeling that most of us are doing not enough aviculturing, especially in the field of African Finches, which have been taken for granted for so long and yet their foothold in American aviculture is oh so precarious." (Warmbrod, 1989, 1991)

Scattered through the text of Don Warmbrod's previously-noted appeal to US aviculturists to work with African Finches are several observations on *Lagonosticta senegala:*

> "I have found…that Fires, Cordons, and Strawberries could all have active nests, which they built literally touching each other in the same bush, and in a perfectly peaceful community…Two pairs of Senegal Fires hardly take notice of one another.
>
> …Senegal Fires are considered fairly delicate, yet are among the very best breeders. Red ears and Orange Cheeks are extremely hardy but you also have a bear of a time trying to breed them. Some, like Cutthroats and Bronze-wings, I would not be particularly concerned with trying to breed with no live food at all, while the Fires and Lavenders I wouldn't consider trying to raise without live food, especially with imports." (Warmbrod, 1989, 1991).

In a phone conversation Don told me that with sufficient live food, firefinches can "cover you up with babies". He used small mealworms.

Terry Dunham was a key player in establishing Gouldian Finch mutations in the United States, as well as Starfinches and Chestnut-breasted Mannikins. Despite his well-deserved reputation with Australian finches, he was also another early out-spoken advocate for establishing African estrildids in America, in contrast to his previously-quoted predecessor J.C. Edwards (1936).

As mentioned in Part I, Terry Dunham (1986) made an effort to establish Red-billed Firefinches in the US by importing several pairs of Australian-bred birds. He observed: "They were domesticated, quite different from the usual wild-caught stock. I set up three pairs for breeding in relatively small cages, and within a month all three were on eggs. I removed the eggs from two pairs and fostered them under Society Finches. I left the eggs with the third pair, and they successfully raised two of three youngsters that hatched. This success, since I was not feeding live food, would almost certainly not be duplicated with wild-caught birds". I am not aware of any US Red-billed Firefinches today that are descended from Australian blood lines.

Terry Dunham wrote:

> "I've always believed that if importations of finches into the U.S. were to be cut off tomorrow, some of the birds we now characterize as the most readily available might quickly become the scarcest because we have not expended the efforts necessary to establish free-breeding populations of them. Quite simply, it has been too easy to go out and… buy a replacement… I hope my point is not overlooked: even the commonest of the African…. finches – and in some ways, especially the commonest ones – have not been mastered by American finch breeders." (Dunham, 1986, 77-78)

In a prophetic vein, he continued: "They ought to be, so that if government regulations—ours or other's change in coming years, these species will remain available to us from American-bred stock rather than via importation." (Dunham, 1986, 78). On 22 October, 1993, Public Law 102-440, which had been enacted a year before, came into force. Titled the Wild Bird Conservation Act, it ended the commercial import of birds listed on any Appendix of the Convention on International Trade in Endangered Species (CITES). Prior to this date, the listing of birds on Appendix III had had a minor effect on the international bird trade. While CITES-participant countries prohibited commercial trade in Appendix I species, and required documentation and government-issued permits for Appendix II species from any origin, Appendix III species only required paperwork from the country that requested that status.

On 26 February, 1976, the Republic of Ghana had a large variety of its wildlife listed on CITES Appendix III. This included most of the most familiar African finches, such as Red-eared Waxbills and Cut-throats—and the Red-billed Firefinch. This had a negligible effect on the international bird trade since mass exports of the commonest finches came from Sengeal and Mali. It was only in 1992, after the passage of the Wild Bird Conservation Act, that this listing impacted American Aviculture, with the prohibition of commercial importation of those species to the US, effective in 1993. African Finches not found in Ghana; East and Southern African endemics and several others, were not affected. Two Appendix III species, the Orange-cheeked Waxbill and Bronze-winged Mannikin are established as feral populations in the Commonwealth of Puerto Rico, a US territory, so that their importation to the US mainland is not controlled by the Wild Bird Conservation Act. Louis Viellot (1805-1809, 1979) recorded that the "Petit Senegali Rouge" had "multiplied in Cayenne [French Guiana, in South America] after several individuals imported from Africa escaped: nevertheless, they are still rare there." The presence of the "Senegal Finch" in French Guiana was also noted by John Latham (1823): " [Le Comte de] Buffon [1707-1788] mentions one of these being killed at Cayennne, but it had most probably been a caged bird, which had escaped." However, there are no known feral populations existing outside of Africa today. So Red-billed Firefinches were not commercially imported from 1993 until 2007, when, at the Request of Ghana, the birds listed from that country were removed from Appendix III, and were no longer controlled by the Wild Bird Conservation Act.

