Urban systems in the Roman Near East: historical and functional dimensions of urbanism in Roman Syria, Mesopotamia, Palestine and Arabia

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Chapter 4 Antioch and its territory

In chapter Chapter 1 it has been demonstrated that Antioch-on-the-Orontes was by far the largest city of the Roman Near East, with a built-up area of perhaps 500 hectares. We also happen to know that Antioch had a huge administrative territory, with 4,500 km^2 representing a reasonable estimate for the amount of land controlled by the city. These observations raise a number of further questions.

One of these concerns the capacity of Antioch's rural territory to sustain the urban population. In an article which appeared 40 years ago, Hopkins argued that the food crops produced in Antioch's territory cannot have been enough to feed the city. On this basis he asserted that the city must have imported large amounts of food from other areas.[763] Since these imports had to be paid for, it would follow from this that Antioch also exported large amounts of manufactured goods. The validity of this line of reasoning can only be assessed by estimating the size of the urban population and by comparing the outcome of this exercise with population estimates based on the carrying capacity of Antioch's rural territory.

The vast size of Antioch's administrative territory also raises important questions regarding the economic functions performed by the cities and towns of the Roman Near East. As has been explained in Chapter 3, in pre-modern societies the typical catchment area for a market town is believed to have been a two to three hour walking distance, corresponding to 10-15 kms (depending on terrain conditions).[764] A large proportion of the population of Antioch's territory lived beyond this 2-3 hour radius, if Antioch was the only urban market centre. At the same time studies of pre-modern societies strongly suggest that markets played an important role in the rural economies of most pre-modern societies.[765] Against this background we should consider the possibility that Antioch's vast territory contained a considerable number of 'secondary agglomerations' which served as market centres for the inhabitants of the surrounding rural districts. Do we have any archaeological evidence for the existence of such secondary centres? And if such centres existed, were they spread in such a way that most or all of the inhabitants of Antioch's administrative territory lived within walking distance of at least one secondary town or village providing various 'central-place' functions?

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[763] Keith Hopkins, 'Models, Ships and Staples', in *Trade and Famine in Classical Antiquity*, ed. Peter D. A. Garnsey, Keith Hopkins, and C. R. Whittaker (London: Chatto & Windus, 1983), 89.

[764] Willet, *The Geography of Urbanism in Roman Asia Minor*, 157–58; Bintliff, 'Going to Market in Antiquity'.

[765] L. de Ligt, *Fairs and Markets in the Roman Empire: Economic and Social Aspects of Periodic Trade in a Pre-Industrial Society* (JC Gieben (Amsterdam), 1993).

4.1   Territory size, population and urbanisation

4.1.1   The size of Antioch's administrative territory

The extent of the Antiochene is relatively well defined. In their study of the dead cities, Tchalenko and Seyrig were able to distinguish between the Antiochene and the territories of its surrounding cities on the basis of the eras used on dated inscriptions, as the other cities kept using a Seleucid era, while Antioch's was a Caesarian era, starting in 49 B.C.E..[766] Following from that, the southern part of Jebel Zahwiye was shown to be Apamean territory, but the northern half of that jebel (from Ruweiha and Rayan) used an Antiochene era. The same counts for inscriptions from several locations in the northern jebels.[767] This has also been confirmed by J. and J. Ch. Balty, who identified a number of villages described as being part of the Apamean territory, which had been mentioned in inscriptions found throughout the empire. The villages correspond well to the border given by Tchalenko and Seyrig, as none appears to lie north of Al-Bara.[768] Towards the northeast, the inclusion of Gindarus to the Antiochene is also proven this way, as mentioned by Cohen, although following Strabo, Gindarus would still have been considered as part of the Cyrrhestice.[769] But besides an Antiochene era inscription from 106 C.E., the place is also mentioned several centuries later by Theodoret as a village controlled by Antioch.[770]

For determining the western limit of Antioch's territory, the map by Seyrig and Tchalenko falls short. However, between Antioch and Seleucia, the border must have lain somewhere south of Daphne. Without any better data, the best approach available here has been to take as a limit the mountain stream called Büyuk Karaçay, ancient Melas, roughly hallway upstream from the shore to Antioch.[771] Considering however the limited distance between Daphne and Seleucia and the mountainous terrain between them, the difference caused by taking a border closer to Seleucia would only make a limited impact on the overall picture (at most 60 km²). For the remainder, a straight line has been drawn towards the westernmost site surveyed by Tchalenko. The resultant area can be seen in Figure 52. Clearly, this extends a lot further than the 2 to three hour

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[766] Georges Tchalenko, *Villages antiques de la Syrie du Nord: le massif du Bélus à l'époque romaine*, vol. 1 (Paris: Geuthner, 1953), 422–23 note 3; Tchalenko, *Villages antiques de la Syrie du Nord*, 1953, 3:11-14: inscription 10a; 57 fig. 7.

[767] Tchalenko, *Villages antiques de la Syrie du Nord*, 1953, 3:22 no. 21; Georges Tchalenko, *Villages antiques de la Syrie du Nord: le massif du Bélus à l'époque romaine*, vol. 2 (Paris: Geuthner, 1953), plan LXXX.

[768] Janine Balty and Jean-Charles Balty, 'L'Apamène Antique et les limites de la Syria Secunda', in *La géographie administrative et politique d'Alexandre à Mahomet: actes du colloque de Strasbourg 14 - 16 juin 1979* (Brill Archive, 1979), 57–59, 72 note 147, 73: I was unable to locate 'Zabboude', 'Kerratın', 'Rbe'a', 'Meyzın' and 'Bsilla'.

[769] Strabo, 16.2.8.

[770] Cohen, *The Hellenistic Settlements in Syria, the Red Sea Basin, and North Africa*, 170–71, referring to Theodoret, Philotheos hist. 2.9.

[771] Pamir and Brands, 'Asi Deltası ve Asi Vadisi Arkeoloji Projesi: Antiocheia, Seleuceia Pieria ve Sabuniye Yüzey Araştırmaları 2004 Yılı Çalışmaları', 99, image 1.

'market' zone from chapter 3.2.1.3 would allow. In 4.2 we will take a closer look at the secondary agglomerations that may have fulfilled an intermediate role throughout the area.
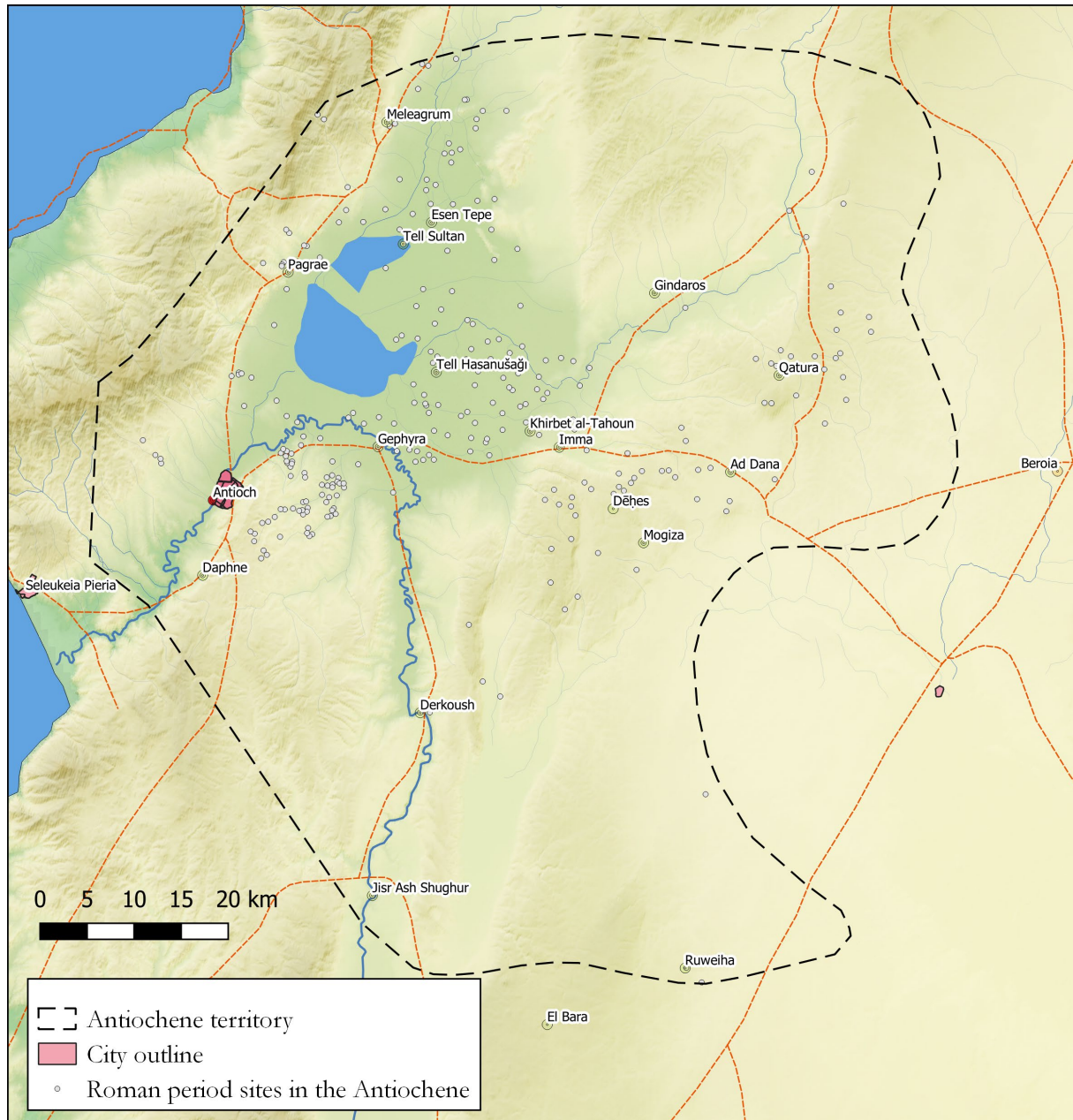

Figure 52 The territory of Antioch

In Figure 53 the areas marked in grey and dark green (42,000 hectares) indicate mountainous areas unsuitable for habitation or cultivation due to high slope and elevation, 28,000 consisting of the wooded mountain slopes of the Amanos. Furthermore, in red, there are large sections of rugged or broken terrain with a high variation between changing elevation and flat areas. These would probably only be partly cultivable, and amounts to about 202,000 hectares. Secondly, the dashed grey zones show those parts of the territory for which no survey data are available (20% of the region), and in fact overlap three quarters of the area marked as rugged terrain, leaving

55,336 hectares of rugged terrain in the Jebels that were surveyed. Liebeschuetz estimated the total area mapped out by Seyrig to be between 600,000 and 700,000 hectares.[772] Measurements of the area mapped here show that he is essentially correct, with 653,300 hectares, minus 42,000 hectares of uninhabitable terrain and at least 6,000 hectares for the lake, leaving 605,300 hectares of cultivable land in the Antiochene territory. Of course it is possible that habitation had not spread throughout the entire territory around 250 C.E. In fact, the evidence collected by Tchalenko suggests that the fourth and fifth centuries witnessed significant population growth in the Massif Calcaire.[773] For the purposes of the present study (which focuses on the mid-third century C.E.) the estimate of 605,300 hectares must therefore be regarded as a maximum figure.

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[772] J. H. W. G. Liebeschuetz, *Antioch : City and Imperial Administration in the Later Roman Empire* (Oxford: At the Clarendon Press; London etc, 1972), 40–41.

