V.A.Rybalko. ILLUSTRATIVE MODELS OF STRATEGIES FOR REGULATING THE NUMBER OF STRAY DOGS. IRREVERSIBLE CAPTURE AND CNVR.

The work was written jointly with the participants of the forum of the Movement "Realistic Animal Protection"

Introduction.

The number of stray dogs in settlements is directly dependent on human activity. Two groups of factors can be distinguished:

1. Untargeted influence is a human activity that does not have the purpose of somehow intentionally affecting stray dogs. These are, first of all, the habitat conditions that determine the number and distribution of: a) hideouts, b) food resources extracted by dogs independently (territorially determined food resource - garbage from trash containers, etc.), c) the frequency of meetings with a person (anxiety factor). It is well known that the population density of stray dogs varies markedly depending on whether the dogs live in a multi-storey block, or in a "private sector" area, or in a vacant lot near the market, or in a forest park or, finally, in an industrial zone with many "fence" areas and landfills.

Adjacent to the same group is the unfocused replenishment of stray dogs subpopulation during the ejection and loss of owner dogs.

2. Targeted exposure – an activity directly intentionally directed at stray dogs. Two areas can be distinguished here:

2.1. actions to reduce the number - in fact, usually attempts by the municipality to regulate the number of dogs by one method or another, and in the absence and failure of such - the activities of the citizens themselves in crisis situations (usually the so-called lynchings, or neutering of street dogs by guardians "at their own expense"). These are the very "regulatory strategies" whose effect we will try to simulate.

2.2. Actions on population growth (although they are usually not recognized as such) are the usual feeding of dogs by permanent guardians or random passers-by (a socially determined food resource). The growth of the food resource is usually accompanied by an increase in the population of animals that consume this resource.

Since the changes in factors from the first group require considerable time and effort, they can be recognized as constant for the purposes of our modeling. They define the "background," the "stage" on which the drama of homelessness is played out. Actually, in real life it is so – the appearance of cities changes slowly, changes in garbage collection and collection systems require many years, as well as an increase in the culture of attitudes towards pets.

In the shorter term, changes in numbers are mainly influenced by factors of the second group. Indeed, in Russia it happens that in one city large packs run through the streets, in another - rare loners. Although the cities differ little, the difference is often determined only by the presence of regular trapping in the second city.

It should be noted right away that the influence of the first group is extremely large, and they also need to be influenced within the framework of a balanced integrated approach to

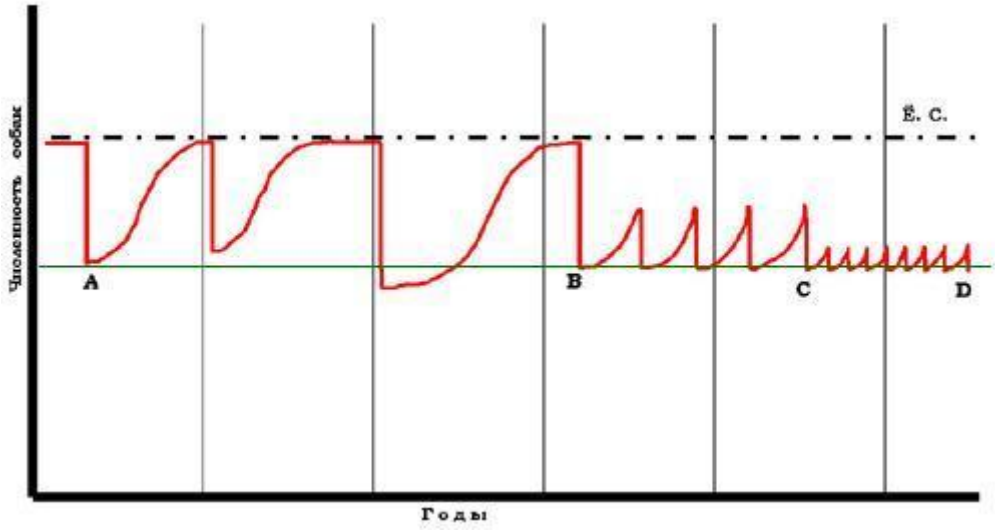
solving the problem of stray dogs. First of all, it is necessary to work in the field of avoiding the throwing away animals, combating overproduction, combating self-walking and subsequent wildness of dogs in villages and small towns, etc. But this will not give the desired effect if powerful short-term factors – namely regulation – do not "work" correctly. A dense subpopulation of stray dogs is able to rely on the resources that it itself brings to life! – therefore, it becomes relatively insensitive to throwing away owner animals (self-healing due to reproduction of its own females), or to the closure of containers with garbage (it switches to begging and the care of guardians). Moreover, it also negatively affects our attempts to combat the same throwing away (after all, discarded mongrel dogs are easily lost among the homeless; the market for mongrel animals, already so narrow, is oversaturated with stray puppies taken from the streets, which exacerbates overproduction; self-walking flourishes, etc.). Thus, parallel work on two groups of factors is very important, with a very clear understanding of the importance of actively intervening in the subpopulation of the homeless in the form of a properly selected regulatory strategy.