Post WBCA – Private Aviculture…

The 1990's saw an impressive series of articles on African finches published in *AFA Watchbird.* Most of them concerned rarer species, and none was entirely devoted to the typical West African Red-billed Firefinch *(Lagonosticta senegala senegala)*. Stash Buckley and Carol Anne Calvin, who maintained a remarkable collection of estrildids in their New Jersey basement and wrote an equally amazing collection of articles for *AFA Watchbird* in the 1990's (Thompson, 1995), did publish an account of birds they wrote about as *L. senegala brunneiceps,* and believed might belong in a different species (Buckley & Calvin, 1994, 1997). Not

only were the males a "much deeper red", with "no white dots" like those seen in the West African birds, but the vocalizations were distinctive: "…most un-firefinch-like…high, shrill and haunting" (Buckley & Calvin, 1997) the "contact call…much like a begging juvenile Society and their song similar to that of a Bar-breasted Firefinch *(Lagonosticta rufopicta)* (Buckley & Calvin, 1994). They observed it to be far more aggressive than other Red-billed Firefinches, and intolerant of other *L. senegala.* They noted: "In fact, we lost a hen Brunneiceps when a cock Senegal was housed close enough for her mate to see him. Since the cock Brunneiceps could not get to the cock Senegal, he killed his own mate in frustration" (Buckley & Calvin, 1997). Such behavior is unheard of in *Lagonosticta senegala senegala.*

The French aviculturist Aime Decoux, whose enthusiasm for *Lagonosticta senegala* was previously noted, received birds from Ethiopia, which be today's classification would be *L. senegala brunneiceps.* He referred to them as *"Lagonosticta brunneiceps".* He wrote:

> "In early June [1926] a Marseilles dealer sent me twelve of these little Waxbills, which had just arrived from Abyssinia. For some weeks I kept them indoors, in one of my bird-rooms. They seemed rather more delicate than the Common Firefinches, and I lost some from chills or bronchitis, for the temperature was then rather low. At the end of July there were only seven of them left, two adult cocks, a young one beginning to assume the adult plumage, and four hens. I turned out the cocks and three hens into a small outdoor aviary, thickly planted and with a comfortable shelter attached to it. We had put up some pine-branches against the shelter walls and on 4th September I found a typical spherical nest. It stood at about 2 feet from the ground, was made of hay and feathers and had two entrance holes, instead of one like the ordinary Firefinch's nest. This is perhaps the proof of a more cautious and timid character, for the second hole is evidently used to take flight if some enemy should approach the other. Every time one of the Firefinches entered the nest it shut the entrance hole with a feather, so that the nest appeared completely closed… Two young left the nest on 22nd September, about three weeks old… This species had not been previously bred in France, but it had been last year in Germany. Herr Karl Neunzig, the editor of *Gefiederte Welt,* wrote me that a pair reared seven young ones in two broods in his son's aviary." (Decoux, 1926).