[773] See also Jesse J. Casana, 'Mediterranean Valleys Revisited: Linking Soil Erosion, Land Use and Climate Variability in the Northern Levant', *Geomorphology* 101, no. 3 (15 October 2008): 437, 439, https://doi.org/10.1016/j.geomorph.2007.04.031.
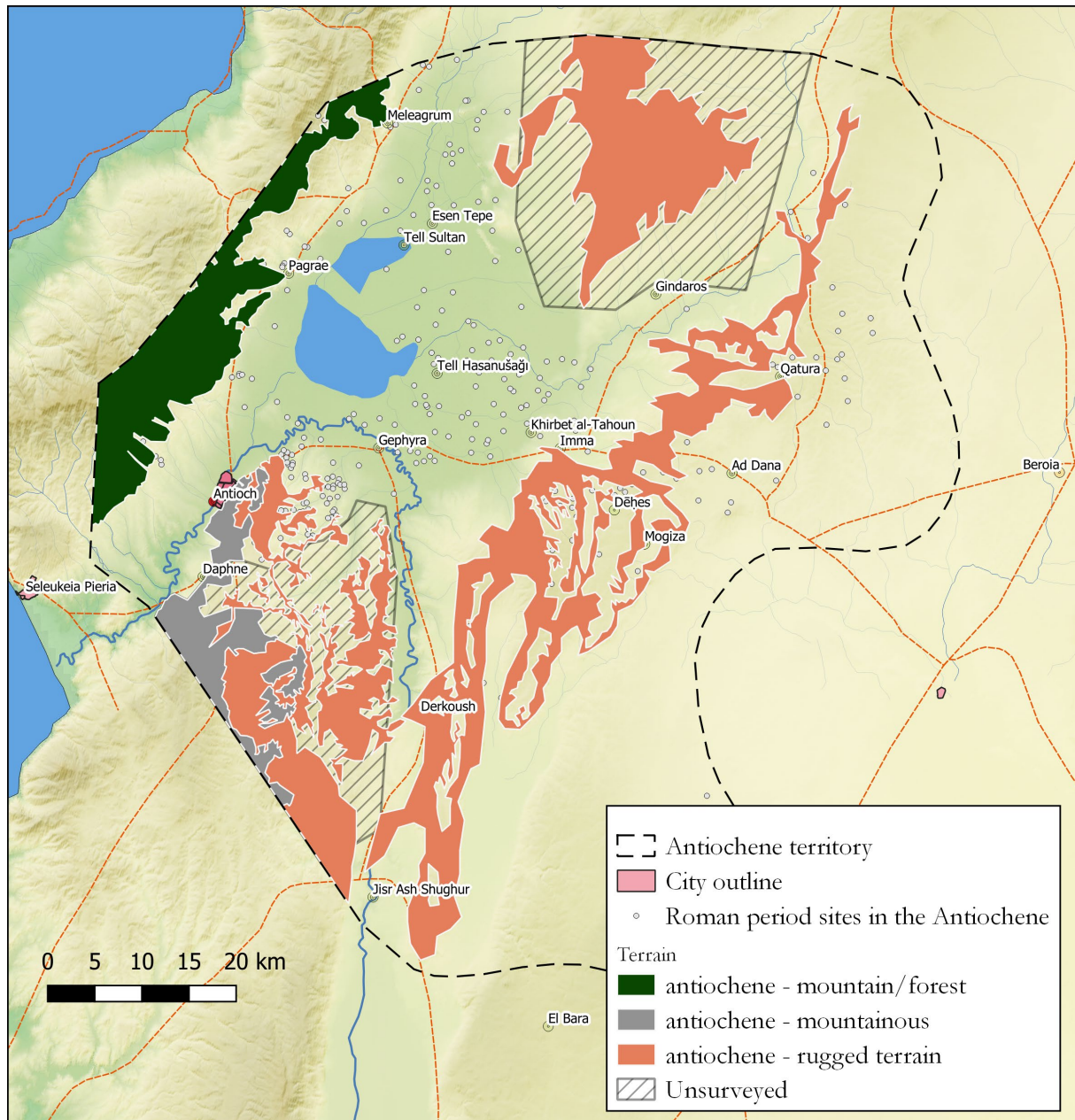
Figure 53 Antiochene terrain with terrain classification

In 1938 the province of Latakia, the most densely populated province of Syria at that time, had 0.61 inhabitants per hectare (including non-arable land). However, as Liebeschuetz observed long ago, overall population densities in the territory must have been higher, for the simple reason that in 1938 only half of the arable land was actually under cultivation.[774] In an article dealing with early-Byzantine Syria, Peña (1997) calculates that the 61 villages of the Djebel Barisha had 21,000 inhabitants, implying an average density of 1 person per hectare for this area. For the Djebel A'la he calculated a density of only 0.53 inhabitants per hectare, but this might be due to a lower rate of preservation of archaeological remains. On any view the

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[774] Liebeschuetz, *Antioch*, 41 note 2.

population of the city must be added to that of the densely populated countryside. Based on these admittedly imperfect indications, the average population density in Antioch's rural territory may be estimated as at least 1 person per hectare of arable land, implying a total population estimate of *c.* 600,000 (for city and territory).

4.1.2 Urban population densities in the Roman empire

In an article dealing with the size of urban populations in the Roman empire Andrew Wilson argues that urban population densities are likely to have ranged between 100 inhabitants per hectare and 400 inhabitants per hectare, with 150-250 inhabitants per hectare representing the most common values. Higher concentrations are known in Rome and Ostia, but in a similar fashion he writes that in Alexandria, and if Alexandria had a population of 500,000, as may well have been the case, it would have been 517 inhabitants per hectare. Wilson claims the latter figure to be "high, but quite conceivable, given the likelihood of multi-storey apartment blocks in the capital [of Egypt]"[775] His figures only focus on the intra-mural parts of the city, but subtract areas of uninhabitable terrain and use a lower average density for monumental areas.[776]

For the cities of Roman Africa as a whole Wilson operates with a high urban population figure of 200 persons per hectare. This figure is based on an analysis of urban population densities in a handful of city quarters displaying an orthogonal lay-out, such as Timgad. We can be certain that population densities in many unplanned cities in Roman North Africa were considerably lower. For the cities of Roman Asia Minor Wilson operates with an estimate of 150/ha. While such a figure looks realistic for some cities, it has been criticised as too high for urban centres which were loosely organised (Willet 2020). In the case of Egypt Wilson arrives at densities of between 156 and 185/ha, but Memphis is credited with between 185 and 258 inhabitants per hectare/ha, Hermopolis Magna with 232-247 inhabitants per ha. The biggest exception is Alexandria, with perhaps more than 500 inhabitants per hectare.[777].

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[775] Andrew Wilson, 'City Sizes and Urbanization in the Roman Empire', in *Settlement, Urbanization, and Population*, ed. Alan Bowman and Andrew Wilson (Oxford University Press, 2011), 176–77, 185 but note that the basis for the population of Alexandria is no stronger than that of Antioch. The figure might be significantly lower.
[776] Wilson, 170–71.
[777] Wilson, 183–87.

4.1.3   Population densities in the cities of Ottoman Syria

There is a significant amount of demographic data available from several centuries of Ottoman rule in Syria, among which the 19th century *salnames* (yearbooks) of the vilayets (provinces) Haleb and Suriye are of particular value.

Of course, figures from the 19th century can in no way be applied as a substitute for data lacking in the Roman period. Too many differences in political, social and economic organisation, ranging from different forms of territorial organisation, land ownership and taxation to altered attitudes towards commerce and inheritance, clearly stand in the way of that. In addition, the 19th century itself saw a number of reforms or attempted reforms in all those fields. Furthermore, while industrialisation may have come later, the Ottoman Empire certainly did not remain untouched by global economic changes.[778] Nonetheless, the 19th century Ottoman data offer the most detailed perspective on a still mostly pre-industrial society in the same area that is being studied here. As such, it can provide a frame of reference or highlight the possibilities for other periods.

Since the territory of Roman Antioch lay within the boundaries of the Ottoman vilayet of Haleb, it seems reasonable to start with this city. In the Seleucid and Roman period Aleppo was known as Beroia (see Figure 54). Although it seems to have been a major trade centre in a fertile and strategic location, it was clearly overshadowed by Antioch and Damascus. However, under Ottoman rule, it became a provincial capital of its own, no longer ruled from Damascus.[779] Aleppo played an important role in the trade of Iranian silk, and the ups and downs of this trade had an important impact on urban development. This was reflected in a slowdown of public construction and probably population growth in the first half of the seventeenth century due to climatic and political instability. While it seemed to have prospered again in the following century, in the final quarter of the 18th century and the first of the 19th, it once again endured a series of crises: political upheaval, revolts, plagues and an earthquake were enough to make a

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[778] See for instance Şevket Pamuk, *The Ottoman Empire and European Capitalism, 1820-1913: Trade, Investment and Production* (Cambridge: Cambridge University Press, 1987); Şevket Pamuk, 'Institutional Change and Economic Development in the Middle East, 700–1800', in *The Cambridge History of Capitalism*, ed. Larry Neal and Jeffrey G. Williamson, vol. 1 (Cambridge: Cambridge University Press, 2014), 193–224, http://dx.doi.org/10.1017/CHO9781139095099.008.

[779] Edhem Eldem, Daniel Goffman, and Bruce Masters, *The Ottoman City between East and West : Aleppo, Izmir, and Istanbul*, Cambridge Studies in Islamic Civilization 841459630 (Cambridge: Cambridge University Press, 1999), 17–22.

large impact on the urban population.[780]
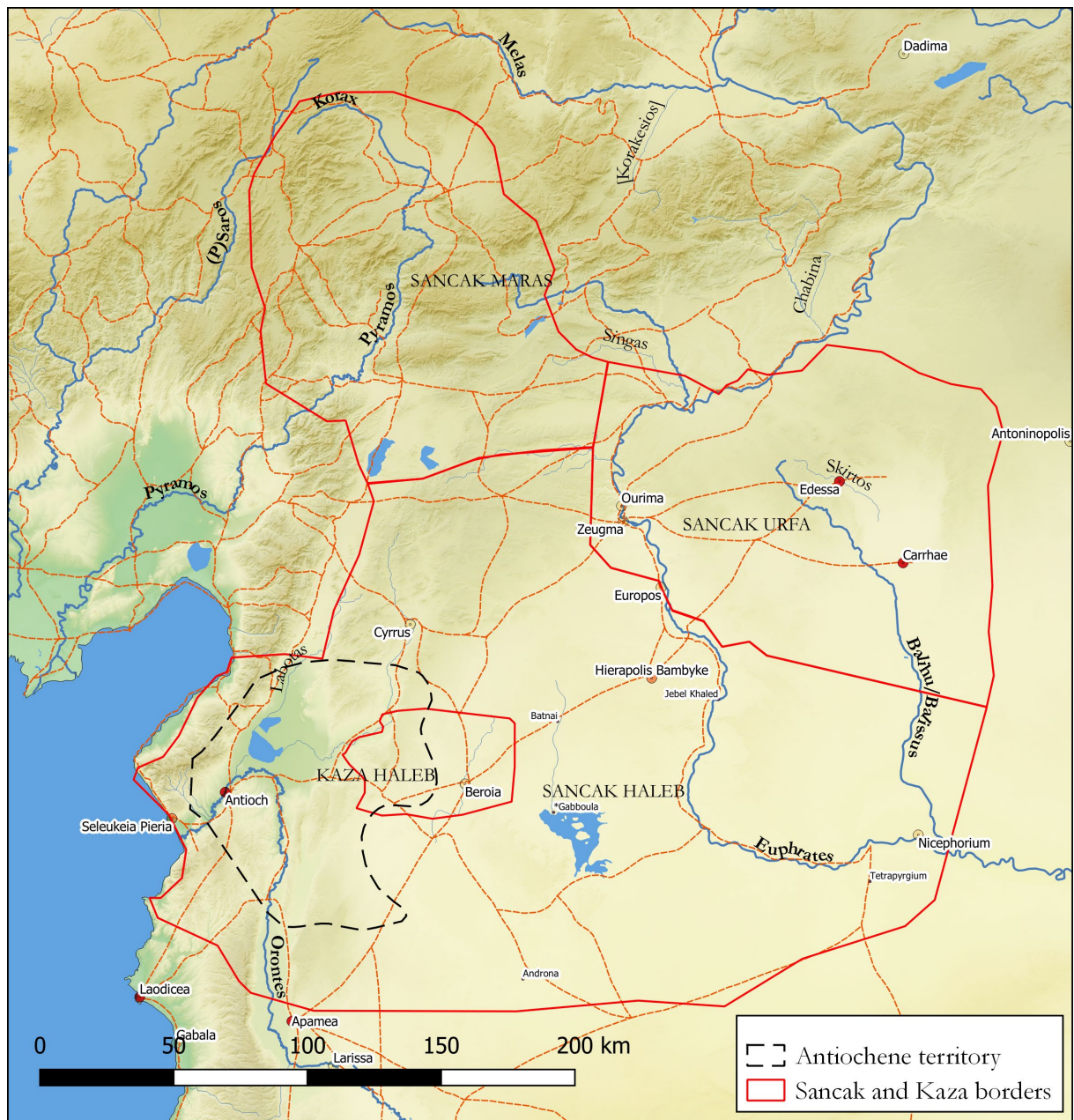
Figure 54 Sancaks in the vilayet of Haleb, with Roman settlements for reference

In an important article Jean Sauvaget managed to map the evolution of the city's physical extent during a period of four centuries. As calculated by André Raymond, it follows from Sauvaget's plans that the total built-up area of the town expanded from 238 to 349 hectares between the sixteenth and the nineteenth centuries. Of this area, 91 hectares were suburban in the sixteenth

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[780] André Raymond, 'Alep à l'époque Ottomane (XVIe-XIXe Siècles)', *Revue Du Monde Musulman et de La Méditerranée* 62, no. 1 (1991): 277–80, https://doi.org/10.3406/remmm.1991.1525; but compare also Eugen Wirth, 'Alep Dans La Première Moitié Du XIXe Siècle : Un Exemple de Stabilité et de Dynamique Dans l'économie Ottomane Tardive', *Revue Du Monde Musulman et de La Méditerranée* 62, no. 1 (1991): 133–49, https://doi.org/10.3406/remmm.1991.1528, who places a far greater emphasis on the role of the internal trade of the Ottoman empire for the economy of Aleppo.

century, rising to 198 in the nineteenth, growing along the main commercial routes from the larger gates.[781] Raymond himself argued, based on older maps and lists of quarters from various centuries, that most of this expansion had already taken place by the end of the sixteenth century, but that the city declined in the seventeenth century, before starting to grow again in the eighteenth.[782]

According to Raymond, the population of the city rose from 75,000 in the late sixteenth, to 115,000 in the late seventeenth century, despite the decline he argues to have taken place in the first half of the seventeenth century. To be more exact, the data he used, referred to by a French consul in the seventeenth century, indicate a rise from 9,049 to 13,854 hearths or households; so Raymond's calculations are based on a multiplier of about 8 persons per hearth.[783]

In his article on the Damascene population, Jean-Luc Arnaud has gone into more detail into the issue of *khânas*, translated either as houses, hearths, or households, as they have served as the basis of population estimates by the Ottoman administration as well. He shows that for 1870s Damascus, figures lay around 6 persons per *khâna*, but with a variation on the one hand between 5 and 10 throughout the different regions of the Syrian vilayet, and a variation on the other hand between different faiths.[784] Within the *sancak* of Aleppo itself, figures for the cities at the end of 19th century (more on which later) show a range of between 5 and 7 inhabitants per house, and in Aleppo itself no less than 8.8 inhabitants.[785]

Tahrir tax records indicate Aleppo had 8,430 registered taxpayers in 1584, in fact having declined from higher figures earlier in the century (11,224 in 1519, to 8,883 in 1526).[786] The taxpayers mentioned in the *tahrirs* are supposed to represent the adult male population, without those exempt from taxation, such as garrison soldiers and slaves. Problems of census evasion and an increase in military enlistment have been used to argue for adding 20% to resultant population figures. On the other hand, it has been voiced that for counts based on adult males, a far lower multiplier than Raymond's eight should be employed, as adult males tend to comprise

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[781] Sauvaget, Alep, fig. LVI–LXX; Raymond, 'La Conquête Ottomane et Le Développement Des Grandes Villes Arabes', 128 and 132. Raymond's figures imply an estimate of 147-151 hectares for the size of the area enclosed by the town wall. Raymond's figures imply an estimate of 147-151 hectares for the size of the area enclosed by the town wall.

