

Animal Husbandry on the Three Southernmost Channel Islands: A Preliminary Overview, 1820–1950

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Abstract. The study provides comparative analysis of 120 yr of animal husbandry on 3 southernmost Channel Islands—Santa Catalina, San Nicolas and San Clemente. Compared to large mainland shepherding operations, the island industry was small, much less professional and mostly established when the mainland wool industry was in decline. Sheep grazing on the islands appears not to have developed as a stable regional economy or to have contributed to the art of wool raising in California. The cattle operation on Santa Catalina, which began in the late 1800s, is perhaps most significant for bringing the Channel Islands to the attention of the Vail family, which later established a profitable stocker operation on Santa Rosa.

Keywords: San Clemente; San Nicolas; Santa Catalina; cattle; sheep; Banning; Kimberly; Howland; Blair; Vail; Brooks; Wrigley; Propst.

Introduction

Santa Catalina is the largest, best watered and most heavily vegetated of the 3 southernmost Channel Islands. Santa Catalina also has been privately owned, whereas both San Clemente and San Nicolas have been controlled by federal agencies, first the Lighthouse Bureau and now the U.S. Navy. Additionally, while livestock was a principal interest on the latter 2 islands, sheep and cattle ranching on Santa Catalina have been ancillary to recreation and tourism, its primary economic base.

There are several general observations to be made about ranching on the islands:

1. Resources for such an undertaking were limited. All 3 islands have a semi-desert climate. Rainfall averages from 12 to 14 in. annually on Santa Catalina, approximately 8 in. on San Nicolas and 7–8 in. on San Clemente. San Nicolas has enough springs and seeps to provide fresh water for its 200 or so naval and civilian personnel, but water for the naval facilities on San Clemente is barged in (Hyder 1986b; Daily 1990). Although fog and a heavy marine layer can help compensate for inadequate water, vegetation is nonetheless affected. Island plants evolved as tender flora, unadapted to intense grazing.
2. At first glance, island sheep ranching seems to have had specific advantages. Fences weren't needed to keep stock from straying or as protection against encroachment. The islands were free from the bears, mountain lions, bobcats and other large predators that plagued mainland herds. Nor were they subject to raids by Native Americans and lawless whites who were known to confound southern California cattle and sheep ranchers, although in later years, island ranchers did have to contend with stock that was shot from offshore.
3. Furthermore, island ranchers, who were in the main either squatters (primarily on Santa Catalina) or leased the land from the government (on San Clemente and San Nicolas), were not affected by continually escalating mainland land values, a fact that must have made the islands particularly attractive in the land boom years following statehood (Hayes 1872; Robinson 1948).
4. Balancing these were the liabilities peculiar to the islands. Island sheep operations followed the old Spanish style of dividing sheep into flocks of from 1,000 to 1,500 animals, watched over by a single shepherd. On the islands, large numbers of sheep were often left largely unattended for long periods of time and became difficult to handle (Lester 1974; Roberts 1989; Roberts 1991). When rancher Walter Vail requested an exact count of the number of sheep on Santa Catalina, he was told by partner Frank Whittley that it would take at least a year to round up the approximately 1,000 animals thought to be on the island (Vail 1892b). A modern study of feral sheep on the northern island of Santa Cruz, suggests changes in fleece on sheep long removed from domestication (Warren).

5. Additionally, although sheep were able to survive on the overgrazed islands by feeding on less desirable vegetation such as ice plant, cactus, and woody shrubs, their fleece was often contaminated with burrs, and cactus spines. Buster Hyder, who ferried sheep and supplies to and from the various islands, recalled that sheep from San Clemente Island were so full of burrs that he and his boatman had to protect themselves against being badly scratched (Hyder 1986b).
6. Although all sheep ranchers suffered losses in drought years, such problems were more acute on the islands, where there was no easy way to move the stock to more well-watered areas. Speaking about the cattle operation on Santa Catalina in the first half of this century, former ranch manager, Doug Propst described the finely tuned equilibrium that is the bottom line of island ranching—balancing the number of livestock with seasonal variables in water and feed (Propst 1993a).
7. Transportation was another challenge. In the later 1800s, Walter Vail discovered, for example, that butchers were hesitant about Santa Catalina mutton because they couldn't depend on where and when it would be delivered (Vail 1892a). Arrangements for transporting livestock and supplies to and from the islands could be casual, expensive, and frustrating. Unlike rock from Santa Catalina, which was much in demand because it was cheaper to ship by water from the island than by road from mainland quarries, getting sheep and fleece to market was a potential liability. Hyder, who with his father provided virtually the only systematic cross channel transportation, noted the difficulties of landing sheep and supplies in inadequate harbors and under adverse weather conditions. Hyder lost his father in 1938 in rough surf off San Nicolas, and his body was never found (Hyder 1986a).