As we understand it today, *L. senegala brunneiceps* is restricted to "Eritrea and Ethiopia above 1,000 m, E Sudan N down R Nile, S Somalia, and N Kenya " (Payne, 2010b). .In the days before widespread airfreight, when the Red Sea was a vital shipping lane (including what is now Eritrea), Ethiopia (or Abyssinia, as it was then called) was an important commercial source of birds. Thus *L. senegala brunneiceps* was available then. In the 1990's, East African Red-billed Firefinches *(L. senegala ruberrima)* arrived in the US from Tanzania, and as I suspect, were the birds identified by Buckley & Calvin (1994, 1997) as *L. senegala brunneiceps.* (Derek Goodwin (1982) designated the birds from Eastern Tanzania as *L. senegala somaliensis,* but his fellow ornithologist Robert Payne (2010b) restricts *L. s. somaliensis* to Somalia and adjoining Ethiopia and includes all Tanzanian birds in *L. s. ruberrima.* Goodwin (1982) mentions that Eastern Tanzanian

birds often have no spots. While Payne (2010b), in his text does not mention the absence of white spots in any subspecies, the painting of *L. s. ruberrima* on page 336 depicts no spots at all. Buckley & Calvin (1997) published a photo of a bird similarly devoid of spots. When I was maintaining finches out of doors at the Fort Worth Zoo in the 1990's I was horrified one morning to see a male Firefinch outside the aviary complex. A quick check revealed it was not one of the zoo's birds. It was shortly trapped and found to be have no white spots. It was also, on comparison with the West African birds in Fort Worth Zoo's collection a brighter shade of red – more reminiscent of tomatoes than the rose-red of the West Africans. I thus concluded this "fly-in" was an East African bird. Today, the regular appearance of both East African endemics, such as Blue-headed Cordon Bleus and West African birds, such as Black-and-White Mannikins , Aurora Finches, and Black-billed Firefinches, might lead one to think both West African and East African red-billed Firefinches may be represented in the current importations. As I will report further on, this appears to be the case.

While Buckley & Calvin's account of their "Brunneiceps" is the only AFA Watchbird article I am aware of that is devoted to any form of *Lagonosticta senegala,* the species is mentioned in several other *Watchbird articles* discussing African finches in general. As previously mentioned, Don Warmbrod (1989, 1991) recorded some observations.

Grant Rishman, in Victoria British Columbia, presented a brief profile of the "Senegal Firefinch":

> "These birds are not good travelers, requiring the utmost care and attention until they are established. At this time they are still reasonably delicate requiring a temperature no lower than 50F. In their natural habitat they are found around human habitation making them tame and confiding in captivity. One of the most even tempered of all birds, the Fire Finch spends a great deal of time searching the aviary floor for insects and seeding grasses. It is probably the easiest member of the waxbill family to breed and will nest in either a wicker basket or wooden box" (Rishman, 1992).

The longest *Watchbird* account of Red-billed Firefinches is that of the late Loyd Wright (1994), another proponent of African Finch aviculture, included in a summary of twenty years of observations from his Madill, Oklahoma aviaries:

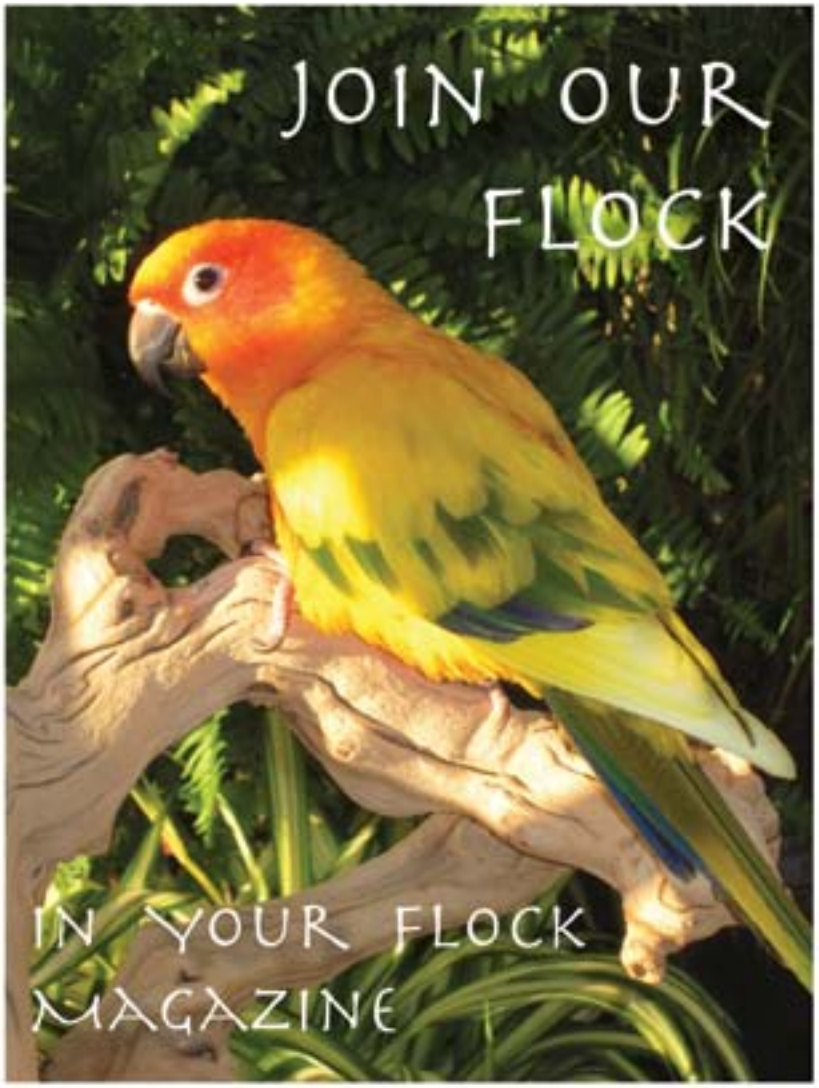
> "African Fires are more reliable in this regard [rearing chicks], but do not tolerate interference at breeding time and require more privacy. Infertile eggs are numerous among this species if too crowded as copulation is easily interrupted. They are very good breeders if in the right environment. I have successfully bred them in cages of approximately 3' X 3' X 2' as well as in a large planted greenhouse. In the cage arrangement they can be housed with other benign species such as Strawberries (Red Avadavat), Bichenos (Owl finches), Lady Goulds, etc., without interference." (Wright, 1994)

Lloyd's greenhouse was 10' X 16' X 8':

> "The greenhouse is full of many plants such as three bougainvillea loaded with blooms most all season…There are many ferns, clivia, gardenias, tropical hibiscus and baskets of impatiens and variegated airplane plants. There are many foliage varieties.
>
> In the years I have used this unit, I have learned what does well in it and what does not. The species I do not use in this situation are any of the singers *[Serinus],* weavers, Lady Goulds or Societies. The Societies, like the Zebras, are too noisy and will interfere with nesting. The Singers and Weavers are too aggressive... I feel the Goulds would be okay if not cage-raised only. They seem to be disoriented when in such a large area and will injure themselves. Temperature is kept about 60F with an automatically operated exhaust fan for ventilation in the summer. This unit now house five pairs of Gold-breasted Waxbills, three pairs of Strawberries, four pairs of African Fires, Five pairs of St. Helenas, six pairs of Redcheeked Cordon Bleus and on pair of Binchenos. There are many unsexed fledglings at this time and I have an auxiliary area that is opened for the birds to fly into and, when closed off, allows catching excess birds to keep this colony under control. Without this facility, catching would be impossible due to the dense foliage.
>
> The feeding program consists of a seed mixture of four parts finch mix, one part straight canary and one part parakeet mix. Meal worms and fly larvae wigglers are thrown three times a day in the breeding season and once a day during the non-breeding season. I use a mixture of Hard-cooked eggs with shells crushed to which is added vionate, wheat term, Skipio's high protein mix and Gerber's High Protein Cereal. The cereal is added to give a light and less dense mixture making it easier to dispense. Frozen mixed vegetables are put on top of the seed and the egg mixture on top of that to keep it cool. Nothing is left of the vegetable and egg food mixtures when the next feeding time comes around. In the breeding season, this is done morning and noon. If the nest has four or more chicks, I repeat this at night and it is always gone when I turn out the light around 9:00PM. The greenhouse operates on seasonal light only with a 60 watt night light on year around." (Wright, 1994)

Lloyd told me that, in his experience, Red-billed Firefinches and Red-cheeked Cordon Bleus which lost all their chicks in the first season usually raised them successfully in the next one. (Lindholm, 1993, 203).