Graphs and explanations.

Especially for clarity, the following drawings-schemes are proposed, in a simplified form representing how the number of stray dogs changes with different approaches (strategies) to their regulation. As a model, a conditional section of the urban area inhabited by a group of dogs is chosen - such a number that can be covered by one catch action. The E.C. line is the level of supporting capacity of the medium, the maximum possible number of adult dogs that can feed on the site. It is set both by environmental conditions (random hideouts, territorially determined food resources) and by socially determined food resources, and sometimes by the creation of special shelters ("guardians' kennels").

The number of dogs is reproduced by both: a) the reproduction of dogs (the intensity of this process depends on the density of subpopulation and determines the dynamics of recovery), and: b) due to migration - which includes the ejection of animals - the intensity of this process does not directly depend on the density of subpopulation and in our model remains constant.

In the models presented below, the main influence on recovery is self-reproduction (as in reality - with a high number, close to the supporting capacity of the medium). With a low number, a significant role begins to play replenishment at the expense of former owner animals.

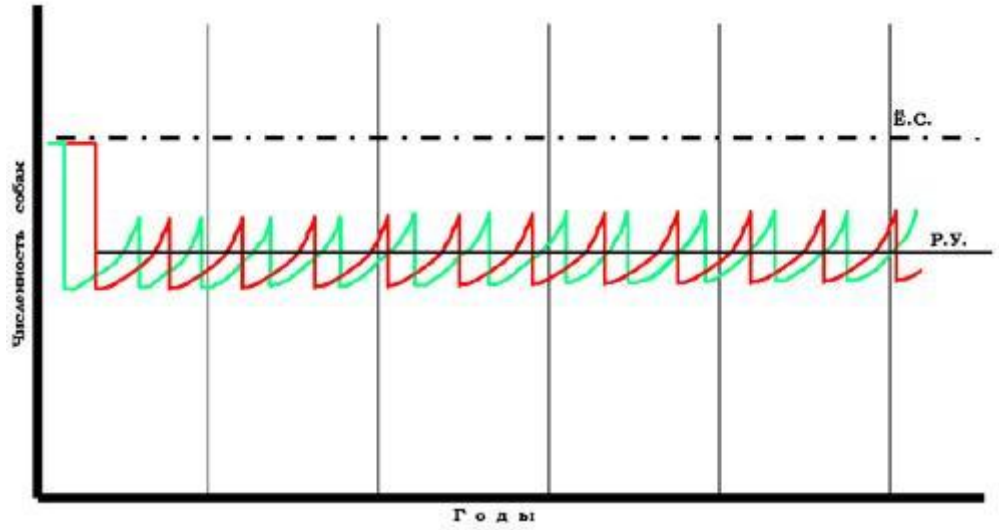


Pic. 1. The impact on the number of dogs of irreversible capture of different periodicities, but limited to approximately the same "limit of availability" (depicted by the green line). A certain proportion of dogs always remain outside the capture - for example, more cautious dogs fleeing in wastelands, or hiding in closed areas of enterprises - the trapping service does not seek to cover the entire territory of the conditional site). This proportion is a constant value, and the number does not fall below this value (i.e. the "limit of availability"). Period A - B corresponds to the scenario of "catching with