Animal Husbandry in California

Ranching in California began with Spanish missionaries who brought herds of long-legged, narrow-bodied, long-horned cattle north for food and later introduced Mexican churro sheep as industry for the mission's Native American converts. The padres apparently considered sheep raising an easier alternative to growing cotton or flax (Hayes 1872; Cleland 1975).

Ranching in California, largely focused in the "cow counties" of the south, was a comparatively effortless occupation well suited to a dry, arid land, with what seemed like endless open acres of range. Cattle ran wild, largely unattended, and were assembled only once a year for roundup. In the years before statehood, the hide and tallow business was virtually California's only industry.

With Mexican independence and introduction of breeding cattle, the California industry slowly evolved into meat production. Herds of cattle were driven north on the hoof to supply miners streaming into California during the Gold Rush (Cleland 1975).

It was a short-lived renaissance. A series of bad weather years brought alternating floods and drought, and post-statehood breakup of the large land holdings for agriculture and housing. In 1892, grazing land was so tight in southern California that Walter Vail noted it was impossible to rent pasture in Los Angeles, San Diego, or San Bernadino counties at a price "that will insure a profit except for the fattening or finishing of cattle" (Vail 1892b). One notable aspect of the early operations was the vast amount of open range needed to sustain cattle in sufficient numbers to be economically viable.

During the 1850s, large drives of sheep into California inspired careful observers to ruminate about California's sheep-raising potential—its mild winters, good feed, miles of unfenced land, and mountain foothills for late-season grazing. Contemporary estimates had it that 5–10 sheep could be fed on land needed for 1 cow, and with the importation of breeding stock from the east and implementation of organized ranching practices, sheep supplanted cattle as an important cash crop. The industry in California was driven in part by the disruption of the cotton trade by the Civil War and by the local demand for mutton (Cleland 1975).

Ranching on the Channel Islands

Evidence suggests that sheep-raising operators on the Channel Islands subscribed to neither of 2 then-prevailing myths about the industry—that sheep raising is an art (referring to the intricacies of breeding, etc.) or that sheep are among the most demanding of animals, requiring great thought and care (Powers 1884). For those who considered the industry an art, there were certain liabilities to be overcome in California:

1. Heat, especially in inland ranches such as parts of San Luis Obispo and Kern County, where sheep were known to seek shade by huddling together with their heads under each other's bellies; this applied less to island and coastal ranching.
2. Dust and burrs in the wool from herding on the open range.
3. Inconsistency in feed, resulting from failure to stockpile reserves. (Short feed was known to result in short wool and sometimes weak fiber.)
4. The system of semi-annual clips, which meant quicker return on investment but made for a shorter staple (fiber)—roughly half of the usual 2–3 in. (Hayes 1872).

In the mid-1800s, Milne's overview of the industry (1880) suggested the following stratification:

- a. The big sheep men—ranchers who owned thousands of acres, with sheep divided into flocks or bands of from 2,000 to 3,000 each and who left the day-to-day business largely in the hands of a *majordomo*. The Tejon Ranch where partners Beale and Baker had from 60,000 to 80,000 head and the San Joaquin and Arritos Ranches of Los Angeles County, with from 30,000 to 40,000 head apiece, were examples of this type of ranching.
- b. The smaller operator, who was limited by the amount of land he owned or leased, which restricted him to a flock of 5,000–10,000 sheep; he also tended to rely on someone to stay with the herd and oversee operations, although circumstances sometimes required that he also be involved.
- c. The "atom," the "parvenu," or "interloper," the small beginner who owned a handful of ewes and who with years of hard work might end up as the proprietor of a band of 1,000–2,000 sheep, which would make him "the big man on his block." This landless individual was in essence a nomad and was looked down on by the larger operators.

From what we currently know, it seems that Channel Island sheep ranchers fell into some combination of the latter 2 categories.