I made Lloyd Wright's acquaintance in the 1990's, while I was working with African finches at the Fort Worth Zoo. In those years I corresponded with many American African finch enthusiasts. Two of them provided me with further notes on Red-billed Firefinches for a paper I presented at the 1993 AFA National Convention in Salt Lake City (Lindholm, 1993).



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One of a confiscated group of nine males received by the Fort Worth Zoo from the US Fish and Wildlife Service on 30 December, 1992, one of which sired 24 chicks from 1993 through 1995, as described in the text. John Wise photo

Diana Mosier, in Dallas, Texas converted a bedroom into a flight, connected to an outdoor window-box. There she maintained a pair of Red-billed Firefinches, along with several pairs of prolific African Silverbills (Mosier, 1993), a pair of Red-cheeked Cordon Bleus and a pair of Combassous (Village Indigo Birds *(Vidua),* the natural brood parasite of *Lagonosticta senegala* (Lindholm, 1993). The Firefinches raised their chicks on a diet of live food including ants, earthworms, mealworms, and fruit flies as well as a rich softfood of Ms. Moseir's own devising: "a cornbread concoction, which consists of three eggs, two tablespoons of beanut butter, and…water instead of milk" (Mosier, 1993).

Belinda Engstrom, in Kansas, parent-reared four chicks in 1993. Her pair shared a cage 2' by 4' by 4' in the company of a pair each of Auroras, Blue-headed Cordon Bleus and St. Helena waxbills. Her only live food was mealworms, but she considered "loaded soaked seed" to be "the most beneficial thing you can do to Africans". Ms. Engstrom "loaded" her soaked seed with cod liver oil, petamine, and other suppliments. (Lindholm, 1993).

Despite these promising efforts of the 1990's, it appears that by the time the CITES Appendix III listing was lifted in 2007, and Red-billed Firefinches could again be commercially imported, there was no predictably available source of captive-bred birds in the US, as there exists in the United Kingdom, Continental Europe, and Australia.

Post WBCA – American Zoos…

As, mentioned earlier, none of Red-billed Firefinches hatched in US zoos in the 1970's and '80's were sent to other collections.

Not long after I commenced my seven year tenure at the Fort Worth Zoo, I presented a paper at the 1992 Central Regional Conference of the AAZPA (as the AZA was then still known) on African finches as US zoo animals (Lindholm, 1992). During the '90's, especially after the passage of the Wild Bird Conservation Act, I attempted to promote zoo programs for African Estrildid Finches, through the AZA's Passerine Taxon Advisory Group. A number of African species were discussed during the intense meetings held in Seattle in 1995, resulting in the drafting of the first Regional Collection Plan.

Today, two species of African Finches are established in American Zoos, but both are Ploceid Weavers: The enormous White-headed Buffalo Weaver *(Dinemellia dinemelli)* which, in mid-2015, had a population of 99 distributed among 28 US collections, and the Taveta Weaver *(Ploceus castaneiceps)* (unknown in aviculture be for the late 1980's), whose mid-2025 population of 728 in 39 collections makes it the most abundant passerine in US zoos .

ZIMS documents that four US zoos bred Red-billed Firefinches in the 1990's (Table I.). Two of them did send offspring to other collections.

Of the five Toledo Zoo chicks that survived to independence, one, a female that hatched 2 September, 1990, was sent to Fort Worth Zoo on 25 April 1996, together with its father (purchased from the late Ed Hamilton, 15 June, 1989). They were returned to Toledo from Fort Worth 20 May 1997. The female died there 13 Feb 1999, and its sire died 25 January, 2000, at over ten years of age, a comparatively impressive record for an imported firefinch.