full recovery of the number". Trappings follow with a frequency of about once a year. During this time, the number of adult dogs has time to recover from the "limit of availability" of capture to the highest possible level (to the level of the supporting capacity of the medium). Note that the rate of population growth at the beginning of the recovery period is lower than in the middle – this is due to the relatively small proportion of adolescents in the dense subpopulation before capture – namely, adolescents make up the reserve for immediate recovery during self-reproduction. Then, due to the higher survival rate of the young in the sparse subpopulation after capture, the recovery rate increases. As you approach the level of supporting capacity, the speed slows down again - there are fewer and fewer resources for young animals.

The B-C period corresponds to the scenario of "catching with incomplete recovery of the population". The population does not have time to recover to the supporting tank for the simple reason that trapping is carried out about twice as often as it was before.

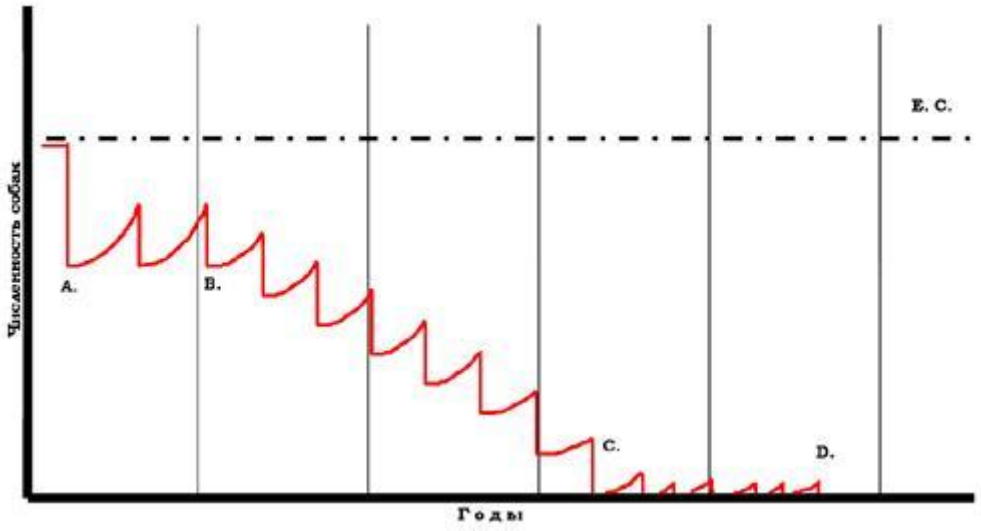
The C-D period also corresponds to the scenario of "with incomplete recovery of population" but with even more frequent trapping.

Obviously, the average number of dogs in the site is less the more often captures occur. With their frequency, it approaches the number of dogs that always remain outside the capture (limit of availability). Accordingly, the number of dogs seized at each capture event is not the same, and depends on the frequency of capture (the more often, the smaller it is).



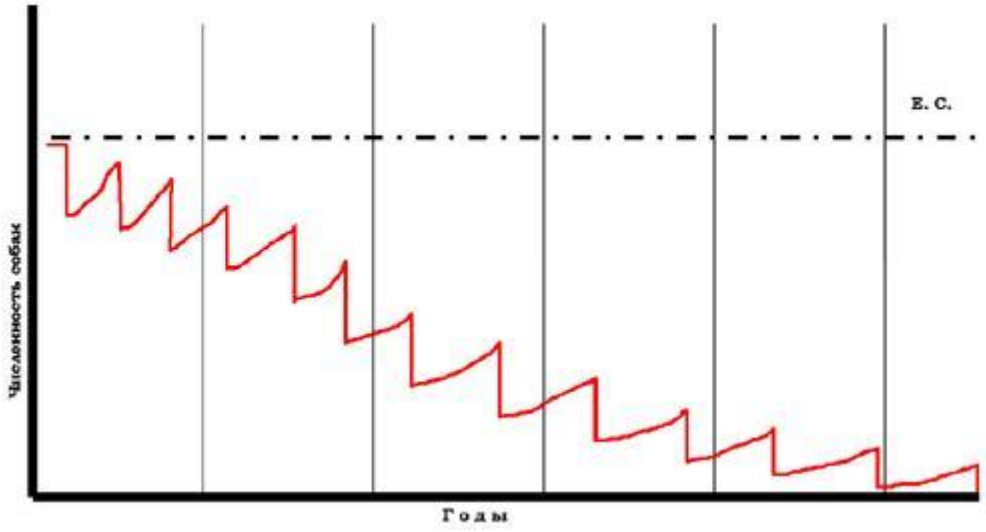
Pic. 2. A graph showing the dynamics of the number of dogs in two areas (on one - it is shown in red, on the other - in green). Trapping occurs not simultaneously, but with the same period (about three times a year). The "availability limit" for both sites is the same (the figure does not show it, it corresponds to the minimum number of both lines).