Origins

The exact origin of sheep ranching on the Channel Islands is vague. We know that on the northern islands, former otter hunter, fur trapper, and overland guide George Nidever put 50 sheep on San Miguel island in 1850, allowed the flock to multiply to 6,000 head until they ate the island bare of vegetation and then sold his holdings in 1863 (Ellison 1937; Roberts 1991). Without realizing it, Nidever, who knew little about ranching, probably initiated the tradition that prevailed on the islands until this century: the untrained/inexperienced entrepreneur taking advantage of what appeared to be a low cost or no cost investment.

We also know that squatters had settled on Santa Catalina Island at about the time that Thomas Robbins was granted the island in 1839 by the last Mexican governor of California, Pio Pico. Robbins is said to have wanted the island for ranching and farming, but his interest must have waned because within 4 yr he had passed it on to his brother-in-law, Jose Maria Covarrubias, who apparently sold it to land speculators (Johnson, unpubl. ms.). Nonetheless, by 1863, when the first census was taken by Union Army troops stationed at the isthmus, Santa Catalina was home to 22,000 sheep, 620 cattle, 10

mares and colts, and from 7,000 to 8,000 goats, roughly one grazing animal per every 1.6 a. (Gay 1989).

Aside from these circumstances, the first large-scale grazing operation on the southern islands was Martin Kimberly's on San Nicolas (Swanson 1993). Kimberly was a bit of a man-about-the-islands. He knew enough about the area to be among the first to locate a mining claim on Santa Catalina in 1863 (Guinn 1890) and to settle on Santa Cruz to raise sheep and pigs when his health failed around 1852 (Daily 1990; Roberts 1991; Swanson 1993). Kimberly was included on a mid-century list of individuals "prominently and publicly known as sheepherders," although the entry also included the information that he was located on Santa Cruz Island and that he was running English South Downs (Carmen et al. 1892). Forced to move from Santa Cruz, Kimberly set himself up on San Nicolas Island.

Of the organized efforts at sheep ranching on the 3 southern islands, Kimberly's appears to be the only 1 established during the heyday of the California sheep industry, the so-called Era of Wool, which spanned the 10 yr between 1870 and 1880. According to Swanson (1993) and Carmen et al. (1892) in 1880, there were more than 4 million sheep in California, and wool production was estimated more than 16,000,000 lb. This in marked contrast to 1850, when the United States Census located only 17,574 sheep in the entire state. In 1854, California contributed 175,000 lb of wool to the economy, and less than 20 yr later, the annual clip totaled more than 22 million lb and was valued in excess of \$6 million. The boom was short-lived, however. By 1891, the industry was showing signs of decline as the value of California's 2-million-plus sheep dropped to a little greater than \$4,000,000. Local trends reflected the statewide industry. In 1850, there were almost 5,000 sheep in Santa Barbara County; 3 yr later, the number had expanded to 65,550, and by 1870 there were 189,358 sheep in and around Santa Barbara, mostly of French or Spanish merino or a merino blend, much more valuable than the small churro sheep driven from Mexico in the early years.

Kimberly was in the main an absentee manager of his 15,000 animals (Roberts 1991; Swanson 1993). His operation on San Nicolas was run by a Lennie or James Crabbe, while Kimberly went off to hunt otter, his main preoccupation. In 1860, he was known to own 800 sheep, which produced a clip of 2,000 lb. A few years later, the flock was said to have almost tripled at 15,000 animals. A dry cycle kicked in 2 yr later, however, and many sheep were lost. The turning point for Kimberly was 1869; the 1870 agricultural census listed him as having only 3,400 sheep, which produced a clip of 30,000 lb, and for Kimberly the operation was over. Perhaps he had tired of the business, or perhaps having married in 1865, he felt the need to settle down in a more established occupation. Kimberly attempted to remove the sheep from the island for sale at auction in San Francisco, but despite his

efforts, 4,000 are thought to have been left on the island to forage on severely overgrazed vegetation.

A series of owners followed Kimberly, the most notable of which was Pacific Wool Company, which also operated on both San Miguel and Anacapa islands and seems to have held San Nicolas from 1870 until sometime in the 1880s (Daily 1990; Swanson 1993). Pacific Wool management was aggressive, but in the end its San Nicolas operations failed, and in 1875–1876 the company found itself on Ventura county's delinquent tax rolls (Roberts 1991; Swanson 1993). One of the Pacific Wool principals was Hiram W. Mills, perhaps the same individual who owned a lucrative wool operation on the mainland (Swanson 1993).