Fort Worth Zoo's involvement in firefinch propagation came about as a result of a US Department of the Interior confiscation of nine males imported from Senegal in 1992. The reason for this confiscation is unknown to me, but on these nine birds were

donated to the Fort Worth Zoo, where a program for African finches had been initiated in 1991 (Lindholm, 1992, 1993, 1994). They arrived 30 December, 1992. Seven were released in Fort Worth's World of Primates building, joining a collection of African and Asian birds (Lindholm, 1994). Another was exchanged to the well-known show judge, Clarence Wright, of Springtown, Texas, in exchange for a female, on 25 February, 1993. This female was paired with a male from the 1992 confiscation.

This pair was placed in an off-exhibit indoor aviary in March, 1993. Eggs were discovered in May, 1993. For reasons I cannot now remember they were fostered to Society Finches and died the day they hatched. The pair did not nest again until September, producing two chicks that hatched 10 October. Both of these were parent-reared and successfully fledged. Again, for some reason I cannot recall, the next five eggs, laid in December, were fostered to societies, with only one fledging though all five hatched.

In 1994, this pair nested twice successfully parent-raising single chicks in April and June. The breeding female died 18 July, ending propagation for that year. However, the female hatched 1 June, 1994 paired with its male parent, and in 1995, these two produced twelve offspring. An egg was hatched in a Grumbach incubator on 16 Janurary, with the intention of attempting to hand-rear the chick. However, it died the next day. Three more hatched in February from eggs fostered to Societies, but all died at a day of age. The three hatched in March were parent-reared, and all fledged. A single chick hatched in May was also fledged by its parents. Of the four chicks hatched and parent-reared in June, three fledged. As will be further discussed, all three went to other collections. In a weird coincidence, the breeding female died 18 July, 1995, exactly a year after its female parent.

One of the female chicks hatched in June 1995 produced all nine of the chicks hatched in 1996. Its mate was a male which hatched in the above-noted Oklahoma aviaries of Lloyd Wright, received at Fort Worth in March, 1996. The resulting pair's first chicks were three hatched in an off-exhibit outdoor aviary from 23-25 June, but all died 28 June, the victims, if memory serves, of fire ants. Three chicks that hatched 3-4 September were all successfully fostered by Society Finches, and two went to other collections. Whether the three that hatched from 22-23 September were fostered or parent-reared is not recorded, but all of them were fully reared and sent out of the collection.

Fourteen Red-billed Firefinches were sent from Fort Worth Zoo in 1997 – Fort Worth's total holdings. Changes in the zoo's administration led to a decision to end the finch propagation program initiated in 1991. After birds had been caught up for a shipment to Honolulu, a nest of three eggs was discovered and fostered to Society Finches. All three hatched 13 February, 1997. One died 3 March, but the other two, by then identified as females, were included among the two males and five females sent to Toledo Zoo, 20 May, 1997. Two of these were the above mentioned father daughter pair that had come from Toledo to Fort Worth 25 April, 1996, but the remainder all hatched in

Forth Worth, two in 1995, and one in 1996. In light of Toledo's previous successes through 1991, it is disappointing that none of these birds reproduced.

Likewise, none of the seven birds sent from Fort Worth to Honolulu Zoo on 18 February, 1997 reproduced there. These seven included the male from 1992 confiscation which sired all 24 of the chicks that hatched from 1993 through 1995, as well as the male from Lloyd Wright's aviaries that sired all nine of the 1996 chicks. The other five were all bred at Fort Worth, a male hatched in 1995 and two males and two female hatched in 1996. All were gone from Honolulu's collection by early 2000, Again, this is disappointing in light of Honolulu having hatched 21 and fledging eleven from 1994 through 1996 (Table I.) None of these were sent to other collections. Likewise, ZIMS documents that none of the eleven chicks surviving out of the fourteen hatched at the Kansas City zoo in 1994 were sent elsewhere.

From what I can tell, after Fort Worth's Zoo last Firefinches hatched in 1997, there were no further US Zoo breedings of this species until 2013, when Tulsa Zoo hatched nine. In 2014 60 hatched at Tulsa Zoo. On 25 November, 2015 the 59th and 60th hatched this year were discovered, and breeding activity remains at a high level…

That story will told in Part III, the final installment of this account.

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