The P.Y. line is the "equilibrium level" – the average long-term number of dogs at two sites (as well as throughout the city, if catches at other sites occur with the same intensity). Thus, this is a clear demonstration of the long-term impact of the "partially effective" trapping common in Russian cities on the number of stray dogs in the settlement. The number of dogs remains below the maximum possible value, experiencing relatively small local fluctuations. Obviously, in order to increase the efficiency of trapping, it is necessary to overcome the "availability threshold".

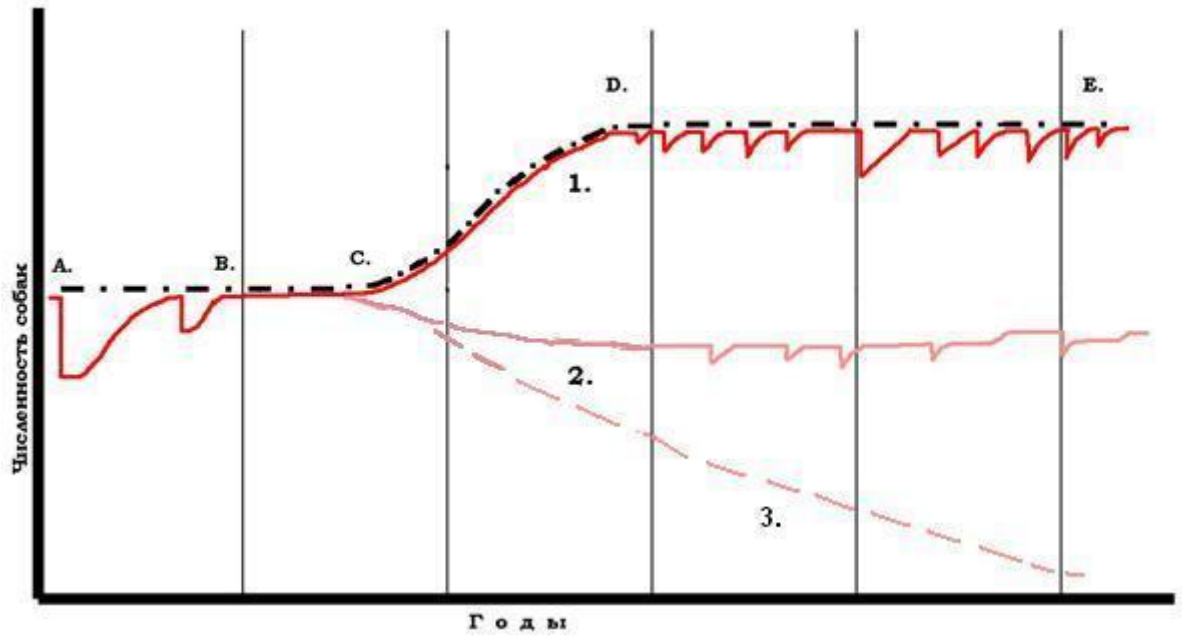


Pic. 3. Illustration of the action of long-term capture, for which almost all dogs in the model area become available (that is, the "limit of availability" is overcome), and at each capture event, a strictly defined number of dogs are caught (that is, the number of dogs seized does not depend on the frequency of capture, unlike the previous scenario). The A–B section corresponds to the capture shown in the first two graphs, which is limited by the "limit of availability". But starting from point B, at each subsequent capture, the same number of dogs is seized, while it obviously exceeds the number of animals that repopulate the site in the period between captures. Unlike the situation in the previous two illustrations, trapping begins to cover the "hidden" part of the subpopulation – that is, the availability threshold is no longer a hindrance. This can be achieved both by changing the method of trapping (for example, by switching to a shelter system, with the correct propaganda more popular among the population - dogs will be less hidden), and by increasing the professionalism and interest of catchers (the current Russian "spetstrans" and "special vehicle firms" consider trapping usually as an unnecessary burden, additions to the main activity of garbage collection - this changes when creating specialized enterprises for working with animals). A great effect will be given by the regulation of the maintenance of dogs in the territories of enterprises, which are now often the focus of the lion's share of the "hidden mass" of dogs beyond the threshold of availability of capture.

It is clearly visible that with the continuation of such trappings, the number of stray dogs (in this model) in about three years will decrease to zero (in the region of the C point). Then, when new stray animals appear on the site, periodic captures almost immediately remove them (segment C - D).



Pic. 4. The same scenario is shown as in the previous figure (no "availability threshold"), but with an adjustment (bringing the model closer to real life), taking into account the smaller reproduction potential of the declining subpopulation. After each new catch, the recovery of the number is slower. This is due to the fact that an increasingly decreasing number of females are not able to maintain a constant saturation of subpopulation with young animals, subpopulations are increasingly "relying" on discarded animals, the influx of which is usually less intense than in self-reproduction. At the same time, the number of dogs caught may gradually decrease - the number will still fall. This is a scenario that has been gradually implemented in developed countries (for example, in the USA, where a few decades ago stray dogs were quite numerous in the cities of the east of the country (data from A. Beck).