[782] Raymond, 'La Conquête Ottomane et Le Développement Des Grandes Villes Arabes', 127.

[783] Raymond, 'Alep à l'époque Ottomane (XVIe-XIXe Siècles)', 101.

[784] Jean-Luc Arnaud, 'La population de Damas à la fin de la période ottomane', *Annales de démographie historique* 101, no. 1 (1 May 2001): 186–88, 204, tables 5 and 6.

[785] Vital- Cuinet, *La Turquie d'Asie : géographie administrative, statistique, descriptive et raisonnée de chaque province de l'Asie-mineure*, vol. 2 (Paris: Leroux, 1892), 177–224. Although it is not entirely clear if the given the number of houses, 14.500, is that of the entire agglomeration.

[786] Suraiya N. Faroqhi, 'Ottoman Population', in *The Cambridge History of Turkey*, ed. Suraiya N. Faroqhi and Kate Fleet, vol. 2 (Cambridge: Cambridge University Press, 2012), 380, http://universitypublishingonline.org/ref/id/histories/CHO9781139049047A024.

a quarter to a third of the general population.[787] If adult males (excluding slaves and servants) accounted for one quarter of Aleppo's population in 1584, applying a correction factor of 1.2 results in a population estimate of approximately 40,000. Nonetheless Raymond's much higher estimate of 75,000 continues to be regarded as being of the right order of magnitude, in part because the expansion of the built-up area and the construction of new religious and commercial buildings suggest growth rather than decline.[788]

Skipping the 18th century because of missing figures, we find a figure of 120,000 inhabitants around 1800, dropping in several decades to 70,000 in 1837. By 1892 however, the city appears to have regained its former levels of population. In his survey of the Ottoman empire Cuinet credited Aleppo and its thirteen suburbs with 127,000 inhabitants.[789] This figure refers to the joint population of all settlements which were situated within an area with a perimeter of no less than twelve kilometres. The size of this area must have been at least 1,150 hectares. Within this vast area the population of the 349 hectares occupied by the old city (delimited by the city wall) and the continuously built-up areas adjoining this nucleus stood at approximately 98,000.[790]

All in all, before the 20th century, the size of the urban population appears to have been oscillating between 70,000 and 100,000.

For urban densities, this means the following. If at the end of the sixteenth century, when Aleppo had a population of 75,000, its surface area was 238 hectares, we would have about 315 inhabitants per hectare. However, if, as Arnaud claims, it had by that time already expanded towards the higher 349 hectares, this figure would have to be lowered to 215/ha. Within the 170 hectares enclosed by the wall of the early fifteenth century densities appear to have been higher. According to Raymond this part of the city was home to about 42,500 inhabitants in 1537, implying a density of 250 inhabitants per hectare.[791]

Based on the population estimate of 70,000 for the 1830s, the city had 201 inhabitants per hectare in this period, and this seems reasonable as a lower limit. The population figure of 98,000 for the end of the 19th century implies an upper limit of 280 inhabitants per hectare, on the simplifying assumption that the built-up area had not expanded since the mid-nineteenth century.[792]

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[787] Faroqhi, 362–63; Arnaud, 'La population de Damas à la fin de la période ottomane', 180.
[788] Faroqhi, 'Ottoman Population', 381.
[789] Arnaud, 'La population de Damas à la fin de la période ottomane', 206.
[790] André Raymond, 'The Population Of Aleppo In The Sixteenth And Seventeenth Centuries According To Ottoman Census Documents', *International Journal of Middle East Studies* 16, no. 04 (November 1984): 447–60, https://doi.org/10.1017/S002074380002849X.
[791] Raymond.
[792] Sauvaget, *Alep*, fig. LXX.

Similar figures can be obtained for the city of Damascus. In size, the city of Damascus grew from 212 to 420 hectares between the sixteenth century and 1860, around a walled centre of 137 hectares.[793] Similarly to Aleppo, the *tahrirs* show that the city counted 10,423 registered taxpayers in the 1520s, but only 7,778 in 1595, although the built up area of the city expanded.[794] Arnaud's population estimate for the late 16th century, when the city occupied an area of c. 230 hectares, is 55,000, implying a density 239 inhabitants per hectare.[795]

In the case of Damascus, population estimates for the urban population are easier to obtain than in the case of Aleppo. The main reason for this is that in the case of Damascus the *salnames* show the population of the city of Damascus itself, whereas those for Aleppo refer to the entire *sancak*. This is not to say that the surviving evidence is totally unproblematic. For instance, one *salname* only provides the number of *khanas*, and several others only the male population. Some of these *salnames* were copied from previous years.

Based on a careful analysis of the evidence Arnaud concludes that Damascus had about 87,500 inhabitants in 1786. This figure increased to about 136,000 in 1860, implying an average annual growth rate of 0.6%. In 1860 the urban population declined by approximately 10,000, after the massacre of 5,000 Christian inhabitants, the flight of survivors, and the punitive conscription of 3,000 males into the army, but by 1886 it had risen to 134,800 (a figure derived from the *salname* of that year, corrected by about 19%).[796] If a similar correction is applied to the population figures for the end of 19th century, we obtain an estimate of over 170,000 inhabitants.

Arnaud has convincingly argued that Volney's population estimate of 40,000 for 1785 must refer only to those living in the inner city. With 137 hectares, this gives a density of 290/ha for the walled city. Of course Volney's figure must be regarded as a rough approximation. According to Arnaud, the inner city had 47,823 inhabitants in the 1930s, implying a density of 350 persons per hectare. He argues that the inner city's population remained more or less stable at least until the 1850s, as the layout of that area did not alter much.[797] Based on Arnaud's estimate of 55,000 for the entire city of Damascus in the late sixteenth century, assigning 40,000 people to the inner

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[793] Raymond, 'La Conquête Ottomane et Le Développement Des Grandes Villes Arabes', 126–27; Jean-Luc Arnaud, 'Corpus Cartographique Pour l'histoire de Damas, Syrie, à La Fin de La Période Ottomane (1760– 1924)', *Imago Mundi* 53, no. 1 (1 January 2001): 47, https://doi.org/10.1080/03085690108592937. By 1918 the city would have even expanded to 570 hectares.

[794] Faroqhi, 'Ottoman Population', 381.

[795] Arnaud, 'La population de Damas à la fin de la période ottomane', 178.

[796] Arnaud, 191, 194–95, 202, 205–6 tables 1, 9 and 10.

[797] Arnaud, 178–79.

city implies a rough estimate of 15,000 for the suburbs of that period. This implies a population density of *c.* 160 inhabitants for the extra-mural quarters.

The population estimate for the mid-nineteenth, when the city extended over 420 hectares, imply a density of 324 people/ha for the city as a whole and a suburban density as high as 339/ha. (Admittedly, with a population in the centre closer to the figure of the 1930s, the density of the inner city would remain higher to that of the suburbs).

4.1.4   Urban housing in the Roman and Ottoman periods

The question whether such densities would be applicable to Roman Antioch, also depends on how residential space was used. Essentially, how do Roman urban houses compare to Ottoman ones? In the nineteenth century most domestic architecture in Damascus was built in the traditional Arab style, with a single entrance and a central courtyard onto which the rooms of the house opened. Large houses had several courtyards but rarely had more than two storeys.[798] The basic design of these dwellings was similar to that of the urban courtyard houses of Roman Syria (Butcher 2003, 303).[799]

In a passage from his eleventh oration Libanius refers to the presence of multi-storied houses in fourth-century Antioch. Highlighting the agreeable living conditions prevailing in the city, he claims that "[the wind] does not stream only into the mansions of the rich and into houses of three stories, and remains suspended above lower houses and those which belong to the poor"[800] This passage suggests that low-rise domestic buildings were the norm but also shows that a considerable number of three-storied houses existed. There is textual evidence for the existence of tall tower blocks in Aradus, which was built on an island, and Tyre, which was built on a peninsula. The obvious reason for this was that the geographical settings of these cities offered little scope for lateral expansion (Butcher p. 303).

Although the amount of archaeological and literary evidence relating to domestic architecture in the Roman Near East is not exactly overwhelming, we are left with the impression that the domestic quarters of the Ottoman period did not differ dramatically from those of the Roman-imperial period.

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[798] Christa Salamandra, *A New Old Damascus: Authenticity and Distinction in Urban Syria*, Indiana Series in Middle East Studies (Bloomington: Indiana University Press, 2004).
[799] Kevin Butcher et al., 'Small Change in Ancient Beirut: The Coin Finds from BEY 006 and 045; Persian, Hellenistic, Roman and Byzantine Periods', 2003, 303.
[800] Lib. *Or.* 11.225.

4.1.5 Population estimates for Roman Antioch

In the 1930s Weulersse identified three different grids in the area occupied by Roman Antioch that could still be discerned in the layout of several streets and fields of that period. To a somewhat lesser extent this still holds true in the current situation, especially north of the Parmenios. The first two grids are those found between the river and the mountains, oriented towards the main road, with insulae of 116 x 58 m, and which in all likelihood built on the original grid laid out in the third century B.C. The difference between them is a slight difference in orientation north of the Parmenios, as the main street indicates a small change in direction from that point onwards, probably to do with the orientation of the mountains, and perhaps somewhat with the variable courses of the Parmenios. The third grid is that of the island, with insulae of 107 x 71 m, with a northwards orientation and perhaps to be dated to a later period, as Leblanc and Poccardi believe to discern traces of grid II on the island as well.[801] Note from earlier, that for the area in mountains, a fourth grid has been discerned that matches the island's orientation, but with insulae in a 2:1 size ratio like those in the first two grids, and of roughly half their size.