There appears to be little or no further organized ranching effort of much scope on San Nicolas Island until 1919 when E. N. Vail, nephew of rancher Walter Vail, took over the lease. The Vail family introduced something new to island ranching: experience and background in livestock management and a sensitivity to the resources of the natural environment (Daily 1990; Roberts 1991; Propst 1993a, 1993b; Swanson 1993). Realizing the condition of San Nicolas and the investment it would take to make the operation a success, Vail applied for a 25-yr lease from the Lighthouse Bureau, the agency that had acquired control of the island as of 1900. Vail's request was denied, although he went on to hold 3 consecutive leases culminating in 1934 (Swanson 1993).

Vail's activities indicated that he set out to establish a professional organization. He moved the center of operations from the east to the northeast shore between the east end and Corral Harbor (Brooks Landing), added a pier, erected fencing and established a rest rotation system to protect vegetation. The San Nicolas range was said to be in such dismal shape that Vail let it lie fallow for the most of the first years of his lease (Swanson 1993).

In 1919–1934, Vail took in an unlikely partner. Robert Moore Brooks was an easterner with a degree from Yale and a yearning for the outdoor life. Brooks held the lease on San Miguel, and in 1923–1924 negotiated a 1-yr arrangement with Vail to graze his drought-ridden San Miguel sheep on San Nicolas. The arrangement apparently appealed to both and was continued until 1933 when Brooks sold his 1,000 merino sheep in anticipation that the navy would soon take over the island. Vail's lease was up the next year, but sheep ranching continued under Roy Agee and L.P. Elliott who ran a flock of approximately 1,200 sheep until World War II (Daily 1990; Roberts 1991; Swanson 1993).

San Clemente Island

San Nicolas was not the only Vail interest on the Channel Islands. It is thought that someone in the Vail family ran cattle and sheep on San Clemente sometime in

the late 1800s before government leasing was implemented (Daily 1990), and it is possible the Vails became interested in San Clemente as a result of their operations of Santa Catalina (Gates 1893). Additionally at the time of E. N. Vail's interest in San Nicolas, Walter Vail had already established a cattle operation on Santa Rosa in partnership with J. V. Vickers.

Ranching operations on San Clemente Island were not well documented until the Lighthouse Bureau leases began in 1900. However, a traveler who visited the island just before then as part of a geological expedition described it as providing pasture for thousands of sheep and smaller numbers of cattle (Smith 1899). Wilson Cove, on the island's channel side, had been established as headquarters for the shepherders who were in residence mainly in spring and summer, the sheep being largely left unattended during the rainy season. At that time, "one old man, who had lived there for thirty years" had established himself not far from a "few rough buildings used by the sheepmen." According to the writer, the man was the Gallagher for whom the cove was originally named and who was also known to have either settled or visited Santa Catalina, where another cove is named for him (Johnson, unpubl. ms.; Bruce 1993). Rain caught and stored in tanks was the only source of water, although photographs accompanying the article show a windmill near the sheep and cattle corrals. The writer makes no specific mention of the origins of the cattle.

Members of the Howland family who emigrated from Santa Catalina to San Clemente were instrumental in establishing one of the island's more well documented operations. William Howland, a sea captain, settled with his wife on Santa Catalina, perhaps about the time Martin Kimberly was beginning his operation on San Nicolas. He made his home at the channel-side cove that currently bears his name and supposedly ran anywhere from 8,000 to 15,000 sheep. Later, Howland and son Charles removed their sheep to San Clemente, a decision perhaps precipitated by the stricter controls associated with James Lick's ownership of Santa Catalina. The Howland family was later involved in sheep operations on Santa Barbara, San Nicolas, and Anacapa islands as well as being principals in San Clemente Wool, the company formed to exploit that island for sheep. Buster Hyder, who sometimes lent a hand rounding up San Clemente sheep, recalled that one George Holland (Howland) lived on San Clemente for 25 yr with several acres under cultivation and had a windmill for fresh water. Hyder also remembered a Mr. Holland (Howland) and Mr. Whittle who raised horses and sheep on San Clemente and leased the island for 5 yr at a cost of \$15,000 (Hyder 1986a; Daily 1990).