Pic. 5. For comparison, the scenarios of population changes when using CNVR are given. Line A - B corresponds to irreversible capture of varying intensity. At point B, trapping stopped and "neutering with return" began. Depending on the conditions (both the features of the subpopulation itself and the intensity of the CNVR campaign), two scenarios are possible. The

first (indicated by the number 1) is an example of a typical "failed CNVR", in which the proportion of sterilized females necessary for a successful result is not achieved. After the cessation of trapping for a relatively short period (B - C), the number stabilizes. Then begins the process (representing a unique feature of the urban ecosystem) of increasing the level of supporting capacity of the environment, primarily by increasing the food base. This is the result of the growth of dog feeding by part of the population (according to the principle "the more dogs, the more food is brought"). A "socially dependent" food resource is growing. Following it, the number also grows - thereby again spurring feeding. This process is reflected in segments C through D. But this interdependent growth in resources and numbers is not infinite. Feeding resources are being depleted – but, most importantly, other processes are beginning to play an increasingly significant role. This can be an increased mortality of young animals from infectious diseases, and competition for resources among adults. But usually in the city, another factor is more important. The number overcomes the "threshold of conflict", after which lynchings by the population begin, semi-legal and illegal trapping, etc. They - often in interaction with other adverse factors, such as an increase in the number of infectious diseases - lead to a relative stabilization of the number of dogs. After that, the food base also stops growing - because new dogs that need to be fed do not appear. The number fluctuates, then decreasing after another lynching, then recovering again (segment D - E).

Scenario 2 is "successful CNVR". The "threshold of efficiency" of 70 to 80 percent of neutered females is overcome. A gradual decline in numbers to a new equilibrium level of "stable population" (CNVR proponents' term) follows. Further decline is difficult due to the fact that some dogs are slipping away from neutering (also the population is replenished with discarded owner dogs). In contrast to the strategy of irreversible capture, in the case of CNVR, it is very difficult to quickly remove and neuter such dogs, since they "dissolve" in the already existing stray population - they need to be "searched for" in it. With irreversible capture, the need to separate dogs on the principle of "neutered or not" disappears, since all dogs are subject to capture.

Scenario 3 is the "ideal" of CNVR, which is nowhere to be achieved (according to available data, only the experiment of Dorothea Fritz on a closed factory territory in the city of Taranto in Italy, where the number of dogs has decreased by two thirds, and the experience of some small settlements, approaches it.)

In real urban conditions of a large settlement, such success is not shown.