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[801] Poccardi and Leblanc, 'Etude de La Permanence Des Tracés Urbains et Ruraux Antiques à Antioche-Sur-l'Oronte', 91–93, 123–26.
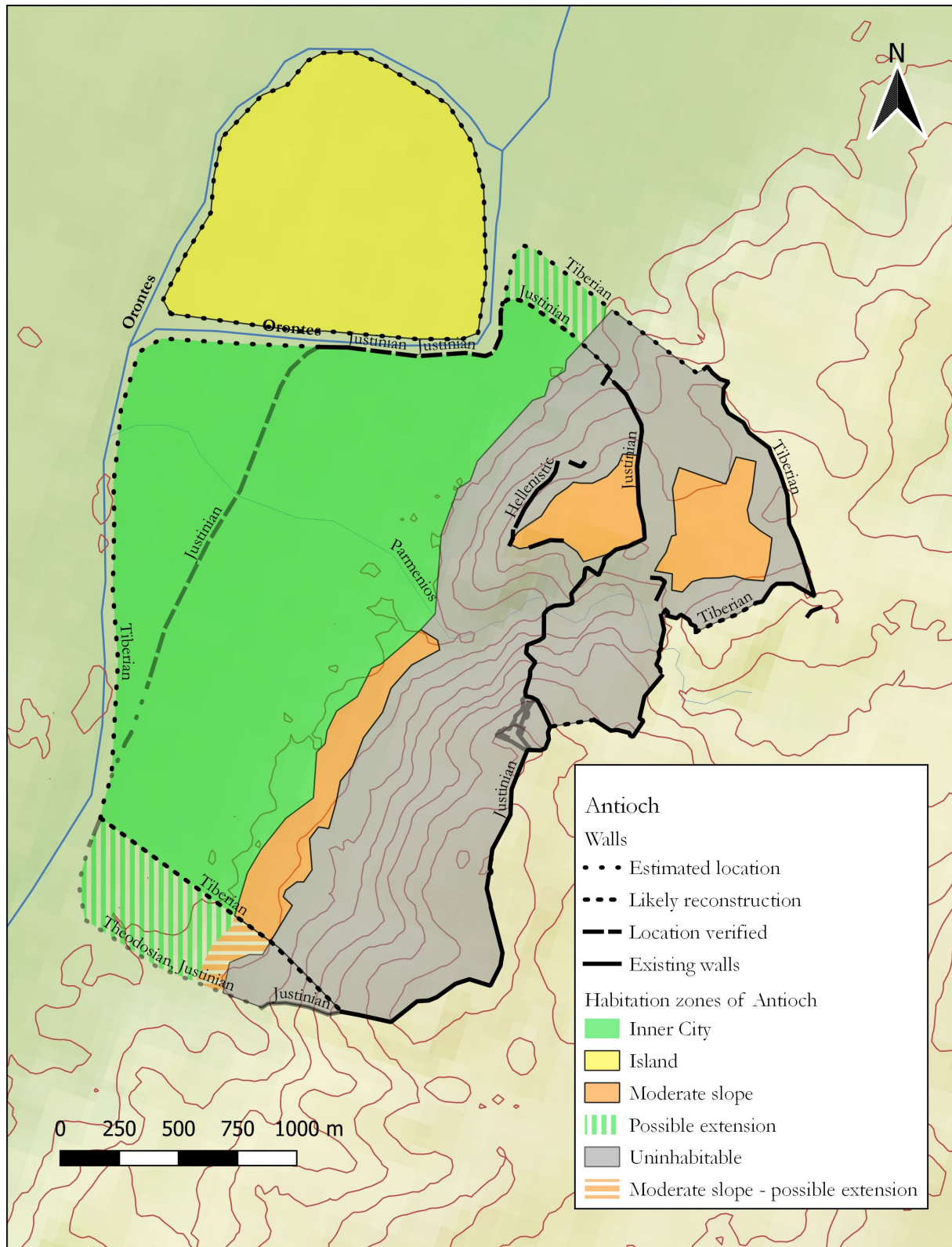
Figure 55 Urban densities in Antioch

Based on what is known about the characteristics of various parts of Antioch, it seems inconceivable that a single population density figure would be applicable to its entirety. For the island a high level of monumental buildings or public space are to be expected, even if less so than

when the Diocletian palace was built, possibly replacing a partly residential area. Additionally, one residential building, described as an urban villa, was excavated on the island. If this domicile was the norm for housing on the island, this would similarly suggest a lower building density. For the lower slopes of the mountains and the quarter in the mountains, similarly a lower density would be expected, based on Libanius' claim that "those who live on the slope of the mountain boast of the finer breezes and the peacefulness and the view over the whole city" compared to the active and industrious character he assigns to the city in general.[802] The suburbs pose an additional problem, in that densities are likely to have declined with increasing distance from the city, and there is the unanswerable question as to what level agricultural production and cemeteries competed with residential space. At the very least we have once again Libanius' description that "as soon as you pass through the gates[towards Daphne], on the left are varied gardens and charming inns and an abundance of springs and houses hidden in trees and chambers which rise above the groves and luxurious baths," followed by more houses, gardens and vineyards.[803] This certainly does not suggest a densely packed and highly populated zone.

Table 15 shows a series of possible density values for the various zones indicated within the city, the resultant population figures and the averages. Within the city proper, the high-density areas consist of the 'old city', essentially the left bank area enclosed by the walls. The low-density areas consist of the island, the quarters on Mount Staurin and the lower slopes of the Silpius. For the suburbs, we should expect far lower densities, considering that a high use of land for gardens should be expected. In the first set of densities a minimum situation is sketched. For the high density areas 250 residents/ha was chosen in line with the densities which can be calculated for the walled districts of various cities of Ottoman Syria. The lower density for the island 150, is comparable to the dense suburbs of Damascus in the 16th century. On the slopes we expect somewhat lower density compared to the island, as the terrain would be more difficult. Range 2 was chosen to be a relatively moderate estimate. Range 3 represents the highest likely density figures, with 400/ha matching Wilson's normal upper limit, and any higher would start approaching the exceptional density given to Alexandria, or even that of Ostia. Putting the low density areas at 250/ha describes these areas as being built up like a relatively densely populated city. For the suburbs, the 100/ha figure already comes across as being somewhat too high, as it implies that the suburbs were more densely populated than the average of cities in Egypt and Asia Minor.

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[802] Lib. Or. 11.249.
[803] Libanius, *Or.* 11.234.

Table 15 Population scenarios for Antioch

City size		hectares	Scenario 1		Scenario 2		Scenario 3	
Area type		hectares	Density	Population	Density	Population	Density	Population
flat	min	280	250	70000	300	84000	400	112000
	max	310	250	77500	300	93000	400	124000
slopes and mountain	min	50	125	6250	150	7500	200	10000
	max	55	125	6875	150	8250	200	11000
island	min	120	150	18000	180	21600	240	28800
	max	150	150	22500	180	27000	240	36000
suburbs	min	30	50	1500	75	2250	100	3000
	max	280	50	14000	75	21000	100	28000
			Min total	**95750**	Min total	**115350**	Min total	**153800**
			Max total	**120875**	Max total	**149250**	Max total	**199000**

According to these three models the size of Antioch's population would have ranged between 95,750 and 199,000. It should be noted, that for higher estimated populations the level of uncertainty increases significantly, as they would require a larger portion of the population to have lived in the suburbs for which the figures are less secure, even with the relatively low estimated densities. If we accept that population densities in Roman Antioch did not exceed those which can be calculated for Aleppo and Damascus in the sixteenth-to-nineteenth centuries, and if population densities on the slopes and in the suburbs were lower than those in the densely built-up nucleus (as one would expect them to be), we end up with an estimate of between 110,000 and 150,000. Consider as well from chapter 1.2.1.1, that for the urban size the lower size estimates are more likely to be correct, all this indicates that we should probably expect a population between 110,000 and 135,000.[804]

If the three scenarios are combined with our population estimate of 600,000 for Antioch's administrative territory, we end up with an urbanisation rate of between 15.9 % and 33.2 %. An estimate of 135,000 (exactly between 110,000 and 150,000) would imply an urbanisation rate of 22.5 %. Needless to say, classifying at least some of the 'secondary agglomerations' which have been detected during the archaeological surveys of the past 100 years would result in a somewhat higher urbanisation rate. Similarly, a lower rural population figure would also increase the urbanisation rate.

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[804] Note that in chapter 3 we arrived at a lower figure of 75.000 based on lower average densities that are more likely to be applicable to the other, smaller cities of the Levant.

4.1.6   Urbanisation rates in Ottoman Syria

As with urban densities, we can also see how such an urbanisation rate compares to those of Ottoman Syria. In his survey of the demographic, agricultural and industrial resources of the Ottoman empire Cuinet not only provided population figures for the various provinces (*sancaks*), but also for the central cities or towns of the administrative districts (*kazas*) of these provinces. At least in theory this makes it possible to calculate urbanisation rates.[805]

As many scholars have pointed out, Cuinet never specified the sources on which he drew when compiling his provincial surveys. His population figures are about 15% higher than those in the *salnames* of the 1880s and 1890s – in fact more modest than the 20% correction margin employed by modern scholars. Taking this adjustment into account, his overall totals do seem to correspond to those of the *salnames*.[806]

In his survey of the *sancak* of Aleppo Cuinet provides population figures for the central city but also for 13 other cities or towns. If his figures can be relied upon, the joint population of these cities and towns stood at 262,497, of which nearly half (127,149) lived in Aleppo. His total population for the *sancak* of Aleppo is 602,240 (Cuinet 1892, 163), but his population figures for the fourteen *kazas* add up to 640,687. The latter figure includes 70,000 nomads in the *kaza* of Rakka. Based on the population figures for the *kazas* and the figures for the 14 cities and towns, we obtain an urbanisation rate of 41 per cent.[807]

There are several problems with this very high figure. As has already been pointed out, Cuinet's population estimate for the city of Aleppo includes approximately 30,000 inhabitants of satellite settlements which were situated within an area of at least 1,150 hectares. A considerable proportion of the populations of these suburban agglomerations are likely to have been involved in agricultural activities. Secondly, the central 'towns' of at least some of the *kazas* appear to have been town-like villages or towns with significant agricultural populations. Cuinet himself characterizes the settlement of Djebel Sama'an (Jabal Sam'an) as a 'village' and the agglomeration of Membidj as a 'bourg'. Various other 'towns' are described as 'agricultural centres' ('centres

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[805] Unfortunately, the information contained in the tahrirs of the sixteenth and seventeenth centuries do not permit us to calculate urbanisation rates, for simple reason that the registered taxpayers were concentrated in the city to a very high degree. In the seventeenth century, the city made up between 52% and 74% of the registered taxpayers of the entire vilayet, not even just the sancak of Aleppo. See Charles L. Wilkins, *Forging Urban Solidarities: Ottoman Aleppo 1640-1700* (BRILL, 2010), 55–82.

[806] Compare for Aleppo: Kemal Karpat, *Ottoman Population, 1830-1914 : Demographic and Social Characteristics*, Turkish and Ottoman Studies (Madison etc: University of Wisconsin Press, 1985), 132–33; Cuinet, *La Turquie d'Asie*, 2:114, both tables not including non-sedentary population.

[807] Cuinet, *La Turquie d'Asie*, 2:177–224.

agricoles').[808] The close involvement of at least some of Cuinet's 'urban' populations in agricultural activities helps to explain some of the astonishingly high local 'urbanisation rates' implied by Cuinet's figures. Examples include the *kaza* of Maara, where 49 % of the district's population lived in the central 'town', and that of Beïlan, where the 'urban' population accounted for 39 % of the total population. If only those urban centres which had 10,000+ inhabitants are accepted as 'urban', the urbanisation rate implied by Cuinet's figures drops to 31 %.[809] Thirdly, and perhaps most importantly, there are strong reasons to think that the Ottoman officials responsible for the registration of the population were more successful in registering town-dwellers than in registering the inhabitants of rural areas.[810] In a thoughtful discussion of Cuinet's figures for Ottoman Palestine, David Grossman has argued that the former's estimates for the Galilee and the rural districts surrounding Nablus are under-counts, while the data for the Jerusalem district are over-counts. Grossman also observed that according to Cuinet's figures the district of Acre had more urban residents than rural residents. This picture is at odds with the findings of practically all studies dealing with the late nineteenth century.[811]

If we had better population figures, and detailed data on the occupations of the inhabitants of the smaller towns, we would probably end up with an urbanisation rate of the order of 25 %. Either way, even a high estimated urbanisation rate for the Roman Antiochene would be conceivable when looking at the Ottoman figures. That said, the existence of a considerable number of 'agro-towns' inhabited by farmers, craftsmen and shopkeepers remains a highly interesting phenomenon which cannot be ignored in studies of 'urbanism' in Ottoman Syria.

4.2   Secondary settlements in the Antiochene

In the previous sections, we looked at the overall relationship between Antioch and its territory as a whole. As indicated in chapter 3.2.1.3, one would expect the rural population to require access to amenities usually offered by urban settlements. Of course, solely for the purpose of

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[808] Based on the registers of 1915, A. Ruppin, *Syrien Als Wirtschaftsgebiet, Zweite, Durchgesehene Auflage* (Berlin-Vienna, 1920), 17, suggests that 43.75 % of the Syrian population might have lived in 'cities' or 'towns', but he goes to point out that most inhabitants of towns with fewer than 10,000 inhabitants had agricultural occupations.

[809] The largest towns belonging to the 2,000-10,000 range were Maara and Bab. According to Cuinet, these towns had 300 and 200 shops ('boutiques') respectively; but the much larger town of Kiliss is described as a 'centre agricole'. Cuinet, *La Turquie d'Asie*, 2:186.

[810] J. McCarthy, 'The Population of Ottoman Syria and Iraq, 1878-1914', *Asian and African Studies* 15 (1981): 14. In the case of the sancak of Haleb/Aleppo at least 15 % per cent of the population is thought to have remained unregistered (ibid. 10). According to Ruppin (1920), 12-13, between 15 % and 80 % of the populations of the various kazas of the sancak of Haleb remained unregistered. This problem was particularly acute in the kazas of Maara (50.7 % unregistered), Bab (45.2 %) and Menbidj (79.9 %).

[811] David Grossman, *Rural Arab Demography and Early Jewish Settlement in Palestine: Distribution and Poplation Density During the Late Ottoman and Early Mandate Periods* (Abingdon-New York, 2011).

bringing his main harvest to a market once a year, a farmer would most likely also be willing to make the trip from the outer edges of the Antiochene to the capital itself. But as the following will show, we do see a number of moderately sized 'secondary agglomerations' within the wider Antiochene.