Records kept from the turn of the century onward provide a more precise picture. The first of 2, 5-yr San Clemente leases, 1901–1909, was held by San Clemente Wool Company, whose directors included Charles T.

Howland, R. S. Howland and S. A. Howland, Rent was \$1,000, and the company spent \$5,000 for water development (Hyder 1986a; Hyder 1986b; Daily 1990). In 1914, Charles Howland assumed the presidency of San Clemente Wool, followed by E. G. Blair who bought out his partners, assumed sole management of the company, renamed it the San Clemente Sheep Company, and fortified the operations at Wilson Cove, erecting a barracks-style accommodation known as the Casa Blanca. Although he maintained an apartment in the building for his own use, Blair, like Kimberly, was also an absentee landlord and left most of the day-to-day operation to his son, Irvin, who supervised a crew of 5-7 men (Hyder 1986a, 1986b; Daily 1990). Blair is said to have installed dams, wool sheds, shearing pens, corrals, a blacksmith shop, barn, wharf and tanks for catching water. Hyder also remembered a compressing machine. To help control the traffic of fishermen on and around the island, Blair issued annual leases at \$5 apiece.

Given conditions on the island, the prospects for long-term viability as grazing land seem limited when we consider estimates that during his lease, which lasted until 1934, Blair ran from 11,000 to 12,000 sheep on San Clemente's 36,000 a. of meager vegetation (Daily 1990). A good rule of thumb at the time was one sheep per acre of reasonable quality land, flat or rolling, and with some thought given to rotating pasture (Hyacinth 1870).

To understand the impact at that time of this number of sheep on island rangelands similar to those of San Clemente, as well as the prospect for maintaining a lucrative long-term operation of this sort, it is helpful to review modern studies of the effects of uncontrolled grazing on other Channel Islands. An investigation of the impact of feral sheep on Santa Cruz, for example, sheds some light into the sheep-vegetation equation and suggests the kind of efforts that would have had to have been undertaken to insure the long-term viability of a large-scale island operation (Van Vuren 1980). Observing conditions after years of grazing by feral sheep, the investigators made the following observations about Santa Cruz Island. With *light use* of the range (8 animals per 100 a.) sheep trails were seldom worn to bare ground, and there were few if any areas of denuded vegetation. In areas that were *moderately used* (36 sheep per 100 a.), it was evident that sheep were feeding on shrubs and trees, but their impact was not severe, although even in moderate use, a substantial number of sheep trails were worn to the bare ground and there were evident but not dominant denuded areas. In *heavily impacted* areas (85 sheep per 100 a.), grasses were mostly or completely consumed and browse lines on trees and shrubs were extreme. Many or most sheep trails were worn to the bare ground and denuded soils were evident. Applying these observations, the investigator estimated that more than one-third of Santa Cruz Island was being used by sheep at densities that are greater than twice as large as those permitted on a well-managed sheep ranch.

If areas of moderate use are also included in the calculations, he concluded half the island was supporting greater than normal sheep densities and that, "Clearly sheep densities over most of Santa Cruz vastly exceed any reasonable definition of carrying capacity . . ."

And what were these sheep eating? Thirty-three percent of their diet included grasses and grass-like plants; 17% was forbs and 38% browse—woody shrubs, trees, etc.—as compared to domestic sheep, which seldom eat more than 20% browse.

Researchers investigating the effect of feral goats on the vegetation of Santa Catalina Island concluded that as the number of herbivores increased, vegetation density and the nutritional quality of the remaining forage decreased. Additionally, such increases in the number of animals also affected the rate of increase of marginally utilized or non-utilized plants such as prickly pear cactus and white and black sage, which had increased tremendously in areas of high goat numbers on Santa Catalina (Coblentz 1977).

Given conditions on San Clemente, where ground cover is much less dense than on Santa Cruz, where there is considerably less woody vegetation than on Santa Catalina, and where the topography is steep and rugged, it seems likely that a similar prognosis would apply: with Blair's 11,000 sheep, the island was being grossly overgrazed. Adding to the impact on the range was the presence of a substantial goat herd.