The two core zones of Antioch's territory, the Amuq Valley and the Limestone Massifs have seen several major studies. In the 1930s Braidwood undertook an initial survey of the Amuq valley. His focus on tell sites resulted in a severe underrepresentation of Classical sites in his findings, which up to the publication of the new AVRP surveys gave rise to interpretations that the lowlands around Antioch were quite devoid of settlement. This stood in stark contrast to the standing remains of the Dead Cities, which were studied thoroughly by Georges Tchalenko in the 1950s.

The Amuq Valley Regional Project (AVRP), which took place in several seasons from 1995 to 2005, revisited the area surveyed by Braidwood within the borders of modern Turkey, and expanded the area to include the neighbouring upland areas in the Amanus and the Jebel al-Aqra.[812] While the initial 1995 and 1996 surveys were mostly extensive and aimed at recording known (tell-) sites, from 2001 smaller dispersed sites visible on declassified Corona imagery were studied as well. In seasons from 1997 onwards intensive off-site surveys were undertaken as well (with 20 m between field walkers, at 100 m collection interval). This was however only possible in limited areas lying under fallow or with cereal cultivation, as over 90% of the land surface was obscured by cotton plantations.

Site recovery appears to have been heavily influenced by levels of sedimentation as a result of upland soil erosion and river deposition, which vary in different parts of the valley between 0 up to 4 meters per 1000 years, and as is to be expected, site recovery was highest in those areas with little aggradation – higher levels of aggradation, up to 17 meters per 1000 years such as at Tell Atchana (Alalakh), are the result of human settlement, in this case perhaps because of monumental construction on the tell.[813]

There are still several gaps in the survey coverage within the extent of the Antiochene territory. Around the Limestone massifs, the valleys mostly lack remains of ancient settlements, as more favourable agricultural conditions encouraged continued use throughout the centuries. In Syria, the mountainous area of the Kurt Dagh, and the adjoining section of the foothills up the Turkish

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[812] Casana and Wilkinson, 'Settlement and Landscapes in the Amuq Region', 25–27.
[813] Casana and Wilkinson, 30; El Ouahabi Meriam et al., 'Soil Erosion in Relation to Land-Use Changes in the Sediments of Amik Lake near Antioch Antique City during the Last 4 Kyr', *The Holocene*, 30 June 2017, 11, https://doi.org/10.1177/0959683617715702; Jesse J. Casana, 'Site Morphology and Settlement History in the Northern Levant', in *Proceedings of the 7th International Congress of the Archaeology of the Ancient Near East (7th ICAANE)*, vol. 12 (Harrasowitz Verlag Wiesbaden, 2010), 16.

border remain unsurveyed. Similarly, in Turkey, the highlands of the Amanus and the Jebel al Aqra were not covered, except for a limited area of the latter bordering the Amuq valley.[814] Modern land use and similarity in terrain to the Jebel Zawiye to the east – which did sport a dense settlement system by the later Roman period – suggests that settlement may have continued at least another 10 to 15 kilometres to the south, before elevation and slope become too prohibitive for agricultural purposes. Finally, the direct surroundings of Antioch were not surveyed, due to modern habitation.[815]

In the lowlands, Braidwood's dating has been corrected in many cases by the AVRP survey. As the Syrian part along the 'Afrin river was not covered by the new surveys, the dating there remains suspect. For example, Braidwood suggests a Roman presence at Ain Dara, the site of a famous Iron Age temple and settlement, discovered 20 years after Braidwood's research. Further surveys and excavation undertaken there show that a new walled Hellenistic settlement existed at the site, but it was uninhabited throughout the Roman period.[816] If settlement in this area developed similarly to the plains, it is to be assumed that there was a significant Roman period population there as well.
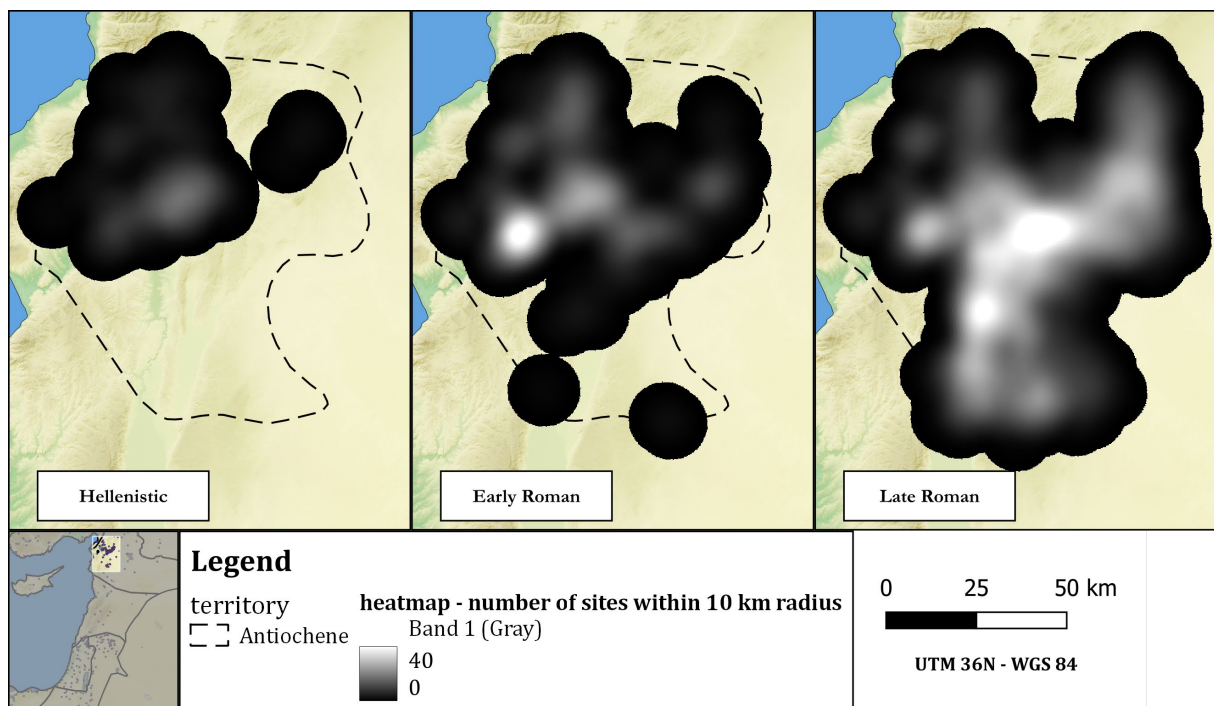
Figure 56 Heatmaps of secondary settlements in the Antiochene

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[814] Casana, 'Geoarchaeology and Geomorphology: Soils, Sediments, and Societies'; Tony J. Wilkinson, Jason Ur, and Jesse J. Casana, '14. From Nucleation to Dispersal: Trends in Settlement Pattern in the Northern Fertile Crescent', in *Side-by-Side Survey: Comparative Regional Studies in the Mediterranean World*, 2004, 200.
[815] Casana and Wilkinson, 'Settlement and Landscapes in the Amuq Region', 41.
[816] Elisabeth C. Stone, *The Iron Age Settlement at 'Ain Dara, Syria: Survey and Soundings*, BAR International Series (Oxford: Hedges, 1999).

4.2.1 Coverage of towns and larger villages

Figure 56 show the density heatmaps of settlements within a 10 km radius for the Hellenistic, Roman and Late Roman periods (as defined by the AVRP, 300 to 100 B.C.E. for Hellenistic, 100 B.C.E. to 330 C.E. for Roman, and 330 to 600 C.E. for Late Roman). For Tchalenko's data, any place with indications the existence of temples or habitation before the fourth century has been added to the early Roman period, either from a mention in Tchalenko's own study, or that of Georges Tate. Note, a small cluster around Brad of Roman period sites from the Limestone Massif surveys fall within the Apamene and therefore do not show in the following maps. It clearly shows the expansion out of the plains into the surrounding highlands. It also shows a shift from the densest cluster of sites first towards the highlands south of the valley, and then east into the Jebel Barisha.

Considering however the sizes of these sites, one clearly sees that larger sites of several hectares are mostly clustered in the valley, around the site density hotspots of the Hellenistic period, in addition to several larger sites in the northern Jebels, especially Barisha and Sim`an. The Jebel al-Aqra sites are small, and the dense cluster may also be the result of improved site survival outside the valleys. Of the limestone massif sites, Tate's indexation of the actual number of rooms in per settlement associated to the Roman period shows that in the northern chains only Kafr Nābo and Šeiḫ Sleimān were significantly larger than the surrounding sites, with 57 and 64 identified rooms respectively.[817] The site of Telanissos for instance, while suggested by Tchalenko to have been settled somewhere between the first and fourth centuries, only grew to prominence with the foundation of the sanctuary for Simeon the Stylite.[818] Its size of 9 hectares, derived from Tchalenko's maps and satellite imagery, thus only indicates the largest extent of the village in later centuries. The same can be said of the other sites, and in fact the AVRP sites also lack period-specific site indications. Still, as Tate indicates, the earliest datable house in the areas he studied was from 204 C.E. However, he also counted almost as many datable inscriptions and tombs from the period of 140 to 250 C.E., as there were from 330 to 530 C.E. He expects that despite the disappearance of earlier houses, there must have been a significant number in that period, which in his tables, he spreads equally over the jebels.[819] We should

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[817] Tate, *Les campagnes de la Syrie du Nord du IIe au VIIe siècle*, fig. 282.

[818] Tchalenko, *Villages antiques de la Syrie du Nord*, 1953, 1:208.

[819] Tate, *Les campagnes de la Syrie du Nord du IIe au VIIe siècle*, 173–81. Note however the serious issues indicated by Andrea Zerbini concerning Tate's dating of buildings, suggesting considerable higher early occupation, as well as stronger continuous growth over the centuries. Andrea Zerbini, 'Society and Economy in Marginal Zones: A Study of the Levantine Agricultural Economy (1st-8th c. AD)' (Royal Holloway, University of London, 2013), 98–100, https://pure.royalholloway.ac.uk/portal/en/publications/society-and-economy-in-marginal-zones-a-study-of-the-levantine-agricultural-economy-1st8th-c-ad(04f13f83-92b4-4bf7-b605-1736adeb6824).html.

certainly expect more sites to have had early occupation than is evident from the available data.
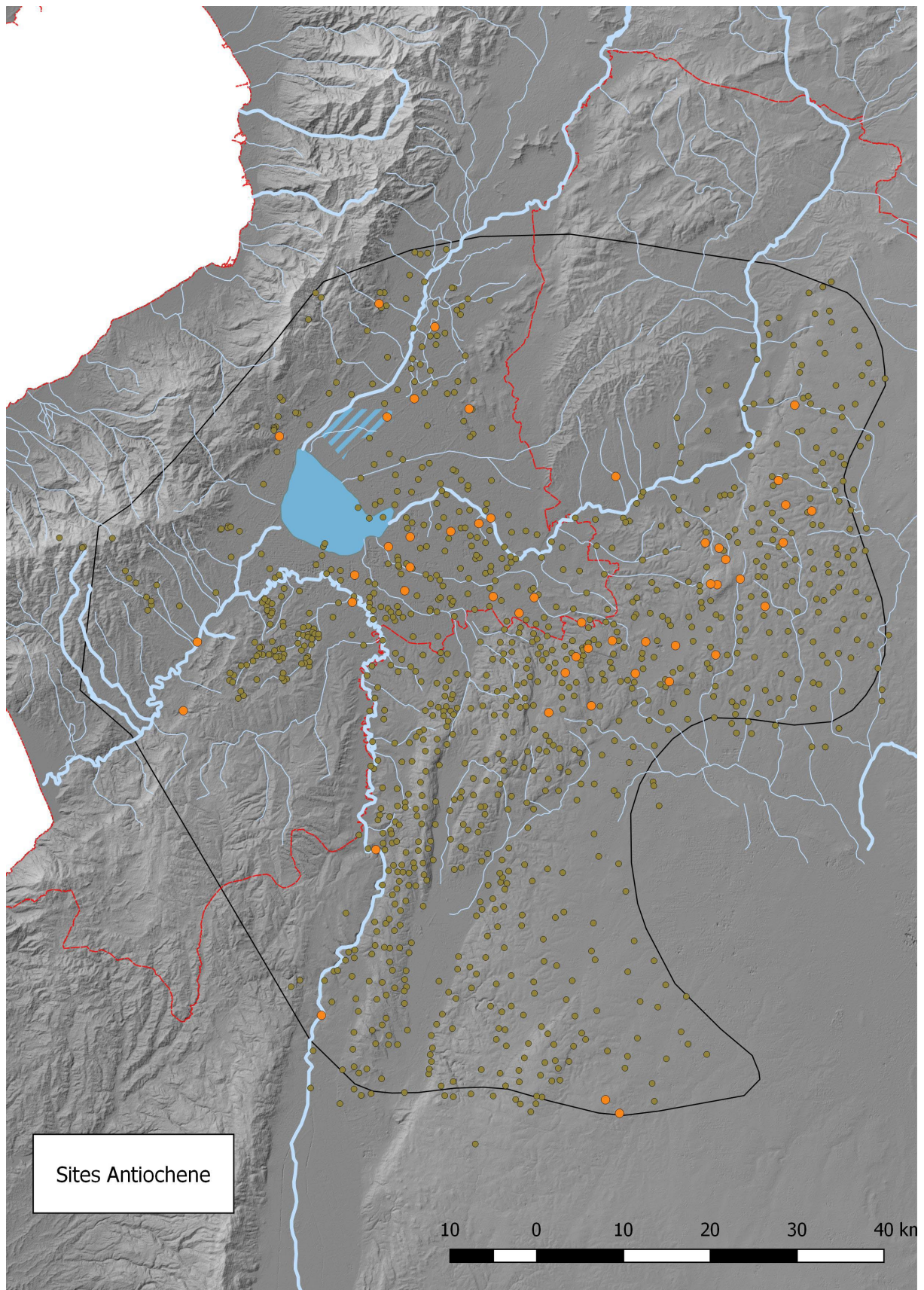
Figure 57 Survey sites in the Antiochene (in orange: larger settlements with Roman period habitation)

It is in any case clear that the majority of the larger sites in the region had a Roman period presence, suggesting that to a limited degree an agglomeration effect was present here, with a slight preference to settle at an existing settlement rather than in a new foundation. According to Andrea Zerbini, initially villages developed in clusters around sanctuary sites.[820] The vast number of dispersed, small settlements of course shows that this was only true to a limited degree.