Santa Catalina Island

In the late 1800s, Ukiah sheep rancher Sam S. Baechlel, in business with his brother, described their method of operation: "Have lots of qualified shepherds, have as many sheds as separate fields; keep hay for bad weather; sheep should not be confined; best hay is the native grasses of the country; in low conditions, feed sheep grain, barley is best" (Carmen et al. 1892). Another observer quoted by Carmen et al. suggested combining animal husbandry with a limited farming operation: grow roots, feed them to the sheep; fertilize the fields with sheep manure; grow hay against droughts. The same writer observed that breeders in the eastern United States have smaller flocks than ranchers in California, that they feed them consistently and provide shelter. Drought in fact, has always been a limiting factor in western ranching operations. One long-time cattle cowboy observed, for example, that in any ranching operation that depends on rain to grow feed, success is "about 40 percent luck [a good feed year] and 60 percent knowledge . . ." (Powers 1988).

Correspondence between cattle rancher Walter Vail and the Banning brothers concerning a proposal to run sheep and cattle on Banning-owned Santa Catalina Island offers insight into wool production on the islands generally. Vail had entered into an agreement with Santa

Catalina rancher Frank P. Whittley, wherein Whittley offered Vail a one-half interest in all his sheep, horses, cattle, and equipment in exchange for which Vail agreed to provide 300 head "of 2-yr-old cattle of the brand of 1890" and 300 yearlings "of the brand of 1891" (Whittley and Vail 1892). In an April 1892 letter to his friend Hancock Banning regarding this transaction, Vail relates considerable concern regarding the way in which island stock operations had been conducted up to that time. To insure that the current venture would be off to a solid start, Vail suggested immediate steps be taken to ascertain how much stock was on the island and to keep "a strict account" of "everything that leaves and price paid." As a bottom line, Vail wanted to know "for a certainty" the number of sheep currently on Santa Catalina Island and what the associated costs of the operation had been. In subsequent correspondence, Vail made it clear that he did not distrust partner Whittley but that he was concerned about the casual way operations had previously been handled, specifically that Whittley "may not be as particular as he should be in regard to prices" (Vail 1892a).

Reassuring the Bannings of his continued interest in the island, Vail forecast that the venture would be a paying one. In a telling statement, he also noted that he had yet to find anyone who had been interested in the island who had not made money, although "none of them can give figures to show what their investment or profit have been." He noted his concern that this might be the same with Whittley, "unless we succeed in starting in right."

Continuing to explain his view of island ranching, Vail made a suggestion that Santa Catalina operations would be more profitable if the number of sheep on the island were reduced by half. His suggestion is meaningful for 2 reasons: (1) it suggests that professional standards for animal husbandry did exist at the time among knowledgeable ranchers, and (2) it suggests that such standards and practices were not in effect on the islands. In what may seem obvious to us now, Vail noted that lessening the load on Santa Catalina's rangelands would "be much better for the island and for those interested in grazing."

Vail's interest in Santa Catalina came immediately on the heels of the Bannings' purchase of the island. Although the Bannings' primary purpose was to develop Santa Catalina as a vacation destination, the brothers had apparently decided to seek an organized approach to the sheep business they inherited (Anonymous 1917). Previous to the Bannings' tenure, control of island sheep had been in the hands of 3 individuals. William Howland used the central part of the island for range; Frank Whittley, son of Thomas Whittley, an original settler at the isthmus, was headquartered at White's Landing and used the east end for range; and John Johnson, who lived at Emerald Bay (then called Johnson's Landing) and used the west end for range (Johnson, unpubl. ms.). At some point, the three men "bought miscellaneous holdings" of island property, probably from James Lick at the time he

initiated his efforts to remove squatters from the island, and Whittley apparently emerged as a local leader. He had a boat and a house in Avalon Canyon, and it is thought that he was placed in charge of the island for George Shatto who purchased Santa Catalina from the Lick Trustees in 1877.

The shearing pens for the various Santa Catalina operations were centrally located in Avalon, 300 ft back from the main street (now Crescent Avenue) about where Sumner Street is now located. This suggests that the wool was shipped out of Avalon Harbor. The Bannings subsequently changed this arrangement, using the pier at the Empire Landing quarry on the channel side just east of the isthmus. Shipping for cattle operations under Wrigley family management was out of Whittley's old headquarters at White's Landing (Banning 1904; Propst 1993a).