With these reservations in mind, it is possible to discern something of a settlement hierarchy in the Antiochene countryside, even if accepting that for some parts this did not fully crystalize until the fourth century. In the valley, especially the small towns of Gindaros, Meleagrum and Gephyra stand out, at 15 hectares for the first two, and 8 for the last, and in the highlands Brad is among the largest villages with habitation throughout the Principate. These larger towns seem to be spread out rather evenly, with moderate villages of 4 to 8 hectares between them. To the south, along the Orontes towards Apamea, also lie two larger villages: Derkoush (possibly Platanos), and Jisr ash Shughur, which may be Seleucia ad Belum.

Among the larger settlements in the Antiochene one town stands out particularly. At 7,5 km distance south of Antioch, there was the town of Daphne, which in fact gave Antioch the name used by several authors: Antioch-at-Daphne (Strabo 15.1.73; Pliny *Nat. hist.* 5.18). Libanius defines Daphne as a suburb of the city, using the term προάστειον, but towards the end of a passage giving praise to Daphne's temples, aqueducts, gardens, baths and beautiful houses, he writes "Indeed it possesses each of these things in such a number that the fact that it is spoken of merely in the class of a suburb is to the shame of a city which, if it wished to dispute with other cities, has so many things by which it may win".[821] From Julian's Misopogon it can be gleaned that Daphne and its temples used to play an important role in the religious life of the city, with an annual festival that would, at least according to Julian's expectations, have seen citizens

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[820] Zerbini, 'Society and Economy in Marginal Zones: A Study of the Levantine Agricultural Economy (1st-8th c. AD)', 102 ff.
[821] Libanius, *Or.* 11.239.

visiting from Antioch.[822] It gives a sense of how the secondary agglomerations in the Antiochene were viewed from the city.
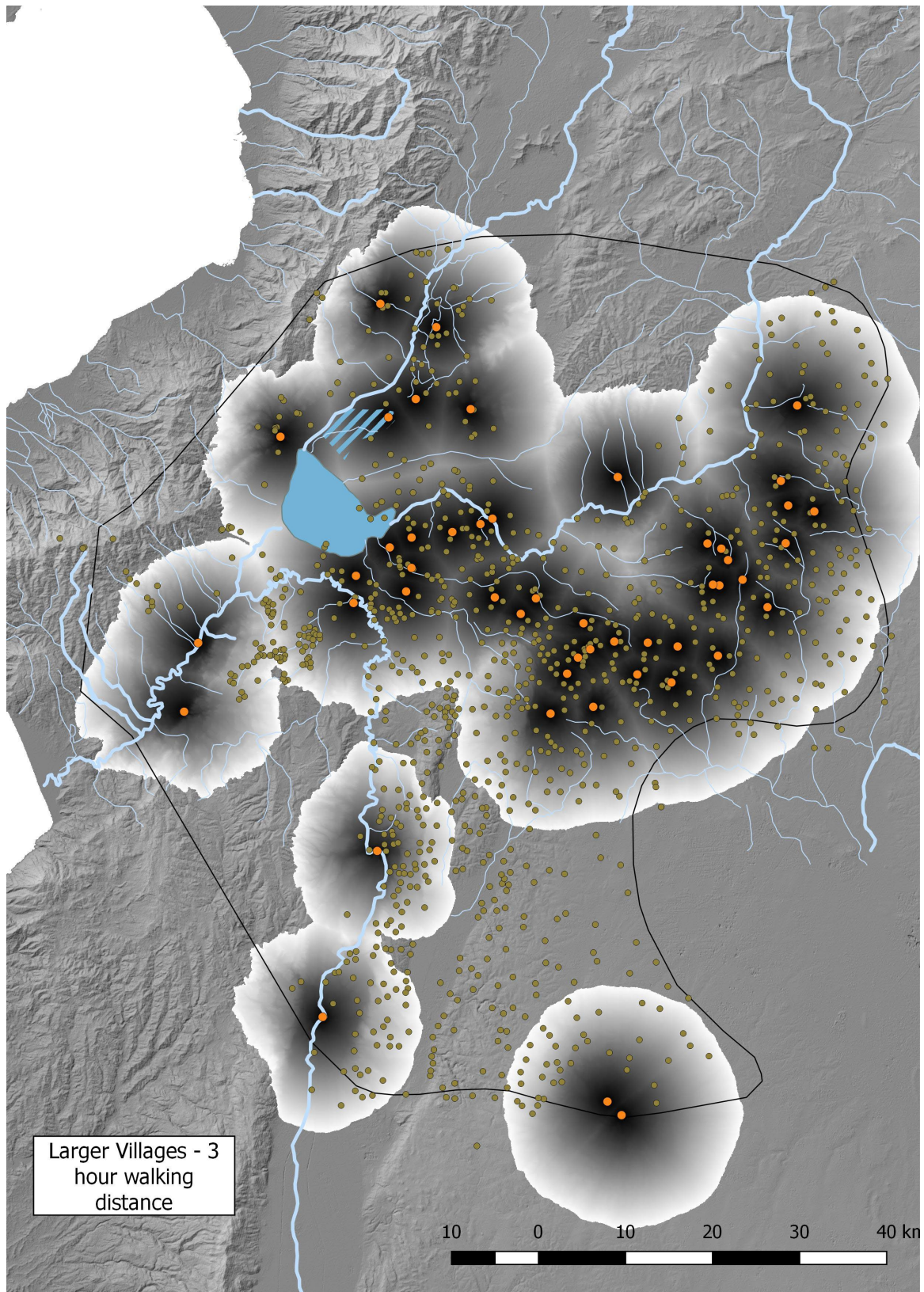

Figure 58 Walking distance from larger villages (up to 3 hours distance)

Figure 58 shows the walking time (in seconds) from the larger villages (and Antioch itself). This is calculated using Tobler's hiking function. See for an explanation paragraph 3.2.1.2. When limited at 3 hours distance, the majority of the territory seems to be covered. In other words, if we take 3 hours as the maximum distance from any place towards towns performing a market function, then these larger villages and towns could have provided such services for the countryside. The idea, as summarised in for instance in Bintliff's 'Going to the market in Antiquity', behind a 3 hour radius is that this would allow farmers to sell their produce in a town close enough to go there and return in a single day, avoiding too much time taken away from labour and additional costs of overnight stay.[823] Only the north of the Jebel Zawiye, around modern Idlib, lacks coverage. This could possibly have been covered by the village of Seremis – modern Sarmīn – which is known from an inscription in Rome from between the second and fourth century, and at least in the 6th century belonged to the territory of Antioch.[824] Secondly, potentially a larger village may also have existed in the Rūğ valley, which like the Amuq valley, also contained a lake until it was drained in modern times. A potential larger village might have been located at Tell el-Kerkh, the largest tell site in the Rūğ valley. Jacques-Claude Courtois, who studied the tells in this valley mentions that it contained "nombreaux tessons relevant des périodes classiques et postérieures."[825] Tell Daoud is an alternative, but unfortunately Courtois' interest was firmly focused on earlier periods, so any indication of pottery beyond the Iron Age was lumped together in a similar fashion.[826]

Even though they cover most of the territory, they are not quite spread equally over the area, but rather form four clusters with multiple larger villages together: a northern and southern cluster in the Amuq valley, a chain of villages in the northern jebels, and a cluster in the southern Jebel Zawiye, mostly falling within the Apamene. The southern and northern clusters in the valley might be more connected, for instance if one of the sites that were impossible to survey in the central valley had turned out to be a larger one as well. That doesn't take away the fact that there are clearly more large villages closer together than in the north. In both cases the terrain is similarly cut through by multiple watercourses, the Kara Su and the Yaghrā in the north, and

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[823] Bintliff, 'Going to Market in Antiquity', 215–18.

[824] Todt and Vest, *Syria (Syria Prote, Syria Deuteria, Syria Euphratēsia)*, 1723–25; Idlib itself could possibly have been a classical site itself, but beyond perhaps a 6th century convent, little can be said about the place for earlier periods. See Tchalenko, *Villages antiques de la Syrie du Nord*, 1953, 1:97.

[825] Jacques-Claude Courtois, 'Prospection archéologique dans la moyenne vallée de l'Oronte (El-Ghab et Er Roudj. Syrie du Nord-Ouest)', *Syria* 50, no. 1 (1973): 90, https://doi.org/10.3406/syria.1973.6431.

[826] Courtois, 94.

multiple branches of the Afrin in the south. Especially in the south, there is evidence of additional canals being dug from the early Roman period onwards.[827]

4.2.2   Coverage of small villages and farms
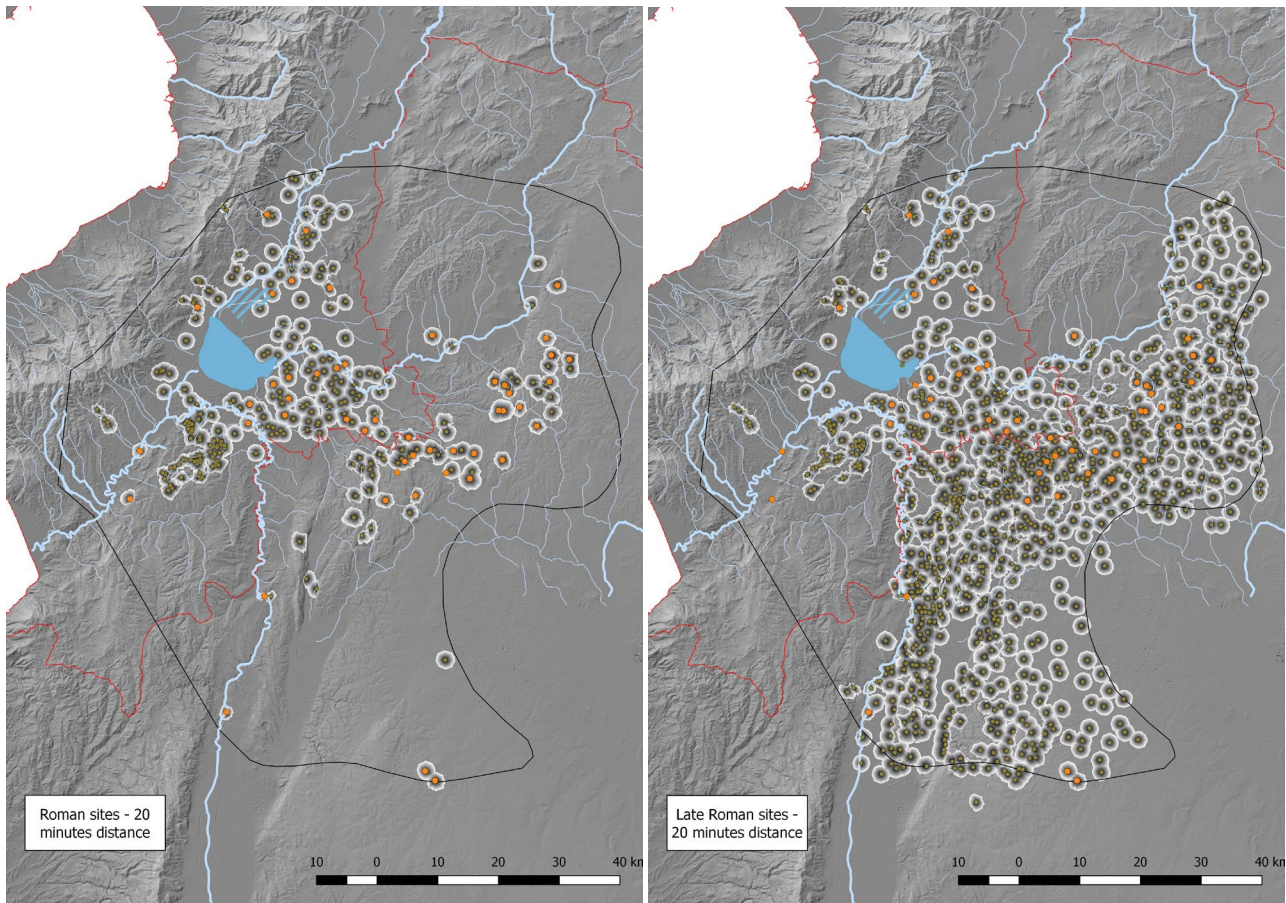
Figure 59 20 minute walking distance around Roman and Late Roman sites

Figure 59 shows walking distances around all Roman and Late Roman sites. Here it can be seen that for the Late Roman period, only below 20 minutes distance do larger gaps start to appear in the coverage of the region. Nonetheless, even at 15 minutes around there is still a reasonable coverage of the territory. Within 20 minutes distance 404,004 hectares fall within reach, which drops to 270,694 hectares for 15 minutes around all sites (so from roughly two-thirds to half of the cultivable land of the Antiochene; which is considerable if you consider this includes areas that were not surveyed). Gaps are most pronounced in the central eastern and northern Amuq valley, where it would not be unreasonable to expect more hard-to-detect single farms and non-mounded sites – and naturally there is no coverage in the unsurveyed valleys between the jebels. In other words, if we expect the smaller sites to have been of the order of magnitude of single farms and hamlets, and expect their 'territories' to have been limited to areas within at most 15

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[827] Meriam et al., 'Soil Erosion in Relation to Land-Use Changes in the Sediments of Amik Lake near Antioch Antique City during the Last 4 Kyr'.

minutes reach, and furthermore expect full coverage of the landscape, then there clearly are numerous places missing, especially in the gaps indicated. But even so, it is clear that most of the arable territory could be farmed from a village or farm 20 minutes away, and nearly all of it within 30 minutes from a farm.[828]

If we take an upper limit of one hour walking distance from all sites (irrespective of period), the resulting area could be subdivided on the basis of Thiessen polygons (polygons drawn on the basis of all halfway points of each site and its nearest neighbours) to estimate the area available for cultivation per site. The mean area around each site of the full set of survey sites within the Antiochene would be 593.4 hectares. Consider however that even within this one hour limit, the polygons on the outer edge and bordering the lake are significantly larger than the whole (at a mean value of 1705.3 hectares and making up 89% of the polygons over 1400 hectares). Without the outer areas, the mean area surrounding each site is 410.2 ha. In reality, this would still be on the high side, considering that the recovery rate of lowland sites is limited. Even so, Tate assigned similar sized areas to the villages he studied.[829]

As was to be expected from the heatmaps as well, for the earlier Roman centuries overall coverage drops to a number of disconnected chains of sites and a few solitary isolated villages. Here coverage of the landscape is only contiguous at 1 hour travel distances, and that is disregarding the sites in the southern Jebel Zawiye. At 15 minutes, only 70,152 hectares lie within reach of a site, and at 20 minutes 106,329 hectares. However, the gaps in the Amuq valley are smaller, as a higher number of small sites dotted the landscape. This suggests that while expansion took place during the later Roman period further into the marginal lands of the jebels, gaps were filled in between older settlements and were brought under cultivation, whereas areas closer to the capital were consolidated, with smaller farms disappearing in favour of the growth of villages such as Imma and Gindaros. De Giorgi highlights this as well, indicating that by the fourth century only 47% of the AVRP sites were in use (versus 72% between the first and third centuries). His suggestions are that in the first place, partly as a result of unsustainable agriculture in the highlands, increased upland erosion and runoff caused the growth of the lake

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[828] John Bintliff, *Testing the Hinterland: The Work of the Boeotia Survey (1989-1991) in the Southern Approaches to the City of Thespiai*, McDonald Institute Monographs. 226579549 (Cambridge: McDonald Institute for Archaeological Research, University of Cambridge, 2007).

[829] Tate, *Les campagnes de la Syrie du Nord du IIe au VIIe siècle*, 315; Cf. Dimitri Van Limbergen, 'Figuring out the Balance between Intra-Regional Consumption and Extra-Regional Export of Wine and Olive Oil in Late Antique Northern Syria. In Olive Oil and Wine Production in Eastern Mediterranean in Antiquity (2015), 169-189', in *Olive Oil and Wine Production in Eastern Mediterranean during Antiquity*, ed. Adnan Diler, Kaan Senol, and Ümit Aydinoglu (Izmir, 2015), 178–80, https://www.academia.edu/12218423/Figuring_out_the_balance_between_intra_regional_consumption_a nd_extra_regional_export_of_wine_and_olive_oil_in_late_antique_northern_Syria_In_Olive_Oil_and_Wine_Pr oduction_in_Eastern_Mediterranean_in_Antiquity_2015_169_189.

and wetlands around the Kara Su and Afrin, and coupled with severe flooding of these rivers as well as the Orontes caused diminishing returns in the plain. As such, moving into the highlands would be one of the few viable alternatives. Secondly, that the larger centres started to behave rather more as competitive centres towards Antioch, instead of the more dependent role they would have played throughout the Principate. Thirdly, there may have been an increase in private ownership of villages and larger estates in the hands of wealthy urban elites, pushing away smaller independent farmers. Nonetheless, De Giorgi states that this third issue was likely to have been less prominent than suggested by earlier scholars such as Weulersse and Liebeschuetz – who still thought the landscape of Antioch to have been almost entirely devoid of settlement.[830]

4.2.3 Erosion, soil degradation and longer term settlement patterns

When it comes to environmental effects, it should be noted however, that while De Giorgi is likely correct about the erosive effects of upland agriculture, the period when this took place is less certain.[831] Upland deforestation seems to have already taken place since the Bronze Age, but Casana states that at least for the Jebel al Aqra any activity there did not have a significant impact on erosion of the hillslopes.[832] In comparison, Bronze Age deforestation and overgrazing in southern Jordan (as well as the wider Near East) may serve as an example of where irreversible impact on the environment did already take place that early, with desertification following on vulnerable steppe areas being stripped of land-cover.[833]

Even with increased settlement from the later Hellenistic period onwards in the Syrian Jebels, increased erosion did not start to take place until after the mid second century, and peaked only after the fourth century. Several alluvial fans around the Amuq plains likely formed in the Late- or post-Roman period, as these cover Late Roman soils, up to the 6th century.[834] Casana's idea is that while increased agriculture in the highlands created the preconditions for soil degradation, this only happened in several short periods of severe erosion, as the result of extreme rainfall events. As such, it may serve better as an explanation for the severe decrease in settlement around 700 C.E., with the Late Roman settlement expansion as a cause rather than a result of

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[830] Andrea U De Giorgi, *Ancient Antioch: From the Seleucid Era to the Islamic Conquest* (Cambridge: Cambridge University Press, 2016), 89–90.

[831] Gerritsen et al., 'Settlement and Landscape Transformations in the Amuq Valley, Hatay', 263.

[832] Casana, 'Geoarchaeology and Geomorphology: Soils, Sediments, and Societies', 435, 439.

[833] Naomi Frances Miller, 'The Macrobotanical Evidence for Vegetation in the Near East, c. 18 000/16 000 B.C to 4 000 B.C.', *Paléorient* 23, no. 2 (1997): 197–207, https://doi.org/10.3406/paleo.1997.4661; Patricia Fall, Steven Falconer, and Lee Lines, 'Agricultural Intensification and the Secondary Products Revolution Along the Jordan Rift', *Human Ecology* 30 (1 December 2002): 445–82, https://doi.org/10.1023/A:1021193922860.

[834] Casana, 'From Alalakh to Antioch', 73–77.

environmental change.[835] In his section on the geomorphology of the valley, Tony Wilkinson also indicates that the large areas of marshland stretching northeast from the lake mainly formed after the Late Roman period, from the discharge of water of the northern Afrin canal.[836] Furthermore, a recent core taken from the former lake also suggests that the greatest change in the Orontes watershed took place around the change into the Islamic period, which the authors link to the removal of soil in the jebels.[837]

It is of course quite possible that De Giorgi is right in stating that this process was already underway and affecting the settlement pattern throughout the Later Roman period. On the other hand, some of the contraction in smaller settlements must have already taken place during the Roman period itself, as a number of these sites show no Late Roman evidence at all. It also doesn't take away the fact that there already was some growth of the lake and the marshland even before the Late Roman period, especially considering the lake had only formed between the 7th and 4th centuries B.C.E., and some sites certainly did disappear as a result.[838] A good example comes from AS 187, Hisarlik Tepesi, which seems to have been abandoned after the second century and may have been entirely submerged.[839] Other, earlier sites (AS 74, 180 and 181) around the south-eastern shore of the lake suffered the same fate already by the first century B.C.E..[840]

4.2.4   Wider regional context

From other studies we can gain some insight into the development of non-urban settlements as well. Especially Dan Lawrence's thesis on early urbanism in the Levant and his subsequent publications, give a valuable overview of long term settlement dynamics based on a number of regional surveys. While his main focus lies on the fifth to third millennium B.C.E., he also shows developments in settlement density, built area and new foundations into the Classical era. He highlights a very strong overall settlement expansion from the Hellenistic period in western Syria (within the confines of the AVRP and Homs surveys), especially compared to the far more moderate fluctuations in the Jazira and Middle Euphrates regions. Focussing down to sites over and under 5 hectares, he shows that there was relative stability in small site density. Up to the Classical expansion in the west, small site densities were also quite similar in the three regions.

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[835] Casana, 'Geoarchaeology and Geomorphology: Soils, Sediments, and Societies', 436–349.

[836] K. Aslıhan Yener et al., 'The Amuq Valley Regional Project, 1995-1998', *American Journal of Archaeology* 104, no. 2 (1 April 2000): 177, https://doi.org/10.2307/507449.

[837] Meriam et al., 'Soil Erosion in Relation to Land-Use Changes in the Sediments of Amik Lake near Antioch Antique City during the Last 4 Kyr'.

[838] Casana, 'From Alalakh to Antioch', 67.

[839] Gerritsen et al., 'Settlement and Landscape Transformations in the Amuq Valley, Hatay', 269 note 27.

[840] Gerritsen et al., 251.

The greatest changes took place in the density of large sites: the Jazira dominated in the third and second millennia, in stark contrast to its low density in the Classical period.[841]

Based primarily on 9 surveys connected to the Fertile Crescent Project, the actual area covered by his PhD-study is inevitably limited, even though he does compare where he can with neighbouring studies. Where even between the FCP surveys themselves differences in methodology already pose difficulties for comparison, this is even more true for comparisons with other surveys. As such, it is not possible to create a quantitative analysis of all surveyed places in the northern Levant.[842] For specifically the Roman period, surveyed areas that offer detailed information on the settlement patterns of such smaller sites are even more constrained.

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[841] Dan Lawrence, 'Early Urbanism in the Northern Fertile Crescent: A Comparison of Regional Settlement Trajectories and Millennial Landscape Change' (Doctoral, Durham University, 2012), 302–5, http://etheses.dur.ac.uk/5921/.
[842] Lawrence, 162, 243, 276, 280.

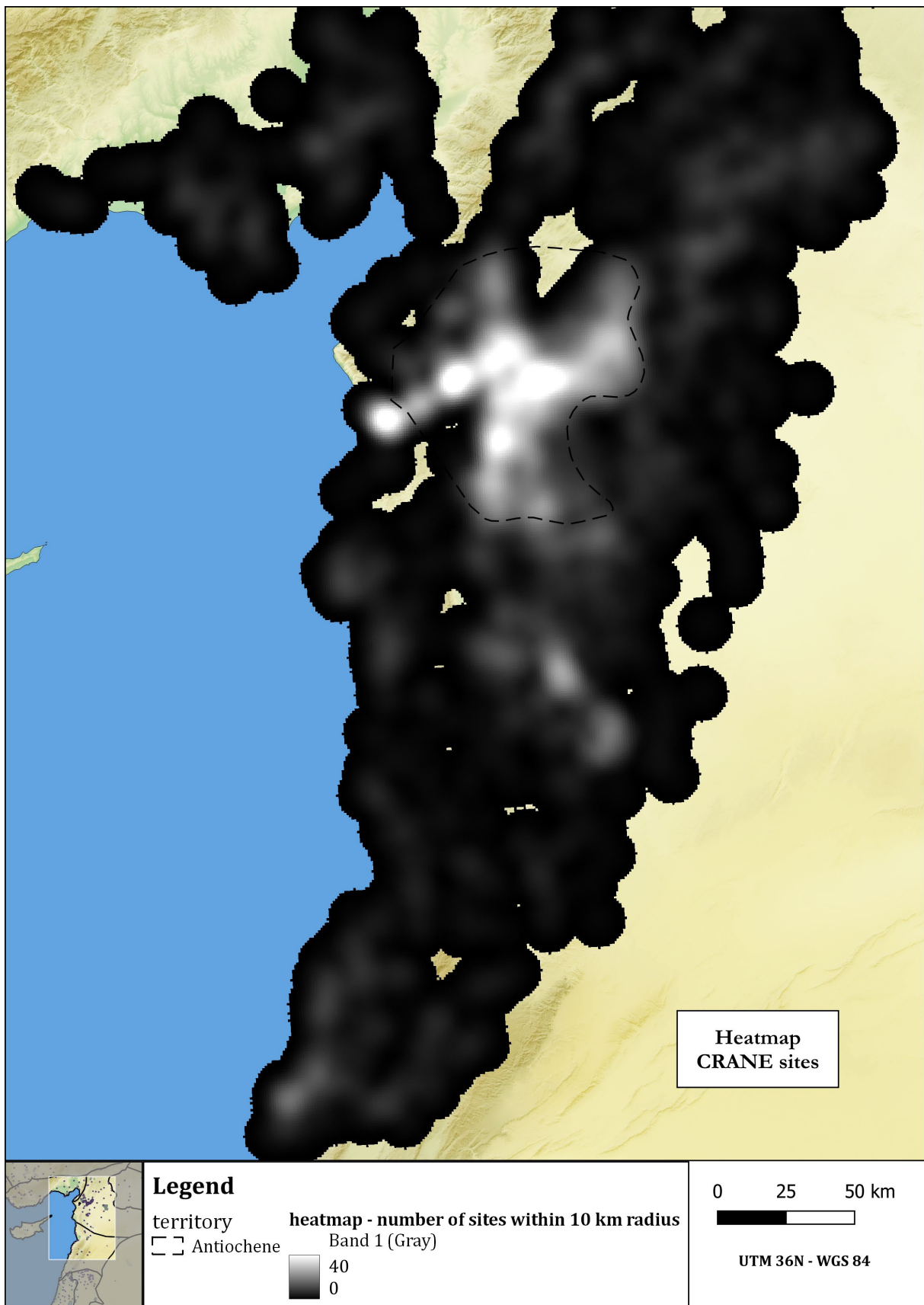The CRANE (Computational Research on the Ancient Near East) dataset from the University of