The Vail relationship with Santa Catalina was brief. In the dry year of 1893, Walter Vail was writing the Bannings to discuss the legalities of removing his stock from the island and being compensated for buildings and other property associated with the business (Vail 1893). The Bannings apparently did not give up on ranching, however, and as of 1901, the brothers were on record as owning three-fourths interest in the Banning Wool Company, which was described as controlling all sheep on Santa Catalina Island (Banning 1901). In a 1904 letter to George S. Patton, a partner in the Santa Catalina operations, Hancock Banning reported he had just sold \$2,300 worth of wool at 10¢/lb and that during the last 2 wk, he had arranged a \$2,500 sale of sheep at \$3 a head "and upward." Banning indicates that he had personally been concentrating on the sheep operation, which "notwithstanding the dry year, is exceeding our expectations . . . It looks as though all we need is a little rain each year so that the business will net from \$15,000 to \$20,000" (Banning 1901).

It was known that the Banning brothers differed on issues of management related to the island (Renton 1993), and the viability of sheep ranching must have been one of them. A 1917 company memo discussed pros and cons of the industry and concluded that the operation should be run internally, this despite the fact that the Bannings were essentially real estate investors/developers and had little direct experience with animal husbandry. It appears, however, that operations were indeed leased out to a "Mr. Baker and Mr. Mauer," presumably of the Mauer Cattle Company which in 1916 leased the entire island except Avalon and ran both sheep and cattle (Anonymous 1917).

Removal of Santa Catalina's sheep coincided with the purchase of Santa Catalina in 1919 by William Wrigley, Jr. Cattle, however, remained on the island until the 1950s when the size of the herd had grown to 5,000 head. Given conditions at the time, these numbers indicated that Santa Catalina was overstocked. A 1954-1955 report of the Soil Conservation Service of the U.S. Department of Agriculture notes:

At present, there is very little native feed on the island. Actually the entire island is far beyond the proper utilization stage; that is, for protection of the soil and growth of next year's feed crop. The cattle are entering the dry season with practically no feed to carry them. And cattle that remain on the island must be fed. Whether this can be done economically is doubtful. My recommendation would be to remove all cattle as soon as possible (Reconnaissance Survey 1954).

In subsequent correspondence with Doug Propst, the agency estimated a total of 5,225 animal units (adult cow equivalent) using the island range, which given resources at the time could only support 440 animal units. The letter concluded with the reminder, "In range management it is essential to keep the available forage and animal population in balance to allow for forage plant recovery and seed production to perpetuate the species" (Cureton 1955). Livestock of course was not the only problem on Santa Catalina; there were also pigs, deer, goats and bison.

The Mauer Cattle Company had apparently run a cow and calf operation on Santa Catalina, a potentially difficult arrangement in a semi-desert climate such as exists on Santa Catalina. It requires careful balancing of available feed and number of animals. Even then, return on investment is subject to trends in the cattle market. Cattle prices were known to be high in the period of the First World War, and Santa Catalina managers were apparently able to find a good market for their cattle. Of the 2 other cattle operations on the Channel Islands, the Stantons ran a cow and calf operation on Santa Cruz and the Vails run a stocker operation on Santa Rosa (Daily 1990).

It was in the period after the war that the Wrigleys apparently decided to assume direct management of the Santa Catalina cattle. In 1925, the former Mauer cow and calf operation was phased out and under the direction of manager Jack White, half-bred brahma steers were introduced (Johnson, unpubl. ms.; Propst 1993a). A drop in the post World War II market made it difficult to sell Santa Catalina stock, which created an imbalance between livestock and resources, and White was forced to keep more animals on the island than was prudent, conditions that eventually led to the overgrazing observed by the Soil Conservation Service.

The Wrigley cattle operation¹ was discontinued in the late 1950s. Like the Bannings before them, the Wrigleys were not experienced ranch managers. At the time the cattle were removed from Santa Catalina, cottonseed cake was being imported to supplement the meager island range, and the cattle were feeding on singed cactus from which the spines had been burned off (Sanders 1968; Propst 1993a). The exit of cattle from Santa Catalina in

the 1950s concluded the era of ranching on the southernmost of the Channel Islands, leaving Santa Cruz and Santa Rosa to continue a tradition whose roots extend back to the earliest days of California.

Conclusions

Questions about island ranching remain: the need for more precise verification of sheep and cattle numbers; more accurate information on ownership; more enlightening information on the individuals involved; more insight into how the operations were actually run and whether they were indeed fringe operations or in some way advanced the cause of animal husbandry in southern California, or at the least offered insight into how to manage livestock under adverse conditions.

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