Figure 60 Heatmap of Antiochene surveys combined with CRANE dataset

Toronto contains settlement data for surveys undertaken throughout the regions adjoining the Antiochene as well.[843] A limited extract of the dataset is open to the public, containing site names, ID's and the source survey the data originated from. Again, many of these surveys offer only limited data on the Roman period. Figure 60 shows a heatmap based on all settlements in the study area from the AVRP and Tchalenko surveys, without regard for the date of their existence, combined with the sections of the CRANE dataset falling outside the study-area. It indicates the number of settlements within a 10 kilometre radius of each cell. The heatmap clearly shows that the Antiochene region stands out with overall densities in a 10 km radius of well over 25 settlements (0.32 sites per square kilometre) – in fact peaking at twice that number in the Jebel Barisha, around Bamuqqa, and in the foothills of the Jebel al Aqra. This means that the data from this region cannot be considered as indicative for the wider northern Levant without further consideration. It is quite possible that it is merely a reflection of survey intensity, and that similar site densities should be expected throughout the wider region – of course taking environmental conditions into account. The small dense cluster in the region around Larissa could be seen as an argument for this, as it is the only area that offers a similar cluster of 0.3 sites per square kilometre. Here a recent intensive survey was undertaken by Karin Bartl and Michel al-Maqdissi, showing a research methodology far closer to that of the AVRP than for instance Matthers' extensive surveys around tell Rifa'at. Here only visible tell sites were studied in the vicinity of the river Qoueik, albeit 88 of them.[844] Of course, the same is true for Tchalenko's survey, with nonetheless vastly different densities.

As noted, this takes all sites into account, without regard for dating. Even within the Antiochene, the ratio of sites showing Roman period material differs a lot: while for the AVRP data 205 of the 287 sites were occupied in the Roman period,[845] the vast majority of the sites in the Limestone Massif were only inhabited in later centuries. As such, one cannot expect similar densities to that of the Amuq valley in the wider region. To give another example, in the Qoueik survey, of the 88

[843] Timothy P. Harrison, 'Computational Research on the Ancient Near East (CRANE): Large-Scale Data Integration and Analysis in Near Eastern Archaeology', *Levant* 52, no. 1–2 (3 May 2020): 1–4, https://doi.org/10.1080/00758914.2018.1492784; Stephen Batiuk and Lynn Welton, 'The Computational Research on the Ancient near East (CRANE) Project: Archaeological Data Integration, Simulation and Data Mining', accessed 12 July 2022, https://www.academia.edu/35266878/The_Computational_Research_on_the_Ancient_near_East_CRANE_Project_Archaeological_Data_Integration_Simulation_and_Data_Mining; 'The CRANE Project', accessed 12 July 2022, https://crane.utoronto.ca/.
[844] John Matthers, 'Tell Rifa'at 1977: Preliminary Report of an Archaeological Survey', *Iraq* 40, no. 2 (1978): 119–62, https://doi.org/10.2307/4200095; John Matthers and Dominique P. M. Collon, *The River Qoueiq, Northern Syria, and Its Catchment: Studies Arising from the Tell Rifa'at Survey 1977-1979*, BAR International Series (Oxford: BAR, 1981), 11–21; Matthers and Collon, fig. 201; Or more precisely, 88 sites, of which only 68 turned out to be tells. See Paolo Matthiae and Nicolò Marchetti, *Ebla and Its Landscape: Early State Formation in the Ancient Near East* (Walnut Creek, Calif.: Left Coast, 2013), 251–54.
[845] Gerritsen et al., 'Settlement and Landscape Transformations in the Amuq Valley, Hatay', 252.

sites, only 20 showed evidence of Late Roman fine ware, 9 of which also contained early Roman material.[846]

4.2.5   Potential cereal productivity of territory

Settlement name	Settlement size	regional population to be fed	1 person/ha surplus	FAO surplus	FAO halved surplus
Antioch	500.0	375,000	-347,823	-314,286	-344,643
Eš Šeiḫ Sleimān	7.5	5,625	32,766	126,841	60,608
Imma	3.0	2,250	7,451	29,985	13,867
Khirbet al-Tahoun	4.5	3,375	11,376	25,203	10,914
Gephyra	8.0	6,000	30,262	56,950	25,475
Meleagrum	15.0	11,250	19,120	55,686	22,218
Ad Dana		-	22,267	75,544	37,397
Mogiza	3.0	2,250	28,933	135,231	66,491
Esen Tepe	9.8	7,350	12,862	36,712	14,681
Daphne		-	28,961	80,718	39,984
Tell Sultan	9.0	6,750	6,395	21,328	7,289
Pagrae	4.5	3,375	26,759	55,977	26,301
Derkoush	7.0	5,250	35,143	104,618	49,684
Gindaros	15.0	11,250	29,713	110,001	49,376
AS254	7.5	5,625	14,671	29,974	12,175
Jebel Sheikh Barakat	3.3	2,475	12,826	38,821	18,173
Bāqirḥā	2.4	1,800	9,502	32,175	15,187
Ruweiha *	8	6,000	21,075	76,709	35,354
	597.5	**455,625**	**2,259**	**778,187**	**160,531**

Table 16 Antiochene secondary settlement surplus production (* Ruweiha production has been halved, as half its calculated territory would fall in the Apamene)

By taking the potential surplus of the 18 market zones that would fall within the Antiochene (Table 16), following the surplus calculations used in

Applying carrying capacity (page 213 and onwards, thus including consumption by both urban and rural population), it is immediately clear that the Antiochene comes far closer to a self-sustaining productive unit, with a small surplus in the 1 person per hectare scenario, and considerable surpluses when considering the FAO figures, which reflect the fertility and rainfall levels of the Antiochene lowlands. Even if we halve the FAO figures – as it is very unlikely that all available land would be used for cultivation.

Of course, part of the surplus would go to the populations of Ad Dana and Daphne, with especially the latter likely still having a considerable population. Furthermore, as shown above,

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[846] Matthers and Collon, *The River Qoueiq, Northern Syria, and Its Catchment*, 439–40.

the actual area within 15 to 20 minute farming distance of sites with clear evidence for existence in the first to third century is considerably smaller. Additionally, in the jebels there's another 55,300 ha of rough terrain, and a further 146,500 in the Antiochene as a whole (albeit almost entirely in the unsurveyed areas).

On the other hand, a 20% urbanisation rate seems unlikely just for the market radius of Antioch itself. Having 82% of the population of the entire Antiochene living just within the direct market zone of Antioch itself, as the table above suggests, is perhaps unlikely. It would give too many hands to work far too little land. On the other hand, it does show that even with a far larger urban population than suggested in this chapter, and limited agricultural activity directly around the city, the wider territory as a whole could in fact support the city.

For the greater Antiochene a total population gravitating towards half a million is far more conceivable. As indicated in 4.1.1, we even set an upper limit of around 600,000. Even then, the FAO figures, whether halved or not, would allow for a population that size. And while we lack evidence, considering how the larger Late Antique villages of the Limestone Massifs grew around older settlements, we should also expect an earlier rural presence around Deir Mishmish in the north and especially Seremyn in the south of the Antiochene – where continued post-Roman habitation and agriculture resulted in a limited archaeological landscape. The additional villages would potentially fill in the gaps seen in Figure 58, therefore also increasing the 'land under cultivation' for the purpose of this calculation.

4.3   Conclusion

As seen above, in the case of Antioch we can get a closer look at probable population figures and the interplay between city and territory. Antioch did indeed have a considerable population for a city of its period, even when making a cautious estimate between 110,000 and 135,000 inhabitants. And the countryside around it would have been a thriving, densely populated region, even if we expect a lower figure than the (not so cautious) estimate of 600,000 people in total, minus the urban population of course. In comparison, we find that the population densities we consider for Antioch compare realistically to those of Ottoman-era cities in the region. The exceptionally high Ottoman urbanisation rates may both reflect a larger portion of agricultural workers living in cities, as well as under-registration of the rural population. But it certainly shows that a 20% urbanisation rate is not set in stone.

Furthermore, we know that the major part of the territory lay at considerable distance from the city, certainly more than the 3 hour market zone defined in 3.2.1.3. As stated in the introduction, one would expect some form of central places for a variety of services, at the very least for local markets, at shorter distances. Indeed, there were a number of larger villages and towns

throughout the territory of Antioch that could very well fit this role. Some are also known from various sources to have indeed performed urban-like functions, such as Daphne, Gephyra, Imma and Gindaros. Barring some gaps, we find that if we generate similar market zones around these settlements as we did around Antioch itself, most of the territory would be within easy reach of these secondary agglomerations.

Theoretically, the Antiochene hinterland would be able to sustain both the metropolis and a rural population as large as suggested above. Naturally, this comes with a great many caveats. A number of these were discussed in Chapter 3: in the first place, actual land use would be quite different from 100% cereal cultivation. Especially in the Massif Calcaire, we know that there was mixed agriculture, with wine cultivation, olive oil production and animal husbandry. While there is discussion on the main crop being cultivated, Dimitri van Limbergen makes a solid case for a strong focus on olive cultivation. Also taking a look at Andrea Zerbini's thesis on Levantine agricultural economy, his detailed study of Dehes shows how at least for the later Roman period, over half the available land of the village would have been dedicated to wine and oil cultivation, suggesting a vast overproduction compared to possible local consumption. Essentially, cultivation was strongly focussed on production for the market, rather than self-sustainability. He argues, in fact that this is a sensible approach to overcome poor harvests due to the highly variable rainfall in the uplands.[847]

So too would diets consist of more than just grain consumption, and other sources of food would be available as well (as for instance, fish from the lake of Antioch or brought upriver from the sea, meat, vegetables from the gardens around Antioch, etc.). As mentioned in 3.2.2, this does not necessarily mean that the land would fulfil less of the caloric demands of the population. Depending on local suitability for alternative crops or land use, carrying capacity could also be higher than when planting (and eating) wheat. Additionally, population pressure and (over)intensive land use could result in a number of ecological issues, as indicated in 4.2.3., causing diminishing returns over time. For the Antiochene, some of these effects would already have been noticeable in the first to third centuries, but would mostly start taking their toll in later periods.

In practice then, it is apparent that the Antiochene population could live off the produce of its territory, and probably did so for the bulk of its food. There is then no solid basis for the argument by Hopkins we mentioned in the introduction, that there was a structural *need* for

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[847] Zerbini, 'Society and Economy in Marginal Zones: A Study of the Levantine Agricultural Economy (1st-8th c. AD)', 175–98; See also Limbergen, 'Figuring out the Balance between Intra-Regional Consumption and Extra-Regional Export of Wine and Olive Oil in Late Antique Northern Syria. In Olive Oil and Wine Production in Eastern Mediterranean in Antiquity (2015), 169-189', who instead rather suggests a focus on oil.

food imports and therefore, a need for large amounts of income through trade. Even so, we should still expect that at least some part of Antioch's food supply came from outside her proper territory through the market, either supplementing primary production or alleviating shortages when harvests failed. As also indicated in 3.2.4, a good number of Syrian exports throughout the empire could be sourced to Antioch. Of all settlements discussed, certainly Antioch would have been integrated enough into a wider market. Clearly it did produce goods for export, so that it might have been capable to structurally complement her food supply. It should nonetheless be stressed that there is no literary evidence for this, except for the incidental purchase of grain in crisis situations.